CHILD DEVELOPMENTAL PSYCHOLOGY - TOPICAL APPROACH



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sabbatical

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Detailed Licensing

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This compilation

These modules have been compiled while on sabbatical from Pasadena City College 2022-23 academic year.

I have gone back and forth teaching developmental classes topically and chronologically. At this point in time, I think I have reached the optimal solution to this question - I teach lifespan chronologically since the time span we cover is so large. However, child development is a different deal. When I first started teaching, I thought it was easier for students to deal with developmental issues from a chronological perspective, and several publisher textbooks I used fit well into that model. However, I began to teach it topically about five years ago, and that made a lot of sense because the time span is much more contained, and theories can be taught well in that topical framework. I have enjoyed it so much I was looking to continue doing so in the foreseeable future, but there was no OER I could use to achieve this end. Hence this compilation...

I started primarily and fundamentally with the Paris, Ricardo and Rymond's Child Growth and Development book and pulled it apart into topics. I have revised many topics, added content to modules, and worked on the issues with a social justice lens in mind. For example, I added content about CRT to the theories module, and I made many grammatical voice changes to the prenatal development chapter in particular with the intent of reducing long-held heteronormative biases. I am extremely grateful to Paris, Ricardo and Rymond's strong foundation that I built upon using my own perspective and a justice lens. Needless to say, this compilation will all continue to remain a work in progress. I also spent some time thinking about which module certain pages fit better under. That is partly why I decided to start this project in canvas, so that I or anyone else who wishes to use this work, can easily move these pages into a different section and simply do what makes most sense to them. Now it can be remixed in Libretext.

In the meantime, I am very grateful for having the opportunity to do this work. Sabbatical is such a wonderful concept and I feel grateful to have been able to do this. For this, I am thankful to all my community at PCC who made it possible and supported me from conceptually sharing ideas about sabbatical applications to helping to move my application through the logistical trail, to supporting me during the compilation and writing. I would be remiss in not mentioning in particular my friend, colleague and chair extraordinaire - Julie Kiotas - who has been a champion of OER from the very beginning, and who is right now chair of psychology and chair of the OER committee. I could have done nothing without my family's support - my adult children - Varun, Mithra and Zerxes - who are social justice warriors and my moral compass, and my husband, Rayo, who is everything - a sounding board, a comfort, my strongest advocate and sane voice of reason. I am of course grateful for all the thoughtfulness and dedication in the spaces where I have operated most in the past few years - as a student, teacher and cohort member in the OFAR community, as a discipline lead for ASCCC OERI, as a volunteer in the Prison Education Project, and as division rep to C&I at PCC, and for all my amazing colleagues and students who have been a constant reminder of how important what we do is.

It has taken some courage and a bit of procrastination for me to put this into the commons, because I am not sure whether this is good enough to share out. The one thing that I was not able to do was to have someone else review this work. So any advice, help, suggestions, additions or ideas you have, I would be very grateful to receive at brbhadha@pasadena.edu.

CHAPTER OVERVIEW

1: What is Child Development

1.1: Principles of Development
1.2: Periods of Development
1.3: Issues in Development

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1.1: Principles of Development

The terms "growth" and "development" are often used interchangeably. Developmental psychology is the science of human and [other] animal behavior and mental processes as seen through the lens of the passage of time. As the individual organism ages, the behavior and mental processes that we are interested in as psychologists, also change.

There are several underlying principles of development to keep in mind: Development is --

Lifelong

Development is lifelong and change is apparent across the lifespan (although this text deals only with changes up to adolescence). And early experiences affect later development. For example, Tamashiro, Terrillon, Hyun, Koenig and Moran (2009) found that prenatal high fat diet or stress increases adult rat obesity and insulin resistance. Talk about a long term effect!

Multidirectional

Often when I use words like "grow" or "develop" I think of an increase in whatever realm I am talking about. However it is important to keep in mind that development is multidirectional. We show gains in some areas of development, while showing loss in other areas. Certainly, you could say that for something like self esteem, as an individual grows, our self esteem develops into more and more facets. A child may only think of themself as "good" or "bad," whereas an adolescent is more likely to say that they are not a great sibling, but a wonderful friend, and not that good at math but pretty good at social studies.

On the other hand, as we age, not everything increases. For instance, infants are born with certain innate reflexes like the stepping reflex. As they become more coordinated and pulling oneself up and standing and walking emerges as a child grows, those innate reflexes disappear (Story, 2018). Another example is that infants are born with more bones (about 270) than they end up with as adults (about 206)(Cowan and Kahai, 2022). For example, the skull is actually in five pieces at birth, to allow for some malleability as it moves down the vaginal canal during labor. These sutures fuse over during infancy into one skull covering the brain.

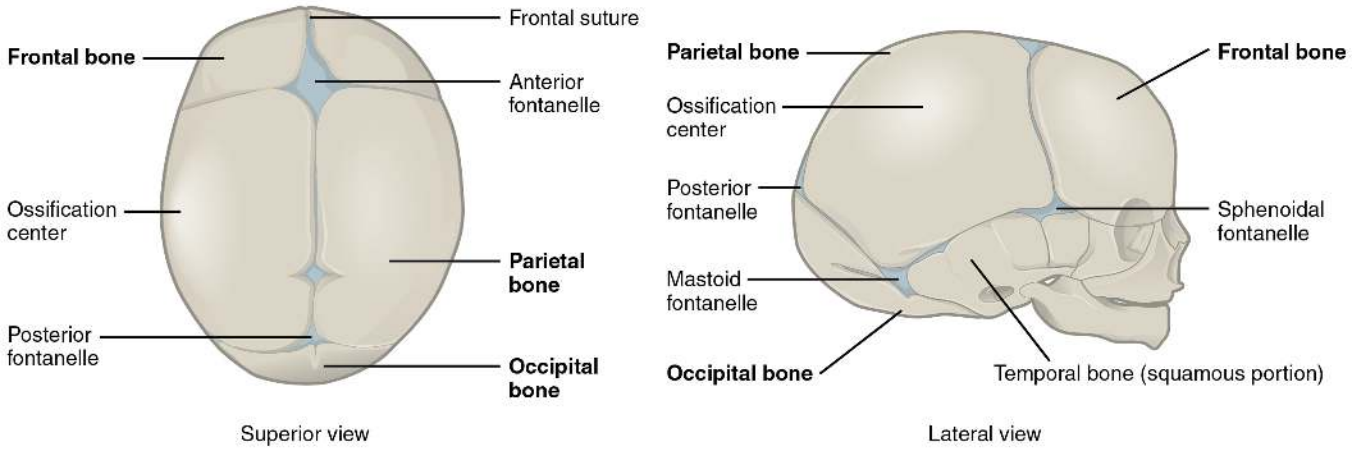


Figure **1.1.1**: Generally infants are born with five bones in their skull with sutures that fuse over making one skull by the end of infancy -- one of the things that leads to adults having fewer bones than newborns do. OpenStax College, CC BY 3.0 <https://creativecommons.org/licenses/by/3.0>, via Wikimedia Commons

Generally infants are born with five bones in their skull with sutures that fuse over making one skull by the end of infancy -- one of the things that leads to adults having fewer bones than newborns do. OpenStax College, CC BY 3.0 <https://creativecommons.org/licenses/by/3.0>, via Wikimedia Commons

Multidimensional

Development is multidimensional. We change across three general domains/dimensions: biological, cognitive, and socio-emotional, as we progress through life.

Biological

The biological domain refers to changes in body size, parts, and functions. As psychologists we are particularly interested in changes in brain development and neurological function. As Arduini points out, we are certainly familiar with the height and weight charts at pediatricians' offices, but it is the brain development that underlies the development of gross and fine motor skills and the coordination between emotion and planning (or lack thereof) in adolescence. Of course, there are also changes in health, resilience and susceptibility. The importance of nutrition and exercise cannot be understated (Arduini, 2022).

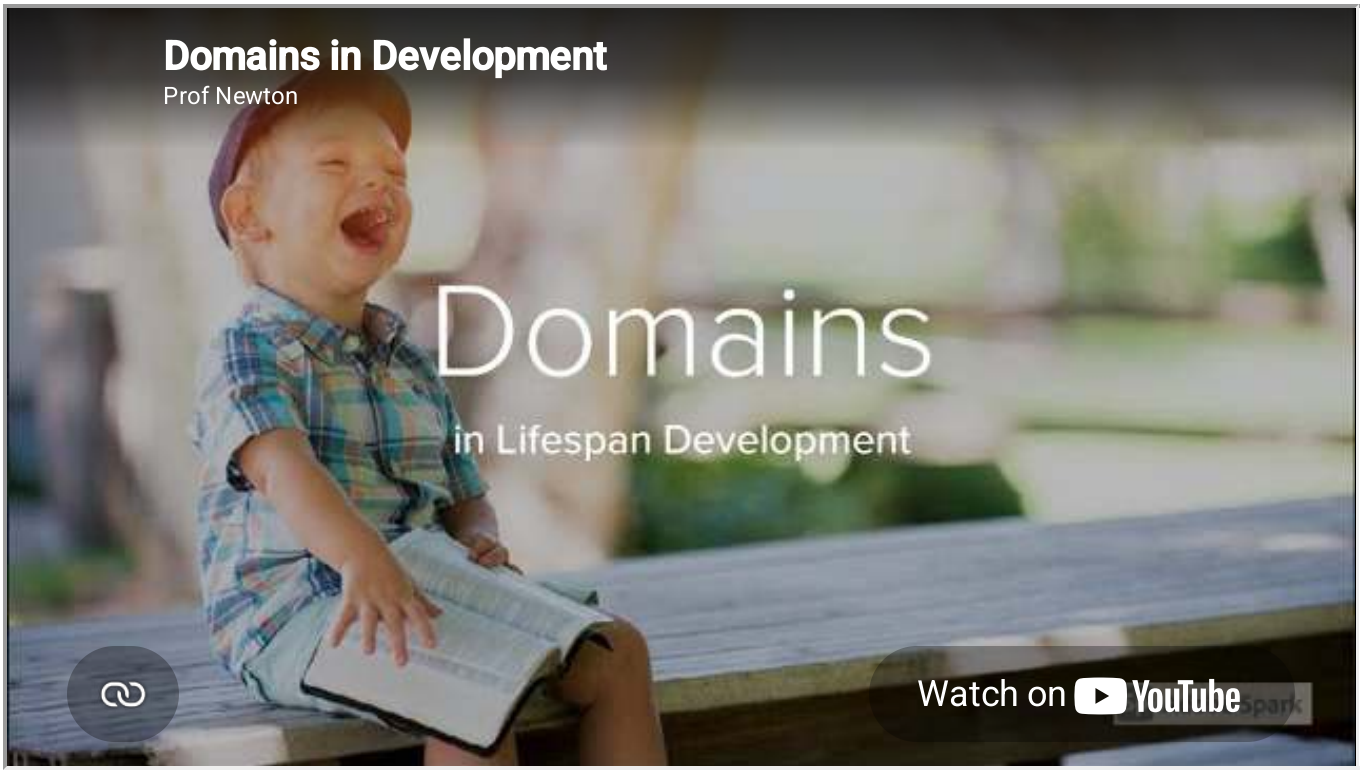
Cognitive

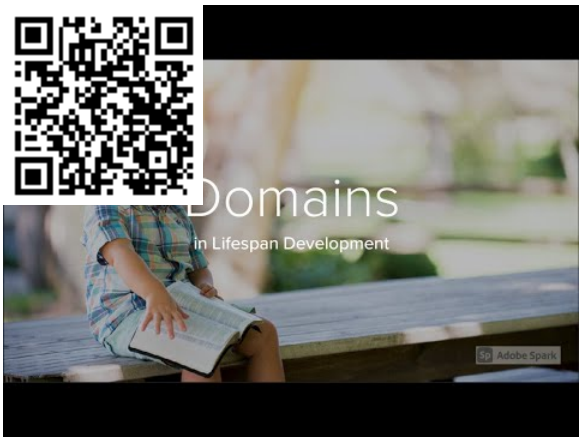
The cognitive domain refers to changes in thinking, problem solving, memory, attention, language and intelligence. All of these change with age as well as with experience, which of course varies widely even in the same city or geographical areas of the world. Most people are aware that brain development affects thinking, memory and problem solving, but they may not necessarily be fully aware of how circumstances can change the trajectory of this development in multiple ways.

Social/Emotional

The social and emotional domain (also referred to as psychosocial) refers to changes in emotions, self regulation, interpersonal relationships beginning with attachment to caregivers, identity development, self esteem and play. In the beginning, it is only one's close family or caregivers that comprise an infant's immediate social realm (of course larger social influences permeate). However, children's immediate social relationships bloom quickly as they enter school, engage with neighbors, friends, religious realms, parks and so on.

Of course, these domains do not develop independently but rather influence each other in multiple interconnected ways. For example, researchers historically viewed the development of moral decision making as a cognitive function. Now it is becoming increasingly clearer that emotions play an important role in moral decisions, and neuroscience has devoted research to examining which areas of the brain might be implicated in such decision making.





Characterized by Plasticity

Development is characterized by plasticity, which is our ability to change and that many of our characteristics are malleable. Young children's brains are particularly changeable (though there is more and more research showing that even older adults; brains remain plastic). While this might appear to be a disadvantage in terms of how easily children's brains can be affected, in fact it is pretty marvelous how this plasticity lends to resilience. For example, Mathern (2010) suggests that when children go through a hemispherectomy (an entire half of the brain is surgically removed) because of seizures, their cognitive abilities improve to the point where many eventually go to college or vocational school.

Multicontextual

Development is multicontextual.[1] Not only do our parents pass down their genes to us, but for the most part they also provide the family and home context within which we develop, and that home is located within a larger community – tribe, village or city – with different climate conditions, economic underpinnings, cultural values and political influences.

In Baltes' theory, the paradigm of contextualism refers to the idea that three systems of biological and environmental influences work together to influence development. Development occurs in context and varies from person to person, depending on factors such as a person's biology, family, school, church, profession, nationality, and ethnicity. Baltes identified three types of influences that operate throughout the life course: normative age-graded influences, normative history-graded influences, and non-normative influences. Baltes wrote that these three influences operate throughout the life course, their effects accumulate with time, and, as a dynamic package, they are responsible for how lives develop.

Normative age-graded influences

Normative age-graded influences are those biological and environmental factors that have a strong correlation with chronological age, such as puberty or menopause, or age-based social practices such as beginning school or entering retirement.

Normative history-graded influences

Normative history-graded influences are associated with a specific time period that defines the broader environmental and cultural context in which an individual develops. For example, development and identity are influenced by historical events of the people who experience them, such as the Great Depression, WWII, Vietnam, the Cold War, the War on Terror, or advances in technology.

This has been exemplified in numerous studies, including Nesselroade and Baltes', showing that the level and direction of change in adolescent personality development was influenced as strongly by the socio-cultural settings at the time of the Vietnam war as age-related factors. The study involved individuals of four different adolescent age groups whom all showed significant personality development in the same direction (a tendency to occupy themselves with ethical, moral, and political issues rather than cognitive achievement). Similarly, Elder showed that the Great Depression was a setting that significantly affected the development of adolescents and their corresponding adult personalities by showing a similar common personality development across age groups. Baltes' theory also states that the historical socio-cultural setting had an effect on the development of an individual's intelligence. The areas of influence that Baltes thought most important to the development of intelligence were health, education, and work. The

first two areas, health and education, significantly affect adolescent development because healthy children who are educated effectively will tend to develop a higher level of intelligence. The environmental factors, health and education, have been suggested by Neiss and Rowe to have as much effect on intelligence as inherited intelligence.

Non-normative influences

Non-normative influences are unpredictable and not tied to a certain time in a person's development or to a historical period. They are the unique experiences of an individual, whether biological or environmental, that shape the development process. These could include milestones like earning a master's degree or getting a certain job offer or other events like going through a divorce or coping with the death of a child.

The most important aspect of contextualism as a paradigm is that the three systems of influence - age-graded, history-graded and non-normative - work together to affect development. Taking adolescent development as an example, the age-graded influences would help to explain the similarities within a cohort, the history- graded influences would help to explain the differences between cohorts, and the non-normative influences would explain the idiosyncrasies of each adolescent's individual development. When all influences are considered together, it provides a broader explanation of an adolescent's development.

Other Contextual Influences on Development

What is meant by the word "context"? It means that we are influenced by when and where we live. Our actions, beliefs, and values are a response to the circumstances surrounding us. Sternberg describes contextual intelligence as the ability to understand what is called for in a situation (Sternberg, 1996). The key here is to understand that behaviors, motivations, emotions, and choices are all part of a bigger picture. Our concerns are such because of who we are socially, where we live, and when we live; they are part of a social climate and set of realities that surround us. Important social factors include cohort, social class, gender, race, ethnicity, and age. Let's begin by exploring two of these: **cohort** and **social class**.

Cohort

(See history-graded influences above.) A cohort is a group of people who are born at roughly the same time period in a particular society. Cohorts share histories and contexts for living. Members of a cohort have experienced the same historical events and cultural climates which have an impact on the values, priorities, and goals that may guide their lives. Consider the differences in experiences of someone from the 'Silent' generation that lived with constant scarcity and rationing during WWII versus the economic prosperity that followed for the 'Baby Boomer' generation and how those historical contexts influence their development.

Socioeconomic status (SES)

Another context that affects our lives is our social standing, socioeconomic status, or social class. Socioeconomic status is a way to identify families and households based on their shared levels of education, income, and occupation. While there is certainly individual variation, members of a social class tend to share similar lifestyles, patterns of consumption, parenting styles, stressors, religious preferences, and other aspects of daily life. We also find differences between social classes in these and other areas of development. Often, those in low socioeconomic groups, people living in poverty, are disadvantaged, lack of opportunities, and have different life experiences than those with more financial stability and wealth.

Poverty describes the state of not having access to material resources, wealth, or income, and also includes the lack of opportunity to improve one's standard of living and acquire resources. Life chances is a term used to describe someone's access to marketplace resources—essentially, how likely it is in their environment that they might be able to find employment or have a social safety net. Someone who is living in poverty but has high life chances may be able to improve their economic standing, but someone with low life chances will likely have a consistently low standard of living. The term for a person's ability to change their economic status in a society is known as **social mobility**.

When families have low social mobility, they may become trapped in poverty for generations; we refer to this as the cycle of poverty. Typically, these families have either limited or nonexistent social and economic resources. There are many disadvantages that collectively work in a circular process to make it virtually impossible for individuals to break the cycle of poverty. They are less likely to have financial capital, education, job skills, reliable transportation, and social capital (connections to people with

specialized knowledge or in power). Without these resources, poverty-stricken individuals experience disadvantages that, in turn, increase their poverty.

Additionally, those living in poverty suffer disproportionately from hunger, poor nutrition, and exhibit disproportionately high rates of physical and mental health issues. These illnesses can be disabling, preventing people in poverty from working, thus reducing one's opportunities to improve their social and economic status.

Finally, poverty increases the risk of homelessness. People who are homeless have low access to neighborhood resources, high-status social contacts, or basic services such as a phone line, limiting their ability to improve their economic position, again perpetuating poverty.

Culture

Culture is often referred to as a blueprint or guideline shared by a group of people that specifies how to live. It includes ideas about what is right and wrong, what to strive for, what to eat, how to speak, what is valued, as well as what kinds of emotions are called for in certain situations. Culture teaches us how to live in a society and allows us to advance because each new generation can benefit from the solutions found and passed down from previous generations.

Culture is learned from parents, schools, churches, media, friends, and others throughout a lifetime. The kinds of traditions and values that evolve in a particular culture serve to help members function in their society and to value their society. We tend to believe that our own culture's practices and expectations are the right ones. This belief that our own culture is superior is called ethnocentrism and is a normal by-product of growing up in a culture. It becomes a roadblock, however, when it inhibits understanding of cultural practices from other societies. Cultural relativity is an appreciation for cultural differences and the understanding that cultural practices are best understood from the standpoint of that particular culture.

Culture is a crucial context for human development, and understanding development requires being able to identify which features of development are culturally based. This understanding is somewhat new and still being explored. So much of what developmental theorists have described in the past has been culturally bound and difficult to apply to various other cultural contexts. For example, Erikson's theory that teenagers struggle with identity assumes that all teenagers live in a society in which they have many options and must make an individual choice about their future. In many parts of the world, one's identity is determined by family status or society's dictates. In other words, there is no choice to make.

Even the most biological events can be viewed in cultural contexts that are incredibly varied. Consider two very different cultural responses to menstruation in young girls. In the United States, girls in public schools often receive information on menstruation around 5th grade, get a kit containing feminine hygiene products, and receive some sort of education about sexual health. Contrast this with some developing countries where menstruation is not publicly addressed, or where girls on their period are forced to miss school due to limited access to feminine products or unjust attitudes about menstruation.

Multidisciplinary

Any single discipline's account of development across the lifespan would not be able to express all aspects of this theoretical framework. That is why it is suggested explicitly by lifespan researchers that a combination of disciplines is necessary to understand development. Psychologists, sociologists, neuroscientists, anthropologists, educators, economists, historians, medical researchers, and others may all be interested and involved in research related to the normative age-graded, normative history-graded, and nonnormative influences that help shape development. Many disciplines contribute important concepts that integrate knowledge, which may ultimately result in the formation of a new and enriched understanding of development across the lifespan.

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Domains in Lifespan Development, July 28, 2020 on YouTube by Prof Newton

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1.2: Periods of Development

Generally child developmentalists are interested in the period from conception until the start of adulthood so that large timeframe from 40 weeks before birth until about 25 years (when the brain fully matures into adulthood) can broadly be divided into five stages

- Prenatal development – conception to birth
- Infancy and toddlerhood – 0-2 years
- Early childhood – 2-7 years
- Middle childhood – 7-13 years
- Adolescence – 13-25 years

Prenatal Development

At the point when sperm fertilizes the ovum, conception is said to have occurred. From this point onwards, the single cell begins to multiply, implant in the uterine wall, differentiate and continue growing. This is the fastest period of growth lasting 40 weeks until a baby is born. Seemingly a universal process, there are health and environmental factors that play a role in fetal development, and certainly both pregnancy and birth are products of many environmental conditions and cultural and socioeconomic influences.



Figure **1.2.1**: By definition an embryo is less than eight weeks old, and here shows just the beginnings of limb and facial development. [1]

Infancy and Toddlerhood

The first two years of life are ones of dramatic growth and change. A newborn, with a keen sense of hearing but very poor vision is transformed into a walking, talking toddler within a relatively short period of time. Caregivers are also transformed from someone who manages feeding and sleep schedules to a constantly moving guide and safety inspector for a mobile, energetic child.



Figure **1.2.2**: Newborns are swaddled in many cultures and spend much of their time sleeping. [2]

Early Childhood

Early childhood is also referred to as the preschool years and consists of the years which follow toddlerhood and precede formal schooling. As a three to five-year-old, the child is busy learning language, is gaining a sense of self and greater independence, and is beginning to learn the workings of the physical world. This knowledge does not come quickly, however, and preschoolers may initially have interesting conceptions of size, time, space and distance such as fearing that they may go down the drain if they sit at the front of the bathtub or by demonstrating how long something will take by holding out their two index fingers several inches apart. A toddler's fierce determination to do something may give way to a four-year-old's sense of guilt for action that brings the disapproval of others.



Figure **1.2.3**: In early childhood, children develop motor and social skills by interacting with their environment and each other.[3]

Middle Childhood

The ages of six through eleven comprise middle childhood and much of what children experience at this age is connected to their involvement in the early grades of school. Now the world becomes one of learning and testing new academic skills and by assessing one's abilities and accomplishments by making comparisons between self and others. Schools compare students and make these comparisons public through team sports, test scores, and other forms of recognition. Growth rates slow down and children are able to refine their motor skills at this point in life. And children begin to learn about social relationships beyond the family through interaction with friends and fellow students.



Figure **1.2.4**: In middle childhood, children develop motor skills by leaps and bounds[4]

Adolescence

Adolescence is a period of dramatic physical change marked by an overall physical growth spurt and sexual maturation, known as puberty. It is also a time of cognitive change as the adolescent begins to think of new possibilities and to consider abstract concepts such as love, fear, and freedom. Ironically, adolescents have a sense of invincibility that puts them at greater risk of dying from accidents or contracting sexually transmitted infections that can have lifelong consequences.[5]



Figure **1.2.5**: Figure – Social interactions are paramount as children mature into teenagers and experiment with makeup, dress and social communications, straddling childhood and adulthood.[6]

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1.3: Issues in Development

There are some big questions in developmental psychology that scientists have argued about for a while.

- Is development the result of genes or environment?
- Does development occur in stages or gradually?
- Do characteristics of individuals remain fairly stable or do people change as they grow?
- Is development universal or culture specific?
- Is an individual active in their own destiny or are they pretty much passive recipients of things happening around them?

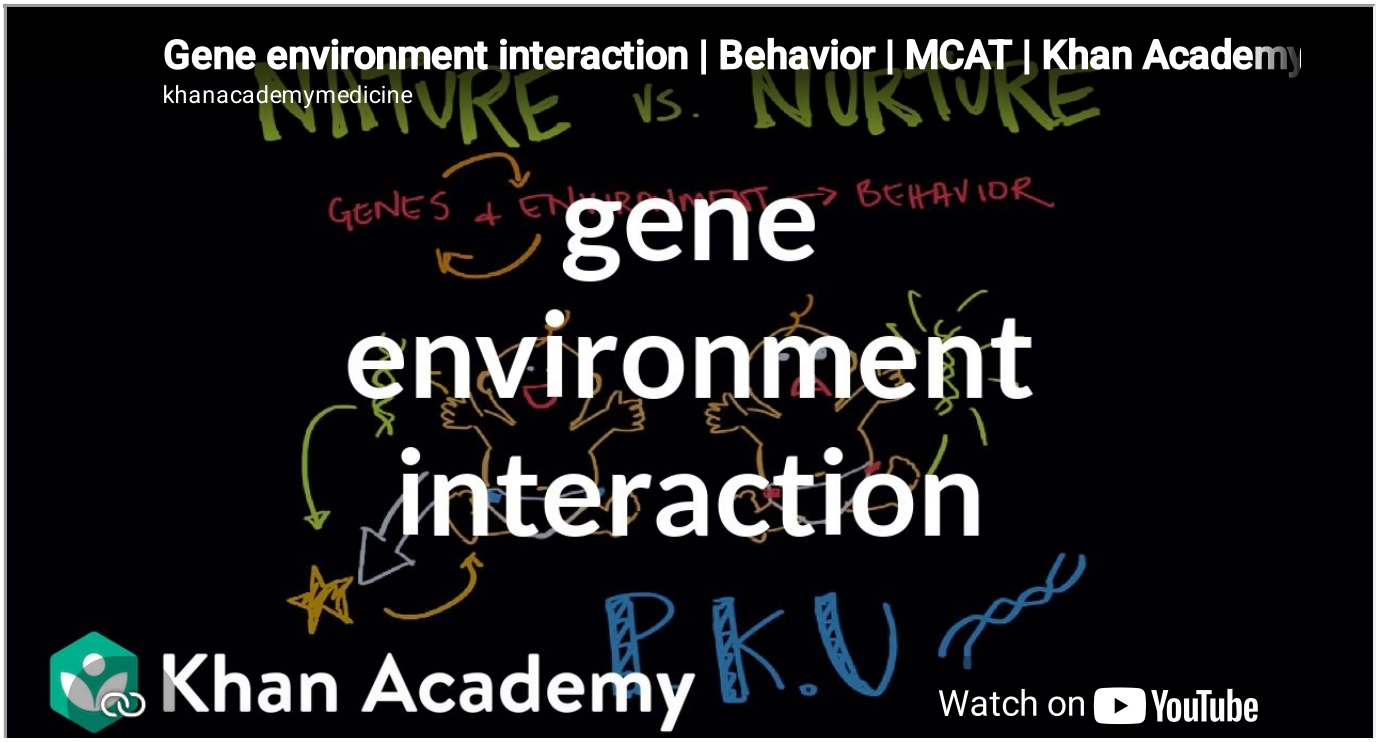
It might be immediately clear to you that there is significant overlap between these questions but they are also each a slightly different question that many theorists disagree about. Many influential theorists actually fall on opposite ends of each of these basic questions.

Nature and Nurture

Why are people the way they are? I am a pretty disagreeable person, while my husband is very agreeable. I am rather short (I like to say I am 5' 2" on a good day), while my best friend is almost 6' tall. Clearly people vary on a number of different characteristics. The nature versus nurture question asks whether we are (primarily) the result of our genes or our environment. At first flush you might think that biological characteristics are genetic while psychological characteristics are environmentally influenced. However, that that is a really narrow view becomes apparent when you consider the following

- Prenatal environment is part of environmental influences (or nurture)
- There are several biological conditions that are environmentally influenced (certainly many diseases fall in this)
- Many psychological disorders are highly heritable (consider Alzheimers, Autism Spectrum and even depression)

There are some theorists who try to explain the genes that underlie such seemingly psychological behaviors like altruism (for example, Thompson, Hurd & Crespi, 2013) while others study the environmental influence on diabetes as seen in the Tamashiro et al (2019) study that showed that the stress that pregnant female rats were exposed to increased susceptibility in those fetuses to diabetes in adulthood. Most theorists today accept that there is always an interplay of genes and environment –and that they are inextricably connected. In fact, there are many who think that this question – whether genes or environment has a greater part to play in some characteristic – is like asking whether a piece of music you are listening to is coming more from the musical instrument or the musician playing it!





Qualitative versus Quantitative

Is human development best characterized as a slow, gradual process, or is it best viewed as one of more abrupt changes? Of course, a child who is two is different from the one who is twelve. The question is whether the changes that occurred in the interim were gradual or stage-like. Some theorists like Freud, Piaget and Erikson believe that change occurs in stages and that certain traits characterize children at a particular stage and that they are **qualitatively** different at each stage from those individuals in a different stage. For example, Piaget asserts that children are not merely smaller adults, they think in different ways than how adults do. Thus, stage theorists assume development is more discontinuous.

On the other hand Vygotsky, behaviorists and information processing theorists believe that cognitive change occurs gradually, and **quantitatively**. In contrast to Piaget for example, information processing theorists believe that the differences between a 2 and 12 year old are that the 2year old has less, not different, capacity for attention, memory and problem solving.

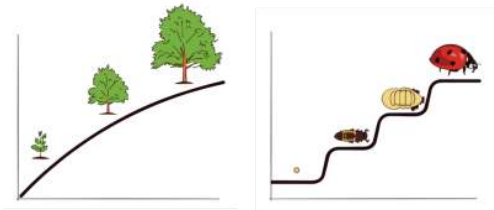


Figure 1.3.1: Development can be continuous or quantitative as shown in the graph to the left depicting the growth of a seedling into a tree, or it can be discontinuous or qualitative as in the graph on the right, likened to the stages of development of a ladybug.[1]

Stability versus Change

Do individuals' traits and characteristics remain relatively stable throughout their lifespans? Some theorists see life as ever changing and our personalities and traits as reflecting those differences. For example, behaviorists consider learning through environmental factors as primary to everything we do and are. Therefore, they believe that it is possible to always change behaviors that have been learned and learn more adaptive ones in their place – no matter your age. On the other hand, more deterministic approaches like Freud's see behavior and particularly personality as more stable. Freud suggested that the root of all adult characteristics can be found in events that occurred in the first five years of life.



Figure **1.3.2**: Traits such as shyness portrayed by this girl, have been found to be relatively stable across childhood.

Universal versus Culture-specific

Is development universal in some ways or does the trajectory of development differ in different cultures? Certainly, it is clear that there are some things that happen in the same way everywhere. All humans are born alive and all people die. But do our circumstances differ substantially such that in between there are many things that are influenced largely by cultural values and circumstances? For example, Ainsworth's theory holds that the relationship between mother and child formed in the first year of life provides a blueprint for all future relationships and that being securely attached to mom in the first year brings positive socioemotional and even cognitive outcomes. However, there are other researchers (for example, Keller, 2013) who hold that to ignore the contextual differences that are built into other cultures takes a highly individualistic view that does not apply to many cultures of the world where children are brought up with much more community, and many older people play an important caregiving role.

Active versus Passive

How much do you play a role in your own developmental path? Are you at the whim of your genetic inheritance or the environment that surrounds you? This is almost a metaphysical question, but developmental theorists certainly take different views on this question. Some theorists see humans as playing a much more active role in their own development. Piaget, for instance believed that children actively explore their world and construct new ways of thinking to explain the things they experience. In contrast, many behaviorists view humans as being more passive in the developmental process.[2] For example, the title of Skinner's book "Beyond Freedom and Dignity" shows how behaviorists believe that we are all way more a product of our circumstances than we might think.



Figure **1.3.3**: Some educational programs allow children to explore their surroundings actively, and learn by doing.

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CHAPTER OVERVIEW

2: Theoretical Perspectives in Development

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2.4: Behaviorism
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2.1: Theories in Science

Students sometimes feel intimidated by theory; even the phrase, “Now we are going to look at some theories…” is met with blank stares and other indications that the audience is now lost. But theories are valuable tools for understanding human behavior; in fact they are proposed explanations for the “how” and “whys” of development. Have you ever wondered, “Why is my 3 year old so inquisitive?” or “Why are some fifth graders rejected by their classmates?” Theories can help explain these and other occurrences.

It is also important to realize that in science the term “theory” does not mean the same as when it is used in regular conversation – perhaps you have a theory about how you look good in yellow, but purple does nothing for you. In science the term theory means something different. Schafersman (1997) proposed the following definition of theory in science – “***A scientific theory is a unifying and self-consistent explanation of fundamental natural processes or phenomena that is totally constructed of corroborated hypotheses.”***

A **theory** guides and helps us interpret research findings as well. It provides the researcher with a blueprint or model to be used to help piece together various studies. Think of theories as guidelines much like directions that come with an appliance or other object that requires assembly. The instructions can help one piece together smaller parts more easily than if trial and error are used.

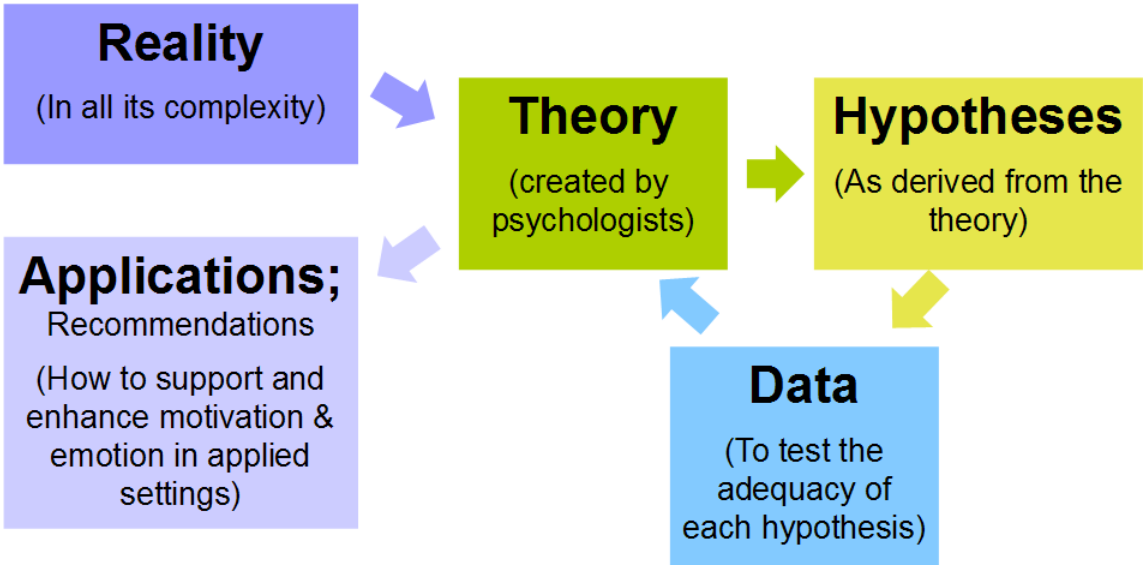


Figure **2.1.1**: Reality in all its complexity influences the psychological theories on which study hypotheses are based and data is collected. The theory is then modified and influences real world recommendations and applications (such as in this case how to support and enhance motivation and emotion in applied settings. Jtneill, CC BY 3.0 via Wikimedia Commons

Theories can be developed using induction in which a number of single cases are observed and after patterns or similarities are noted, the theorist develops ideas based on these examples. Established theories are then tested through research; however, not all theories are equally suited to scientific investigation. Some theories are difficult to test but are still useful in stimulating debate or providing concepts that have practical application. Keep in mind that theories are not facts, but neither are they simply hypotheses or wild ideas; they are guidelines for investigation and practice, and they gain credibility through research that fails to disprove them.[1]

There are many smaller theories in psychology and development but the major theories we will describe in the following pages are theoretical perspectives that form the introductory chapter of many psychology textbooks. These **Developmental theories** offer explanations about how we develop, why we change over time and the kinds of influences that impact development.

I want to start with an explanation in regards to these theories. A cursory perusal of them will show that these are all perspectives propounded by white, heterosexual, cis-gender, European or US males. Should we assume that there have been no developmental theories of import that come from anywhere else? Of course not! Unfortunately the loudest voices have been those that we hear in textbooks. Certainly they are not the only ones. Happy healthy children are raised in families everywhere - in circumstances far different than those on which the traditional theories are based. In the US itself also, Critical Race Theory (which has been written about for decades) has gained more prominent discussion only very recently.

So we will still learn about the traditional theories. But I would urge you to think about how each of these theorist's own circumstances might say as much about their approach than their theory says about children's development. I would also like you to think deeply about what theories your own caregivers used in their care of you, and whether their cherished hopes for you were realized in the way they cared for you.

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Schafersman, S.D. (1997). *An Introduction to Science - Scientific thinking and the scientific method.*

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2.2: Freud and Psychodynamism

We begin with the often controversial figure, Sigmund Freud (1856-1939). Freud has been a very influential figure in the area of development; his view of development and psychopathology dominated the field of psychiatry until the growth of behaviorism in the 1950s. His assumptions that personality forms during the first few years of life and that the ways in which parents or other caregivers interact with children have a long-lasting impact on children's emotional states have guided parents, educators, clinicians, and policy-makers for many years. We have only recently begun to recognize that early childhood experiences do not always result in certain personality traits or emotional states. There is a growing body of literature addressing resilience in children who come from harsh backgrounds and yet develop without damaging emotional scars (O'Grady and Metz, 1987). Freud has stimulated an enormous amount of research and generated many ideas. Agreeing with Freud's theory in its entirety is hardly necessary for appreciating the contribution he has made to the field of development.

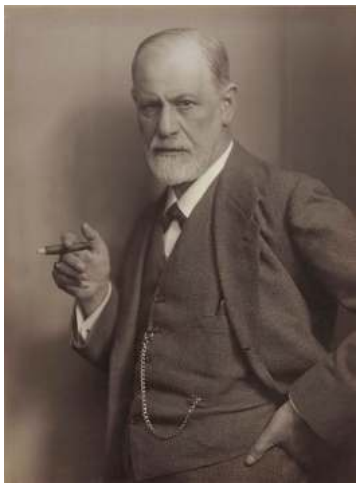


Figure **2.2.1**: Sigmund Freud.[1]

Components of Personality

Freud's theory of self suggests that there are three parts of the self.

Id

The **id** is the part of the self that is inborn. It responds to biological urges without pause and is guided by the principle of pleasure: if it feels good, it is the thing to do. A newborn is all id. The newborn cries when hungry, defecates when the urge strikes. Clearly if humans continued to remain all id throughout our lives, we would not cooperate, get along with each other or collaborate on all the things we do to reach future objectives.

Superego

The **superego** represents society's demands for its members. It is guided by a sense of guilt. Values, morals, and the conscience are all part of the superego. In the start of the child's life, parents act as the superego and represent external controls. It is the internalization of those controls that is the development of the superego.

Ego

The **ego** acts as a referee between the id and superego, since by definition the two are always opposed. The id says "I want it!" and the superego "can't have it!" So the ego develops through interaction with others and is guided by logic or the reality principle. It has the ability to delay gratification. It knows that urges have to be managed.

Psychosexual development

The personality is thought to develop in response to the child's ability to learn to manage biological urges. Parenting is important here. If the parent is either overly punitive or lax, and if the child receives too much or too little stimulation of the erogenous zone, the child may not progress to the next stage. Freud calls this a "fixation." Here is a brief introduction to Freud's stages.

Five stages of psychosexual development (only the first three are considered important according to Freud)

Name of Stage	Descriptions of Stage
Oral Stage	The **oral stage** lasts from birth until around age 2. The infant is all id. At this stage, all stimulation and comfort is focused on the mouth and is based on the reflex of sucking. An oral fixation might manifest as a constant need to suck or chew.
Anal Stage	The **anal stage** coincides with potty training or learning to manage biological urges. The superego and ego are beginning to develop in this stage. Anal fixation may result in a person who is compulsively clean and organized or one who is sloppy and lacks self-control.
Phallic Stage	The **phallic stage** occurs in early childhood and marks the development of the superego and a sense of masculinity or femininity as culture dictates.
Latency	**Latency** occurs during middle childhood when a child's urges quiet down and friendships become the focus. The ego and superego can be refined as the child learns how to cooperate and negotiate with others.
Genital Stage	The **genital stage** begins with puberty and continues through adulthood. Now the preoccupation is that of sex and reproduction.

Strengths and Weaknesses of Freud's Theory

Freud's theory has been heavily criticized for several reasons. The most important is that Freud himself did not do any scientific research and in fact eschewed any notion that his ideas may be incorrect. His response to any criticism of his ideas was to say "come lie down on my therapist's couch and tell me about your own childhood."

The other problem is that it is very difficult to test scientifically. How can parenting in infancy be traced to personality in adulthood? Are there other variables that might better explain development? With the development of biopsychological methods like the EEG, and cross cultural research methods, there has certainly been some work on this front. For example, anthropological ethnographer Malinowski (1927, Sex and Repression in a Savage Society) claimed that his work with the people of Trobriand islanders suggests that the centrality of psychoanalysis in the Oedipus Complex is flawed. In Trobriand society, the boy's biological father (of course the mother's sexual partner) is not also the disciplinarian. Rather, that disciplinarian is the mother's biological brother, the boy's uncle, and that boys' relationship with their uncle seems to be fraught with the same tensions as Freud claims is the basis of the all-important Oedipus complex in psychoanalysis. On the other hand, there are also other theorists who have used the mechanisms of neuroscience and in fact suggested a seemingly unlikely field of neuropsychoanalysis (Northoff, 2012)[2].

Another criticism of Freud is that his theory is also considered to be sexist in suggesting that women who do not accept an inferior position in society are somehow psychologically flawed. The Neo-Freudian psychologist, Karen Horney, suggested that Freud's notion of women "suffering penis envy" can actually be replaced with the idea that men suffer from "womb envy."

Freud focuses on the darker side of human nature and suggests that much of what determines our actions is unknown to us, and that it is based on bestial impulses.

So why do we study Freud? As mentioned above, despite the criticisms, Freud's assumptions about the importance of early childhood experiences in shaping our psychological selves have found their way into child development, education, and parenting practices. Freud's theory has value in providing a framework from which to elaborate and modify subsequent theories of development. Many later theories, particularly behaviorism and humanism, were challenges to Freud's views.[3]

In general, Freud is credited with the emphasis on desires and drives that are unconscious and based in early childhood experiences. And Freud's perspective inspired several other important psychological figures – Adler, Jung, Horney - to propound their theories. These individuals are called Neo-Freudians, and with our interest in developmental psychology, we turn to Erikson.

Main Points to note about Freud's psychodynamic theory

Freud believed that:

- Development in the early years (0-5years) has a lasting impact – receiving too much or too little stimulation in the early years leads to fixation in that stage.

- There are three parts of the self: the id, the ego, and the superego, and the subconscious plays a very large role in the personality.
- People go through five stages of psychosexual development that are focused on different body parts: the oral stage, the anal stage, the phallic stage, latency, and the genital stage.

We study Freud because his assumptions the importance of early childhood experience provide a framework for later theories (that both elaborated and contradicted/challenged his work).

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2.3: Erikson and Psychosocial stages of development

Erik Erikson is less controversial though he is considered a Neo-Freudian. Erikson (1902-1994) suggested in his theory of psychosocial development that our relationships and society's expectations motivate much of our behavior. Erikson was a student of Freud's but emphasized the importance of the ego, or conscious thought, in determining our actions. In other words, he believed that we are not driven by unconscious urges. We know what motivates us and we consciously think about how to achieve our goals. He also took issue with Freud's idea that only the first five years of life determine outcomes in the future. He is considered the father of developmental psychology because his model gives us a guideline for the entire life span and suggests certain primary psychological and social concerns throughout life.



Figure **2.3.1**: Erik Erikson.[1]

Erikson expanded on his Freud's by emphasizing the importance of culture in parenting practices and motivations and adding three stages of adult development (Erikson, 1950; 1968). He believed that we make conscious choices in life and these choices focus on meeting certain social and cultural needs rather than purely biological ones. Humans are motivated, for instance, by the need to feel that the world is a trustworthy place, that we are capable individuals, that we can make a contribution to society, and that we have lived a meaningful life. These are all psychosocial problems.

Psychosocial Stages

Erikson divided the lifespan into eight stages. In each stage, we have a major psychosocial task to accomplish or crisis to overcome. Erikson believed that our personality continues to take shape throughout our lifespan as we face these challenges in living. Here is a brief overview of the eight stages:

Table **2.3.1**: Erikson's eight developmental stages extend through the lifespan

Name of Stage	Description of Stage
Trust vs. mistrust (0-1)	The infant must have basic needs met in a consistent way in order to feel that the world is a trustworthy place.
Autonomy vs. shame and doubt (1-2)	Mobile toddlers have newfound freedom they like to exercise and by being allowed to do so, they learn some basic independence.
Initiative vs. Guilt (3-5)	Preschoolers like to initiate activities and emphasize doing things “all by myself.”
Industry vs. inferiority (6-11)	School aged children focus on accomplishments and begin making comparisons between themselves and their classmates
Identity vs. role confusion (adolescence)	Teenagers are trying to gain a sense of identity as they experiment with various roles, beliefs, and ideas.
Intimacy vs. Isolation (young adulthood)	In our 20s and 30s we are making some of our first long-term commitments in intimate relationships.
Generativity vs. stagnation (middle adulthood)	The 40s through the early 60s we focus on being productive at work and home and are motivated by wanting to feel that we’ve made a contribution to society.
Integrity vs. Despair (late adulthood)	We look back on our lives and hope to like what we see-that we have lived well and have a sense of integrity because we lived according to our beliefs.

These eight stages form a foundation for discussions on emotional and social development during the life span. Keep in mind, however, that these stages or crises can occur more than once. For instance, a person may struggle with a lack of trust beyond infancy under certain circumstances (see the idea of “fixation” in Freudian theory).



Figure **2.3.2**: Trust v. mistrust – the first relationship between infant and caregiver sets the stage for future experiences of trust versus mistrust - (Photo Source: Engin Akyurt on Pixabay)



Figure **2.3.3**: Autonomy v shame/doubt – when caregivers allow and support children to become autonomous individuals, there are positive developmental outcomes (Parenting and Family Diversity Issues by Diana Lang, 2020, published by Iowa State University is licensed under CC BY-NC-SA 4.0)



Figure **2.3.4**: Identity - High school cliques may be a movie cliche, but adolescent relationships do influence identity. (Photo Source: Eliott Reyna on Unsplash)

Critiques

Erikson's theory has been criticized for focusing so heavily on stages and assuming that the completion of one stage is prerequisite for the next crisis of development. His theory also focuses on the social expectations that are found in certain cultures, but not in all. For instance, the idea that adolescence is a time of searching for identity might translate well in the middle-class culture of the United States, but not as well in cultures where the transition into adulthood coincides with puberty through rites of passage and where adult roles offer fewer choices.[2]

Main points to note about Erikson's theory

Erikson was a student of Freud but focused on conscious thought.

- His stages of psychosocial development address the entire lifespan and suggest primary psychosocial crisis in some cultures that adults can use to understand how to support children's social and emotional development.
- The stages include: trust vs. mistrust, autonomy vs. shame and doubt, initiative vs. guilt, industry vs. inferiority, identity vs. role confusion, intimacy vs. isolation, generativity vs. stagnation, and integrity vs. despair.

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2.4: Behaviorism

While Freud and Erikson looked at what was going on in the mind, behaviorism rejected any reference to mind and viewed overt and observable behavior as the proper subject matter of psychology. Through the scientific study of behavior, it was hoped that laws of learning could be derived that would promote the prediction and control of behavior.[1]

Ivan Pavlov and Classical Conditioning

Ivan Pavlov (1880-1937) was a Russian physiologist interested in studying digestion. While recording the amount of salivation his laboratory dogs produced as they ate, he noticed that they actually began to salivate before the food arrived as the researcher walked down the hall and toward the cage. “This,” he thought, “is not natural!” One would expect a dog to automatically salivate when food hit their palate, but BEFORE the food comes? Of course, what had happened was . . . you tell me. That’s right! The dogs knew that the food was coming because they had learned to associate the footsteps with the food. The key word here is “learned”. A learned response is called a “conditioned” response.

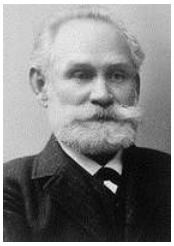


Figure **2.4.1**: Ivan Pavlov.[2]

Pavlov began to experiment with this concept of **classical conditioning**. He began to ring a bell, for instance, prior to introducing the food. Sure enough, after making this connection several times, the dogs could be made to salivate to the sound of a bell. Once the bell had become an event to which the dogs had learned to salivate, it (the sound of the bell) was called a **conditioned stimulus**. The act of salivating to a bell was a response that had also been learned, now termed in Pavlov’s jargon, a **conditioned response**. Notice that the response, salivation, is the same whether it is conditioned or unconditioned (unlearned or natural). What changed is the stimulus to which the dog salivates. One is natural (unconditioned - the food) and one is learned (conditioned - sound of the bell).

Let’s think about how classical conditioning is used on us. One of the most widespread applications of classical conditioning principles was brought to us by the psychologist, John B. Watson.

John B. Watson

John B. Watson (1878-1958) believed that most of our fears and other emotional responses are classically conditioned. He had gained a good deal of popularity in the 1920s with his expert advice on parenting offered to the public.



Figure **2.4.2**: John B. Watson.[3]

He tried to demonstrate the power of classical conditioning with his famous experiment with an 11 month old boy named “Little Albert”. Watson sat Albert down and introduced a variety of seemingly scary objects to him: a burning piece of newspaper, a white rat, etc. But Albert remained curious and reached for all of these things. Watson knew that one of our only inborn fears is the fear of loud noises so he proceeded to make a loud noise each time he introduced one of Albert’s favorites, a white rat. After hearing the loud noise several times paired with the rat, Albert soon came to fear the rat and began to cry when it was introduced. Watson

filmed this experiment for posterity and used it to demonstrate that he could help parents achieve any outcomes they desired, if they would only follow his advice. Watson wrote columns in newspapers and in magazines and gained a lot of popularity among parents eager to apply science to household order.

B.F. Skinner and Operant Conditioning

Operant conditioning, on the other hand, looks at the way the consequences of a behavior increase or decrease the likelihood of a behavior occurring again. B. F. Skinner (1904-1990), who brought us the principles of operant conditioning, suggested that reinforcement is a more effective means of encouraging a behavior than is criticism or punishment. By focusing on strengthening desirable behavior, we have a greater impact than if we emphasize what is undesirable. Reinforcement is anything that an organism desires and is motivated to obtain.

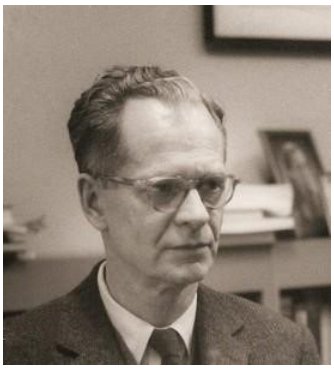


Figure 2.4.3: B. F. Skinner.[4]

A **reinforcer** is something that encourages or promotes a behavior. Some things are natural rewards. They are considered intrinsic or primary because their value is easily understood. Think of what kinds of things babies or animals such as puppies find rewarding.

Extrinsic or secondary reinforcers are things that have a value not immediately understood. Their value is indirect. They can be traded in for what is ultimately desired.

The use of **positive reinforcement** involves adding something to a situation in order to encourage a behavior. For example, if I give a child a cookie for cleaning a room, the addition of the cookie makes cleaning more likely in the future. Think of ways in which you positively reinforce others.

Negative reinforcement occurs when taking something unpleasant away from a situation encourages behavior. For example, I have an alarm clock that makes a very unpleasant, loud sound when it goes off in the morning. As a result, I get up and turn it off. By removing the noise, I am reinforced for getting up. My getting up increases in order to avoid or escape that noxious sound.

Punishment is an effort to stop a behavior. It means to follow an action with something unpleasant or painful. Punishment is often less effective than reinforcement for several reasons. It doesn't indicate the desired behavior, it may result in suppressing rather than stopping a behavior, (in other words, the person may not do what is being punished when you're around, but may do it often when you leave), and a focus on punishment can result in not noticing when the person does well.

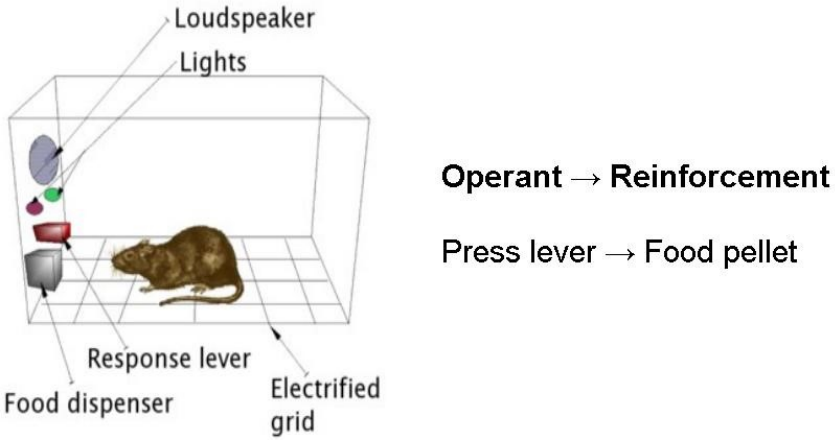


Figure 2.4.4: Operant conditioning with a laboratory rat. This rat in its cage will learn to press the lever (operant behavior) in order to obtain a food pellet (positive reinforcement). That the bottom of the cage is an electrified grid can be used as a negative reinforcer - teaching the rat to increase jumping to avoid getting an electrical shock; or as a punishment by teaching the rat to stop pressing the lever so that the shock stops. (Anna Leon, West Hills Community College, Children's Development: Prenatal through Adolescent Development, CC BY 4.0)

Evaluation of the theory

As you might have noticed the tenets of behaviorism are completely different from those of Freudian theory. In fact, Behaviorism was born out of a desire to make psychology a "science" just like chemistry or physics. To that end, Behaviorists conducted a lot of research on their ideas and much of this research was done with cats, dogs, pigeons and rats. In fact, many current animal paradigms in biological research are based on the ideas of reward, punishment and conditioning that Behaviorism espoused.

However, even a cursory reading of these theories might make it clear that even though Behaviorism overcomes the most damaging criticism of Psychodynamism – and bases all ideas on empirical observation, swinging to that other extreme exclusively, results in other problems. The original behaviorists believed that all we should be concerned with is "observable" behavior and that anything that cannot be observed – dreams, motivations, thoughts, and so on – is not worthy of scientific examination. They also believed that all human experience can be explained by the principles of operant and classical conditioning.

The other criticism of the learning perspective (including social learning) comes from its failure to explain some major developmental issues like gender development and language development. These areas of psychology need an understanding of biology and cognition in order to explain their development.

Main Points about Behaviorism

- Behaviorists look at observable behavior and how it can be predicted and controlled.
- Pavlov experimented with classical conditioning, the process of conditioning a response to stimulus (the dog's salivating to the bell).
- Watson offered advice to parents to show them how classical conditioning can be used. His most famous experiment was conditioning Little Albert to fear a white rat.
- Skinner believed that reinforcing behavior is the most effective way of increasing desirable behavior. This is called operant conditioning.

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2.5: Operant Learning and School/Education (Extra Resources)

Since the original research about operant conditioning used animals, it is important to ask whether operant conditioning also describes learning in human beings, and especially in students in classrooms. On this point the answer seems to be clearly "yes." There are countless classroom examples of consequences affecting students' behavior in ways that resemble operant conditioning, although the process certainly does not account for all forms of student learning (Alberto & Troutman, 2005). Consider the following examples. In most of them the operant behavior tends to become more frequent on repeated occasions:

- A seventh-grade boy makes a silly face (the operant) at the girl sitting next to him. Classmates sitting around them giggle in response (the reinforcement).
- A kindergarten child raises her hand in response to the teacher's question about a story (the operant). The teacher calls on her and she makes her comment (the reinforcement).
- Another kindergarten child blurts out her comment without being called on (the operant). The teacher frowns, ignores this behavior, but before the teacher calls on a different student, classmates are listening attentively (the reinforcement) to the student even though he did not raise his hand as he should have.
- A twelfth-grade student—a member of the track team—runs one mile during practice (the operant). He notes the time it takes him as well as his increase in speed since joining the team (the reinforcement).
- A child who is usually very restless sits for five minutes doing an assignment (the operant). The teaching assistant compliments him for working hard (the reinforcement).
- A sixth-grader takes home a book from the classroom library to read overnight (the operant). When she returns the book the next morning, her teacher puts a gold star by her name on a chart posted in the room (the reinforcement).

These examples are enough to make several points about operant conditioning. First, the process is widespread in classrooms—probably more widespread than teachers realize. This fact makes sense, given the nature of public education: to a large extent, teaching is about making certain consequences (like praise or marks) depend on students' engaging in certain activities (like reading certain material or doing assignments). Second, learning by operant conditioning is not confined to any particular grade, subject area, or style of teaching, but by nature happens in every imaginable classroom. Third, teachers are not the only persons controlling reinforcements. Sometimes they are controlled by the activity itself (as in the track team example), or by classmates (as in the "giggling" example). This leads to the fourth point: that multiple examples of operant conditioning often happen at the same time.

Because operant conditioning happens so widely, its effects on motivation are a bit complex. Operant conditioning can encourage **intrinsic motivation**, to the extent that the reinforcement for an activity is the activity itself. When a student reads a book for the sheer enjoyment of reading, for example, they are reinforced by the reading itself, and we can say that their reading is "intrinsically motivated." More often, however, operant conditioning stimulates *both* intrinsic *and* extrinsic motivation at the same time. The combining of both is noticeable in the examples in the previous paragraph. In each example, it is reasonable to assume that the student felt intrinsically motivated to some partial extent, even when reward came from outside the student as well. This was because *part* of what reinforced their behavior was the behavior itself—whether it was making faces, running a mile, or contributing to a discussion. At the same time, though, note that each student probably was also **extrinsically motivated**, meaning that another part of the reinforcement came from consequences or experiences *not* inherently part of the activity or behavior itself. The boy who made a face was reinforced not only by the pleasure of making a face, for example, but *also* by the giggles of classmates. The track student was reinforced not only by the pleasure of running itself, but *also* by knowledge of his improved times and speeds. Even the usually restless child sitting still for five minutes may have been reinforced partly by this brief experience of unusually focused activity, even if he was *also* reinforced by the teacher aide's compliment. Note that the extrinsic part of the reinforcement may sometimes be more easily observed or noticed than the intrinsic part, which by definition may sometimes only be experienced within the individual and not also displayed outwardly. This latter fact may contribute to an impression that sometimes occurs, that operant conditioning is really just "bribery in disguise," that only the *external* reinforcements operate on students' behavior. It is true that external reinforcement may sometimes alter the nature or strength of internal (or intrinsic) reinforcement, but this is not the same as saying that it destroys or replaces intrinsic reinforcement.

Key concepts about operant conditioning: Operant conditioning is made more complicated, but also more realistic, by several additional ideas. They can be confusing because the ideas have names that sound rather ordinary, but that have special meanings

with the framework of operant theory. Among the most important concepts to understand are the following:

- extinction
- generalization
- discrimination
- schedules of reinforcement
- cues

The paragraphs below explain each of these briefly, as well as their relevance to classroom teaching and learning.

Extinction refers to the disappearance of an *operant behavior* because of lack of reinforcement. A student who stops receiving gold stars or compliments for prolific reading of library books, for example, may extinguish (i.e. decrease or stop) book-reading behavior. A student who used to be reinforced for acting like a clown in class may stop clowning once classmates stop paying attention to the antics.

Generalization refers to the incidental conditioning of behaviors similar to an original *operant*. If a student gets gold stars for reading library books, then we may find them reading more of other material as well—newspapers, comics, etc.–even if the activity is not reinforced directly. The "spread" of the new behavior to similar behaviors is called generalization. Generalization is a lot like the concept of transfer discussed early in this chapter, in that it is about extending prior learning to new situations or contexts. From the perspective of operant conditioning, though, what is being extended (or "transferred" or generalized) is a behavior, not knowledge or skill.

Discrimination means learning **not** to generalize. In operant conditioning, what is **not** overgeneralized (i.e. what is discriminated) is the operant behavior. If I am a student who is being complimented (reinforced) for contributing to discussions, I must also learn to discriminate when to make verbal contributions from when not to make them—such as when classmates or the teacher are busy with other tasks. Discrimination learning usually results from the combined effects of reinforcement of the target behavior and extinction of similar generalized behaviors. In a classroom, for example, a teacher might praise a student for speaking during discussion, but ignore him for making very similar remarks out of turn.

In operant conditioning, the **schedule of reinforcement** refers to the pattern or frequency by which reinforcement is linked with the operant. If a teacher praises me for my work, does she do it every time, or only sometimes? Frequently or only once in a while? In respondent conditioning, however, the schedule in question is the pattern by which the conditioned stimulus is paired with the unconditioned stimulus. If I am student with Mr Horrible as my teacher, does he scowl every time he is in the classroom, or only sometimes? Frequently or rarely?

Behavioral psychologists have studied schedules of reinforcement extensively (for example, Ferster, et al., 1997; Mazur, 2005), and found a number of interesting effects of different schedules. For teachers, however, the most important finding may be this: partial or intermittent schedules of reinforcement generally cause learning to take longer, but also cause extinction of learning to take longer. This dual principle is important for teachers because so much of the reinforcement we give is partial or intermittent. Typically, if I am teaching, I can compliment a student a lot of the time, for example, but there will inevitably be occasions when I cannot do so because I am busy elsewhere in the classroom. For teachers concerned both about motivating students and about minimizing inappropriate behaviors, this is both good news and bad. The good news is that the benefits of my praising students' constructive behavior will be more lasting, because they will not extinguish their constructive behaviors immediately if I fail to support them every single time they happen. The bad news is that students' negative behaviors may take longer to extinguish as well, because those too may have developed through partial reinforcement. A student who clowns around inappropriately in class, for example, may not be "supported" by classmates' laughter every time it happens, but only some of the time. Once the inappropriate behavior is learned, though, it will take somewhat longer to disappear even if everyone—both teacher and classmates—make a concerted effort to ignore (or extinguish) it.

Finally, behavioral psychologists have studied the effects of **cues**. In operant conditioning, a cue is a stimulus that happens just prior to the operant behavior and that signals that performing the behavior may lead to reinforcement. In the original conditioning experiments, Skinner's rats were sometimes cued by the presence or absence of a small electric light in their cage. Reinforcement was associated with pressing a lever when, and only when, the light was on. In classrooms, cues are sometimes provided by the teacher deliberately, and sometimes simply by the established routines of the class. Calling on a student to speak, for example, can be a cue that *if* the student *does* say something at that moment, then he or she *may* be reinforced with praise or acknowledgment.

But if that cue does *not* occur—if the student is *not* called on—speaking may *not* be rewarded. In more everyday, non-behaviorist terms, the cue allows the student to learn when it is acceptable to speak, and when it is not.

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2.6: Bandura and Social Learning

Not all behaviors are learned through association or reinforcement. Many of the things we do are learned by watching others. This is addressed in social learning theory. We don't learn everything through association or reinforcement. We also learn through watching others.

Albert Bandura (1925-2021) was a leading contributor to social learning theory. He calls our attention to the ways in which many of our actions are not learned through conditioning; rather, they are learned by watching others (1977). Young children frequently learn behaviors through imitation

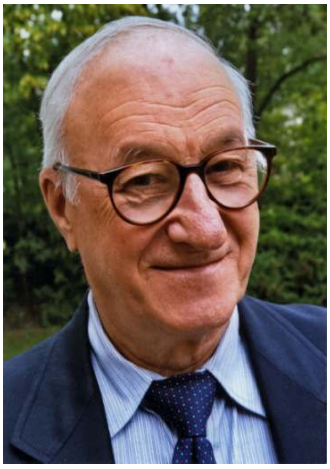


Figure **2.6.1**: Albert Bandura.[1]

Sometimes, particularly when we do not know what else to do, we learn by modeling or copying the behavior of others. A kindergartner on his or her first day of school might eagerly look at how others are acting and try to act the same way to fit in more quickly. Adolescents struggling with their identity rely heavily on their peers to act as role-models. Sometimes we do things because we've seen it pay off for someone else. They were operantly conditioned, but we engage in the behavior because we hope it will pay off for us as well. This is referred to as vicarious reinforcement (Bandura, Ross and Ross, 1963).Unlike the original behaviorists, Bandura (1986) suggests that there is interplay between the environment and the individual. We are not just the product of our surroundings, rather we influence our surroundings. Parents not only influence their child's environment, perhaps intentionally through the use of reinforcement, etc., but children influence parents as well. Parents may respond differently with their first child than with their fourth. Perhaps they try to be the perfect parents with their firstborn, but by the time their last child comes along they have very different expectations both of themselves and their child. Our environment creates us and we create our environment.[2]



Figure **2.6.2**: Children observe a social model (an experienced chess player) to learn the rules of the game. (Photo Source: David R. Tribble, CC BY-SA 3.0.)

Bandura and the Bobo Doll Experiment & Today's Children and the Media

Other social influences: TV or not TV? Bandura et al (1963) began a series of studies to look at the impact of television, particularly commercials, on the behavior of children. Are children more likely to act out aggressively when they see this behavior modeled? What if they see it being reinforced? Bandura began by conducting an experiment in which he showed children a film of a woman hitting an inflatable clown or "bobo" doll. Then the children were allowed in the room where they found the doll and immediately began to hit it. This was without any reinforcement whatsoever. Not only that, but they found new ways to behave aggressively. It's as if they learned an aggressive role.

Children spend far more screen time today than in the 1960s. The amount of screen time varies by age. As of 2017, children 0-8 spend an average of 2 hours and 19 minutes. Children 8-12 years of age spend almost 6 hours a day on screen media. And 13- to 18-year-olds spend an average of just under 9 hours a day in entertainment media use.

https://www.youtube.com/watch?v=dmBqwWlJg8U





Bandura's Bobo Doll Experiment

The prevalence of violence, sexual content, and messages promoting foods high in fat and sugar in the media are certainly cause for concern and the subjects of ongoing research and policy review.

Many children spend even more time on the computer viewing content from the internet. The amount of time spent connected to the internet continues to increase with the use of smartphones that essentially serve as mini-computers. And the ways children and adolescents interact with the media continues to change. The popularity of YouTube and the various social media platforms are examples of this. What might be the implications of this?[3]

Main Points about Social Learning

- Bandura noted that many behaviors are not learned through any type of conditioning, but rather through imitation.
- He believed that people are not only influenced by their surroundings, but that they also have an impact on their surroundings.

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Bandura's Bobo Doll experiment by Everywhere Psychology, on YouTube August 28, 2012

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Rasmussen, Eric (2017, Oct 19). *Screen Time and Kids: Insights from a New Report*. Retrieved from https://www.pbs.org/parents/thrive/screen-time-and-kids-insights-from-a-new-report

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2.7: Piaget's Cognitive perspective

Jean Piaget (1896-1980) is one of the most influential cognitive theorists. Piaget was inspired to explore children's ability to think and reason by watching his own children's development. He was one of the first to recognize and map out the ways in which children's thought differs from that of adults. His interest in this area began when he was asked to test the IQ of children and began to notice that there was a pattern in their wrong answers. He believed that children's intellectual skills change over time through **maturation** (biologically driven process that happens from within). Children of differing ages interpret the world differently in kind, not just amount.



Figure **2.7.1**: Jean Piaget.[1]

Tenets of Piagetian theory

Piaget's theory is replete with ideas that he propounded based on his observational research. To understand his theory there are some basic concepts that we need to discuss in more detail.

Equilibrium

Piaget believed our desire to understand the world comes from a need for cognitive **equilibrium**. This is an agreement or balance between what we sense in the outside world and what we know in our minds. If we experience something that we cannot understand, we try to restore the balance by either changing our thoughts or by altering the experience to fit into what we do understand. When you see an animal that you have never seen before how do you make sense of this animal? You might use them to establish a new category of animal in your mind or you might think about how they are similar to another animal you have a category for.

Schema

A **schema** or schemes are categories of knowledge. They are like mental boxes of concepts. A child has to learn many concepts. They may have a scheme for "under" and "soft" or "running" and "dog". All of these are schema. Our efforts to understand the world around us lead us to develop new schema and to modify old ones.

Assimilation

One way to make sense of new experiences is to focus on how they are similar to what we already know. This is **assimilation**. So the animal we see that is very different may be understood as being "sort of like a dog" or "it has fur and walks on four legs." Or a new food may be assimilated when we determine that it tastes like chicken!

Accomodation

Another way to make sense of the world is to change our mind. We can make a cognitive accommodation to this new experience by adding new schema. This food is unlike anything I've tasted before. I now have a new category of foods that are bitter-sweet in flavor, for instance. This is **accommodation**. Do you accommodate or assimilate more frequently? Children accommodate more frequently as they build new schema. Adults tend to look for similarity in their experience and assimilate. They may be less inclined to think "outside the box."

Stages of Cognitive Development

Piaget suggested different ways of understanding that are associated with maturation. His theory is often cited as an example of qualitative theories of development. He divided cognitive development into four stages, claiming that children don't simply have less memory or other cognitive abilities but rather that they think differently at different ages.

Table **2.7.1**: - Piaget believed that children go through 4 stages of cognitive development

Name of Stage	Description of Stage
Sensorimotor Stage	During the s**ensorimotor stage** children rely on use of the senses and motor skills. From birth until about age 2, the infant knows by tasting, smelling, touching, hearing, and moving objects around. This is a real hands-on type of knowledge.
Preoperational Stage	In the **preoperational stage**, children from ages 2 to 7, become able to think about the world using symbols. A **symbol** is something that stands for something else. The use of language, whether it is in the form of words or gestures, facilitates knowing and communicating about the world. This is the hallmark of preoperational intelligence and occurs in early childhood. However, these children are preoperational or pre-logical. They still do not understand how the physical world operates.
Concrete Operational	Children in the **concrete operational** stage, ages 7 to 11, develop the ability to think logically about the physical world. Middle childhood is a time of understanding concepts such as size, distance, and constancy of matter, and cause and effect relationships. A child knows that a scrambled egg is still an egg and that 8 ounces of water is still 8 ounces no matter what shape of glass contains it.
Formal Operational	During the **formal operational** stage children, at about age 12, acquire the ability to think logically about concrete and abstract events. The teenager who has reached this stage is able to consider possibilities and to contemplate ideas about situations that have never been directly encountered. More abstract understanding of religious ideas or morals or ethics and abstract principles such as freedom and dignity can be considered.

Criticisms of Piaget's Theory

Piaget has been criticized for overemphasizing the role that physical maturation plays in cognitive development and in underestimating the role that culture and interaction (or experience) plays in cognitive development. Looking across cultures reveals considerable variation in what children are able to do at various ages. Piaget may have underestimated what children are capable of given the right circumstances.[2]

Further, not everyone agrees that development is stage-like and discontinuous as Piaget so strongly suggests.

Main Points about Piaget and Cognitive stages of Development

Piaget, one of the most influential cognitive theorists, believed that

- Children think differently than adults do and this difference is one of kind, not only amount
- Understanding is motivated by trying to balance what we sense in the world and what we know in our minds. When presented with new knowledge we may add new schema (categories of knowledge) or modify existing ones.
- Children's understanding of the world changes as their cognitive skills mature through 4 stages: sensorimotor stage, preoperational stage, concreate operational stage, and formal operational stage.

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2.8: Constructivism and School/Education (Extra Resource)

Constructivism: changes in how students think

Behaviorist models of learning may be helpful in understanding and influencing what students do, but teachers usually also want to know what students are *thinking*, and how to enrich what students are thinking. For this goal of teaching, some of the best help comes from **constructivism**, which is a perspective on learning focused on how students actively create (or "construct") knowledge out of experiences. Constructivist models of learning differ about how much a learner constructs knowledge independently, compared to how much he or she takes cues from people who may be more of an expert and who help the learner's efforts (Fosnot, 2005; Rockmore, 2005). For convenience these are called **psychological constructivism** and **social constructivism** (or sometimes **sociocultural theory**). Both focus on individuals' thinking rather than their behavior, but they have distinctly different implications for teaching.

Psychological constructivism: the independent investigator

The main idea of psychological constructivism is that a person learns by mentally organizing and reorganizing new information or experiences. The organization happens partly by relating new experiences to prior knowledge that is already meaningful and well understood. Stated in this general form, individual constructivism is sometimes associated with a well-known educational philosopher of the early twentieth century, **John Dewey** (1938–1998). Although Dewey himself did not use the term constructivism in most of his writing, his point of view amounted to a type of constructivism, and he discussed in detail its implications for educators. He argued, for example, that if students indeed learn primarily by building their own knowledge, then teachers should adjust the curriculum to fit students' prior knowledge and interests as fully as possible. He also argued that a curriculum could only be justified if it related as fully as possible to the activities and responsibilities that students will probably have *later*, after leaving school. To many educators these days, his ideas may seem merely like good common sense, but they were indeed innovative and progressive at the beginning of the twentieth century.

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2.9: Vygotsky's Sociocultural Development

Lev Vygotsky (1896-1934) was a Russian psychologist who wrote in the early 1900s but whose work was discovered in the United States in the 1960s but became more widely known in the 1980s. Vygotsky differed from Piaget in that he believed that a person not only has a set of abilities, but also a set of potential abilities that can be realized if given the proper guidance from others. His sociocultural theory emphasizes the importance of culture and interaction in the development of cognitive abilities. He believed that through guided participation known as **scaffolding**, with a teacher or capable peer, a child can learn cognitive skills within a certain range known as the **zone of proximal development**.[1] His belief was that development occurred first through children's immediate social interactions, and then moved to the individual level as they began to internalize their learning.[2]



Figure **2.9.1**: Lev Vygotsky.[3]

Have you ever taught a child to perform a task? Maybe it was brushing their teeth or preparing food. Chances are you spoke to them and described what you were doing while you demonstrated the skill and let them work along with you all through the process. You gave them assistance when they seemed to need it, but once they knew what to do-you stood back and let them go. This is **scaffolding** and can be seen demonstrated throughout the world. This approach to teaching has also been adopted by educators. Rather than assessing students on what they are doing, they should be understood in terms of what they are capable of doing with the proper guidance. You can see how Vygotsky would be very popular with modern day educators.[4]

Main Points about Vygotsky's theory

- Vygotsky concentrated on the child's interactions with peers and adults. He believed that the child was an apprentice, learning through sensitive social interactions with more skilled peers and adults.
- Vygotsky believed that older individuals scaffold a child's learning and push them along their zone of proximal development

Comparing Piaget and Vygotsky

Vygotsky concentrated more on the child's immediate social and cultural environment and his or her interactions with adults and peers. While Piaget saw the child as actively discovering the world through individual interactions with it based on their internal/brain maturation, Vygotsky saw the child as more of an apprentice, learning through a social environment of others who had more experience and were sensitive to the child's needs and abilities.[5]

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2.10: Information Processing Theory

Information Processing theory focuses on cognition just as Piaget and Vygotsky do. However, it is not the work of a single theorist, but based on the ideas and research of several cognitive scientists *studying how individuals perceive, analyze, manipulate, use, and remember information*. This approach assumes that humans gradually improve in their processing skills; that is, cognitive development is continuous rather than stage-like. The more complex mental skills of adults are built from the primitive abilities of children. We are born with the ability to notice stimuli, store, and retrieve information. Brain maturation enables advancements in our information processing system, particularly in quantity rather than quality. At the same time, interactions with the environment also aid in our development of more effective strategies for processing information.

Main Points about Information Processing

- Information processing theorists critique Piaget's stage/qualitative theory by emphasizing that development is quantitative in nature
- They compare human thinking to computer models and simulations
- They have done a lot of lab research with children

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2.11: Bronfenbrenner and Ecological Systems

Like Vygotsky's, Bronfenbrenner looked at the social influences on learning and development. Urie Bronfenbrenner (1917-2005) offers us one of the most comprehensive theories of human development. Bronfenbrenner studied Freud, Erikson, Piaget, and learning theorists and believed that all of those theories could be enhanced by adding the dimension of context. What is being taught and how society interprets situations depends on who is involved in the life of a child and on when and where a child lives.

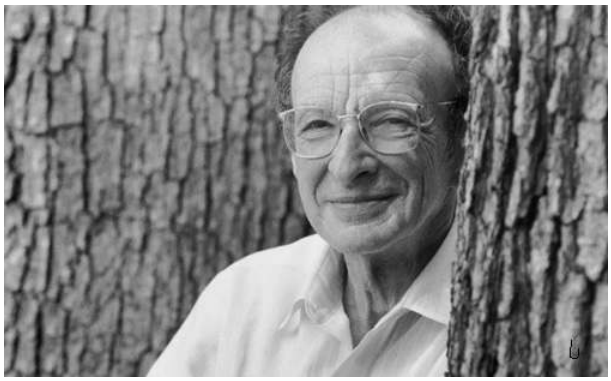


Figure **2.11.1**: Urie Bronfenbrenner.[1]

Bronfenbrenner's ecological systems model explains the direct and indirect influences on an individual's development.

Table **2.11.1**: Bronfenbrenner suggested that there are nested levels of influences within which we develop

Name of System	Description of System
Microsystems	**Microsystems** impact a child directly. These are the people with whom the child interacts such as parents, peers, and teachers. The relationship between individuals and those around them need to be considered. For example, to appreciate what is going on with a student in math, the relationship between the student and teacher should be known, but also the relationship between the parent and student.
Mesosystems	**Mesosystems** are interactions between those surrounding the individual. The relationship between parents and schools, for example will affect the child.
Exosystem	Larger institutions such as the mass media or the healthcare system are referred to as the **exosystem**. These have an impact on families and peers and schools who operate under policies and regulations found in these institutions.
Macrosystems	We find cultural values and beliefs at the level of **macrosystems**. These larger ideals and expectations inform institutions that will ultimately impact the individual.
Chronosystem	All of this happens in an historical context referred to as the **chronosystem**. Cultural values change over time, as do policies of educational institutions or governments in certain political climates. Development occurs at a point in time. (Consider the idea of cohort differences mentioned in the section on issues in development)

For example, in order to understand a student in math, we can't simply look at that individual and what challenges they face directly with the subject. We have to look at the interactions that occur between teacher and child. Perhaps the teacher needs to make modifications as well. The teacher may be responding to regulations made by the school, such as new expectations for students in math or constraints on time that interfere with the teacher's ability to instruct. These new demands may be a response to national efforts to promote math and science deemed important by political leaders in response to relations with other countries at a particular time in history.



Figure **2.11.2**: Protesting for immigrants. (Photo Source: Minneapolis protest against Arizona immigrant law SB 1070, CC BY 2.0.)

With its focus on interaction within multiple environments, the human ecology framework is an incredibly useful lens to employ **cross-cultural contexts** such as when considering immigrant families. For example, a researcher could ask, "How do Hmong immigrant families manage financial resources in their new environment in the United States?" and "How did Hmong families manage their financial resources while still living in Laos?" The assumptions and central concepts of human ecology theory would apply equally in either culture. The needs, values, and environment would be sensitively identified within each culture.[2]

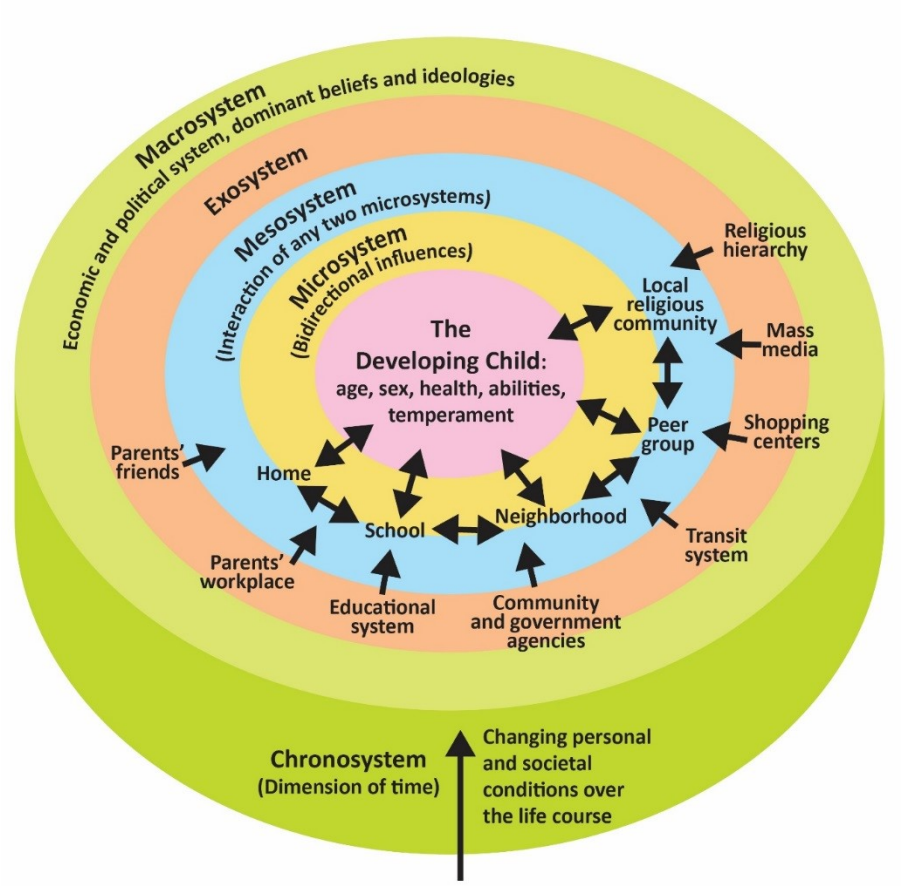


Figure **2.11.3**: Bronfenbrenner's ecological systems theory represented by concentric rings showing the child at the center, with 1. Bidirectional influences of the microsystem, 2 the mesosystem which is the interaction of any two microsystems like local religious community and peer group; or school and home, 3 the exosystem like parents' workplace, transit system, government agencies, 4. Macrosystem consisting of economic and political system, and dominant beliefs and ideologies. Also included is the chronosystem or the dimension of time – changing personal and societal conditional over the life course.[3]

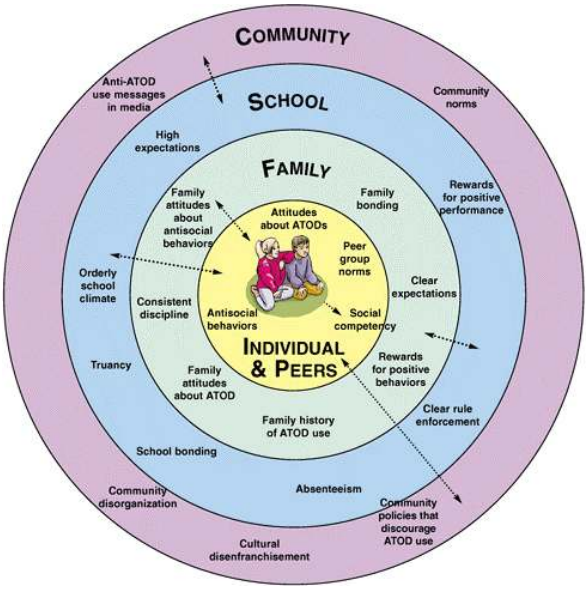


Figure **2.11.4**: Bronfenbrenner's Ecological theory diagram (Image Source: Alyla.K, CC BY SA)

Main Points about Bronfenbrenner

After studying all of the prior theories, Bronfenbrenner added an important element of context to the discussion of influences on human development.

- He believed that the people involved in children's lives and when and where they live are important considerations.
- He created a model of nested systems that influence the child (and are influenced by the child) that include: microsystems, mesosystems, the exosystem, macrosystems, and chronosystems.

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[1] Image by Marco Vicente González is licensed under CC BY-SA 4.0

[2] Solheim, C. A., & Yang, P. N. D. (2010). Understanding generational differences in financial literacy in Hmong immigrant families. *Family and Consumer Sciences Research Journal 38*(4), 435-454.

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2.12: Ethology/Evolutionary Psychology

Evolutionary psychology emphasizes the importance of natural selection; that is, those genes that allow one to survive and reproduce will be more likely to be transmitted to offspring. This viewpoint is also called **ethology**. The idea is that those traits that serve a purpose in development are more likely to persist through generations. Ethologists like Lorenz and Tinbergen attempted to explain behavior in terms of its adaptive value for the organism.



Figure **2.12.1**: The idea of Imprinting suggests that baby ducks are genetically wired to follow the first large moving object that they see because that object is most likely to be their mom. This genetic wiring makes them more likely to get fed and protected from predators. (Kim, CC BY 2.0, via Wikimedia Commons)

Main Points about Ethology/Evolutionary theory

Evolutionary theorists/Ethologists focus on

- Darwinian principles of evolution
- just like you can ask how and why birds have wings, we can ask how and why human behaviors and characteristics have evolved the way they have.

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2.13: Critical Race Theory

It is important to consider that the other theories are the work of the “original” theorists – that is to say the Euro-US/white perspectives on child development that exist in the field of child development as has been conceptualized, presented and sold in the US and Western European contexts. There are today more than 7 million people in the world. Only a small fraction live in the US and Western Europe. Obviously, other cultures have and always have had some views of how children develop, whether children are active in their own development, which adults are most important, how similarities in families are explained, and so on.

The theories presented in developmental psychology textbooks have long been presented as the foundation of developmental and psychological research. With the monumental work of thinkers who have long been considered “controversial” as well as considering the long apology issued by the American Psychological Association, it is this author’s considered opinion that all social science textbooks should include information about Critical Race Theory. It is a conglomeration of ideas that not all proponents of CRT would agree on, but according to Delgado and Stefancic (2001), they would agree on the following

- Racism is normal, not aberrational – most people of color experience it on a daily basis. It is ordinary, and therefore difficult to cure or even address.
- The white-over-color ascendancy serves a material (for white moneyed people) and psychic purpose (for working classes). So large segments of people have little incentive to eradicate it.
- The social construction thesis holds that race is not actually scientifically based. It is a social construct that has moved to serve the purpose of separating people for the expediency of legal and material scapegoating.
- The majority society has racialized different groups at different times in different ways depending on economic, military and other needs.
- Then there is the issue that different races are not different in some essential way, but instead are very similar to all people in many ways, and one brown person might be very different from another in many ways. When I was writing my dissertation about East Indian families with adolescents, there were families I spoke with who were clearly from the highest echelons of SES because of being in business, while others were professionals. Still others were employed in service related jobs, and yet others have arrived in the North American west coast as refugees after protesting the Indian government for a separate state in India. So, one might argue that while ethnically or racially these are all "East Indians" or "South Asians," but their experiences, viewpoints and behaviors differ widely and might be more similar to other Vietnamese political refugees, White Jewish professionals or Cuban business people than each other.
- Somewhat opposite to the previous point is the idea that minorities are able to speak with a voice that White people are not able to. This is the notion that legal storytelling is possible only from a targeted viewpoint.

"The originators of CRT include Derrick Bell, Kimberlé Crenshaw, Cheryl Harris, Richard Delgado, Patricia Williams, Gloria Ladson-Billings, Tara Yosso, among others. CRT transcends a Black/white racial binary and recognizes that racism has impacted the experiences of various people of color, including Latinx, Native Americans, and Asian Americans. As a result, different branches, including LatCrit, TribalCrit, and AsianCRT have emerged from CRT." (George, 2021).

This theory did not grow out of specifically psychological science. However, even if we are looking for traditional connections to a die-hard psychological science approach, we could tie this theory in very neatly with Bronfenbrenner’s theory. It is patently clear that US society has been built on rigid systems of discrimination. Any examination of the topics of development – cognition, stress, health, emotion, relationships – could and should be examined in light of these facts.

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CHAPTER OVERVIEW

3: Developmental Research

3.1: Scientific Approach
3.2: Scientific Method
3.3: Research Design
3.4: Methods of data collection
3.5: Community based participatory research
3.6: Developmental research designs
3.7: Bias
3.8: Ethics and Informed consent

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3.1: Scientific Approach

An important part of learning any science is having a basic knowledge of the techniques used in gathering information. The hallmark of scientific investigation is that of following a set of procedures designed to keep questioning or skepticism alive while describing, explaining, or testing any phenomenon. Some people are hesitant to trust academicians or researchers because they always seem to change their story. That, however, is exactly what science is all about; it involves continuously renewing our understanding of the subjects in question and an ongoing investigation of how and why events occur. Science is a vehicle for going on a never-ending journey seeking knowledge. In the area of development, we have seen changes in recommendations for nutrition, in explanations of psychological states as people age, and in parenting advice. So think of learning about human development as a lifelong endeavor. It is also important to note that the scientific endeavors referred to in standard textbooks are heavily based on and influenced by European and US ideas.

Take a moment to write down two things that you know about childhood. Now, how do you know? Chances are you know these things based on your own history (experiential reality) or based on what others have told you or cultural ideas (agreement reality) (Seccombe and Warner, 2004). There are several problems with personal inquiry. Read the following sentence aloud:

Paris in the

the spring

Are you sure that is what it said? Read it again:

Paris in the

the spring

If you read it differently the second time (adding the second “the”) you just experienced one of the problems with personal inquiry; that is, the tendency to see what we believe. Our assumptions very often guide our perceptions, consequently, when we believe something, we tend to see it even if it is not there. This problem may just be a result of cognitive ‘blinders’ or it may be part of a more conscious attempt to support our own views. Confirmation bias is the tendency to look for evidence that we are right and in so doing, we ignore contradictory evidence. Popper suggests that the distinction between that which is scientific and that which is unscientific is that science is falsifiable; scientific inquiry involves attempts to reject or refute a theory or set of assumptions (Thornton, 2005). Theory that cannot be falsified is not scientific. And much of what we do in personal inquiry involves drawing conclusions based on what we have personally experienced or validating our own experience by discussing what we think is true with others who share the same views.

Science offers a more systematic way to make comparisons guarding against bias.

The general scientific approach has three fundamental features (Stanovich, 2010). The first is *systematic empiricism*. Empiricism refers to learning based on observation, and scientists learn about the natural world systematically, by carefully planning, making, recording, and analyzing observations of it. The second feature of the scientific approach is that it is concerned with *empirical questions*. These are questions about the way the world actually is and, therefore, can be answered by systematically observing it. The third feature is that it creates *public knowledge*. After asking empirical questions, making observations, and drawing their conclusions, scientists publish their work. This usually means writing an article for publication in a professional journal, in which they put their research question in the context of previous research, describe in detail the methods they used to answer their question, and clearly present their results and conclusions. Publication is an essential feature of science for two reasons. One is that science is a social process—a large-scale collaboration among many researchers distributed across both time and space. Our current scientific knowledge of most topics is based on many different studies conducted by many different researchers who have shared their work with each other over the years. The second is that publication allows science to be self-correcting. Individual scientists understand that despite their best efforts, their methods can be flawed, and their conclusions incorrect. Publication allows others in the scientific community to detect and correct these errors so that, over time, scientific knowledge increasingly reflects the way the world actually is.

Keep in mind that the scientific approach consists of

- Systematic empiricism
- Empirical questions

- Public knowledge

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3.2: Scientific Method

The scientific approach uses specific methodology in order to reach replicable conclusions. Empirical research is conducted primarily in one of two ways - quantitative and qualitative.

Quantitative

One method of scientific investigation – particularly quantitative research - involves the following steps:

1. Determining a research question
2. Reviewing previous studies addressing the topic in question (known as a literature review)
3. Determining a method of gathering information
4. Conducting the study
5. Interpreting results
6. Drawing conclusions; stating limitations of the study and suggestions for future research
7. Making your findings available to others (both to share information and to have your work scrutinized by others)

Your findings can then be used by others as they explore the area of interest and through this process a literature or knowledge base is established. This model of scientific investigation presents research as a linear process guided by a specific research question. And it typically involves quantifying or using statistics to understand and report what has been studied. Many academic journals publish reports on studies conducted in this manner.

Qualitative

Another model of research referred to as qualitative research may involve steps such as these:

1. Begin with a broad area of interest
2. Gain entrance into a group to be researched
3. Gather field notes about the setting, the people, the structure, the activities or other areas of interest
4. Ask open ended, broad “grand tour” types of questions when interviewing subjects
5. Modify research questions as study continues
6. Note patterns or consistencies
7. Explore new areas deemed important by the people being observed
8. Report findings

In this type of research, theoretical ideas are “grounded” in the experiences of the participants. The researcher is the student and the people in the setting are the teachers as they inform the researcher of their world (Glazer & Strauss, 1967). Researchers are to be aware of their own biases and assumptions, acknowledge them and bracket them in efforts to keep them from limiting accuracy in reporting. Sometimes qualitative studies are used initially to explore a topic and more quantitative studies are used to test or explain what was first described.

Of course we would be well advised to remember that science is supposed to be unbiased but is always affected by the perspective of the researcher and the zeitgeist of the times they live in.

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3.3: Research Design

Generally quantitative studies examine the relation between two or more variables. Variables are characteristics of the individual or situation that can vary in amount or type. For example age, weight, self esteem and ethnicity are all individual variables. Type of child care situation, public or private funding for schools are situational variables. Generally, for any hypothesis, the variable of interest that is assumed to be the cause is called the independent variable in experimental design studies. The outcome variable is called the dependent variable in experimental design studies. In strictest terms the terms “independent and dependent variables” should only be used in experimental designs, whereas you can use the terms “predictor and outcome variables” to refer to the same variables in quasi-experimental settings. Quantitative research studies are different depending on the amount of control that the researcher can exert on the variables in question. At one extreme is experimental design –

Experimental Design

When you have a hypothesis about the effects of one variable on another, in experimental designs, the researcher manipulates or changes one variable in order to observe the effects on the other variable. For example, if a researcher wanted to study the effects of phonics teaching versus whole language teaching on reading outcomes for K-3 students, in experimental research, the researcher would randomly assign some students to the phonics condition and some students to the whole language condition, and then test their reading levels after having been exposed to the different conditions for some specified period of time.

The steps might look something like this

1. Find 200 Kindergarten students
2. Randomly assign 100 to learn using phonics, and 100 to learn using whole language
3. Two months later administer the same reading test to all 200 children

Quasi Experimental Design

However, if the researcher merely went to two schools where each of the methods – phonics versus whole language - was employed already in each of the schools, and tested children’s reading levels, it might appear that this would be a simpler way to get the same (or similar) results. But you can never be sure. In fact, in the second situation, the researcher has no control over other confounding variables that might systematically vary along with one or both of the variables of interest. For example, it might be that the school where teachers use whole language to teach reading is located in a higher SES area than the one that employs phonics methods. So, when we test children’s reading at both schools, we can’t be sure whether reading levels differ due to the method of teaching or the SES. This kind of study would be considered quasi experimental.

It might also be difficult for the researcher to truly assign individuals to different IV conditions when the hypothesized cause is ethnicity or sex for example. A researcher cannot randomly assign participants to male and female groups or to Black and White groups. Instead they would try to match the two groups in all other ways – e.g. age, SES, and other things that might influence the outcome. The more variables that are controlled or accounted for by the researcher, the more confidence we can have that any relation found between the two variables of interest is truly a valid one. This is also important because there are some variables that cannot be controlled because of ethical considerations.

Can you think of variables that it would be unethical for a researcher to manipulate? Can you think of how those variables do in fact vary and affect other developmental factors? How might researchers study these kinds of conditions?

Correlational Design

Correlational design is another type of research design at the other extreme from experimental designs. Here the researcher only measures two variables. There is no manipulation of any of the variables. For example, a researcher might wish to measure whether children’s aggression levels vary with local temperature, or whether children’s self esteem is related to use of strict discipline. The steps followed in a correlational design are as follows

1. Identify a school where you want to conduct the study
2. Collect data about
    1. Temperature each day
    2. How many kids were sent to the office for aggressive conduct with classmates each day

3. Run statistical analysis to see if there are patterns

In this case, you might find that as temperature increases, the numbers of children sent to the office for hitting their classmates increases. This is considered a positive correlation between the two variables. In the second example above, you might find that the stricter parents report being, the lower their children's self esteem. This would be considered negative correlation between the two variables. The term correlation is used in slightly different ways in different contexts so it's important to note those differences:

- Correlational design is a type of research design where the researcher exists minimal control and only measures two variables.
- Correlation coefficient refers to a statistical calculation that results in a number often denoted by "r." The Pearson Product Moment Correlation coefficient is a number that ranges between 0 and the absolute value of 1 (-1--+1). The direction of the relation is indicated by the sign, and the strength of the relation by its closeness to 1. So a -0.9 correlation indicates a stronger relation between the two variables in question than a +0.3 correlation.
- Correlation refers to the relation between two variables and you will often hear it said that correlation is not causation. This follows from the above explanation of this type of design (ie correlational design versus experimental design). Since the researcher does not control any variables, given a correlation between two variables A and B, it is difficult to tell whether A caused B, B caused A, or some third variable C caused A and B to appear to be related.

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3.4: Methods of data collection

Let's look more closely at some actual techniques, or research methods, used to measure, assess or test variables. Depending partly on what type of method is used, the design would be considered experimental, correlational or quasi experimental, and as discussed above, each type of design has different advantages and disadvantages, particularly in terms of control and generalizability.

Observational Studies

Observational studies involve watching and recording the actions of participants. This may take place in the natural setting, such as observing children at play at a park (naturalistic observation), or behind a one-way glass while children are at play in a laboratory playroom (structured observation). The researcher may follow a checklist and record the frequency and duration of events (perhaps how many conflicts occur among 2-year-olds) or may observe and record as much as possible about an event (such as observing children in a classroom and capturing the details about the room design and what the children and teachers are doing and saying).

In general, observational studies have the strength of allowing the researcher to see how people behave rather than relying on self-report. What people do and what they say they do or would do are often very different. A major weakness of observational studies is that they do not allow the researcher to explain causal relationships. Yet, observational studies are useful and widely used when studying children. Another disadvantage of observation methods is that children, and in fact people in general, tend to change their behavior when they know they are being watched (known as the Hawthorne effect).

Naturalistic and Laboratory Experiments

As discussed in the section on research design, ***Experiments*** are designed to test hypotheses (or specific statements about the relationship between variables) in a controlled setting in efforts to explain how certain factors or events produce outcomes. A variable is anything that changes in value. Concepts are operationalized or transformed into variables in research, which means that the researcher must specify exactly what is going to be measured in the study.

Three conditions must be met in order to establish cause and effect. Experimental designs are useful in meeting these conditions.

1. The independent and dependent variables must be related. In other words, when one is altered, the other changes in response. (The independent variable is something altered or introduced by the researcher. The dependent variable is the outcome or the factor affected by the introduction of the independent variable. For example, if we are looking at the impact of exercise on stress levels, the independent variable would be exercise; the dependent variable would be stress.)
2. The cause must come before the effect. Experiments involve measuring subjects on the dependent variable before exposing them to the independent variable (establishing a baseline). So we would measure the subjects' level of stress before introducing exercise and then again after the exercise to see if there has been a change in stress levels. (Observational and survey research does not always allow us to look at the timing of these events, which makes understanding causality problematic with these designs.)
3. The cause must be isolated. The researcher must ensure that no outside, perhaps unknown variables are actually causing the effect we see. The experimental design helps make this possible. In an experiment, we would make sure that our subjects' diets were held constant throughout the exercise program. Otherwise, diet might really be creating the change in stress level rather than exercise.

One basic experimental design involves beginning with a sample (or subset of a population) and randomly assigning subjects to one of two groups: the experimental group or the control group. The experimental group is the group that is going to be exposed to an independent variable or condition the researcher is introducing as a potential cause of an event. The control group is going to be used for comparison and is going to have the same experience as the experimental group but will not be exposed to the independent variable. After exposing the experimental group to the independent variable, the two groups are measured again to see if a change has occurred in the experimental group, and not in the control group. If so, we are in a better position to suggest that the independent variable caused the change in the dependent variable.

The major advantage of the experimental design is that of helping to establish cause and effect relationships. A disadvantage of this design is the difficulty of translating much of what happens in a laboratory setting into real life.

That is why naturalistic experiments where the researcher enters into a natural situation and changes some variable of interest can increase the generalizability of experimental research. However, while the independent variable is still being manipulated by the researcher, there is some loss of control over other variables that are likely to influence the dependent variable.

Case Studies

Case studies involve exploring a single case or situation in great detail. Information may be gathered with the use of observation, interviews, testing, or other methods to uncover as much as possible about a person or situation. Case studies are helpful when investigating unusual situations such as brain trauma or children reared in isolation. And they are often used by clinicians who conduct case studies as part of their normal practice when gathering information about a client or patient coming in for treatment. Case studies can be used to explore areas about which little is known and can provide rich detail about situations or conditions. However, the findings from case studies are very difficult to generalize or apply to larger populations; this is because cases are not randomly selected and no control group is used for comparison.

For example, case studies are used when studying children born as conjoined twins. Clearly this is not a situation commonly encountered or seen. There are also famous examples of case studies where situations occurred accidentally, but then the person was studied extensively in order to learn about the variables involved. One famous example of this in psychology and neuroscience is Henry Molaison who went through surgery to treat epilepsy when he was in his 20s, which resulted in anterograde amnesia (an inability to form new memories after the removal of his hippocampus). Researchers studied Mr Molaison for many years until his death in 2008 and his brain has been preserved as well currently at UC Davis.

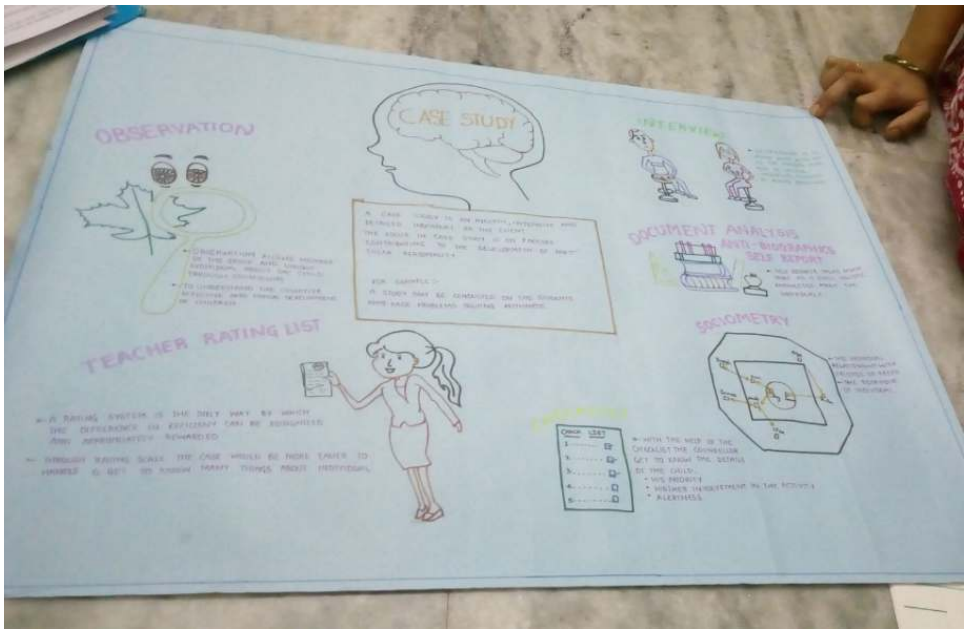


Figure **3.4.1**: A case study is a collection of a lot of data about one specific participants or a very small group of participants.[1]

Surveys

Surveys are familiar to most people because they are so widely used. Surveys enhance accessibility to subjects because they can be conducted in person, over the phone, through the mail, or online. A survey involves asking a standard set of questions to a group of subjects. In a highly structured survey, subjects are forced to choose from a response set such as “strongly disagree, disagree, undecided, agree, strongly agree”; or “0, 1-5, 6-10, etc.” This is known as **Likert Scale**. Surveys are commonly used by sociologists, marketing researchers, political scientists, therapists, and others to gather information on many outcome and predictor variables in a relatively short period of time. Surveys typically yield surface information on a wide variety of factors, but may not allow for in-depth understanding of human behavior.

Of course, surveys can be designed in a number of ways. They may include forced choice questions and semi-structured questions in which the researcher allows the respondent to describe or give details about certain events. Some of the most difficult aspects of designing a good survey is wording questions in an unbiased way and asking the right questions so that respondents can give a

clear response rather than choosing “undecided” each time. Knowing that 30% of respondents are undecided is of little use! Another issue is that each question in a survey needs to be answerable individually and uniquely. For example, if a survey question was worded – “I see myself as an honest and hardworking individual” it is unclear whether I should answer yes or no if I think of myself as honest, but somewhat lazy! So, a lot of time and effort should be placed on the construction of survey items. One of the benefits of having forced choice items is that each response is coded so that the results can be quickly entered and analyzed using statistical software. Analysis takes much longer when respondents give lengthy responses that must be analyzed based on some different criteria.

Once you decide what questions to ask, surveys are easy to use, but not always the right method. Survey use assumes that research participants are able to understand the questions, know the answers to the questions, are motivated to answer, and capable of honest answers.

Surveys are useful in examining stated values, attitudes, opinions, and reporting on practices. However, they are based on self-report or what people say they do rather than on observation and this can limit accuracy.

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3.5: Community based participatory research

While most of the psychological research we have and will be discussing is broadly scientific researcher led and defined, community based participatory research is not. It is where community partners co-design for research protocols, decision making, and the final product of the research. There is much greater buy-in by the community, greater cultural responsiveness in all stages of the research, and therefore greater longevity of the impact of the research. It combines knowledge and action to create sustainable change in communities. Even though it is aligned with the scientific and ethical aims of psychology, it is more often used in the fields of sociology, nursing and public health, and comprised only 0.1% of peer reviewed psychology articles by one count (Collins et al, 2018). However there are some subfields like community and social psychology where this method is utilized a bit more often.

In the late 1970's Colombian sociologist Orlando Fals Borda and colleagues organized the first CBPR conference that came out of the traditions of Paolo Freire's liberation pedagogy and Kurt Lewin's action research. This was in response to the imperialist notions of who defined the problem, who did the research and who makes and controls knowledge (primarily White European and US settler definitions of investigator led research).

According to Collins et al (2018), "Thus, individuals are viewed as embedded within their communities, which are characterized by connection and identification with other individuals, common symbol systems, shared values and norms, mutual influence, common interests, and joint commitment to meeting shared needs (Wallerstein et al., 2017). Communities may be defined by geographical boundaries or may be dispersed across geographical place but have a common identity or shared fate (Wallerstein et al., 2017). Communities must be defined, engaged and involved in the research process to maximize the psychological and physical health of their constituents." Researchers explicitly recognize that they do not have a monopoly on knowledge and they embrace cultural humility. This approach recognizes diverse influences on mental processes and also recognizes and honors the contribution of multiple players in the community in an authentic manner throughout the entire process of research.

In some ways it is similar to ethnographic, qualitative research, in that it is a cyclical, iterative process, and requires the researcher to recognize their own positionality and privilege, while building and maintaining relationships with the community. The community is involved in every aspect and stage of the research process including dissemination of findings.

The difficulties of conducting this type of research include transparency about the multiple roles everyone might be playing in this process, and confidentiality and anonymity of participants. Conflicts of interest can be another area of concern.

The mechanics/an example

One example of this type of study with particular relevance to child developmental psychology was done by Pesch et al (2022) on a co-design of Playful Learning Landscapes in two culturally informed settings. In California, the researchers - Pesch and collegues - partnered with the Santa Ana Early Learning Initiative (SAELI), a non-profit that connected with parents and caregivers in the community for raising early childhood outcomes. In Philadelphia, they partnered with six early childhood education centers (in six distinctly religiously and geographically different settings) to co-design and co-create learning spaces that were community guided. They leveraged these partnerships to include community voices and funds of knowledge in order to create culturally relevant and scientifically informed public learning spaces. Community members were engaged in the planning process, in the implementation and in the evaluation processes in an iterative and cyclical manner.

Planning

In Philadelphia, for example, in the planning process, community values were elicited using a MadLibs type activity where participants generated values important to them by brainstorming learning or principle-related adjectives important to them, and coalesced around the core values they wanted their installations to evoke - diversity, curiosity, inclusion and an "environment of yes." The centers listed what STEM principles were important to them. In California, the planning process involved several rounds of meetings where parents identified geographical areas that they wanted to see renovated and how. Since these meetings were happening during the pandemic, ideas were shared online, and the problems and possible solutions were generated by community members based on their core values of intergenerational learning, heritage and community engagement.

Implementation

In California, life sized mockups of some of the ideas were built and community participants were invited to interact and provide feedback and suggestions. In Philadelphia, architects (who were also chosen from and with community input), shared blueprints with the community. Caregivers responded to verbal and written prompts to make activities more culturally relevant and improve family experiences.

Implementation and evaluation

These processes were iterative until all ideas were included, and family values were maintained. Of course local ordinances were followed. Once all the actual structures were built, evaluation included the research team in collaboration with the community. The surveys (which were iteratively translated in the California setting) were created in collaboration as well to make sure they were community and culturally relevant. The purpose had been to increase adult-child interaction quality and language use, building positive attitudes and beliefs about playful learning, increased ownership of local spaces and increased civic engagement. From the time of the design stages, the relationships formed between people in the community led to greater civic engagement and social cohesion, which in turn led to greater economic health and wellbeing, particularly in the traditionally underserved communities.

The outcomes were that learning increased in these settings, but also in culturally sensitive ways. These projects also yielded structures that reflected scientific practices but also the priorities of the community.

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3.6: Developmental research designs

Developmental designs are techniques used in developmental research (and other areas like clinical research). These techniques try to examine how age, cohort, gender, and social class impact development.

Longitudinal Research

Longitudinal research involves beginning with a group of people who may be of the same age and background, and measuring them repeatedly over a long period of time. One of the benefits of this type of research is that people can be followed through time and be compared with themselves when they were younger.

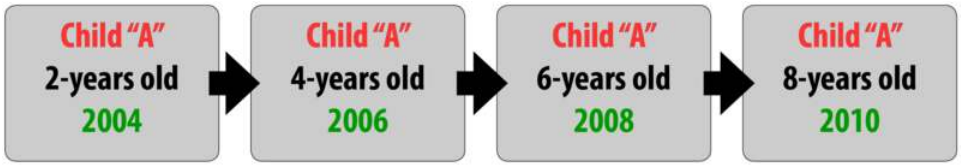


Figure **3.6.1**: A longitudinal research design where the same children (represented by "child A") are studied multiple times over years, months or weeks to observe and record developmental changes.[1]

A problem with this type of research is that it is very expensive and subjects may drop out over time. The Perry Preschool Project which began in 1962 is an example of a longitudinal study that continues to provide data on children's development (Parks, 2000) [2].

Cross-sectional Research

Cross-sectional research involves beginning with a sample that represents a cross-section of the population. Respondents who vary in age, gender, ethnicity, and social class might be asked to complete a survey about television program preferences or attitudes toward the use of the Internet. The attitudes of males and females could then be compared, as could attitudes based on age. In cross-sectional research, respondents are measured only once.

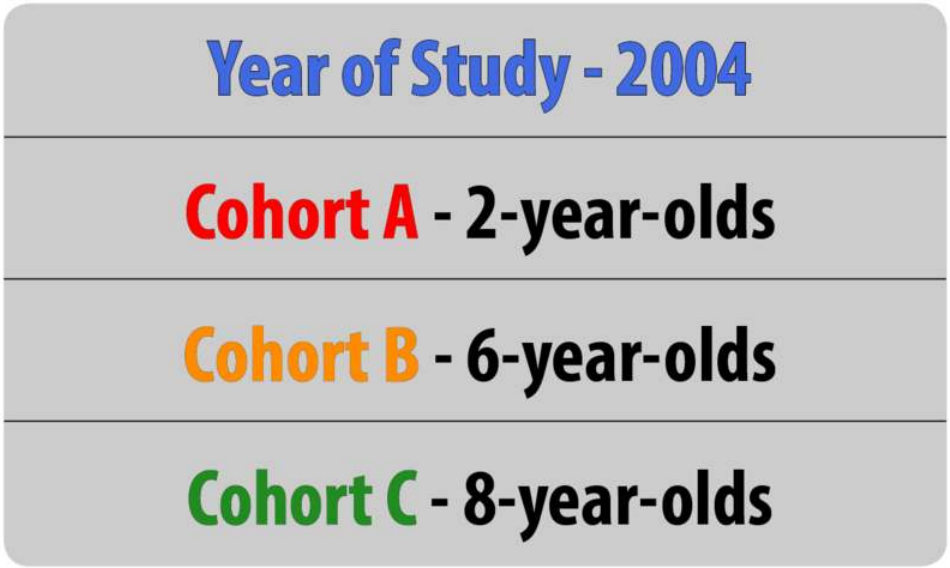


Figure **3.6.1**: In a cross-sectional research design, researchers study different age groups (cohorts) at one point in time and assume that any differences between the groups is the result of their age differences.[3]

This method is much less expensive than longitudinal research but does not allow the researcher to distinguish between the impact of age and the cohort effect. Different attitudes about the use of technology, for example, might not be altered by a person's biological age as much as their life experiences as members of a cohort. For example, my own children were born in 1994, 1996 and 2000. Their comfort and preference for using cellphones was certainly affected partly by their age. However, it was very much affected also by the use of technology that was available at the time they were in grade school. When our oldest was in seventh

grade, it was a status symbol amongst his peers to have a flip phone. By the time the youngest was in seventh grade, you were considered completely outmoded unless you had a smartphone in seventh grade.

Sequential Research

Sequential research involves combining aspects of the previous two techniques; beginning with a cross-sectional sample and measuring them through time.

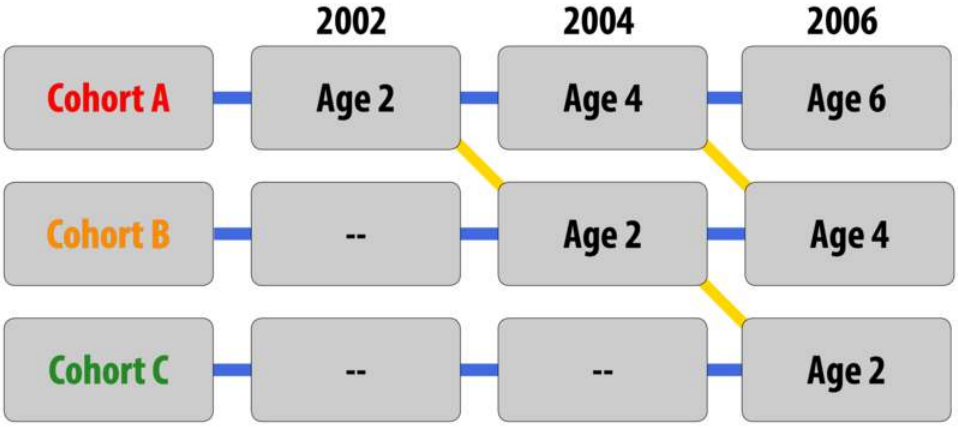


Figure **3.6.1**: In a sequential research design researchers collect data at multiple time points (like here in 2002, 2004 and 2006) with multiple age groups (here cohorts A, B and C). The blue horizontal lines represent longitudinal data comparisons as time passes. In 2006, we can see that at one time point, you can compare cross sectional data from cohort C, B, and A who are 2, 4 and 6 years old respectively.[4]

This is the perfect model for looking at age, gender, social class, and ethnicity. But the drawbacks of high costs and attrition persist in this type of design as well.[5]

Table **3.6.1**: **Advantages and Disadvantages of Different Research Designs**[6]

Type of Research Design	Advantages	Disadvantages
Longitudinal	• Examines changes within individuals over time • Provides a developmental analysis	• Expensive • Takes a long time • Participant attrition • Possibility of practice effects • Cannot examine cohort effects
Cross-sectional	• Examines changes between participants of different ages at the same point in time • Provides information on age-related change	• Cannot examine change over time • Cohort effects are a strong confounding factor
Sequential	• Examines changes within individuals over time • Examines changes between participants of different ages at the same point in time • Can be used to examine cohort effects	• May be expensive • Possibility of practice effects

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[2] Parks, G. (2000). The High/Scope Perry Preschool Project. Juvenile Justice Bulletin.

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3.7: Bias

By writing scientific articles we communicate science among colleagues and peers. By doing this, it is our responsibility to adhere to some basic principles like transparency and accuracy. Authors, journal editors and reviewers need to be concerned about the quality of the work submitted for publication and ensure that only studies which have been designed, conducted and reported in a transparent way, honestly and without any deviation from the truth get to be published. Any such trend or deviation from the truth in data collection, analysis, interpretation and publication is called bias. Bias in research can occur either intentionally or unintentionally. Bias causes false conclusions and is potentially misleading. Therefore, it is immoral and unethical to conduct biased research. Every scientist should thus be aware of all potential sources of bias and undertake all possible actions to reduce or minimize the deviation from the truth. This article describes some basic issues related to bias in research.

Definition of bias

Bias in data collection – volunteer bias, admission bias (like when only hospitalized patients are in study), survivor bias (like in the Seattle longitudinal study, or worse in cross sectional research where patients have died), and misclassification bias (where people may be put in the control group erroneously).

Bias in data analysis

Data analysis bias can occur in a number of different ways -

- reporting non-existing data from experiments which were never done (data fabrication);
- eliminating data which do not support your hypothesis (outliers, or even whole subgroups);
- using inappropriate statistical tests to test your data;
- performing multiple testing (“fishing for p”) by pair-wise comparisons (4), testing multiple endpoints and performing secondary or subgroup analyses, which were not part of the original plan in order to “find” statistically significant difference regardless to hypothesis.

For example, if the study aim is to show that one biomarker is associated with another in a group of patients, and this association does not prove significant in a total cohort, researchers may start “torturing the data” by trying to divide their data into various subgroups until this association becomes statistically significant. If this sub-classification of a study population was not part of the original research hypothesis, such behavior is considered data manipulation and is neither acceptable nor ethical. Such studies quite often provide meaningless conclusions such as with very specific groups that then become meaningless.

There is a very often quoted saying (attributed to Ronald Coase, but unpublished to the best of my knowledge), which says: “If you torture the data long enough, it will confess to anything”. Actually, it is well known that if 20 tests are performed on the same data set, at least one Type 1 error (α) is to be expected. Therefore, the number of hypotheses to be tested in a certain study needs to determined in advance. If multiple hypotheses are tested, correction for multiple testing should be applied or the study should be declared as exploratory.

Bias in data interpretation

There are also biases in interpretation that occur -

- discussing observed differences and associations even if they are not statistically significant (the often used expression is “borderline significance”);
- discussing differences which are statistically significant but are not clinically meaningful;
- drawing conclusions about the causality, even if the study was not designed as an experiment;
- drawing conclusions about the values outside the range of observed data (extrapolation);
- overgeneralization of the study conclusions to the entire general population, even if a study was confined to the population subset;
- Type I (the expected effect is found significant, when actually there is none) and Type II (the expected effect is not found significant, when it is actually present) errors (6).

Publication bias

The problem is that mostly positive results are most likely to be published whereas that should not be the case. So to enable publication of studies reporting negative findings, several journals have already been launched, such as Journal of Pharmaceutical Negative Results, Journal of Negative Results in Biomedicine, Journal of Interesting Negative Results and some other. The aim of such journals is to counterbalance the ever-increasing pressure in the scientific literature to publish only positive results.

The issue of culture

One of the big issues that psychology has been rightly accused of is that much of our research has been conducted with WEIRD (Western, educated, individualistic, rich, democratic) participants. In fact WEIRD participants constitute the data in 95% of studies, but they constitute only 12% of the world's population. This limitation is important to consider because we might assume things like the Muller Lyer illusion is universal, when in fact research (Segall's research with 17 cultures' children and adults) has shown that it is not. Obviously, research needs to be done with people from other cultures to ensure that those "facts" we consider unassailable are actually universal. Also, it is hard to use our tools in other cultures. The most obvious example is that our tests are written in English so a verbal test that measures self esteem will not be understood by Chinese students in China. But even more seemingly universal (because they are biological) tests like EEG are not necessarily foolproof. If infants are put to bed in positions different from Western children, the shape of their heads would preclude our knowing where to place electrodes on their head for research using EEG. Since development is influenced by interacting systems within us and in our environment there is likely no universal standard that can be used. So, a grand average would likely be descriptive of no one.

Child development is a fascinating field of study – but care must be taken to ensure that researchers use appropriate methods to examine infant and child behavior, use the correct experimental design to answer their questions, and be aware of the special challenges that are part-and-parcel of developmental research. Hopefully, this information helped you develop an understanding of these various issues and to be ready to think more critically about research questions that interest you. There are so many interesting questions that remain to be examined by future generations of developmental scientists – maybe you will make one of the next big discoveries![2]

For More Information

Got Bias - Exploring Implicit bias in early childhood education by Tina Sykes has information about reducing implicit bias when working with children and families.

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Bias in research from Simundić AM. Bias in research. Biochem Med (Zagreb). 2013;23(1):12-5. doi: 10.11613/bm.2013.003. PMID: 23457761; PMCID: PMC3900086. Licensed CC-BY 4.0

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Got Bias - Exploring Implicit bias in early childhood education by Tina Sykes

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3.8: Ethics and Informed consent

Research should, as much as possible, be based on participants' freely volunteered informed consent. For minors, this also requires consent from their legal guardians. This implies a responsibility to explain fully and meaningfully to both the child and their guardians what the research is about, potential costs and benefits, and how it will be disseminated. Participants and their legal guardians should be aware of the research purpose and procedures, their right to refuse to participate; the extent to which confidentiality will be maintained; the potential uses to which the data might be put; the foreseeable risks and expected benefits; and that participants have the right to discontinue at any time.

But consent alone does not absolve the responsibility of researchers to anticipate and guard against potential harmful consequences for participants.[1] It is critical that researchers protect all rights of the participants including confidentiality.

There are several particular and different issues we face when doing research in child development – from obtaining informed consent to doing naïve observations in naturalistic settings, from getting permission from young children (and their parents) to protecting confidentiality of older adolescents, and from obtaining information from and about children who cannot talk and some who are presumably not yet self aware enough to tell us about their thoughts and feelings. All psychologists grapple with many of these issues, and some are exacerbated because our participants are special and unique in many ways. But these are the reasons why all government funded research institutions are required to have an Institutional Review Board that meets at least monthly and all research carried out at that institution must receive IRB approval before data collection starts. The idea behind this is to protect the rights of all involved as well as to preempt any potential problems from occurring. Well-meaning researchers may not account for potential conflicts that might arise between the different responsibilities in their roles as researchers, psychologists, and civic-minded adults.

One extreme but important example of this kind of issue is playing out in many schools across the country today. When teenagers and even younger children “come out” about their gender identity to teachers or school social workers but do not feel safe doing so at home to their parents, there are multiple considerations that need to be negotiated ethically as well as legally. This storm that has erupted is not directly about research in child development but you can see how a researcher might encounter similar or parallel issues in their work.

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CHAPTER OVERVIEW

4: Genes and Environment

4.1: Nature v nurture research

4.2: Genes and Chromosomes - the nuts and bolts

4.3: Chromosomal and Genetic Abnormalities

4.4: Nature AND Nurture

4.5: Epigenetics

4.6: Genotype Environment correlations

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4.1: Nature v nurture research

In the section on "Issues in Development" we talked about how nature v. nurture is one of the basic, age-old questions or issues that come up in developmental science. People often ask, “Are we the way we are because of our genes or our environment?” We could make this question slightly less ridiculous and more manageable by narrowing down the question to something like “Are we as tall as we are because of our genes or our environment?” or “Are we as musical as we are because of our genes or our environment?” It becomes immediately clear that even if we are inclined to answer questions such as these, we would answer each of these last two questions differently. Perhaps, most of us would respond by saying that the answer to the first question is genes and the second, environment.

However, most psychologists today agree that this question is highly archaic, and unreasonable. They argue that asking this question is like asking whether a piece of music that you hear is coming from the musician or the instrument she is using. They would argue that those two are completely impossible to disentangle.

Yet many people persist in asking the question, and certainly it is clear that our abilities, traits, disorders, body parts and the way they function are all a result of our genes to some extent and the environmental influences that have acted upon us to some extent. The question that most people ask today is not “Is it genes OR environment that is responsible for…?” but rather “To what extent is the variability in … influenced by genes versus the environment?” So first we acknowledge that both play a role in whatever ability or trait we are looking to discuss. Then we want to get more specific and ask which plays a greater role and to what degree.

In order to find out whether genes play an important role in particular characteristics, researchers perform several different types of research:

Twin research

In this type of research, psychologists would study pairs of identical/monozygotic twins, and pairs of fraternal/dizygotic twins. The idea is that firstly, identical twins share a hundred percent of their genes, while fraternal twins share on average approximately fifty percent. So if identical twin pairs are more similar in whatever trait is of interest to the psychologist than fraternal twin pairs are, then that means that genes play a more important role in influencing that trait. For example, if you were to take ten pairs of identical and fraternal twin pairs each and found that the identical pairs’ musical abilities were more similar to each other, and that the fraternal twin pair’s musical abilities were not as similar as those of the identical pairs’, we would assume that difference between identical and fraternal twins is attributable to genetic differences. There are studies for example looking at “concordance rates” of psychological disorders like autism. In these studies the question that researchers are asking is “Given that one sibling is diagnosed on the Autism Spectrum (ASD), how likely is it that the other sibling will also be diagnosed with ASD?” For example, in a study with 277 twin pairs, ASD concordance was 31% for DZ and 88% for MZ twins (Rosenberg et al., 2009).

Adoption studies

Clearly when children are adopted into non-biologically related families, it is a clear opportunity to measure the similarity of their traits to those of their biological parents and compare those to the similarity with their adoptive parents. Early studies showed fairly large differences between the low IQ scores of biological parents and the much higher scores of their children adopted away. But subsequent research argued that much of those differences might be accounted for by mis-measurement of the biological parents’ IQ, the Flynn effect and the fact that when children were re-measured at a later point, their IQ was found to be lower. So, in this context, it was suggested that it might be better to compare the IQ of siblings, one who had stayed with the biological parent and one who had been adopted away. It was found that there was a significant difference between those comparison groups on average (Kendler et al., 2015). These adoption studies are considered a powerful tool for analyzing the effects of genetic versus environmental influence on traits.

Genomic examination

Human cells contain approximately 20,000 genes. The function of the Human Genome Project was to decode the DNA and identify the genes as well as continue to try and figure out which genes are responsible for what traits. Several genes have known or expected effects, and genomic studies examine the interplay of genetic and environmental factors in psychological outcomes. For example, Kaufman et al (2006) examined the interplay of two genes - a neurotrophic (neuronal food) gene variant and a serotonin

protein expresser gene variant – and child abuse on depressive symptoms in children. In this study a particular version of the BDNF and 5HTTLPR gene predicted highest depression, but only in children who had suffered abuse, and this outcome was moderated in those children who had social support.

Population comparisons

Behavioral geneticists have also looked at the differences between particular populations on different psychological outcomes to see whether a particular genetic variant might be more common among a particular ethnic or cultural group. For example, Gregersen, Kowalsky, Kohn and Marvin (2001) studied the gene for "absolute pitch" that appears to more commonly appear in individuals of Chinese, Japanese and Korean ethnicities. They examined whether this could be accounted for by early childhood music education or the exposure to tonal languages (which Mandarin is, but Japanese and Korean are not).

Conclusions

But the underlying assumption in many of these approaches is that the effects of genes and environment are additive. When we say that the concordance rates of schizophrenia are 48%, the assumption is that the other 52% variability is accounted for by the environment.

However, it is important to realize that the effects of genes and environment are escalative in nature. It is not a simple additive sum of the two like for example if you were to add oil to a cup and then add some water, the level of liquid in the cup would increase of course, but the two would remain dissociable always. Clearly that is not the case with human traits and characteristics. We are an indissociable blend of our genetic and environmental influences, as many of the studies already cited above have already begun to indicate.

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4.2: Genes and Chromosomes - the nuts and bolts

Let's look more closely at just nature/heredity. Nature refers to the contribution of genetics to one's development. The basic building block of the nature perspective is the gene. **Genes** are recipes for making proteins, and proteins influence the structure and functions of cells. Genes are located on the chromosomes and there are an estimated 20,500 genes for humans, according to the Human Genome Project (NIH, 2015).

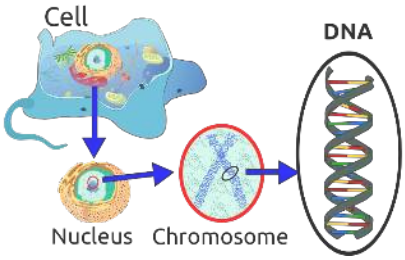


Figure **4.2.1**: DNA's location in the cell, within its nucleus, and therein within the chromosome.[1]

Normal human cells contain 46 chromosomes (or 23 pairs; one set from each parent) in the nucleus of the cells. After conception, most cells of the body are created by a process called mitosis. **Mitosis** is defined as the cell's nucleus making an exact copy of all the chromosomes and splitting into two new cells.

However, the cells used in sexual reproduction, called the gametes (sperm or ova), are formed in a process called **meiosis**. In meiosis, the gamete's chromosomes duplicate, and then divide twice resulting in four cells containing only half the genetic material of the original gamete. Thus, each sperm and egg/ovum possesses only 23 chromosomes. In conception those two fuse to make a cell with 46 chromosomes.

Table **4.2.1**: - Mitosis & Meiosis[2] Contrasting Meiosis and Mitosis

Type of Cell Division	Explanation	Steps
Mitosis	All cells, except those used in sexual reproduction, are created by mitosis	Step 1. Chromosomes make a duplicate copy
		Step 2. Two identical cells are created
Meiosis	Cells used in sexual reproduction are created by meiosis	Step 1. Exchange of gene between the chromosomes (crossing over)
		Step 2. Chromosomes make a duplicate
		Step 3. First cell division
		Step 4. Second cell division

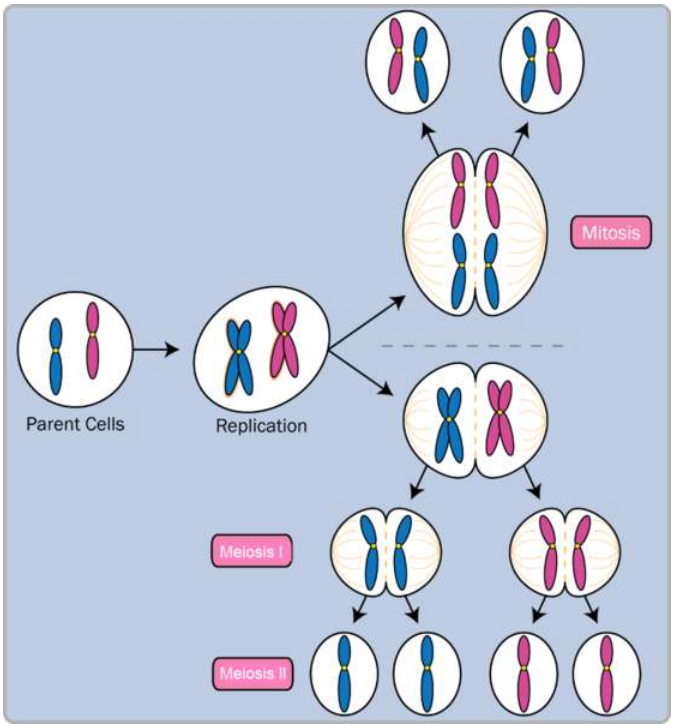


Figure **4.2.2**: Mitosis in the frame above represents cells multiplying and making copies of themselves. In the frame below Meiosis involves two steps whereby chromosomal strands divide, cross over, reattach, and randomly half get assigned to one cell, and half to another in a process of gamete production.[3]

Given the number of genes present and the unpredictability of the meiosis process, the likelihood of having offspring that are genetically identical (and not twins) is one in trillions (Gould & Keeton, 1997).

Of the 23 pairs of chromosomes created at conception, 22 pairs are similar in length and the genes on each of the chromosomes correspond with the genes on the other in the pair. These 22 pairs are called **autosomes**. The remaining pair, or **sex chromosomes**, could be X or Y, and X and Y chromosomes are not the same length. If a child receives the combination of XY, the child will be genetically male. If the child receives the combination XX, the child will be genetically female.[4]

So while all children receive 22 autosomes and one sex chromosome from each of their parents, the particular sex chromosome received by boys will be the Y chromosome from dad and an X from mom. Girls will receive an X from both parents.

Here is an image (called a karyogram) of what the 23 pairs of chromosomes look like. Notice the differences between the sex chromosomes in female (XX) and male (XY). As is clear from the karyotype, the Y chromosome is much shorter than the X chromosome.

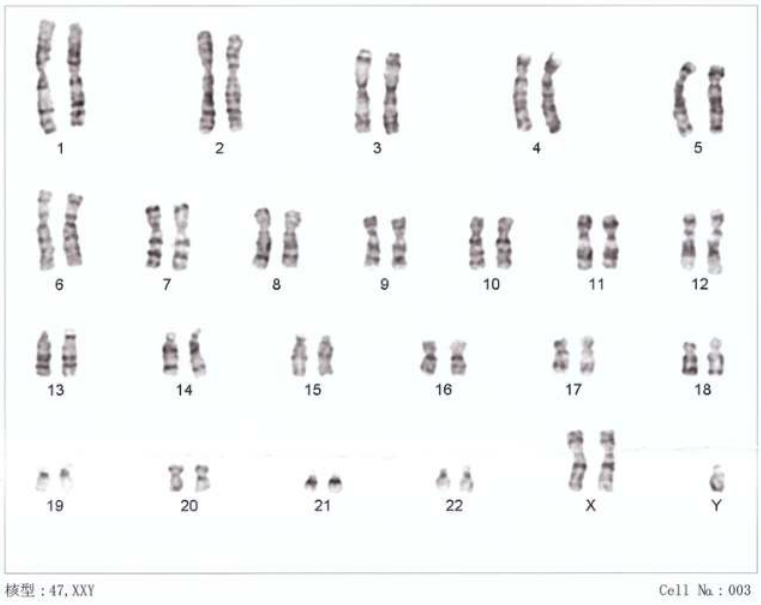


Figure **4.2.3**: A female Karyotype or picture of the 23 pairs of human chromosomes, and one y chromosome represented additionally at the end. [5]

Genotypes, Phenotypes & Patterns of Inheritance

The word **genotype** refers to the sum total of all the genes a person inherits. The word **phenotype** refers to the features that are actually expressed. Look in the mirror. What do you see, your genotype or your phenotype? What determines whether or not genes are expressed?

Because genes are inherited in pairs on the chromosomes, we may receive either the same version of a gene **(alleles)** from our mother and father, that is, be **homozygous** for that characteristic the gene influences. If we receive a different version or allele of the gene from each parent, that is referred to as being **heterozygous**.

In the homozygous situation we will display that characteristic. For example, if you receive genes for attached earlobes from each parent, of course you will have attached earlobes. Similarly, if you receive genes for unattached earlobes from each parent, you will have unattached earlobes.

It is in the heterozygous condition that it becomes clear that not all genes are created equal. If you get an attached earlobe allele from one parent and an unattached allele from the other parent, you are heterozygous on the earlobe attachment gene. In this case, you will have unattached earlobes. This indicates that the unattached earlobe allele is dominant over the attached one. The attached earlobe allele is recessive.

Dominant/Recessive principle

Some genes are **dominant**, meaning they express themselves in the phenotype even when paired with a different version of the gene, while their silent partner is called recessive. **Recessive** genes express themselves only when paired with a similar version gene. Some dominant traits include having unattached earlobes, facial dimples, curly hair, normal vision, and dark hair. Some recessive traits include red hair, being nearsighted, and straight hair.

Polygenic inherittance

Most characteristics are not the result of a single gene; they are **polygenic**, meaning they are the result of several genes. For example, skin color, the likelihood of developing schizophrenia, height, and many other human traits are the result of multiple genes working together.

In addition, the dominant and recessive patterns described above are usually not that simple either. Sometimes the dominant gene does not completely suppress the recessive gene; this is called incomplete dominance.[6]

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4.3: Chromosomal and Genetic Abnormalities

There are abnormalities that might be traced to problems with genes or chromosomes.

Genetic Disorders

Many **genetic disorders** are dominant gene-linked; however, the vast majority of dominant gene linked disorders are not serious or debilitating. For example, the majority of those with Tourette's Syndrome suffer only minor tics from time to time and can easily control their symptoms. When dominant-gene linked diseases are serious, they do not tend to become symptomatic until later in life. Huntington's Disease is a dominant gene linked disorder that affects the nervous system and is fatal, but does not appear until midlife.

Recessive gene disorders, such as cystic fibrosis and sickle-cell anemia may actually claim more lives because they are less likely to be detected as people are unaware that they are carriers of the disease. Most of the known truly harmful genetic disorders are carried on recessive genes. If they were not, they would have not survived the process of natural selection.

Some genetic disorders are sex-linked; the defective gene is found on the X-chromosome. Males have only one X chromosome so are at greater risk for sex-linked disorders due to a recessive gene such as hemophilia, color-blindness, and baldness. For females to be affected by recessive genetic defects, they need to inherit the recessive gene on both X-chromosomes. But if the gene carrying the disorder is dominant, females are equally at risk.

Recessive Disorders (Homozygous):

1The individual inherits a gene change from both parents. If the gene is inherited from just one parent, the person is a carrier and does not have the condition.

Table **4.3.1**: Homozygous recessive disorders[1]

Disorder	Description	Cases per Birth
Sickle Cell Disease (SCD)	A condition in which the red blood cells in the body are shaped like a sickle (like the letter C) and affect the ability of the blood to transport oxygen.	1 in 500 Black births 1 in 36,000 Hispanic births
Cystic Fibrosis (CF)	A condition that affects breathing and digestion due to thick mucus building up in the body, especially the lungs and digestive system. In CF, the mucus is thicker than normal and sticky.	1 in 3500
Phenylketonuria (PKU)	A metabolic disorder in which the individual cannot metabolize phenylalanine, an amino acid. Left untreated, intellectual deficits occur. PKU is easily detected and is treated with a special diet.	1 in 10,000
Tay Sachs Disease	Caused by an enzyme deficiency resulting in the accumulation of lipids in the nerves cells of the brain. This accumulation results in progressive damage to the cells and a decrease in cognitive and physical development. Death typically occurs by age five.	1 in 4000 1 in 30 American Jews is a carrier 1 in 20 French Canadians is a carrier
Albinism	When the individual lacks melanin and processes little to no pigment in the skin, hair, and eyes. Vision problems can also occur.	Fewer than 20,000 US cases per year

Autosomal Dominant Disorders (Heterozygous)

In order to have the disorder, the individual only needs to inherit the gene change from one parent.

Table **4.3.2**: Autosomal dominant gene (heterozygous) disorders[2]

Disorder	Description	Cases per Birth
Huntington's Disease	A condition that affects the individual's nervous system. Nerve cells become damaged, causing various parts of the brain to deteriorate. The disease affects movement, behavior and cognition. It is fatal, and occurs at midlife.	1 in 10,000
Tourette Syndrome	A tic disorder which results in uncontrollable motor and vocal tics as well as body jerking	1 in 250
Achondroplasia	The most common form of disproportionate short stature. The individual has abnormal bone growth resulting in short stature, disproportionately short arms and legs, short fingers, a large head, and specific facial features.	1 in 15,000-40,000

Sex-Linked Disorders

When the X chromosome carries the mutated gene, the disorder is referred to as an X-linked disorder. Males are more affected than females because they possess only one X chromosome without an additional X chromosome to counter the harmful gene.

Table **4.3.3**: Sex-linked Disorders[3]

Disorder	Description	Cases per Birth
Fragile X Syndrome	Occurs when the body cannot make enough of a protein it needs for the brain to grow and problems with learning and behavior can occur. Fragile X syndrome is caused from an abnormality in the X chromosome, which then breaks. If a female has a fragile X, her second X chromosome usually is healthy, but males with fragile X don't have a second healthy X chromosome. This is why symptoms of Fragile X usually are more serious in males.	1 in 4000 males 1 in 8000 females
Hemophilia	Occurs when there are problems in blood clotting causing both internal and external bleeding.	1 in 10,000 males (only 0.5-1.5% of hemophilia sufferers are female)[4]
Duchenne Muscular Dystrophy	A weakening of the muscles resulting in an inability to move, wasting away, and possible death.	1 in 3500 males 1 in 50million females[5]

Chromosomal Abnormalities

A **chromosomal abnormality** occurs when a child inherits too many or two few chromosomes. The most common cause of chromosomal abnormalities is the age of the mother. As the mother ages, the ovum is more likely to suffer abnormalities due to longer term exposure to environmental factors. Consequently, some gametes do not divide evenly when they are forming. Therefore, some cells have more than 46 chromosomes. In fact, it is believed that close to half of all zygotes have an odd number of chromosomes. Most of these zygotes fail to develop and are spontaneously aborted by the mother's body.[6]

Autosomal Chromosome Disorders

The individual inherits too many or two few chromosomes.

Table **4.3.4**: Autosomal chromosomal disorders [7]

Disorder	Description
Down Syndrome/Trisomy 21	Caused by an extra chromosome 21 and includes a combination of birth defects. Affected individuals have some degree of intellectual disability, characteristic facial features, often heart defects, and other health problems. The severity varies greatly among affected individuals.
Trisomy 9 Mosaicism	Caused by having an extra chromosome 9 in some cells. The severity of effects relates to the proportion of cells with extra chromosomes. The effects include fetal growth restriction resulting in low birth weight and multiple anomalies, including facial, cardiac, musculoskeletal, genital, kidney, and respiratory abnormalities.
Trisomy 13	Caused by an extra chromosome 13. Affected individuals have multiple birth defects and generally die in the first weeks or months of life.
Trisomy 18	Caused by an extra chromosome 18 and the affected individual also has multiple birth defects and early death.



Figure **4.3.1**: Infant boy with Trisomy 9 Mosaicism.[8]



Figure 4.3.2: Girl with XXX Syndrome.[9]

Sex linked chromosomal abnormality

When the abnormality is on 23rd pair, the result is a **sex-linked chromosomal abnormality**. This happens when a person has less than or more than two sex chromosomes.[10]

Table 4.3.5: Sex-linked Chromosomal Disorders[11]

Disorder	Description
Turner Syndrome (XO)	Caused when all or part of one of the X chromosomes is lost before or soon after conception due to a random event. The resulting zygote has an XO composition. Turner Syndrome affects cognitive functioning and sexual maturation in girls. Infertility and a short stature may be noted.
Klinefelter Syndrome (XXY)	Caused when an extra X chromosome is present in the cells of a male due to a random event. The Y chromosome stimulates the growth of male genitalia, but the additional X chromosome inhibits this development. The male can have some breast development, infertility, and low levels of testosterone.
XYY Syndrome	Caused when an extra Y chromosome is present in the cells of a male. There are few symptoms. They may include being taller than average, acne, and an increased risk of learning problems. The person is generally otherwise normal, including normal fertility.
Triple X Syndrome (XXX)	Caused when an extra X chromosome is present in the cells of a female. It may result in being taller than average, learning difficulties, decreased muscle tone, seizures, and kidney problems.

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4.4: Nature AND Nurture

The nature versus nurture or genes versus environment controversy has been debated for a while. For a long time, most people have agreed that this question is not a dichotomy, but rather a spectrum. However, the next step has been the attempt to identify the amount of contribution of genes to a trait added to that of the contribution of the environment. This assumes an additive framework which is inherently flawed. Most scholars agree that there is a constant interplay between nature (heredity) and nurture (the environment). It is difficult to isolate the root of any single characteristic as solely nature or nurture, and most scholars believe that even determining the extent to which nature or nurture impacts a human feature is difficult to answer. In fact, almost all human features are polygenic (a result of many genes) and multifactorial (a result of many factors, both genetic and environmental). It's as if one's genetic make-up sets up a range of possibilities, which may or may not be realized depending upon one's environmental experiences. For instance, a person might be genetically predisposed to develop diabetes, but the person's lifestyle may determine whether or not they actually develop the disease.

If we try to say that genes influence traits plus the environment influences that trait to produce some level of that trait, we are ignoring the fact that there might be some interplay of those genes with those environmental factors. It was long thought that genes remain the same from one generation to the next. However, the **epigenetic framework** suggests that the environment can affect the expression of genes just as genetic predispositions can impact a person's potentials. And environmental circumstances can trigger symptoms of a genetic disorder.[1]

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4.5: Epigenetics



Figure 4.5.1: What do our genes teach us about our health?

Your genes play an important role in your health, but so do your behaviors and environment, such as what you eat and how physically active you are. Epigenetics is the study of how your behaviors and environment can cause changes that affect the way your genes work. Unlike genetic changes, epigenetic changes are reversible and do not change your DNA sequence, but they can change how your body reads a DNA sequence.

Gene expression refers to how often or when proteins are created from the instructions within your genes. While genetic changes can alter which protein is made, epigenetic changes affect gene expression to turn genes “on” and “off.” Since your environment and behaviors, such as diet and exercise, can result in epigenetic changes, it is easy to see the connection between your genes and your behaviors and environment.

How Does Epigenetics Work?

Epigenetic changes affect gene expression in different ways. Types of epigenetic changes include:

1. DNA Methylation - DNA methylation works by adding a chemical group to DNA. Typically, this group is added to specific places on the DNA, where it blocks the proteins that attach to DNA to “read” the gene. This chemical group can be removed through a process called demethylation. Typically, methylation turns genes “off” and demethylation turns genes “on.”
2. Histone modification - DNA wraps around proteins called histones. DNA wrapped tightly around histones cannot be accessed by proteins that “read” the gene. Some genes are wrapped around histones and are turned “off” while some genes are not wrapped around histones and are turned “on.” Chemical groups can be added or removed from histones and change whether a gene is unwrapped or wrapped (“on” or “off”).
3. Non-coding RNA - Your DNA is used as instructions for making coding and non-coding RNA. Coding RNA is used to make proteins. Non-coding RNA helps control gene expression by attaching to coding RNA, along with certain proteins, to break down the coding RNA so that it cannot be used to make proteins. Non-coding RNA may also recruit proteins to modify histones to turn genes “on” or “off.”

How Can Your Epigenetics Change?

Your epigenetics change as you age, both as part of normal development and aging and in response to your behaviors and environment.

Epigenetics and Development

Epigenetic changes begin before you are born. All your cells have the same genes but look and act differently. As you grow and develop, epigenetics helps determine which function a cell will have, for example, whether it will become a heart cell, nerve cell, or skin cell.

Example: Nerve cell vs. Muscle cell

Your muscle cells and nerve cells have the same DNA but work differently. A nerve cell transports information to other cells in your body. A muscle cell has a structure that aids in your body’s ability to move. Epigenetics allows the muscle cell to turn “on” genes to make proteins important for its job and turn “off” genes important for a nerve cell’s job.

Epigenetics and Age

Your epigenetics change throughout your life. Your epigenetics at birth is not the same as your epigenetics during childhood or adulthood.

Example: Study of newborn vs. 26-year-old vs. 103-year-old

DNA methylation at millions of sites were measured in a newborn, 26-year-old, and 103-year-old. The level of DNA methylation decreases with age. A newborn had the highest DNA methylation, the 103-year-old had the lowest DNA methylation, and the 26-year-old had a DNA methylation level between the newborn and 103-year-old (1).

Epigenetics and Reversibility

Not all epigenetic changes are permanent. Some epigenetic changes can be added or removed in response to changes in behavior or environment.

Example: Smokers vs. non-smokers vs. former smokers

Smoking can result in epigenetic changes. For example, at certain parts of the AHRR gene, smokers tend to have less DNA methylation than non-smokers. The difference is greater for heavy smokers and long-term smokers. After quitting smoking, former smokers can begin to have increased DNA methylation at this gene. Eventually, they can reach levels similar to those of non-smokers. In some cases, this can happen in under a year, but the length of time depends on how long and how much someone smoked before quitting (2).

Epigenetics and Health

Epigenetic changes can affect your health in different ways:

Infections

Germs can change your epigenetics to weaken your immune system. This helps the germ survive.

Example: Mycobacterium tuberculosis

Mycobacterium tuberculosis causes tuberculosis. Infections with these germs can cause changes to histones in some of your immune cells that result in turning “off” the IL-12B gene. Turning “off” the IL-12B gene weakens your immune system and improves the survival of Mycobacterium tuberculosis (3).

Cancer

Certain mutations make you more likely to develop cancer. Likewise, some epigenetic changes increase your cancer risk. For example, having a mutation in the BRCA1 gene that prevents it from working properly makes you more likely to get breast and other cancers. Similarly, increased DNA methylation that results in decreased BRCA1 gene expression raises your risk for breast and other cancers (4).While cancer cells have increased DNA methylation at certain genes, overall DNA methylation levels are lower in cancer cells compared with normal cells. Different types of cancer that look alike can have different DNA methylation patterns. Epigenetics can be used to help determine which type of cancer a person has or can help to find hard to detect cancers earlier. Epigenetics alone cannot diagnose cancer, and cancers would need to be confirmed with further screening tests.

Example: Colorectal Cancer

Colorectal cancers have increased methylation at the SEPT9 gene. Some commercial epigenetic-based tests for colorectal cancer look at DNA methylation levels at the SEPT9 gene. When used with other diagnostic screening tests, these epigenetic based tests can help find cancer early (5)(6).

Nutrition During Pregnancy

A pregnant woman’s environment and behavior during pregnancy, such as whether she eats healthy food, can change the baby’s epigenetics. Some of these changes can remain for decades and might make the child more likely to get certain diseases.

Example: Dutch Hunger Winter Famine (1944-1945)

People whose mothers were pregnant with them during the famine were more likely to develop certain diseases such as heart disease, schizophrenia, and type 2 diabetes (7). Around 60 years after the famine, researchers looked at methylation levels in people whose mothers were pregnant with them during the famine. These people had increased methylation at some genes and decreased methylation at other genes compared with their siblings who were not exposed to famine before their birth (8)(9)(10). These differences in methylation could help explain why these people had an increased likelihood for certain diseases later in life (7)(10)(11)(12).

More Information

Learn.Genetics: Genetic Science Learning Center at the University of Utah provides a detailed explanation and interactive tutorial about epigenetics

National Human Genomic Research Institute: Epigenomics Fact Sheet provides answers to questions about the epigenome

National Institute of Environmental Health Sciences: Epigenetics provides information about epigenetics, epigenetic research, and a video about epigenetics

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4.6: Genotype Environment correlations

Just as epigenetics addresses how environmental factors affect the structure and expression of genes, **genotype-environment correlations** refer to the processes by which genetic factors contribute to variations in the environment (Scarr & McCartney, 1983; Plomin, DeFries, Knopik, & Neiderhiser, 2013). There are three types of genotype-environment correlations:

Passive

Passive genotype-environment correlation refers to how children passively inherit the genes and the environments their family provides. Certain behavioral characteristics, such as being athletically inclined, may run in families. The children have inherited both the genes that would enable success at these activities, and they are also given the environmental encouragement to engage in these actions because of those same genes being present in their parents who are primarily responsible for their environment.



Figure **4.6.1**: Children's abilities and characteristics are affected by the genes their parents pass on to them as well as by the environment those same parents expose them to.[1]

Evocative

Evocative genotype-environment correlation refers to how the social environment reacts to individuals based on their inherited characteristics. For example, whether one has a more outgoing or shy temperament will affect how they are treated by others, even those who are biologically unrelated to them (and therefore do not share those same shy/outgoing temperaments).

Active

Active genotype-environment correlation occurs when individuals seek out environments that support their genetic tendencies. This is also referred to as niche picking. For example, children who are musically inclined seek out music instruction and opportunities that facilitate their natural musical ability.

Conversely, **Genotype-Environment Interactions** involve genetic susceptibility to the environment. Adoption studies provide evidence for genotype-environment interactions. For example, the Early Growth and Development Study (Leve, Neiderhiser, Scaramella, & Reiss, 2010) followed 360 adopted children and their adopted and biological parents in a longitudinal study. Results have shown that children whose biological parents exhibited psychopathology, exhibited significantly fewer behavior problems when their adoptive parents used more structured parenting than unstructured. Additionally, elevated psychopathology in adoptive parents increased the risk for the children's development of behavior problems, but only when the biological parents' psychopathology was high. Consequently, the results show how environmental effects on behavior differ based on the genotype, especially stressful environments on genetically at-risk children.[2]

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CHAPTER OVERVIEW

5: Prenatal Development

5.1: Periods of Prenatal Development
5.2: Teratogens
5.3: Prenatal Assessment
5.4: Complications of Pregnancy
5.5: Infertility and building families
5.6: Twins

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5.1: Periods of Prenatal Development

Prenatal development lasts for 9 months or 40 weeks. From the point of view of laypersons and the parents, we often divide those into three month periods or trimesters. However, from the scientific viewpoint of prenatal development, this is divided into three unequal parts - the first 2 weeks, 2 weeks to 2 months, and the last 7 months.

The Germinal Period

The **germinal period** (about 14 days in length) lasts from **conception** to implantation of the fertilized egg in the lining of the uterus. At ejaculation millions of sperm are released into the vagina, but only a few reach the egg and typically only one fertilizes the egg. Once a single sperm has entered the wall of the egg, the wall becomes hard and prevents other sperm from entering. After the sperm has entered the egg, the tail of the sperm breaks off and the head of the sperm, containing the genetic information from the biological male, unites with the nucleus of the egg. As a result of fertilization, a new cell is formed. This cell, containing the combined genetic information from both biological parents, is referred to as a **zygote**. It is typically fertilized in the top section of the fallopian tube and continues its journey to the uterus.



Figure **5.1.1**: The ovum is one of the largest human cells and at conception it is fertilized by one of many released sperm.[1]

As it travels down the fallopian tube, the organism begins cell division through mitosis (the process of regular growth where a cell makes a copy of itself). After five days of mitosis there are 100 cells, which is now also called a blastocyst. The blastocyst consists of both an inner and outer group of cells. The inner group of cells, or embryonic disk will become the embryo, while the outer group of cells, or trophoblast, becomes the support system which nourishes the developing organism. This stage ends when the blastocyst fully implants into the uterine wall (U.S. National Library of Medicine, 2015).

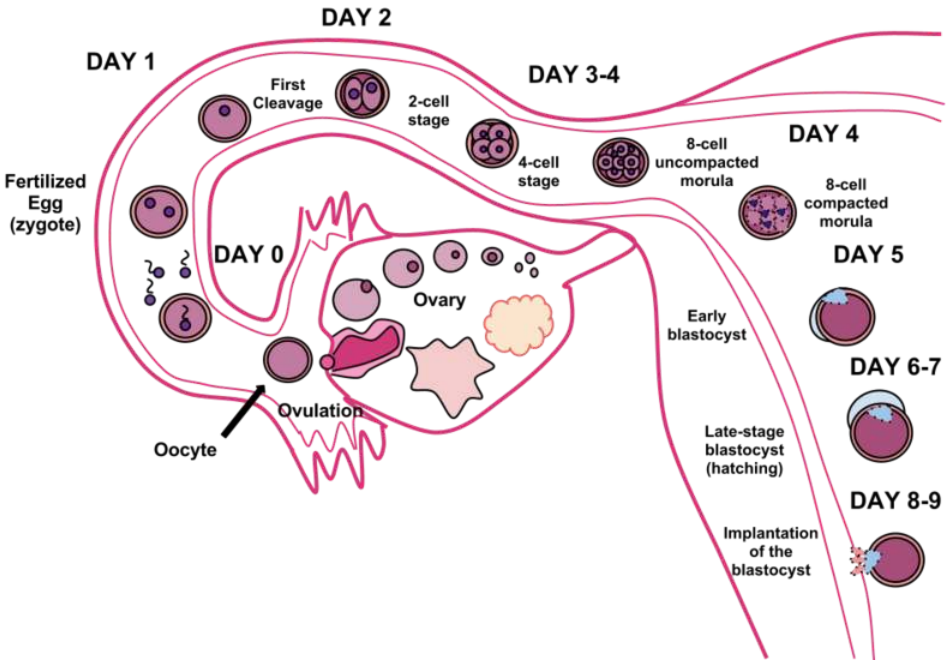


Figure 5.1.2: The cycle of fertilization – on day 0 at the point of ovulation an oocyte (egg) is released from the ovary. When sperm are present in the fallopian tubes, one might fertilize the ovum which is then called a zygote. On day 1 the first cleavage occurs, and by day 3-4, there are 4 cells which turn into an 8 cell uncompacted morula, and an early blastocyst by day 5. All this happens while the zygote is traveling down the fallopian tubes into the uterus. By day 6-7 there is "hatching" and by day 8-9, the blastocyst "implants" into the uterine wall.[2]

Mitosis is a fragile process and fewer than one half of all zygotes survive beyond the first two weeks (Hall, 2004). Some of the reasons for this include: the egg and sperm do not join properly (thus their genetic material does not combine), there is too little or damaged genetic material, the zygote does not replicate, or the blastocyst does not implant into the uterine wall. The failure rate is higher for in vitro conceptions. The figure illustrates the journey of the ova from its release to its fertilization, cell duplication, and implantation into the uterine lining.[3]

The Embryonic Period

Starting in the third week, the blastocyst has implanted in the uterine wall. Upon implantation this multi-cellular organism is called an **embryo**. Now blood vessels grow forming the placenta. The **placenta** is a structure connected to the uterus that provides nourishment and oxygen from the pregnant individual to the developing embryo via the umbilical cord.

During this period, cells continue to **differentiate**. Growth during prenatal development occurs in two major directions: from head to tail called **cephalocaudal development** and from the midline outward referred to as **proximodistal development**. Cephalocaudal means that those structures nearest the head develop before those nearest the feet (actually "caudal" refers to tail). Proximodistal means that those structures nearest the torso develop before those away from the center of the body (such as hands and fingers). You will see that these patterns continue after birth.

The head develops in the fourth week and the precursor to the heart begins to pulse. In the early stages of the embryonic period, gills and a tail are apparent. However, by the end of this embryonic stage they disappear and the organism takes on a more human appearance.



Figure **5.1.3**: A human embryo has a disproportionately large head, very small beginning of limbs, and looks less like a human than it will begin to later.[4]

About 20 percent of organisms fail during the embryonic period, usually due to gross chromosomal abnormalities, often before the pregnant person even knows that they are pregnant. It is during this stage that the major structures of the body are taking form, making the embryonic period the time when the organism is most vulnerable to the greatest amount of damage if exposed to harmful substances. Prospective parents are not often aware of the risks they introduce to the developing embryo during this time. The embryo is approximately 1 inch in length and weighs about 4 grams at the end of eight weeks. The embryo can move and respond to touch at this time.[5]

The Fetal Period

From the ninth week until birth (which is forty weeks for a full-term pregnancy), the organism is referred to as a **fetus**. During this stage, the major structures are continuing to develop.



Figure **5.1.4**: Fetus in amniotic sac that looks very similar to an embryo at first flush

When the organism is about nine weeks old, the embryo is called a **fetus**. At this stage, the fetus is about the size of a kidney bean and begins to take on more human-like form as the “tail” begins to disappear.

From 9–12 weeks, the sex organs begin to differentiate. By the 12th week, the fetus has all its body parts including external genitalia. In the following weeks, the fetus will develop hair, nails, teeth, and the excretory and digestive systems will continue to develop. At the end of the 12th week, the fetus is about 3 inches long and weighs about 28 grams.

At about 16 weeks, the fetus is approximately 4.5 inches long. Fingers and toes are fully developed, and fingerprints are visible. During the 4-6th months, the eyes become more sensitive to light, and hearing develops. The respiratory system continues to

develop. Reflexes such as sucking, swallowing, and hiccupping develop during the 5th month. Cycles of sleep and wakefulness are present at that time as well. Throughout the fetal stage, the brain continues to grow and develop, nearly doubling in size from weeks 16 to 28. The majority of the neurons in the brain have developed by 24 weeks although they are still rudimentary and the glial or nurse cells that support neurons continue to grow. At 24 weeks the fetus can feel pain. [6]

The first chance of survival outside the womb, known as **the age of viability** is reached at about 24 weeks.[7] By the time the fetus reaches the sixth month of development (at about 24 weeks), it weighs up to 1.4 pounds. The hearing has developed, so the fetus can respond to sounds. The internal organs, such as the lungs, heart, stomach, and intestines, have formed enough that a fetus born prematurely at this point has a chance to survive outside of the womb.

Between the 7th and 9th months, the fetus is primarily preparing for birth. It is exercising its muscles, its lungs begin to expand and contract. It is developing fat layers under the skin. The fetus gains about 5 pounds and 7 inches during this last trimester of pregnancy which includes a layer of fat gained during the 8th month. This layer of fat serves as insulation and helps the baby regulate body temperature after birth.

Around 36 weeks, the fetus is almost ready for birth. It weighs about 6 pounds and is about 18.5 inches long, and by week 37 all of the fetus's organ systems are developed enough that it could survive outside the uterus without many of the risks associated with premature birth. The fetus continues to gain weight and grow in length until approximately 40 weeks. By then, the fetus has very little room to move around and birth becomes imminent.



Figure 5.1.5: Figure – A human fetus with fingers, toes differentiated, ribs visible, as also the amniotic sac and umbilical cord.[8]



Figure **5.1.6**: The development of a fetus showing all the milestones at 9 then 12 weeks and every 4 weeks after that.[10]

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5.2: Teratogens

Good prenatal care is essential to protect against parental and fetal/infant mortality and birth complications. The embryo and fetus is most at risk for some of the most severe problems during the first three months of development. Unfortunately, this is a time at which many biological parents are unaware that they are pregnant. Today, we know many of the factors that can jeopardize the health of the developing organism. **Teratogens** are harmful agents/conditions in pregnancy that can contribute to birth defects, and include some parental diseases, pollutants, drugs and alcohol; and the study of factors that are harmful to a developing organism in utero is called teratology.

There are several considerations in determining the type and amount of damage that might result from exposure to a particular teratogen (Berger, 2005). These include:

- **The type of exposure**: For example, depending on whether there is exposure to alcohol or tobacco, the results for the fetus and resultant child will be different. Fetal Alcohol Syndrome is qualitatively and substantially different from Fetal Tobacco Syndrome.
- **The timing of the exposure:** Structures in the body are vulnerable to the most severe damage when they are forming. If a substance is introduced during a particular structure's critical period (time of development), the damage to that structure may be greater. For example, the ears and arms reach their critical periods at about 6 weeks after conception. If the embryo is exposed to certain substances during this period, the arms and ears may be malformed. (see figure below)
- **The amount of exposure:** Some substances are not harmful unless the amounts reach a certain level. The critical level depends in part on the size of the organism and metabolism of the pregnant individual.
- **The interaction of teratogens:** Fetuses exposed to multiple teratogens typically have more problems than those exposed to only one.
- **Genetics:** Genetic makeup also plays a role on the impact a particular teratogen might have on the child. This is suggested by fraternal twins exposed to the same prenatal environment, but not experiencing the same effects. The genetic makeup of the biological parents can also have an effect; some may be more resistant to teratogenic effects than others.
- **Being male or female:** Biological male offspring are more likely to experience damage due to teratogens than are biological females. It is believed that the Y chromosome, which contains fewer genes than the X, may have an impact.[1]

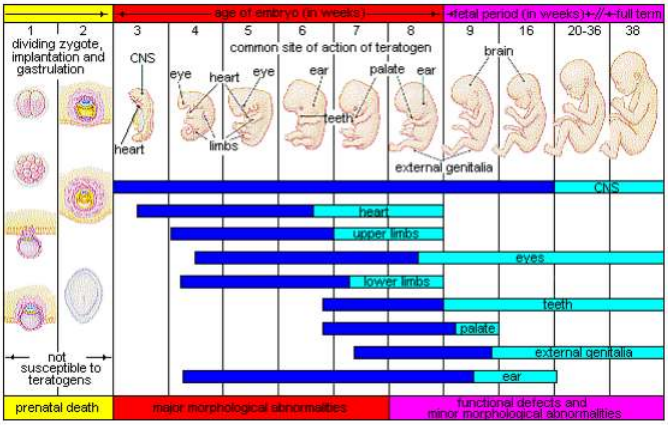


Figure **5.2.1**: The development of an embryo into a fetus, and therefore what parts are most susceptible to harm at particular stages of prenatal development. The figure shows that in the germinal period, teratogenic effects are most likely to result in spontaneous abortion or miscarriage. In the embryonic period, when most critical periods are, teratogenic effects are most likely to result in major morphological abnormalities. In the fetal period, teratogenic effects are most likely to result in functional defects and minor morphological abnormalities.[2]

There are four categories of teratogens:

1. **Physical teratogens:** These could be saunas, hot tubs, or infections that raise a pregnant person's body temperature to 102 degrees Fahrenheit or higher. This is associated with neural tube defects, spontaneous abortions, and various cardiovascular abnormalities.

2. **Metabolic conditions affecting pregnant females**: Metabolic conditions are abnormalities in the chemical process of producing energy from food, and thereby affect the development and function of the body. If a pregnant person is malnourished, then their fetus likely lacks the nutrients essential for its development. These include malnutrition, diabetes, and thyroid disorders.
3. **Infections**: Different parental infections, including rubella virus, herpes simplex virus, and syphilis can cause congenital abnormalities in fetuses.
4. **Drugs and chemicals**: When pregnant individuals ingest or absorb these, they may cause a variety of different effects based on specific agent, amount of exposure, and timing. This category includes radiation, heavy metals (including lead), insecticides and herbicides, prescription and over the counter drugs, illicit and recreational drugs, alcohol, cigarettes, nicotine, caffeine, and even some vitamins.[3]

While there are many, many potential teratogens, the following tables look at the effects of some different types of teratogens. The risks of exposure vary based on lifestyle and health. The effects may vary greatly depending on the factors mentioned previously. Protection and prevention will vary based on the method of exposure.

Drugs as Teratogens

Table **5.2.1**: Drugs as Teratogens

Teratogen	Potential Effects
Caffeine	Moderate amounts of caffeine (200 mg or around 12 ounces of coffee) appear to be safe during pregnancy. Some studies have shown a link between higher amounts of caffeine and miscarriage and preterm birth.[4]
Tobacco	Tobacco use has been associated with low birth weight, placenta previa, preterm delivery, fetal growth restriction, sudden infant death syndrome, cleft lip or palate, and later health problems (such as high blood pressure and diabetes).[5]
Alcohol	There is no safe amount of alcohol a woman can drink while pregnant. Alcohol can slow down the fetus's growth, affect the developing brain, and cause birth defects, and may results in fetal alcohol spectrum disorder (FASD). The effects can be mild to severe. Children born with a severe form of FASD can have specific facial features, severe learning disabilities, behavioral problems, and other problems.[6]
Cocaine	Cocaine use has been connected with low birth weight, stillbirths, spontaneous abortion, placental abruption, premature birth, miscarriage, and neonatal abstinence syndrome (fetal addiction leads the newborn to experience withdrawal).[7]
Marijuana	No amount of marijuana has been proven safe to use during pregnancy. Heavy use has been associated with brain damage, premature birth, and stillbirth.[8]
Heroin	Using heroin during pregnancy can cause birth defects, placental abruption, premature birth, low birthweight, neonatal abstinence syndrome, still birth, and sudden infant death syndrome.[9]
Over-the-Counter (OTC) medication	Some OTC medications are safe to use during pregnancy and others may cause health problems during pregnancy. Pregnant individuals should consult their health care provider before using any OTC medications.[10]
Prescription drugs	Some prescription drugs can cause birth defects that change the shape or function of one or more parts of the body that can affect overall health. Pregnant individuals should consult their health care provider before discontinuing or starting new medications.[11]
Herbal or dietary supplements	Except for some vitamins, little is known about using herbal or dietary supplements while pregnant. Most often there are no good studies to show if the herb can cause harm during pregnancy. Also, some herbs that are safe when used in small amounts as food might be harmful when used in large amounts as medicines.[12]

Environmental Teratogens

Table **5.2.2**: Environmental agents as teratogens

Teratogen	Potential Effects
Lead	Exposure to high levels of lead before and during pregnancy can lead to high blood pressure, problems with fetal brain and nervous system development, premature birth, low birthweight, and miscarriage.[13]
Mercury	Exposure to mercury in the womb can cause brain damage and hearing and vision problems.[14]
Radiation	Exposure to radiation during pregnancy (especially between 2 and 18 weeks of pregnancy) can slow growth, cause birth defects, affect brain development, cause cancer, and cause miscarriage.[15]
Solvents	These chemicals include degreasers, paint thinners, stain and varnish removers, paints, and more. Inhalation of solvents during pregnancy can cause fetal exposure leading to miscarriage, slow fetal growth, premature birth, and birth defects.[16]

Maternal Infections as Teratogens

Table **5.2.3**: Maternal infections as Teratogens

Teratogen	Potential Effects
Rubella	Congenital infection (becoming infected while in the womb) can damage the development of the eyes, ears, heart, and brain and result in deafness.[17]
Zika	Congenital infection can cause microcephaly and other severe brain abnormalities.[18]
Varicella (chicken pox)	Congenital infection can cause a severe form of the infection affecting the eyes, limbs, skin, and central nervous system.[19]
Sexually transmitted infections	Infections such as HIV, gonorrhea, syphilis, and chlamydia can be passed from the pregnant person during pregnancy and/or delivery.[20]
Listeria	Pregnant individuals are more susceptible to this food-borne illness. Congenital infection can cause miscarriage, stillbirth, premature labor, and neonatal sepsis.[21]

Teratogens from Animals/Pets

Table **5.2.4**: Teratogens from Animals/Pets

Teratogen	Potential Effects
Toxoplamosis	This parasite can be passed through cat feces and undercooked meat (especially pork, lamb, or deer meet). If the fetus is infected it can cause miscarriage, stillbirth, hydrocephalus, macro or microcephalus, vision issues, and damage to the nervous system.[22]
Lymphocytic choriomeningitis	This virus carried by rodents including mice, hamsters, and guinea pigs. If passed to the fetus it can cause issues with brain development, long-term neurological and/or visual impairment, and higher mortality rates after birth.[23]

Parental Factors

There are additional factors that affect the outcome of pregnancy for both pregnant individual and prospective child. Let's look at these next.

Pregnancy over age 35

Most people over 35 who become pregnant are in good health and have healthy pregnancies. However, according to the March of Dimes (2016d), biological females over age 35 are more likely to have an increased risk of:

- Fertility problems
- High blood pressure
- Diabetes
- Miscarriages
- Placenta Previa

- Cesarean section
- Premature birth
- Stillbirth
- A baby with a genetic disorder or other birth defects

Because a biological female is born with all their eggs, environmental teratogens can affect the quality of those eggs as the person grows older. Also, the reproductive system ages which can adversely affect the pregnancy. Special prenatal screening tests, such as a maternal blood screening, are generally available to determine if there are any health risks for the fetus.

Although there are medical concerns associated with having a child later in life, there are also many positive consequences to being a more mature parent. Older parents are more confident, less stressed, and typically more likely to be married, providing family stability. Their children perform better on math and reading tests, and they are less prone to injuries or emotional troubles (Albert, 2013). People who choose to wait to get pregnant are often well educated and lead healthy lives. According to Gregory (2007), older parents are more stable, demonstrate a stronger family focus, possess greater self-confidence, and have more money. Having a child later in one's career equals overall higher wages. In fact, for every year a woman delays motherhood, she makes 9% more in lifetime earnings. Lastly, women who delay having children actually live longer.

Teenage Pregnancy

A teenage pregnant person is at a greater risk for having pregnancy complications including anemia, and high blood pressure. These risks are even greater for those under age 15. Infants born to teens have a higher risk for being premature and having low birthweight or other serious health problems. Premature and low birthweight babies may have organs that are not fully developed which can result in breathing problems, bleeding in the brain, vision loss, serious intestinal problems, and higher likelihood of dying. Reasons for these health issues include that teenagers are the least likely of all age groups to get early and regular prenatal care and they may engage in negative behaviors including eating unhealthy food, smoking, drinking alcohol, and taking drugs.

Gestational Diabetes

Seven percent of pregnant individuals develop **gestational diabetes** (March of Dimes, 2015b). Diabetes is a condition where the body has too much glucose in the bloodstream.



Figure 5.2.2: Individuals diagnosed with gestational diabetes need to test, chart and maintain their sugar levels.[25]

Most pregnant individuals have their glucose level tested between 24 to 28 weeks of pregnancy. Gestational diabetes usually goes away after giving birth, but it might indicate a risk for developing diabetes later in life. If untreated, gestational diabetes can cause

premature birth, stillbirth, the baby having breathing problems at birth, jaundice, or low blood sugar. Babies born to persons with gestational diabetes can also be considerably heavier (more than 9 pounds) making the labor and birth process more difficult. For expectant individuals, untreated gestational diabetes can cause preeclampsia (high blood pressure and signs that the liver and kidneys may not be working properly) discussed in another section.

Risk factors for gestational diabetes include age (being over age 25), being overweight or gaining too much weight during pregnancy, family history of diabetes, having had gestational diabetes with a prior pregnancy, and race and ethnicity (African-American, Native American, Hispanic, Asian, or Pacific Islander have a higher risk). Eating healthy and maintaining a healthy weight during pregnancy can reduce the chance of gestational diabetes. People who already have diabetes and become pregnant need to attend all their prenatal care visits, and follow the same advice as those for people with gestational diabetes as the risk of preeclampsia, premature birth, birth defects, and stillbirth are the same.

High Blood Pressure (Hypertension)

Hypertension is a condition in which the pressure against the wall of the arteries becomes too high. There are two types of high blood pressure during pregnancy, gestational and chronic. Gestational hypertension only occurs during pregnancy and goes away after birth. Chronic high blood pressure refers to individuals who already had hypertension before the pregnancy or to those who developed it during pregnancy and it did not go away after birth.



Figure **5.2.3**: At every prenatal visit the pregnant individual's blood pressure is checked, because high blood pressure is indicative of possible problems with the fetus and birth complications.[26]

According to the March of Dimes (2015c), about 8 in every 100 pregnant people have high blood pressure. High blood pressure during pregnancy can cause premature birth and low birth weight (under five and a half pounds), placental abruption, and preeclampsia.

Rh Incompatibility

Rh is a protein found in the blood. Most people are Rh positive, meaning they have this protein. Some people are Rh negative, meaning this protein is absent. Pregnant individuals who are Rh negative are at risk of having a baby with a form of anemia called Rh disease (March of Dimes, 2009). With just one Rh positive gene, the organism will be a carrier for Rh-negative, but be Rh-positive themselves. A biological male who is Rh-positive and biological female who is Rh-negative can conceive a baby who is Rh-positive. Some of the fetus's blood cells may get into the pregnant person's bloodstream and their immune system is unable to recognize the Rh factor. The immune system starts to produce antibodies to fight off what it thinks is a foreign invader. Once their body produces immunity, the antibodies can cross the placenta and start to destroy the red blood cells of the developing fetus. As this process takes time, often the first Rh positive baby is not harmed, but as the biological parent's body will continue to produce antibodies to the Rh factor across their lifetime, subsequent pregnancies can pose greater risk for an Rh positive baby. In the newborn, Rh disease can lead to jaundice, anemia, heart failure, brain damage and death.

Weight Gain during Pregnancy

According to March of Dimes (2016f), during pregnancy most people need only an additional 300 calories per day to aid in the growth of the fetus. Gaining too little or too much weight during pregnancy can be harmful. People who gain too little may have a baby who is low-birth weight, while those who gain too much are likely to have a premature or large baby. There is also a greater risk for developing preeclampsia and diabetes, which can cause further problems during the pregnancy.

The table below shows the healthy weight gain during pregnancy. Putting on the weight slowly is best. Individuals who are concerned about their weight gain should talk to their health care provider.

Table **5.2.5**: Desirable weight gain in pregnancy

If you were a healthy weight before pregnancy:	**If you were underweight before pregnancy:**	**If you were overweight before pregnancy:**	**If you were obese before pregnancy:**
• Gain 25-35 pounds • 1-4½ pounds in the 1st trimester • 1 pound per week in the 2nd and 3rd trimesters	• Gain 28-30 pounds • 1-4½ pounds in the 1st trimester • A little more than 1 pound per week thereafter	• Gain 12-25 pounds • 1-4½ pounds in the 1st trimester • A little more than ½ pound per week in 2nd and 3rd trimesters	• 11-20 pounds • 1-4½ pounds in the 1st trimester • A little more than ½ pound per week in 2nd and 3rd trimesters
Mothers of twins or higher order multiples need to gain more in each category.			

Stress

Feeling stressed is common during pregnancy, but high levels of stress can cause complications including having a premature baby or a low-birthweight baby. Babies born early or too small are at an increased risk for health problems. Stress-related hormones may cause these complications by affecting a pregnant person's immune systems resulting in an infection and premature birth. Additionally, some people deal with stress by smoking, drinking alcohol, or taking drugs, which can lead to problems in the pregnancy. High levels of stress in pregnancy have also been correlated with problems in the fetus's brain development and immune system functioning, as well as childhood problems such as trouble paying attention and being afraid (March of Dimes, 2012b).

Depression

Depression is a significant medical condition in which feelings of sadness, worthlessness, guilt, and fatigue interfere with one's daily functioning. Depression can occur before, during, or after pregnancy, and 1 in 7 people are treated for depression sometime between the year before pregnancy and year after pregnancy (March of Dimes, 2015a). Those who have experienced depression previously are more likely to have depression during pregnancy. Consequences of depression include the baby being born premature, having a low birthweight, being more irritable, less active, less attentive, and having fewer facial expressions.

About 13% of pregnant individuals take an antidepressant during pregnancy. It is important that they discuss the medication with a health care provider as some medications can cause harm to the developing organism.

Paternal Impact

The age of biological fathers at the time of conception is also an important factor in health risks for children. According to Nippoldt (2015), offspring of men over 40 face an increased risk of miscarriages, autism, birth defects, achondroplasia (bone growth disorder) and schizophrenia. These increased health risks are thought to be due to accumulated chromosomal aberrations and mutations during the maturation of sperm cells in older men (Bray, Gunnell, & Smith, 2006). However, like older women, the overall risks are small.



Figure **5.2.4**: Exposure to hazardous chemicals is of particular concern during pregnancy and has been found to adversely affect birth outcomes.[28]

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5.3: Prenatal Assessment

A number of assessments are suggested to pregnant individuals as part of their routine prenatal care to find conditions that may increase the risk of complications for the pregnant individual and fetus (Eisenberg, Murkoff, & Hathaway, 1996). These can include blood and urine analyses and screening and diagnostic tests for birth defects.

There are screenings like AFP blood tests that can screen for the possibility or likelihood of certain problems with the pregnancy or fetus. When these screens suggest an increased likelihood, they might warrant further testing or treatment.

Ultrasound



Figure 5.3.1: Ultrasounds are one of the most common and considered one of the safest means of assessing fetuses and prenatal development.[1]

Ultrasound is one of the main screening tests done in combination with blood tests. The ultrasound is a test in which sound waves are used to examine the fetus. There are two general types. Transvaginal ultrasounds are used in early pregnancy, while transabdominal ultrasounds are more common and used after 10 weeks of pregnancy (typically, 16 to 20 weeks).

Ultrasounds are used to check the fetus for defects or problems. It can also find out the age of the fetus, location of the placenta, fetal position, movement, breathing and heart rate, amount of amniotic fluid in the uterus, and number of fetuses. Most people have at least one ultrasound during pregnancy, but if problems are noted, additional ultrasounds may be recommended.

Amniocentesis

When diagnosis of a birth defect is necessary, ultrasounds help guide the more invasive diagnostic tests of amniocentesis and chorionic villus sampling. **Amniocentesis** is a procedure in which a needle is used to withdraw a small amount of amniotic fluid and cells from the sac surrounding the fetus and later tested.

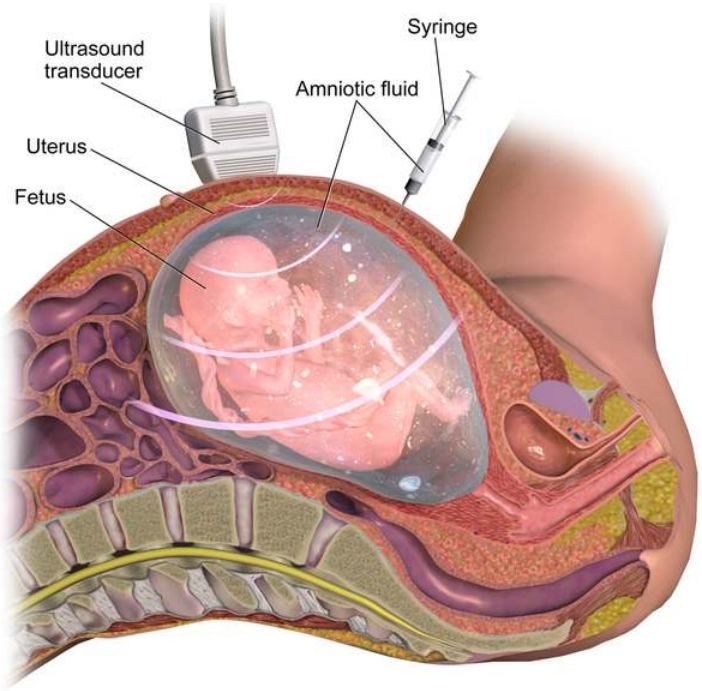


Figure 5.3.1: Amniocentesis – while imaging the pregnant abdomen, a syringe is inserted through the abdominal and uterine wall and amniotic fluid is extracted to be cultured and tested.[2]

CVS

Chorionic Villus Sampling is a procedure in which a small sample of cells is taken from the placenta and tested. The steps of the procedure are very similar to the amniocentesis. What is different is that a CVT is done earlier in pregnancy. Both amniocentesis and chorionic villus sampling have a risk of miscarriage, and consequently they are not done routinely.[3]

Blood and Urine tests

At every prenatal visit the pregnant individual's urine is usually tested for diabetes, urinary tract infections and preeclampsia. Blood tests measure different types of chromosomal abnormalities when done at specific times during pregnancy. They are also used in conjunction with drinking a sugary drink in order to test for gestational diabetes.

In the last decade or so, blood tests have also been used to test for fetal DNA that might indicate issues like Down Syndrome. More recently there are tests being developed to screen for maternal, placental and fetal RNA to see whether there is an increased risk of preeclampsia and preterm births (Kwon, 2023).

Biophysical Profile and non-stress tests

A belt is placed around the pregnant abdomen during the third trimester and the fetal heartbeat is monitored to see if the fetus is getting enough oxygen. The movement, muscle tone and level of amniotic fluid also tells physicians about the health of the fetus.

Why test?

As you might note the tests described above range in their invasiveness. Blood and urine tests, and ultrasounds are very non-invasive and hence are routinely performed to screen for (and in some cases to diagnose) potential problems. However, some tests are much more invasive. The CVT and amniocentesis include more invasive techniques and are usually done only when there is reason to suspect something - for example, advanced maternal age, a positive screen or family history of a genetic condition.

References:

Kwon, D. (2023). New noninvasive RNA tests could help identify at-risk pregnancies. Knowable Magazine from Annual Reviews. doi: 10.1146/knowable-081623-1

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5.4: Complications of Pregnancy

There are a number of common side effects of pregnancy. Not everyone experiences all of these, nor to the same degree. And although they are considered "minor", this is not to say that these problems are not potentially very uncomfortable. These side effects include nausea (particularly during the first 3-4 months of pregnancy as a result of higher levels of estrogen in the system), heartburn, gas, hemorrhoids, backache, leg cramps, insomnia, constipation, shortness of breath or varicose veins (as a result of carrying a heavy load on the abdomen). These are minor issues.

But there are also serious complications of pregnancy which can pose health risks to biological parent and child and that often require hospitalization.

Hyperemesis gravidarum is characterized by severe nausea, vomiting, weight loss, and possibly dehydration. Signs and symptoms may also include vomiting many times a day and feeling faint. The exact causes of hyperemesis gravidarum are unknown. Risk factors include the first pregnancy, multiple pregnancy, obesity, prior or family history of HG, trophoblastic disorder, and a history of eating disorders. Treatment includes drinking fluids and a bland diet. Medication, intravenous fluids, and hospitalization may be required. Hyperemesis gravidarum is estimated to affect 0.3–2.0% of pregnant people. Those affected have a low risk of miscarriage but a higher risk of premature birth.

Ectopic Pregnancy occurs when the zygote becomes attached to the fallopian tube before reaching the uterus. About 1 in 50 pregnancies in the United States are tubal pregnancies and this number has been increasing because of the higher rates of pelvic inflammatory disease and Chlamydia (Carroll, 2007). Abdominal pain, vaginal bleeding, nausea and fainting are symptoms of ectopic pregnancy.



Figure 5.4.1: When the zygote fails to travel down the fallopian tube into the uterus and instead lodges in the fallopian tube and continues to grow there, it is called an ectopic pregnancy.[1]

Spontaneous abortion is experienced in an estimated 20-40 percent of undiagnosed pregnancies and in another 10 percent of diagnosed pregnancies. Usually the body aborts due to chromosomal abnormalities, and this typically happens before the 12th week of pregnancy. Cramping and bleeding result and normal periods return after several months. Some people are more likely to have repeated miscarriages due to chromosomal, amniotic, or hormonal problems, but miscarriage can also be a result of defective sperm (Carrell et. al., 2003).

Preeclampsia, also known as **Toxemia**, is characterized by a sharp rise in blood pressure, a leakage of protein into the urine as a result of kidney problems, and swelling of the hands, feet, and face during the third trimester of pregnancy. Preeclampsia is the most common complication of pregnancy. When preeclampsia causes seizures, the condition is known as eclampsia, which is the second leading cause of maternal death in the United States. Preeclampsia is also a leading cause of fetal complications, which

include low birth weight, premature birth, and stillbirth. Treatment is typically bed rest and sometimes medication. If this treatment is ineffective, labor may be induced.

Maternal Mortality: Approximately 1000 people die in childbirth around the world each day (World Health Organization, 2010). Rates are highest in Sub-Saharan Africa and South Asia, although there has been a substantial decrease in these rates. The campaign to make childbirth safe for everyone has led to the development of clinics accessible to those living in more isolated areas and training more midwives to assist in childbirth.[2]

What is alarming is the rate of infant and maternal mortality rates among Black individuals in the US. Los Angeles County "Black Infants and Families" found "Black women and Black birthing persons are 3 times more likely to die from pregnancy related complications than their white counterparts," while American Indian and Alaska Native women were 2.5 times more likely to suffer a pregnancy-related death.[3] These disparities exist even after accounting for socioeconomic differences. For example, Black infant mortality is 3.1 more deaths per 1,000 live births among college educated Black families than infants of White families who have a high school diploma or less. And Black women with at least a college degree have higher severe pregnancy complications than women of other races and ethnicities who did not graduate high school. [4][5]

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5.5: Infertility and building families

When a couple has failed to conceive a child in a year, they receive the diagnosis of infertility. Infertility affects about 10 to 15 percent of couples in the United States (Mayo Clinic, 2015).

Male factors create infertility in about a third of the cases. For biological males, the most common cause is a lack of sperm production or low sperm production.

Biological female factors cause infertility in another third of cases. One of the most common causes of infertility is the failure to ovulate. Another cause is Pelvic Inflammatory Disease (PID), which is an infection of the female reproductive organs (Carroll, 2007).

Both male and female factors contribute to the remainder of cases of infertility.[1]

Options for Building Families

There are numerous options to pursue parenthood and building families. Let's briefly explore some of these.

Assisted Reproductive Technology

Assisted reproductive technology (ART) is the technology used to achieve pregnancy in procedures such as fertility medication (to stimulate ovulation), surgical procedures, artificial insemination IUI), in vitro fertilization (IVF) and surrogacy. These options are available for people who are experiencing infertility or cannot conceive children naturally (which also includes single parents, and gay/lesbian couples).[2]

Intrauterine insemination (IUI)

IUI as a type of artificial insemination involves the placement of sperm directly into the uterus at the time of ovulation, either in a natural menstrual cycle or following ovarian stimulation.[3]

In vitro fertilization (IVF)

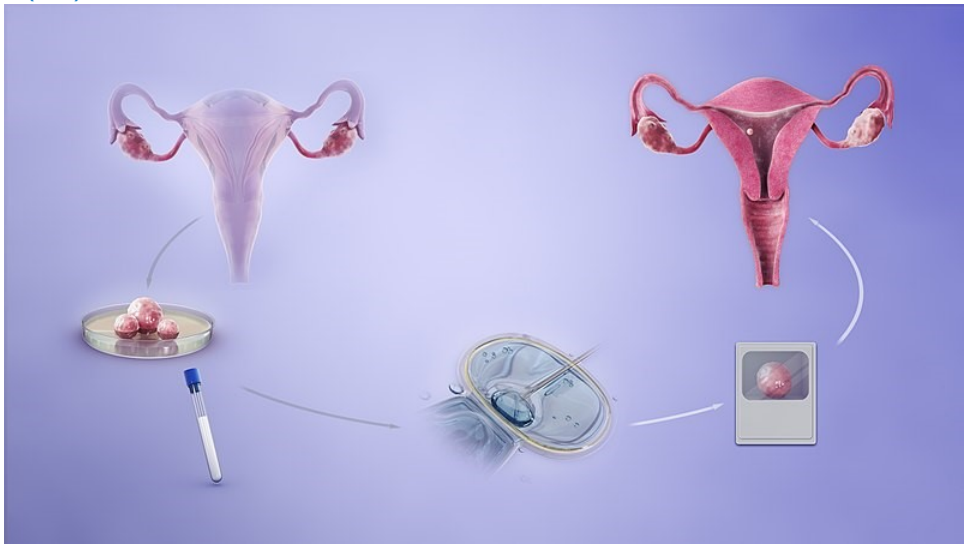


Figure **5.5.1**: The IVF process involves extracting eggs and sperm and fertilizing them in the laboratory. After that the zygote is implanted into the uterus.[5]

Donor Gametes & Embryos

People can also use sperm, ova (eggs), and embryos from donors in conjunction with ART. These donations take place through agencies and donor banks or between private individuals. In the U.S., donors can be compensated for their donations.

Surrogacy



Figure 5.5.2: Family Built with Surrogacy - this same sex couple used a surrogate[7]

Adoption

People can also choose to pursue **adoption** to build their families (with or without experiencing infertility). Adoption can take place through the foster care system, privately, or through agencies. Adoptions can be domestic (within the U.S.) or international. And they can be open (with differing amounts of contact between biological/birth families and adoptive families) or closed.



Figure 5.5.3: Family Built through Adoption - this single mother adopted her daughter.[8]

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5.6: Twins

Monozygotic or identical twins occur when a fertilized egg splits apart in the first two weeks of development. The result is the creation of two separate, but genetically identical offspring. That is, they possess the same genotype and often the same phenotype. About one-third of twins are monozygotic twins.



Figure **5.6.1**: **Monozygotic Twins**[2] Figure – MZ twins look very alike – indeed “identical”

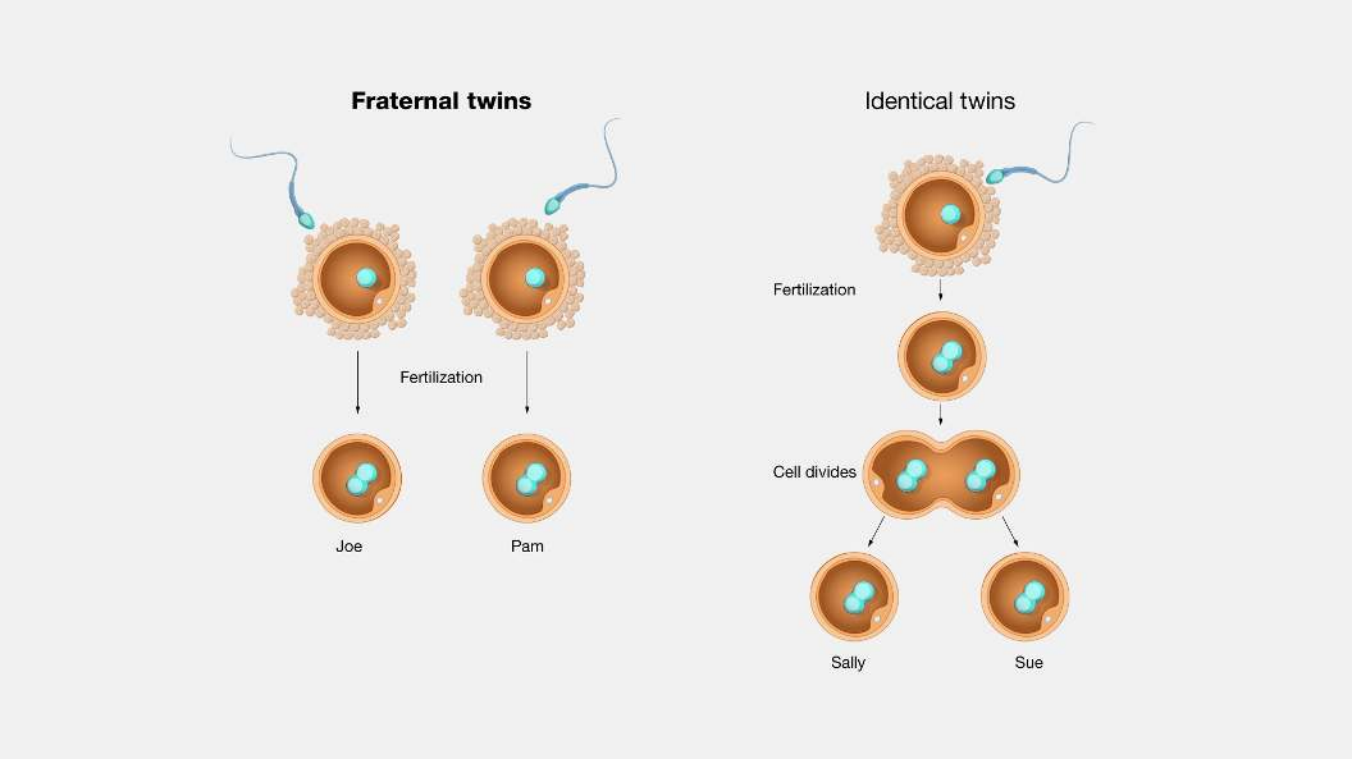
Dizygotic/Fraternal

Sometimes, however, two eggs or ova are released and fertilized by two separate sperm. The result is **dizygotic** or fraternal twins. These two individuals share the same amount of genetic material as would any two children from the same mother and father. In other words, they possess a different genotype and phenotype. They are no more similar or different than any other biological pair of siblings - the only difference being that they are the same age.

Fraternal twinning often runs in families. It would appear that it is a genetic trait that tends to occur commonly in some families. So you might see that some families like mine don't have any twins, while other families like my daughter-in-law's have many twin pairs born.



Figure **5.6.1**: **Dizygotic Twins**[3] Figure – DZ twins are no more similar than any other siblings born at the same time



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CHAPTER OVERVIEW

6: Birth and the Newborn

6.1: Approaches to Childbirth
6.2: Birth process
6.3: Newborn and tests
6.4: Newborn Characteristics
6.5: Newborn Reflexes
6.6: Problems of the Newborn

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6.1: Approaches to Childbirth

After around 266 days of developing inside the womb (for a full-term pregnancy), comes the arduous process of childbirth. After birth, newborns have to regulate their own body temperature, breathe for themselves, and take in all of their nutrition through feeding. Let's look at both the process of birth and some attributes of the newborn.

Prepared childbirth refers to being not only in good physical condition to help provide a healthy environment for the baby to develop, but also helping individuals to prepare to accept their new roles as parents. Additionally, parents can receive information and training that will assist them for delivery and life with the baby. The more future parents can learn about childbirth and the newborn, the better prepared they will be for the adjustment they must make to a new life.

Approaches to Childbirth

There are many different approaches to childbirth that influence how expectant parents prepare. The following table describes a few of these, though the first three are the most commonly used:

Table 6.1.1: **Approaches to Childbirth**[1] Different possible ways to deliver

Method	Description
The Lamaze Method	The emphasis of this method is on teaching the woman to be in control in the process of delivery. It includes learning muscle relaxation, breathing through contractions, having a focal point (usually a picture to look at) during contractions and having a support person who goes through the training process with the mother and serves as a coach during delivery.
The Leboyer Method	This method involves giving birth in a quiet, dimly lit room and allowing the newborn to lie on the mother's stomach with the umbilical cord intact for several minutes while being given a warm bath.
Medicated Childbirth	Health care providers can provide pain relief during labor with different types of medication, including epidurals, spinal blocks, combined spinal-epidurals, and systemic and local analgesia. There are benefits and side effects of each.[7]
Dick-Read Method / Mongan Method / Hypnobirthing	This method comes from the suggestion that the fear of childbirth increases tension and makes the process of childbearing more painful. It emphasizes the use of relaxation and proper breathing with contractions as well as family support and education.
Bradley Method	"The Bradley Method focuses on preparing the mother for a natural childbirth coached by her partner. They learn techniques to reduce the perception of pain and stay relaxed. The emphasis is on being prepared for an unassisted vaginal birth without medication."[2]
Alexander Technique	This is a technique that can be used during childbirth that involves training to stop habitual reactions to pain, such as tensing muscles and increase conscious awareness and control over posture and movement. This involves being able to move freely and stay upright during labor and using body positioning that is beneficial to the labor process.[3]
Waterbirth	Involves immersion in warm water. Proponents believe this method is safe and provides many benefits for both mother and infant, including pain relief and a less traumatic birth experience for the baby. However, critics argue that the procedure introduces unnecessary risks to the infant such as infection and water inhalation.[4]
Lotus Birth	Or umbilical cord nonseverance – UCNS, is the practice of leaving the umbilical cord uncut after childbirth so that the baby is left attached to the placenta until the cord naturally separates at the umbilicus. This usually occurs within 3–10 days after birth. The practice is performed mainly for spiritual purposes of the parents, including for the perceived spiritual connection between placenta and newborn.[5]
Silent Birth	Sometimes known as quiet birth, is a birthing procedure advised by L. Ron Hubbard and advocated by Scientologists in which "everyone attending the birth should refrain from spoken words as much as possible."[6]



Figure **6.1.1**: In many industrialized cultures, people go to childbirth preparation classes to learn about childbirth and newborns.[8]

Choosing Location of Childbirth & Who Will Deliver

The vast majority of births occur in a hospital setting. However, 1.6 percent of women in the US choose "community births" or "out of hospital births" – at home or in a birthing center (MacDorman & DeClercq, 2019)[9]. Women who are at low risk for birth complications can successfully deliver at home. More than half (67%) of home deliveries are by certified nurse midwives. Midwives are trained and licensed to assist in delivery and are far less expensive than the cost of a hospital delivery. However, because of the potential for a complication during the birth process, most medical professionals recommend that delivery take place in a hospital. In addition to home births, one-third of out-of-hospital births occur in freestanding clinics, birthing centers, in physician's offices, or other locations.[10]

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6.2: Birth process

Onset of Labor

Childbirth typically occurs within a week of a woman's due date, unless the woman is pregnant with more than one fetus, which usually causes her to go into labor early. As a pregnancy progresses into its final weeks, several physiological changes occur in response to hormones that trigger labor.

A common sign that labor is beginning is the so-called "bloody show." During pregnancy, a plug of mucus accumulates in the cervical canal, blocking the entrance to the uterus. Approximately 1–2 days prior to the onset of true labor, this plug loosens and is expelled, along with a small amount of blood, and the cervix begins to dilate.

As labor nears, the mothers' pituitary gland produces oxytocin. This begins to stimulate stronger, more painful uterine contractions, which—in a positive feedback loop—stimulate the secretion of prostaglandins from fetal membranes. Like oxytocin, prostaglandins also enhance uterine contractile strength. The fetal pituitary gland also secretes oxytocin, which increases prostaglandins even further.

And the stretching of the cervix by a full-term fetus in the head-down position is regarded as a stimulant to uterine contractions. Combined, these stimulate true labor.[1]

Stages of Birth for Vaginal Delivery

In a natural birth, there are three stages that occur.

The First Stage

Uterine contractions signify that the first stage of labor has begun. These contractions may initially last about 30 seconds and be spaced 15 to 20 minutes apart. These increase in duration and frequency to more than a minute in length and about 3 to 4 minutes apart. Typically, doctors advise that they be called when contractions are coming about every 5 minutes. Some women experience false labor or Braxton-Hicks Contractions, especially with the first child. These may come and go. They tend to diminish when the mother begins walking around. Real labor pains tend to increase with walking. In one out of 8 pregnancies, the amniotic sac or water in which the fetus is suspended may break before labor begins. In such cases, the physician may induce labor with the use of medication if it does not begin on its own in order to reduce the risk of infection. Normally this sac does not rupture until the later stages of labor.

The first stage of labor is typically the longest. During this stage the cervix or opening to the uterus dilates to 10 centimeters or just under 4 inches. This may take on average 12-16 hours for first children or about 6-9 hours for women who have previously given birth.

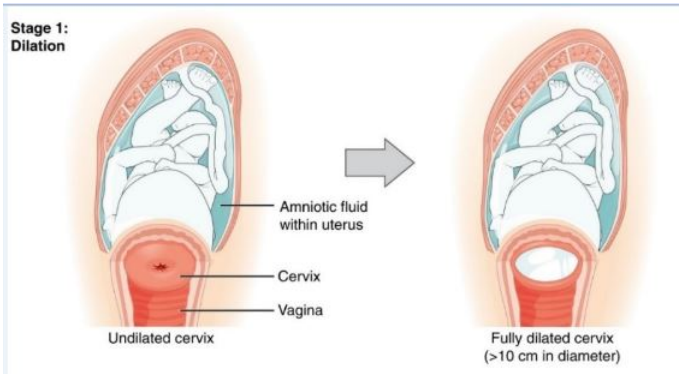


Figure **6.2.1**: Early cervical dilation – on the left is the elongated and nondilated cervix, whereas on the right, the cervix is fully effaced and dilated with the head of the baby entering the birth canal.[2]

The Second Stage

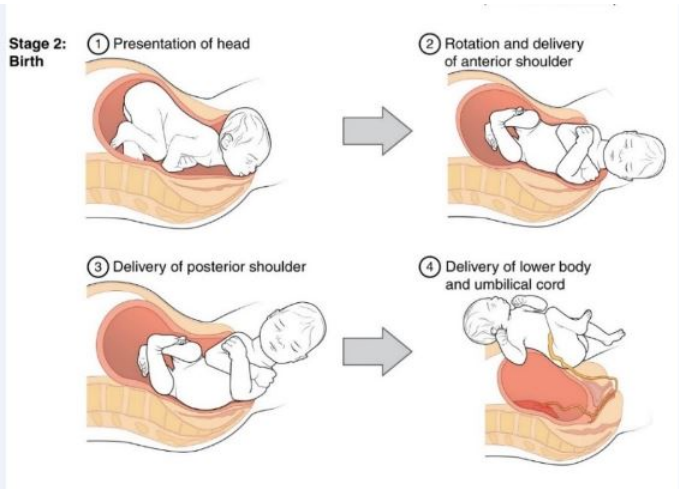


Figure **6.2.2**: Full dilation and expulsion of the newborn going from 1. Presentation of the head (outside the vagina) 2. Rotation and delivery of anterior shoulder, 3. Delivery of posterior shoulder and 4. Delivery of the lower body and umbilical cord.[4]

The Third Stage

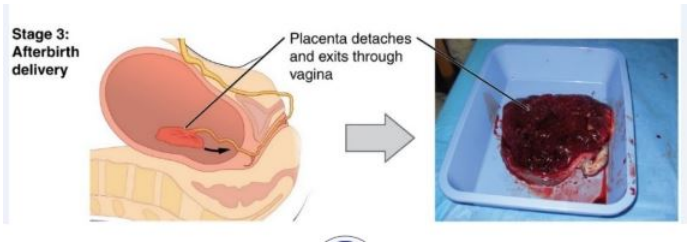


Figure **6.2.3**: In the third and final stage of birth, the placenta detaches and exits through the vagina. Doctors check to make sure it is all there since any remaining piece inside the pregnant person can lead to infection and toxicity.[6]

Additional Considerations

More than 50% of those giving birth at hospitals use an epidural anesthesia during delivery (American Pregnancy Association, 2021). An epidural block is a regional analgesic that can be used during labor and alleviates most pain in the lower body without slowing labor. The epidural block can be used throughout labor and has little to no effect on the baby. Medication is injected into a small space outside the spinal cord in the lower back. It takes 10 to 20 minutes for the medication to take effect. An epidural block with stronger medications, such as anesthetics, can be used shortly before a Cesarean Section or if a vaginal birth requires the use of forceps or vacuum extraction.[7]

Persons giving birth can also receive other pain medications (although medications given through injection can have negative side effects on the baby). In emergency situations (such as the need for a C-section), they may be given general anesthesia. They can also choose not to utilize any pain medications. That is often referred to as **natural childbirth**.



Figure 6.2.4: In the LeBoyer method, the pregnant person sits and delivers the baby in a tub of warm water.[8]

Individuals can also use alternate positions (including standing, squatting, being on hands and knees, and using a birthing stool) and laboring, and even delivering in tubs of warm water to help relieve the pain of childbirth (see alternate methods described in the table section alternatives for childbirth).

Medical Interventions in Childbirth

Sometimes pregnant individuals cannot go into labor on their own and/or deliver vaginally. Let's look at induction of labor and Cesarean Sections.

Induction

Sometimes a baby's arrival may need to be induced before labor begins naturally. **Induction of labor** may be recommended for a variety of reasons when there is concern for the health of the pregnant individual or baby. For example:

- The pregnant person is approaching two weeks beyond their due date and labor has not started naturally
- Water has broken, but contractions have not begun
- There is an infection in the uterus
- The baby has stopped growing at the expected pace
- There is not enough amniotic fluid surrounding the baby
- The placenta peels away, either partially or completely, from the inner wall of the uterus before delivery
- The pregnant person has a medical condition that might put them or their baby at risk, such as high blood pressure or diabetes (Mayo Clinic, 2014).

C-sections

A Cesarean Section (C-section) is surgery to deliver the baby by being removed through an incision in the abdominal and uterine wall. In the United States, about one in three people have their babies delivered this way (Martin et al., 2015). Most C-sections are done when problems occur during delivery unexpectedly. These can include:

- The pregnant individual is carrying more than one baby (twins, triplets, etc.)
- The pregnant individual has health problems, including HIV infection, herpes infection, and heart disease

- The pregnant individual has dangerously high blood pressure
- The pregnant individual has problems with the shape of their pelvis
- There are problems with the placenta
- There are problems with the umbilical cord
- There are problems with the position of the baby, such as breech where the head is not in the downward position
- The baby shows signs of distress, such as a slowed heart rate
- The pregnant individual has had a previous c-section



Figure **6.2.5**: A person receiving a C-section lies flat on their back as doctors/nurses take the baby out surgically through a cut in the abdomen.[9]



Figure **6.2.6**: A baby being delivered by C-section in a surgical procedure.[10]

Although the surgery is relatively safe for adult and baby, it is considered major surgery and carries health risks. Additionally, it also takes longer to recover from a C-section than from vaginal birth. After healing, the incision may leave a weak spot in the wall of the uterus. This could cause problems with an attempted vaginal birth later. In the past, doctors were hesitant to allow a vaginal birth after a C-section. However, now more women who have a C-section go on to have a vaginal birth later.[11] This is referred to as a **Vaginal Birth After Cesarean (VBAC)**.

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6.3: Newborn and tests



Figure **6.3.1**: Many hospitals in the US try to give the parents the newborn to hold on to as soon as possible after delivery.[1]

Assessing the Newborn

EVENT MEDICINE
EDUCATION PLANNING OPERATIONS

APGAR SCORE

SCORE	APPEARANCE	PULSE	GRIMACE	ACTIVITY	RESPIRATION
0	Blue all over	No pulse	No response to stimulation	No movement	No respiration
1	Blue extremities	<100 beats/min	Grimace on stimulation	Some flexion	Weak, irregular, slow
2	No blue colouration	>100 beats/min	Cry on stimulation	Flexed limbs that resist extension	Strong cry

≥7 NORMAL 4-6 LOW ≤3 CRITICAL

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Figure **6.3.2**: The Apgar assessment consists of rating baby's appearance, pulse, grimace, activity, and respiration on a a scale from 0-2 each. A score of 7 or above is considered normal, 4-6 low and 3 or below is considered critical.[3]

Another way to assess the condition of the newborn is the Neonatal Behavioral Assessment Scale (NBAS). The baby's motor development, muscle tone, and stress response are assessed. This tool has been used around the world to further assess the newborn, especially those with low Apgar scores, and to make comparisons of infants in different cultures (Brazelton & Nugent, 1995).

Newborns are also routinely screened for different conditions. Within the first 24 to 48 hours after birth, babies born in hospitals undergo a simple heel stick and a few drops of blood are collected on a special paper card. Providers test those dried blood spots for a variety of different congenital disorders, or conditions that are present when the baby is born. In California, newborns are now screened for 80 different genetic and congenital disorders.



Figure **6.3.3**: Copy and Paste Caption here. (Copyright; author via source)

A medical professional performing the heel stick test to test the newborn's blood for some common disorders.[4]

Newborns are also screened for hearing disorders and certain serious heart problems using methods other than dried blood spots.[5]

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6.4: Newborn Characteristics

Size

The average newborn in the United States weighs about 7.5 pounds and is about 20 inches in length. For the first few days of life, infants typically lose about 5 percent of their body weight as they eliminate waste and get used to feeding. This often goes unnoticed by most parents, but can be cause for concern for those who have a smaller infant. This weight loss is temporary, however, and is followed by a rapid period of growth.



Figure **6.4.1**: A newborn is weighed as soon as they are born and then multiple times after birth and at their well baby visits.[1]

Body Proportions

The head initially makes up about 50 percent of our entire length when we are developing in the womb. At birth, the head makes up about 25 percent of our length (think about how much of your length would be head if the proportions were still the same!).

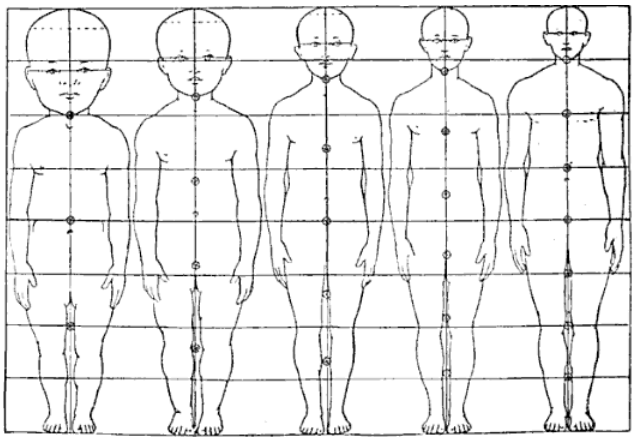


Figure **6.4.2**: Body proportions from infancy to adulthood – this graph shows how body dimensions change not only in size but proportionality with age.[2]

Brain Development

Some of the most dramatic physical change that occurs during this period is in the brain. At birth, the brain is about 25 percent its adult weight and this is not true for any other part of the body. While most of the brain's 100 billion neurons are present at birth, they are not fully mature. During the next several years dendrites or connections between neurons will undergo a period of transient exuberance or temporary dramatic growth.[3]

Appearance at Birth

During labor and birth, the infant's skull changes shape to fit through the birth canal, sometimes causing the child to be born with a misshapen or elongated head. It will usually return to normal on its own within a few days or weeks.

Some newborns have a fine, downy body hair called **lanugo**. It may be particularly noticeable on the back, shoulders, forehead, ears and face of premature infants. Lanugo disappears within a few weeks. Likewise, not all infants are born with lush heads of hair. Some may be nearly bald while others may have very fine, almost invisible hair. Some babies are even born with a full head of hair. Amongst fair-skinned parents, this fine hair may be blond, even if the parents are not. The picture shows lanugo on the shoulders of newborn twins.



Figure **6.4.3**: Lanugo on the shoulder and back of twin girls.[4]



Figure **6.4.4**: A newborn baby covered in vernix.[5]

Immediately after birth, a newborn's skin is often grayish to dusky blue in color. As soon as the newborn begins to breathe, usually within a minute or two, the skin's color returns to its normal tone. Newborns are wet, covered in streaks of blood, and coated with a white substance known as **vernix**, which is thought to act as an antibacterial barrier, seen in the figure.

The scalp may be temporarily bruised or swollen, especially in hairless newborns, and the area around the eyes may be puffy.

The newborn may also have slate grey nevi (blue or blue black birthmark on the lower back that used to be called Mongolian blue spots), various other birthmarks, or peeling skin, particularly on the wrists, hands, ankles, and feet. [6]

A newborn's genitals are enlarged and reddened, with male infants having an unusually large scrotum. The breasts may also be enlarged, even in male infants. This is caused by naturally-occurring maternal hormones and is a temporary condition.

The umbilical cord of a newborn is bluish-white in color. After birth, the umbilical cord is normally cut, leaving a 1–2 inch stub. The umbilical stub will dry out, shrivel, darken, and spontaneously fall off within about 3 weeks. Occasionally, hospitals may apply triple dye to the umbilical stub to prevent infection, which may temporarily color the stub and surrounding skin purple.



Figure 6.4.5: The clamping and cutting of a newborn’s umbilical cord is one of the first things that is done once the baby is born.[7]

Newborns lose many of the above physical characteristics quickly. Thus, older babies look very different. While older babies are considered "cute," newborns can be "unattractive" by the same criteria and first time parents may need to be educated in this regard.[8] A funny story that used to be told in my own family is that when my own mother’s friends and family came to visit her in the hospital after my birth, they remarked in private on what an ugly little newborn I was! My baby pictures don’t bear out that initial disappointment though (at least I hope not :)). **maybe put baby photo of self here**

Sleep



Figure **6.4.6**: An older infant sleeps often in the day[10]

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6.5: Newborn Reflexes

Newborns are equipped with a number of **reflexes,** which are involuntary movements in response to stimulation. Some of the more common reflexes, such as the sucking reflex and rooting reflex, are important to feeding. The grasping and stepping reflexes are eventually replaced by more voluntary behaviors. Within the first few months of life these reflexes disappear, while other reflexes, such as the eye-blink, swallowing, sneezing, gagging, and withdrawal reflex stay with us as they continue to serve important adaptive functions.[1]

Sucking reflex

A newborn sucks on anything that touches their lips. The sucking reflex clearly supports feeding.



Figure **6.5.1**: Image is in the public domain

Moro reflex

A sudden noise or loss of support to the head and neck will cause infants to spread out their arms and legs out then quickly contract them inward. It is less clear what survival purpose this reflex might serve, but perhaps when startled, this might prevent falling.



Figure **6.5.2**: Image is in the public domain

Rooting reflex

When their cheeks is touched, infants turn their head to that side. Again clearly this serves the purpose of feeding. In fact when my newborn used to wake up hungry, he would try turning to the mattress or anything that touched his cheek, hungrily looking for something to take into his mouth!



Figure **6.5.3**: Image is in the public domain

Tonic Neck Reflex

When lying on the back with the head to one side infants will extend the arm and leg on that side while flexing the limbs on the opposite side (looks like a fencer pose).



Figure **6.5.4**: (Image by Samuel Finlayson is licensed under CC BY-SA 4.0)

Grasping

When something touches an infant's palm, they grab on with their fists. Again, it is unclear what adaptive purpose this reflex might serve. When considering that humans evolved from other primates, it might become clearer that this reflex kept infants safe when they were being carried on their mothers' back while their mothers were swinging around on trees. Those infants who did not have this hardwired grasping reflex might fall onto the forest floor and never pass on those non-grasping genes to future generations!



Figure **6.5.5**: This grasping reflex of human infants might also foster care and concern in adults who are hardwired to feel a nurturing impulse toward helpless smallness (Image by Raul Luna is licensed under CC BY 2.0)

Stepping reflex

An infant will make stepping motions when their feet touch a flat surface. This is one of the reflexes that might portend future skills. It is important to make sure to support infants' weight when trying this out, because they are certainly not well developed enough to do so themselves.



Figure **6.5.6**: Infants "reflexively" make stepping motions when held so that their feet are touching a flat surface. (Image is in the public domain)

Babinski reflex

An infant's toes will fan out and curl when the sole of the foot is stroked from heel to toe. Again the survival value of this might be similar to that of the grasping and Moro reflexes described above.



Figure **6.5.7**: The Babinski reflex (Image by Medicus of Borg is licensed under CC BY-SA 3.0)

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6.6: Problems of the Newborn

Anoxia

Anoxia is a temporary lack of oxygen to the brain. Difficulty during delivery may lead to anoxia which can result in brain damage or in severe cases, death. Babies who suffer both low birth weight and anoxia are more likely to suffer learning disabilities later in life as well.

Low Birth Weight

A newborn is considered low birth weight if they weigh less than 5 pounds 8 ounces (2500 grams). About 8.2 percent of babies born in the United States are of low birth weight (Center for Disease Control, 2015a). Sixty-seven percent of these babies are also preterm.

A low birth weight baby has difficulty maintaining adequate body temperature because it lacks the fat that would otherwise provide insulation. Such a baby is also at more risk for infection.

Very low birth weight babies (2 pounds or less) have an increased risk of developing cerebral palsy. Many causes of low birth weight are preventable with proper prenatal care.

Preterm

A newborn might also have a **low birth weight** if it is born at less than 37 weeks gestation, which qualifies it as a **preterm baby** (CDC, 2015c). Early birth can be triggered by anything that disrupts the mother's system. For instance, vaginal infections can lead to premature birth because such infection causes the pregnant individual to release anti-inflammatory chemicals which, in turn, can trigger contractions. Smoking and the use of other teratogens can lead to preterm birth. A significant consequence of preterm birth includes respiratory distress syndrome, which is characterized by weak and irregular breathing (see the image below). Premature babies often cannot yet regulate their own temperature or feed by nursing or bottle. They may struggle to regulate their heart rate effectively and may experience jaundice. They often require care in the Neonatal Intensive Care Unit (NICU) until they are as healthy as a full-term baby.



Figure **6.6.1**: Premature infants might need much help and medical attention in a neonatal intensive care unit, particularly with breathing, since the lungs are the last to develop in a full term pregnancy.[1]

Small-for-Date Infants

Infants that have birth weights that are below expectation based on their gestational age are referred to as **small-for-date**. These infants may be full term or preterm (see image below), but still weigh less than 90% of all babies of the same gestational age. This

is a very serious situation for newborns as their growth was adversely affected. Regev et al. (2003) found that small-for-date infants died at rates more than four times higher than other infants.



Figure **6.6.2**: This baby was born at 32 weeks and only weighed 2 pounds and 15 ounces.[2]

Postmature

When babies are not born by 42 weeks gestation, or two weeks after their due date, they are considered overdue or **postmature**. There are some concerns about how long the placenta can function and most doctors will consider induction for overdue babies.

Stillborn

When a fetus dies while still inside the uterus (after 20-24 weeks gestation) or dies during delivery (childbirth). It is said that the delivered baby is **stillborn**. The causes of many stillbirths are unknown, even when special tests are done to learn the cause. Possible causes include: nicotine, alcohol, or drugs taken by the mother during pregnancy, physical trauma, radiation poisoning, Rh disease, and umbilical cord problems. The number of stillbirths in the United States is about 1 in 115 births, which is about 26,000 a year, or one every 20 minutes.[3]

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CHAPTER OVERVIEW

7: Physical Development

7.1: Size and Proportions
7.2: Brain development
7.3: Brain and cognition in adolescence
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7.1: Size and Proportions

Body growth is not a smooth or gradual process. In fact, the child grows in many spurts and starts. As mentioned in the section about newborns, the average newborn in the United States weighs about 7.5 pounds and is about 20 inches in length. After about a 5% weight loss in the first few days, there is a period of rapid growth. By the time an infant is 4 months old, it usually doubles in weight and by one year has tripled its birth weight. By age 2, the weight has quadrupled. The average length at one year is about 26-32 inches.[1]

Two hormones are very important to this growth process. The first is Human Growth Hormone (HGH) which influences all growth except that in the Central Nervous System (CNS). The hormone influencing growth in the CNS is called Thyroid Stimulating Hormone. Together these hormones influence the growth in early childhood.

Proportions of the Body

One dramatic physical change that takes place in the first several years of life is the change in body proportions. The head initially makes up about 50 percent of our entire length when we are developing in the womb. At birth, the head makes up about 25 percent of our length (think about how much of your length would be head if the proportions were still the same!). By age 25 it comprises about 20 percent our length. Imagine now how difficult it must be to raise one's head during the first year of life! And indeed, if you have ever seen a 2 to 4 month old infant lying on the stomach trying to raise the head, you know how much of a challenge this is. The comparison in this graphic was originally introduced in the last chapter.

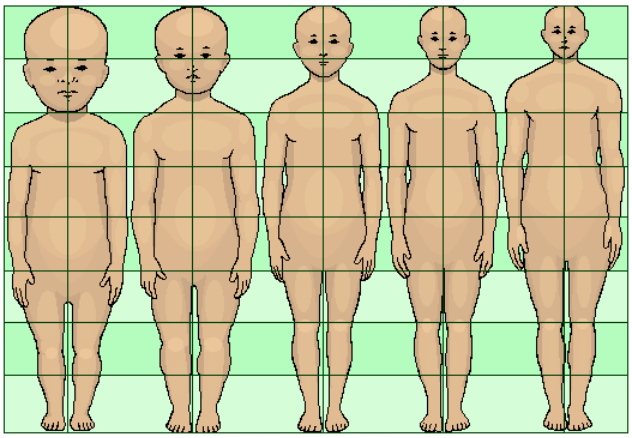


Figure **7.1.1**: Shown from left to right: Human body proportions at birth, at 2 years, at 6 years, at 12 years, and at 19 yearsHuman body proportions changing as the subject matures. The diagram shows that the head becomes proportionately smaller and the limbs become proportionately longer as the subject matures..[2]

Some of the most dramatic physical change that occurs during this period is in the brain. At birth, the brain is about 25 percent its adult weight and this is not true for any other part of the body. By age 2, it is at 75 percent its adult weight, at 95 percent by age 6 and at 100 percent by age 7 years.

Growth in early childhood

Children between the ages of 2 and 6 years tend to grow about 3 inches in height each year and gain about 4 to 5 pounds in weight each year. The 3 year old is very similar to a toddler with a large head, large stomach, short arms and legs. But by the time the child reaches age 6, the torso has lengthened and body proportions have become more like those of adults. The average 6 year old weighs approximately 46 pounds and is about 46 inches in height. This growth rate is slower than that of infancy.

During the early childhood years of three to five we see significant changes in the way children look, think, communicate, regulate their emotions, and interact with others.



Figure **7.1.2**: Two early childhood kids - a girl and a boy - contrasted in size.[3]

Middle childhood

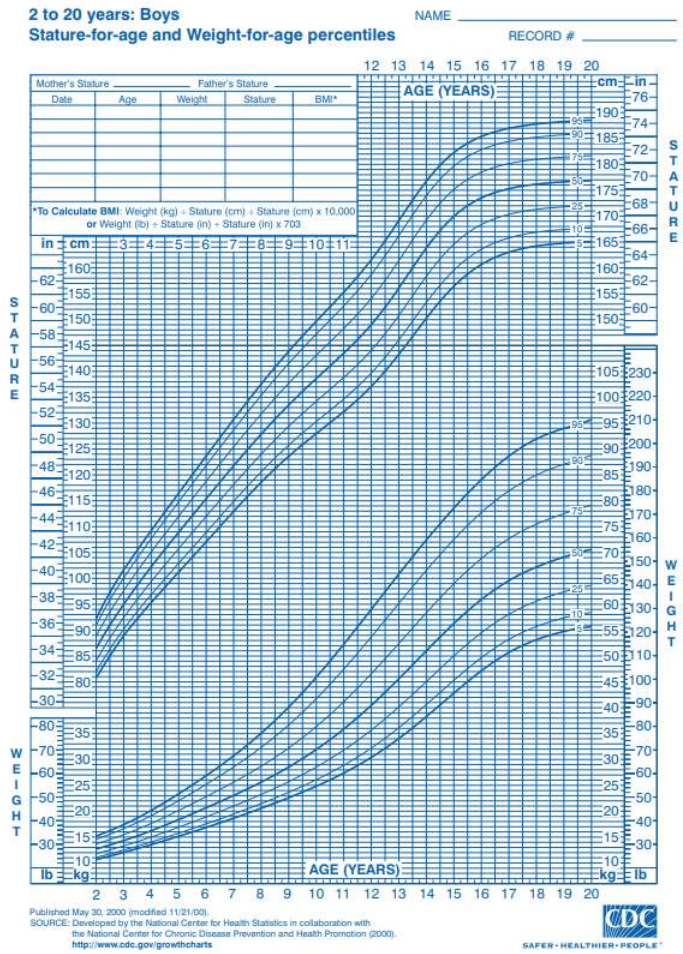


Figure **7.1.3**: Stature for age and weight for age percentiles of boys – these are charts used by pediatrician offices to graph children's weight over time.[5]

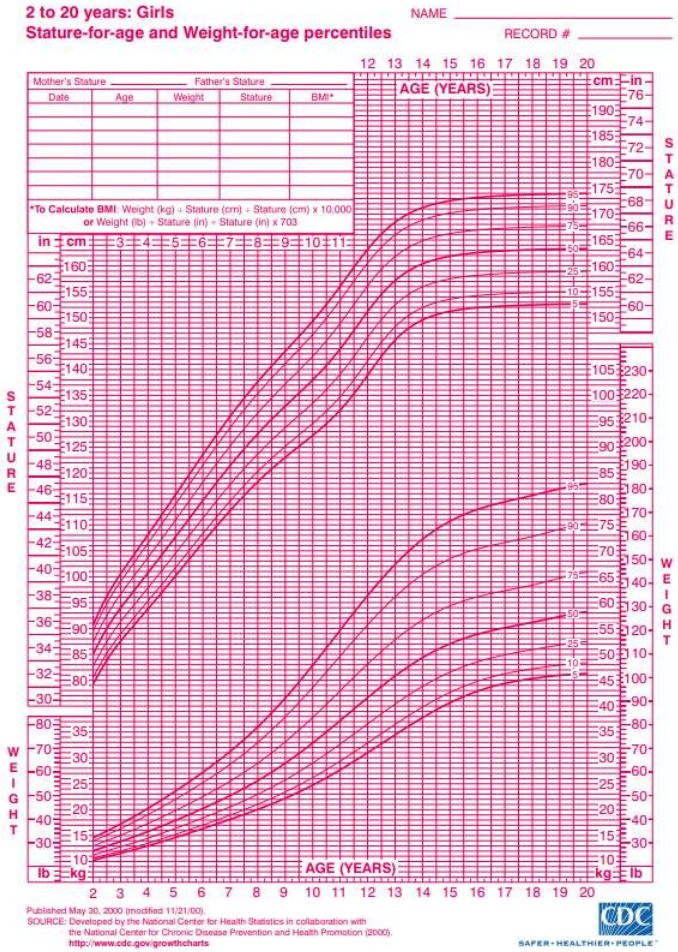


Figure **7.1.4**: Stature for age and weight for age percentiles of girls – these are charts used by pediatrician offices to graph children's weight over time.[5]

Physical Growth in Adolescence

The **adolescent growth spurt** is a rapid increase in an individual's height and weight during puberty resulting from the simultaneous release of growth hormones, thyroid hormones, and androgens. Males experience their growth spurt about two years later than females. The accelerated growth in various body parts happens at different times, but for all adolescents it has a fairly regular sequence. The first places to grow are the extremities (head, hands, and feet), followed by the arms and legs, and later the torso and shoulders. This non-uniform growth is one reason why an adolescent body may seem out of proportion. During puberty, bones become harder and more brittle.

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Polan EU, Taylor DR. Journey Across the LifeSpan: Human Development and Health Promotion. Philadelphia: F. A. Davis Company; 2003, 150–51

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7.2: Brain development

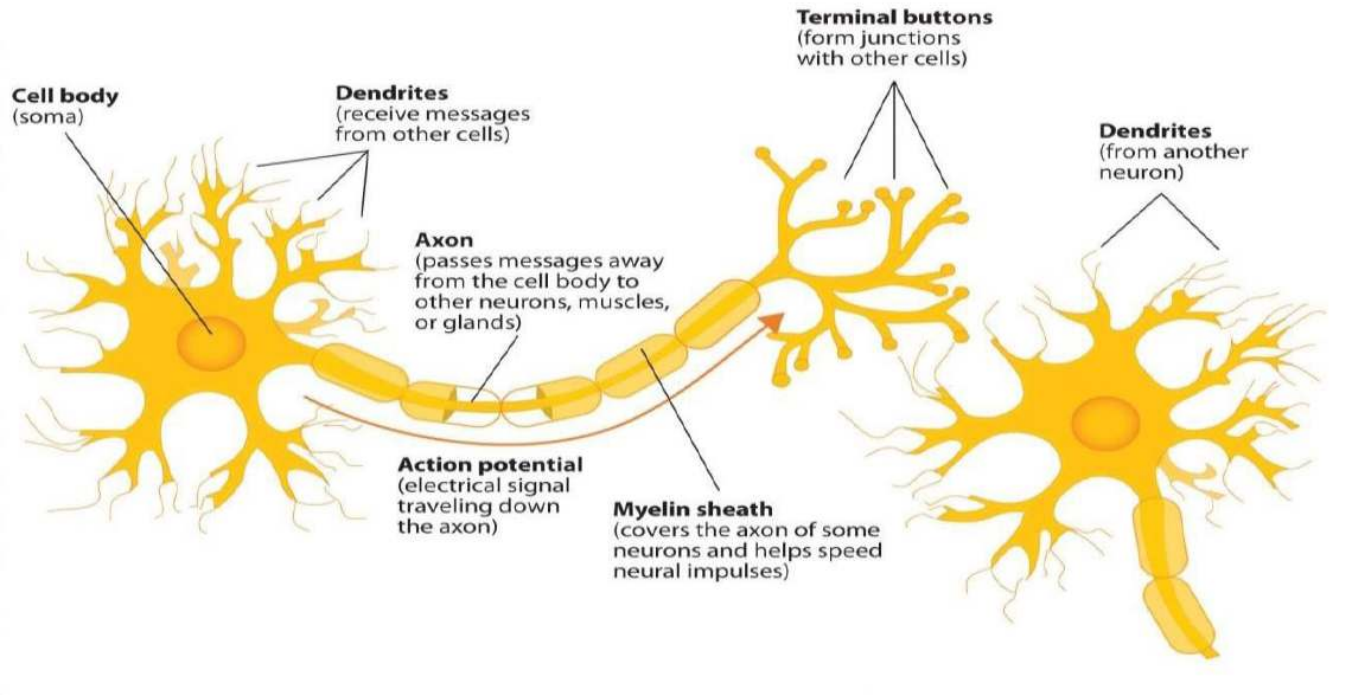


Figure **7.2.1**: This is generally the diagram of neurons and synapses that is shown. In actual fact, the main neuron pictured here is a motor neuron and neuron shapes and sizes differ greatly across the nervous system, but we use this diagram because the different parts of neurons are most clearly seen and differentiated here.

In the third week of gestation, a section of embryonic cells become differentiated into the neural plate, soon tipping at the edges to form a neural groove, and eventually completing the tipping to form a neural tube. The neural tube is filled with fluid and neurogenesis occurs (at the rate of 250,000 per minute at its fastest rate) in the center of the neural tube. These neurons migrate along nervous system supportive cells called radial glia to the genetically programmed area where they will form structures by adhering to other neurons. The cells also begin to form both dendrites and axons prenatally, such that different structures connect to each other. Dendrite formation continues throughout the lifespan lending to brain plasticity - the changeability of the brain even in adulthood.

While we end up with a total of about 86 billion neurons in average adults, each neuron makes connections with thousands of other neurons such that by some counts there are 100,000 trillion (!!) synapses. Clearly each of these connections cannot be genetically preprogrammed but are affected by a number of genetic, environmental (epigenetic) and experiential conditions that the fetus and child are exposed to.

Axons grow before birth for the most part. Dendrites and dendritic branches continue to branch and deteriorate throughout life. Nowhere else is the adage “use it or lose it” more true than in brain development. If neurons do not connect to other neurons, they die. These synapses and synaptic changes are genetically influenced but the prenatal environment clearly also plays an important part in this process. A number of factors ranging from psychoactive drugs, diet, parental and peer relationships and intestinal flora influence the plasticity of the nervous system throughout life. However, this plasticity is also dependent on the age of the fetus and the child.

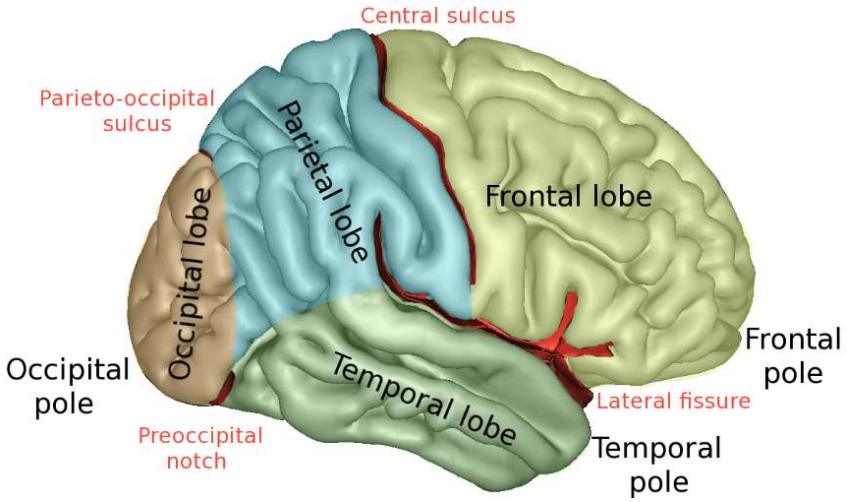


Figure **7.2.2**: The brain continues developing into early adulthood- seen here is the outer wrinkled surface of the brain with the four lobes (frontal, temporal, parietal and occipital), and lateral fissure and main sulci marked.[1]

The prefrontal cortex that is located behind our forehead continues to grow and mature throughout childhood and experiences an additional growth spurt during adolescence. It is the last part of the brain to mature and will eventually comprise 85 percent of the brain's weight. Experience will shape which of these connections are maintained and which of these are lost. Ultimately, about 40 percent of these connections will be lost (Webb, Monk, and Nelson, 2001). As the prefrontal cortex matures, the child is increasingly able to regulate or control emotions, to plan activity, strategize, and have better judgment. Of course, this is not fully accomplished in infancy and toddlerhood, but continues throughout childhood and adolescence. This changeability of the brain is called plasticity.

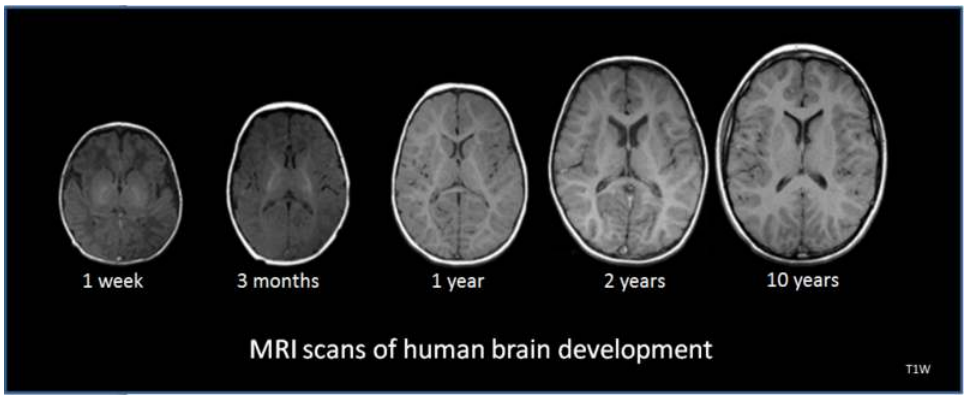


Figure **7.2.3**: MRI scans of the human brain at different ages - 1 week, 3 months, 1 year, 2 years, and 10 years..[3]

Brain development in Early Childhood

Brain weight

The brain is about 75 percent its adult weight by two years of age. By age 6, it is approximately 95 percent its adult weight. Myelination and the development of dendrites continues to occur in the cortex and as it does, we see a corresponding change in the child's abilities. Significant development in the **prefrontal cortex** (the area of the brain behind the forehead that helps us to think, strategize, and control emotion) makes it increasingly possible to control emotional outbursts and to understand how to play games. Consider 4- or 5-year-old children and how they might approach a game of soccer. Chances are, every move would be a response to the commands of a coach standing nearby calling out, "Run this way! Now, stop. Look at the ball. Kick the ball!" And when the child is not being told what to do, he or she is likely to be looking at the clover on the ground or a dog on the other side of the fence! Understanding the game, thinking ahead, coordinating movement, and handling losing improve with practice and myelination.[4]

Growth in the Hemispheres and Corpus Callosum

Between ages 3 and 6, the left hemisphere of the brain grows dramatically. This side of the brain or hemisphere is typically involved in language skills. The right hemisphere continues to grow throughout early childhood and is involved in tasks that require spatial skills such as recognizing shapes and patterns. The **corpus callosum** which connects the two hemispheres of the brain undergoes a growth spurt between ages 3 and 6 and results in improved coordination between right and left hemisphere tasks.

Brain development in Middle childhood

The brain reaches its adult size at about age 7. Two major brain growth spurts occur during middle/late childhood (Spreen et al, 1995). Between ages 6 and 8, significant improvements in fine motor skills and eye-hand coordination are noted. Then between 10 and 12 years of age, the frontal lobes become more developed and improvements in logic, planning, and memory are evident (van der Molen & Molenaar, 1994). Children in middle to late childhood are also better able to plan, coordinate activity using both left and right hemispheres of the brain, and to control emotional outbursts. Paying attention is also improved as the prefrontal cortex matures (Markant & Thomas, 2013) [5]

Myelin also continues to develop and the child's reaction time improves as well. Myelination improvement is one factor responsible for these growths. From age 6 to 12, there is rapid myelination all over the brain in areas that are responsible for coordinating different sensory and motor activities. This myelination contributes to increases in information processing speed and the child's reaction time. The **hippocampus**, which is responsible for transferring information from the short-term to long-term memory, also shows increases in myelination resulting in improvements in memory functioning (Rolls, 2000).

Changes in the brain during this age enable not only physical development, but also allow children to understand what others think of them and dealing socially with the positive and negative consequences of that. Within this development period, children may struggle with mental health disorders or other health problems. As children are growing and becoming more capable, adults need to remember that children don't grow physically in isolation. The development of their bodies isn't separate from the changes that are occurring socially, emotionally, and cognitively. Awareness and understanding of their other developmental domains and needs will support the child during these changes.[6]

Adolescence brain growth

Brain growth continues into the early 20s. The development of the frontal lobe, in particular, is important during this stage. Adolescents often engage in increased risk-taking behaviors and experience heightened emotions during puberty; this may be due to the fact that the frontal lobes of their brains—which are responsible for judgment, impulse control, and planning—are still maturing until early adulthood (Casey, Tottenham, Liston, & Durston, 2005).

The brain undergoes dramatic changes during adolescence. Although it does not get larger, it matures by becoming more interconnected and specialized (Giedd, 2015). The myelination and development of connections between neurons continues. This results in an increase in the white matter of the brain, and allows the adolescent to make significant improvements in their thinking and processing skills. Different brain areas become myelinated at different times. For example, the brain's language areas undergo myelination during the first 13 years. Completed insulation of the axons consolidates these language skills but makes it more difficult to learn a second language. However myelination is itself also an experience-dependent plastic process (Monje, 2018).

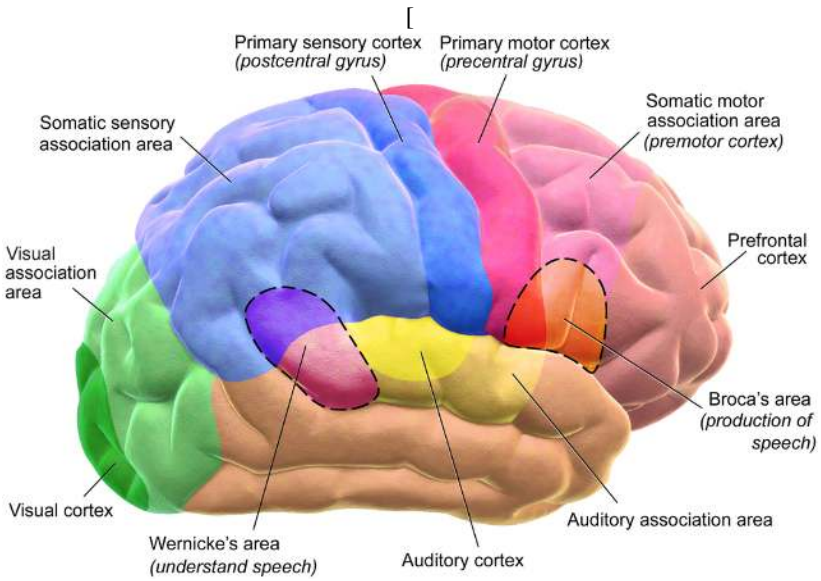


Figure **7.2.4**: During adolescence the brain becomes more interconnected and specialized. Different areas like Broca's area, auditory cortex, and particularly the prefrontal area grow more complex.[8]

The **limbic system**, which regulates emotion and reward, is linked to the hormonal changes that occur at puberty. The limbic system is also related to novelty seeking and a shift toward interacting with peers. In contrast, the **prefrontal cortex,** which is involved in the control of impulses, organization, planning, and making good decisions, does not fully develop until the mid-20s. According to Giedd (2015) the significant aspect of the later developing prefrontal cortex and early development of the limbic system is the "mismatch" in timing between the two. The approximately ten years that separates the development of these two brain areas can result in risky behavior, poor decision-making, and weak emotional control for the adolescent. When puberty begins earlier, this mismatch extends even further.

Teens often take more risks than adults and, according to research, it is because they weigh risks and rewards differently than adults do (Dobbs, 2012). For adolescents, the brain's sensitivity to the neurotransmitter dopamine peaks, and **dopamine** is involved in reward circuits so the possible rewards outweigh the risks. Adolescents respond especially strongly to social rewards during activities, and they prefer the company of others their same age. In addition to dopamine, the adolescent brain is affected by **oxytocin,** which facilitates bonding and makes social connections more rewarding. With both dopamine and oxytocin engaged, it is no wonder that adolescents seek peers and excitement in their lives that could end up actually harming them.

Because of all the changes that occur in the adolescent brain, the chances for abnormal development can occur, including mental illness. In fact, 50% of mental illness occurs by the age 14 and 75% occurs by age 24 (Giedd, 2015). Additionally, during this period of development the adolescent brain is especially vulnerable to damage from drug exposure. For example, repeated exposure to marijuana can affect cellular activity in the endocannabinoid system. Consequently, adolescents are more sensitive to the effects of repeated marijuana exposure (Weir, 2015).

=



Figure **7.2.5**: Adolescents prefer the company of others their same age.[10]

The physical growth and the changes of puberty mark the onset of adolescence (Lerner & Steinberg, 2009). For both boys and girls, these changes include a growth spurt in height, growth of pubic and underarm hair, and skin changes (e.g., pimples). Hormones drive these pubescent changes, particularly the increase in testosterone for boys and estrogen for girls.[11]

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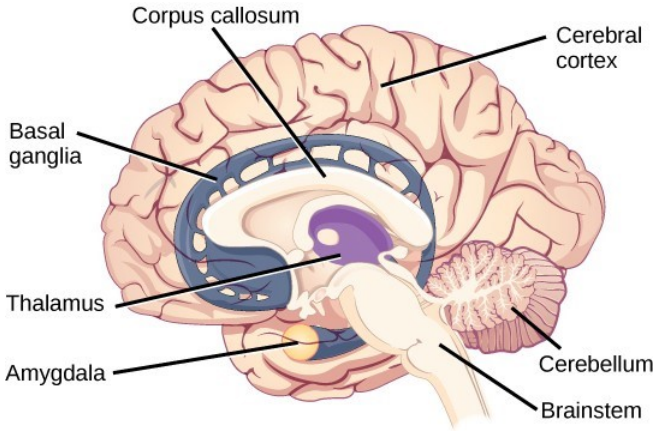
7.3: Brain and cognition in adolescence

During adolescence more complex thinking abilities emerge. Earlier researchers suggested this is due to increases in processing speed and efficiency rather than as the result of an increase in mental capacity—in other words, due to improvements in existing skills rather than development of new ones (Bjorkland, 1987; Case, 1985). However there has been a lot of research dedicated to studying adolescence and emerging adulthood. For example there is the Fundamentals of the Adolescent Brain Laboratory (FABLAB) at Yale University, the Developmental Social Neuroscience Lab at Univ of North Carolina, UCLA Center for the Developing Adolescent, and Society Youth Neuroscience Connected (SYNC lab) at Erasmus University in the Netherlands. (Casey, Getz & Galvan, 2008)

The brain undergoes dramatic changes during adolescence. Although it does not get larger, it matures by becoming more interconnected and specialized (Giedd, 2015). The myelination and development of connections between neurons continues. This results in an increase in the white matter of the brain, and allows the adolescent to make significant improvements in their thinking and processing skills. Different brain areas become myelinated at different times. For example, the brain's language areas undergo myelination during the first 13 years. Completed insulation of the axons consolidates these language skills, but makes it more difficult to learn a second language. With greater myelination, however, comes diminished plasticity as a myelin coating inhibits the growth of new connections (Dobbs, 2012).

Even as the connections between neurons are strengthened, synaptic pruning occurs more than during childhood as the brain adapts to changes in the environment. This synaptic pruning causes the gray matter of the brain, or the cortex, to become thinner but more efficient (Dobbs, 2012). The corpus callosum, which connects the two hemispheres, continues to thicken allowing for stronger connections between brain areas. Additionally, the hippocampus becomes more strongly connected to the frontal lobes, allowing for greater integration of memory and experiences into our decision making.

The limbic system, which regulates emotion and reward, is linked to the hormonal changes that occur at puberty. The limbic system is also related to novelty seeking and a shift toward interacting with peers. In contrast, the prefrontal cortex which is involved in the control of impulses, organization, planning, and making good decisions, does not fully develop until the mid-20s.



(b) Sagittal section

Figure **7.3.1**: In this sagittal section one can see the the subcortical regions of the brain like the amygdala and thalamus are responsible for emotions while prefrontal cortex (the front part of the outer covering) develops last and is responsible for inhibiting impulsive behavior. The locations of the brainstem, cerebellum and basal ganglia can be seen.

According to Giedd (2015) the significant aspect of the later developing prefrontal cortex and early development of the limbic system is the "mismatch" in timing between the two. The approximately ten years that separates the development of these two brain areas can result in risky behavior, poor decision making, and weak emotional control for the adolescent. When puberty begins earlier, this mismatch extends even further.

Teens often take more risks than adults and according to research, it is because they weigh risks and rewards differently than adults do (Dobbs, 2012). For adolescents, the brain's sensitivity to the neurotransmitter dopamine peaks, and **dopamine** is involved in reward circuits so the possible rewards outweigh the risks. Adolescents respond especially strongly to social rewards during activities, and they prefer the company of others their same age. In addition to dopamine, the adolescent brain is affected by

oxytocin which facilitates bonding and makes social connections more rewarding. With both dopamine and oxytocin engaged, it is no wonder that adolescents seek peers and excitement in their lives that could end up actually harming them.

Because of all the changes that occur in the adolescent brain, the chances for abnormal development can occur, including mental illness. In fact, 50% of the mental illness occurs by the age 14 and 75% occurs by age 24 (Giedd, 2015). Additionally, during this period of development the adolescent brain is especially vulnerable to damage from drug exposure. For example, repeated exposure to marijuana can affect cellular activity in the endocannabinoid system. Consequently, adolescents are more sensitive to the effects of repeated marijuana exposure (Weir, 2015).

However, researchers have also focused on the highly adaptive qualities of the adolescent brain which allow the adolescent to move away from the family towards the outside world (Giedd, 2015; Dobbs, 2012). Novelty seeking and risk-taking can generate positive outcomes including meeting new people and seeking out new situations. Separating from the family and moving into new relationships and different experiences are actually quite adaptive for society.

Prosocial behavior and complexity

For example, much research points out that the adolescent brain becomes more sensitive to social processing. Karan et al (2022) used fMRI analyses with charitable giving paradigms to provide further evidence for increased differentiation in prosocial behavior across the teenage years by which older adolescents increasingly give more to known others as compared to strangers. This differentiation in behavior was associated with age-related increases in brain activation in the lateral prefrontal cortex, suggesting an important role played by cognitive control networks in the developmental changes in prosocial behavior during the adolescent years. The significant patterns of activation in brain regions associated with cognitive control, social cognition, and reward processing highlight the important role played by developments in these networks for prosocial behavior during adolescence. Neural activation when giving to others increased with age in regions associated with cognitive control.

Greater stress and emotional wellness vulnerability

Zou et al's (2022) study in China with more than 2000 11-17 year olds showed that high optimism is correlated with a subjective sense of wellbeing more than the absence of pessimism is. The latter is correlated more with depression. And these connections are mediated by positive reappraisal and acceptance.

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7.4: Sensory Capacities

Throughout much of history, the newborn was considered a passive, disorganized being who possessed minimal abilities. William James, an early psychologist, had described the newborn's world as "a blooming, buzzing confusion," (Shaffer, 1985). However, current research techniques have demonstrated just how developed the newborn is with specially organized sensory and perceptual abilities.

Vision



Figure **7.4.1**: A newborn gazing up at a parent.[1]



Figure **7.4.2**: An adult carefully holding an infant. (Photo Source: Pikrepo, DMCA)

The womb is a dark environment void of visual stimulation. Consequently, vision is the most poorly developed sense at birth and time is needed to build those neural pathways between the eye and the brain. Newborns' visual acuity is about 20/400, which means that an infant can see something at 20 feet that an adult with normal vision could see at 400 feet. Thus, the world probably looks blurry to young infants. Because of their poor visual acuity, they look longer at checkerboards with fewer large squares than with many small squares. Infants' thresholds for seeing a visual pattern are higher than adults'. Thus, toys for infants are sometimes manufactured with black and white patterns rather than pastel colors because the higher contrast between black and white makes the pattern more visible to the immature visual system. By about 6 months, infants' visual acuity improves and approximates adult 20/25 acuity.



Figure **7.4.3**: An infant looking up at the person feeding them.[2]

When viewing a person's face, newborns do not look at the eyes the way adults do; rather, they tend to look at the chin—a less detailed part of the face. However, by 2 or 3 months, they will seek more detail when exploring an object visually and begin showing preferences for unusual images over familiar ones, for patterns over solids, for faces over patterns, and for three-dimensional objects over flat images. Newborns have difficulty distinguishing between colors, but within a few months they are able to discriminate between colors as well as adults do. Sensitivity to binocular depth cues, which require inputs from both eyes, is evident by about 3 months and continues to develop during the first 6 months. By 6 months, the infant can perceive depth in pictures as well (Sen, Yonas, & Knill, 2001). Infants who have experience crawling and exploring will pay greater attention to visual cues of depth and modify their actions accordingly (Berk, 2007).

Hearing

The infant's sense of hearing is very keen at birth, and the ability to hear is evidenced as soon as the 7th month of prenatal development (DeCasper and Spence, 1986). In fact, an infant can distinguish between very similar sounds as early as one month after birth and can distinguish between a familiar and unfamiliar voice even earlier. Infants are especially sensitive to the frequencies of sounds in human speech and prefer the exaggeration of infant-directed speech (discussed in more detail in the section on language). Newborns also prefer their mother's voices over another female when speaking the same material (DeCasper & Fifer, 1980). Additionally, they will register in utero specific information heard from their mother's voice.[3]

Prenatal development

DeCasper and Spence (1986) tested 16 infants whose mothers had previously read to them prenatally. The mothers read several passages to their fetuses, including the first 28 paragraphs of *The Cat in the Hat*, beginning when they were 7 months pregnant. The fetuses had been exposed to the stories on average of 67 times or 3.5 hours.



Figure **7.4.4**: When pregnant mothers read “Cat in the Hat” to their bellies at 7 months, infants responded differently to the sound of their mothers reading the same book than any other book after birth.[5]

Ullal et al (2013) reviewed multiple research studies and suggested that "even prior to birth" - as early as 25 weeks in utero - "human listeners may begin to acquire rudimentary auditory representations that may be considered as the earliest building blocks" of language and music.

Touch and Pain

Immediately after birth, a newborn is sensitive to touch and temperature, and is also highly sensitive to pain, responding with crying and cardiovascular responses (Balaban & Reisenauer, 2013). Newborns who are circumcised, which is the surgical removal of the foreskin of the penis, without anesthesia experience pain as demonstrated by increased blood pressure, increased heart rate, decreased oxygen in the blood, and a surge of stress hormones (United States National Library of Medicine, 2016). Research has demonstrated that infants who were circumcised without anesthesia experienced more pain and fear during routine childhood vaccines. Fortunately, many circumcisions are now done with the use of local anesthetics.

Taste and Smell

Studies of taste and smell demonstrate that babies respond with different facial expressions, suggesting that certain preferences are innate. Newborns can distinguish between sour, bitter, sweet, and salty flavors and show a preference for sweet flavors. Newborns also prefer the smell of their mothers. An infant only 6 days old is significantly more likely to turn toward its own mother’s breast pad than to the breast pad of another baby’s mother (Porter, Makin, Davis, & Christensen, 1992).



Figure **7.4.5**: Young infants are soothed sucking on a pacifier.[7]

Interaction between different senses

Infants seem to be born with the ability to perceive the world in an intermodal way; that is, through stimulation from more than one sensory modality. For example, infants who sucked on a pacifier with a smooth surface preferred looking at visual models of a pacifier with a smooth surface. But those that were given a pacifier with a textured surface preferred to look at a visual model of a pacifier with a textured surface.[6]

Ullal et al (2013) review of prenatal audition also showed that infants look more at the faces of adults who speak their native language (especially those who speak without an accent and with the same cadence) than at faces of adults who speak a different language (or those who speak with an accent).

By 4 months, infants can match lip movements with speech sounds and can match other audiovisual events. Although sensory development emphasizes the afferent processes used to take in information from the environment, these sensory processes can be affected by the infant's developing motor abilities. Reaching, crawling, and other actions allow the infant to see, touch, and organize his or her experiences in new ways.[8].

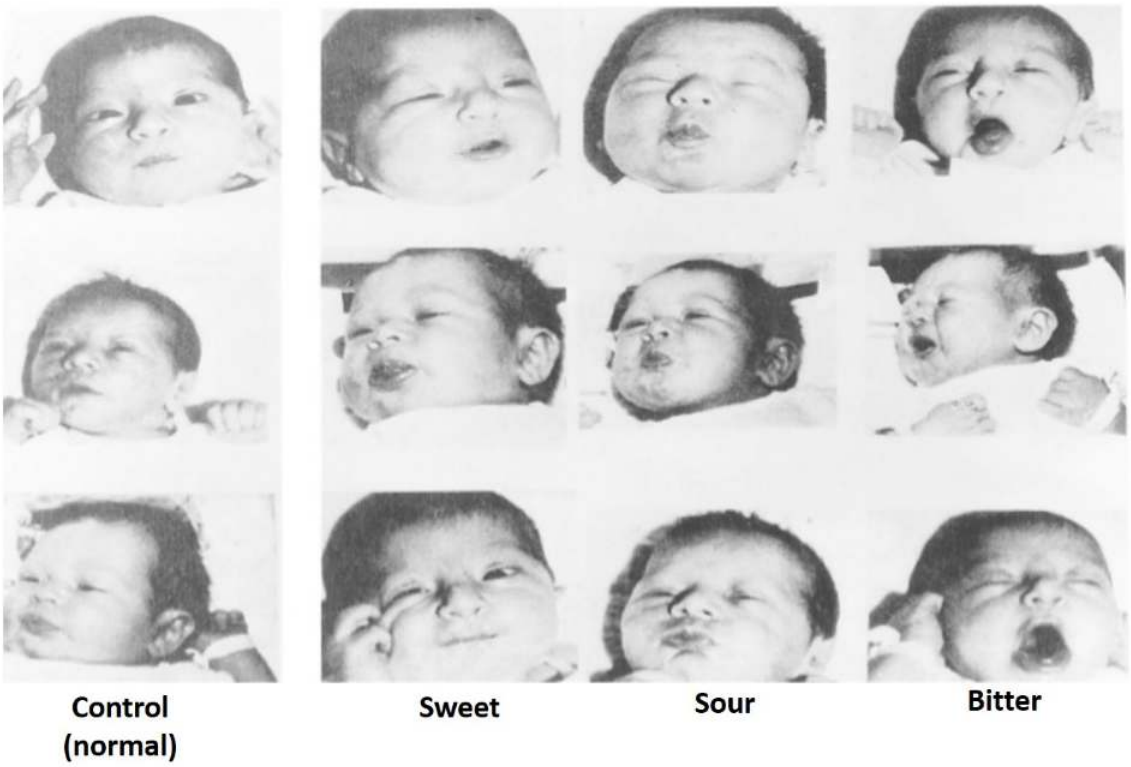


Figure 7.4.6: The responses of infants to different tastes – sweet, sour and bitter.[9]

References:

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7.5: Motor Development

Infants and children grow and develop at a rapid pace during the first few years of life. Infants are born with a set of reflexes (as seen in the section about the newborn). The development of both gross and fine motor skills helps a child go from a completely dependent newborn to an independently functioning toddler in about a 3-year span.[1]

Gross Motor Skills

Voluntary movements involve the use of large muscle groups and are typically large movements of the arms, legs, head, and torso. They are referred to as **gross motor skills** (or large motor skills). These skills begin to develop first. Examples include moving to bring the chin up when lying on the stomach, moving the chest up, rocking back and forth on hands and knees, and then crawling. But it also includes exploring an object with one's feet as many babies do as early as 8 weeks of age if seated in a carrier or other device that frees the hips. At a few days after birth infants start to reach with their hands, but it is not until 6 months that you see coordinated reaching (Hadders-Algra, 2018)[2]. And sometimes an infant will try to move toward an object while crawling and surprisingly move backward because of the greater amount of strength in the arms than in the legs! This also tends to lead infants to pulling up on furniture, usually with the goal of reaching a desired object. Usually this will also lead to taking steps and eventually walking.[3]

Infancy Gross Motor Milestones

As stated above, children grow very quickly and meet physical milestones rapidly in the first few years of life. The following is a table of the major **milestones** (behaviors or physical skills seen in infants and children as they grow and develop that typically occur within normal range) that occur in children during those first formative years. [4]

Table **7.5.1**: Gross motor development in infancy**[5]**

Typical Age	What Most Children Do by This Age
2 months	• Can hold head up and begins to push up when lying on tummy • Makes smoother movements with arms and legs
4 months	• Holds head steady, unsupported • Pushes down on legs when feet are on a hard surface • May be able to roll over from tummy to back • Brings hands to mouth • When lying on stomach, pushes up to elbows
6 months	• Rolls over in both directions (front to back, back to front) • Begins to sit without support • When standing, supports weight on legs and might bounce • Rocks back and forth, sometimes crawling backward before moving forward
9 months	• Stands, holding on • Can get into sitting position • Sits without support • Pulls to stand • Crawls
1 year	• Gets to a sitting position without help • Pulls up to stand, walks holding on to furniture (“cruising”) • May take a few steps without holding on • May stand alone
18 months	• Walks alone • May walk up steps and run • Pulls toys while walking • Can help undress self
2 years	• Stands on tiptoe • Kicks a ball • Begins to run • Climbs onto and down from furniture without help • Walks up and down stairs holding on • Throws ball overhand



Figure **7.5.1**: Infants explore different textures with their hands and their movements.[6]

Early childhood gross motor development

Early childhood is a time when children are especially attracted to motion and song. Days are filled with jumping, running, swinging and clapping and every place becomes a playground. Even the booth at a restaurant affords the opportunity to slide around in the seat or disappear underneath and imagine being a sea creature in a cave! Of course, this can be frustrating to a caregiver, but it’s the business of early childhood.

Children continue to improve their gross motor skills as they run and jump. They frequently ask their caregivers to “look at me” while they hop or roll down a hill. Children’s songs are often accompanied by arm and leg movements or cues to turn around or move from left to right.

Here is a table showing the progression of gross motor skills that children will typically develop during early childhood:

Table 7.5.2: Gross motor development in early childhood[7]

Typical Age	What Most Children Do by This Age
3 years	Climbs well • Runs easily • Pedals a tricycle (3-wheel bike) • Walks up and down stairs, one foot on each step
4 years	• Hops and stands on one foot up to 2 seconds • Catches a bounced ball most of the time
5 years	• Stands on one foot for 10 seconds or longer • Hops; may be able to skip • Can do a somersault • Can use the toilet on own • Swings and climbs

Activities to Support Gross Motor Skills

Here are some activities focused on play that young children enjoy and that support their gross motor skill development.

- Tricycle
- Slides
- Swings
- Sit-n-Spin
- Mini trampoline
- Bowling pins (can use plastic soda bottles also)
- Tent (try throwing blankets over chairs and other furniture to make a fort)
- Playground ladders
- Suspension bridge on playground
- Tunnels (try throwing a bean bag chair underneath for greater challenge)
- Ball play (kick, throw, catch)
- Simon Says
- Target games with bean bags, ball, etc.
- Dancing/moving to music
- Pushing self on scooter or skateboard while on stomach



Figure **7.5.2**: By early childhood, children's developing motor skills allow them to ride tricycles and use other such equipment with some ease.[8]

Fine Motor Skills

More exact movements of the feet, toes, hands, and fingers are referred to as **fine motor skills** (or small motor skills). These include the ability to reach and grasp an object in coordination with vision. Newborns cannot grasp objects voluntarily but do wave their arms toward objects of interest. At about 4 months of age, the infant is able to reach for an object, first with both arms and within a few weeks, with only one arm. Grasping an object involves the use of the fingers and palm, but no thumbs.



Figure **7.5.3**: Infants and toddlers are still developing fine motor skills such as eating using a spoon.[10]

Fine Motor Milestones in infancy

While fine motor skills are slower to develop (in accordance with proximodistal development), pretty remarkable progress is made in fine motor development during the first two years. As stated above, in the first few years of life children go from having no intentional fine motor control to being able to manipulate objects to play and learn, as well as beginning to care of themselves. The following is a table of the major milestones in fine motor development.

Table **7.5.3**: Fine motor development in infancy[11]

Typical Age	What Most Children Do by This Age
2 months	• Grasps reflexively • Does not reach for objects • Holds hands in fist
4 months	• Brings hands to mouth • Uses hands and eyes together, such as seeing a toy and reaching for it • Follows moving things with eyes from side to side • Can hold a toy with whole hand (**palmar grasp**) and shake it and swing at dangling toys
6 months	• Reaches with both arms • Brings things to mouth • Begins to pass things from one hand to the other
9 months	• Puts things in mouth • Moves things smoothly from one hand to the other • Picks up things between thumb and index finger (pincer grip**)**
1 year	• Reaches with one hand • Bangs two things together • Puts things in a container, takes things out of a container • Lets things go without help • Pokes with index (pointer) finger
18 months	• Scribbles on own • Can help undress herself • Drinks from a cup • Eats with a spoon with some accuracy • Stacks 2-4 objects
2 years	• Builds towers of 4 or more blocks • Might use one hand more than the other • Makes copies of straight lines and circles • Enjoys pouring and filling • Unbuttons large buttons • Unzips large zippers • Drinks and feeds self with more accuracy

Early childhood drawings



Figure **7.5.4**: Early scribbles.[1]

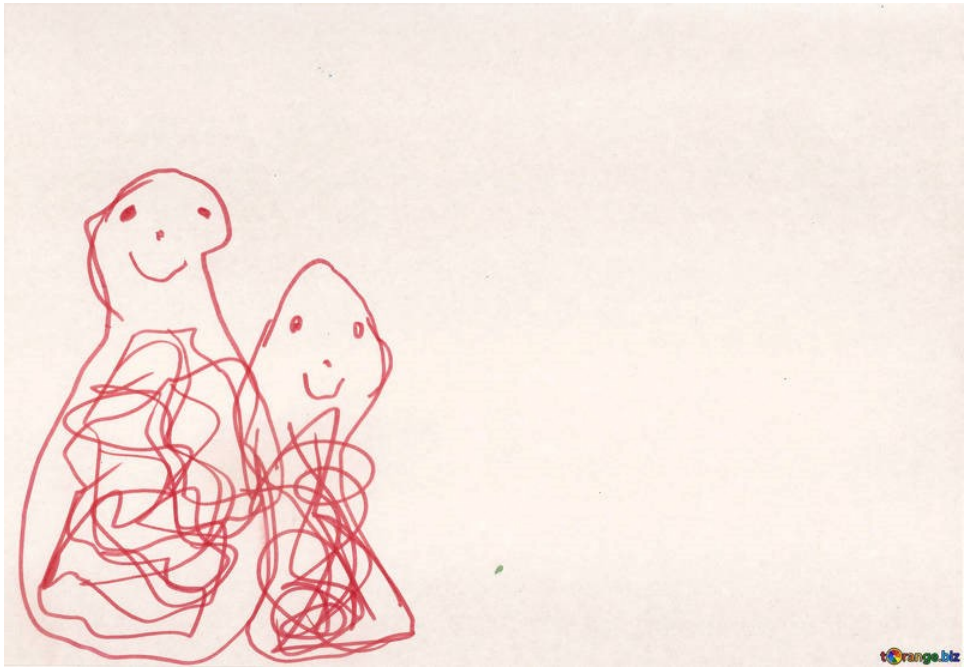


Figure **7.5.5**: Creatures with heads.[2]



Figure **7.5.6**: A detailed face.[3]

Fine Motor Skills in early childhood

Fine motor skills are also being refined as they continue to develop more dexterity, strength, and endurance. Fine motor skills are very important as they are foundational to self-help skills and later academic abilities (such as writing).

Here is a table showing how fine motor skills progress during early childhood for children that are typically developing.

Table **7.5.4**: Fine motor development in early childhood[4]

Typical Age	What Most Children Do by This Age
3 years	• Copies a circle with pencil or crayon • Turns book pages one at a time • Builds towers of more than 6 blocks • Screws and unscrews jar lids or turns door handle
4 years	• Pours, cuts with supervision, and mashes own food • Draws a person with 2 to 4 body parts • Uses scissors • Starts to copy some capital letters
5 years	• Can draw a person with at least 6 body parts • Can print some letters or numbers • Copies a triangle and other geometric shapes • Uses a fork and spoon and sometimes a table knife

Activities to Support Fine Motor Skills

Here are some fun activities that will help children continue to refine their fine motor abilities. Fine motor skills are slower to develop than gross motor skills, so it is important to have age appropriate expectations and play-based activities for children.

- Pouring water into a container
- Drawing and coloring
- Using scissors
- Finger painting
- Fingerplays and songs (such as the Itsy, Bitsy Spider)
- Play dough
- Lacing and beading
- Practicing with large tweezers, tongs, and eye droppers



Figure **7.5.7**: Children's fine motor skills in early childhood are expressed in coloring, peeling, and sticking in art work.[5]

Middle childhood

Children between ages 6 and 9, show significant improvement in their abilities to perform motor skills. This development growth allows children to gain greater control over the movement of their bodies, mastering many gross and fine motor skills that were beyond that of the younger child. Riding a bike that is bigger or running longer and further is a big improvement in gross motor skills. Eye-hand coordination and fine motor skills allow for children to become better at writing and cutting. Sports and extracurricular activities may become a part of the lives of children during middle childhood due to their physical growth and capabilities.

Systems approach as it applies to motor development

Systems approach suggests that interacting motor, perception and cognition changes occur. Consider that in the infant the changes are to overcome gravity (from the prenatal stages where all movements were possible until space constricted them). Once posture is stable, the infant can move and it gives them new vantage points for perception and exploration.

As posture control changes, arms and hands become available for reaching, holding and manipulating objects so that infant can develop more knowledge about textures, sizes and 3-dimensionality.

Posture also influences perception because the infant develops greatly changed vantage points from the prone to the sitting to the standing.

Posture is influenced by perception, for example when walls sway, we move our muscles to counteract that swaying and maintain balance. Infants do that also, but not as smoothly as adults do.

Stepping has been believed to be a reflex that appears at 2 mos, disappears, and then walking develops later. But claim is that if the infant gets upright practice, the stepping never would disappear. In Western culture infants spend lot of time supine, they do kick in the air – which is the same as the stepping movement – but they develop more fat than muscle in their legs making it difficult to walk. So changes in the body, not the brain (change in cortical control acc to the reflex proponents) explains development of walking.

Infants use various strategies for locomotion. Motivated by their caregiver for example and the initial position they are put in (tummy down for example) they try out various ways to move including log rolling, pivoting, turning etc to look at and get to where they want to. When they have to get off steep places they try out different things like sliding or backing down (which is harder because they have to coordinate backward movements and have no visual feedback). They also use (or choose not to use) handrails when trying to maintain balance in creative ways.

Walking is very much influenced by practice (massage and exercise of the kind in African and Caribbean cultures. Infants learn the balance issues – first walk with feet wider apart, more time standing, less time with one foot in the air etc. With practice, children learn to walk and run much faster than in Western cultures. In East Africa women and in Nepal both genders learn to walk with much larger than own body weight loads with reduced energetic cost.

Many studies have been done to test locomotion with deep drop offs using not just the visual cliff apparatus (because infants will learn after the first time that there is glass there). What is found is that infants don't generalize the perceptual information from one locomotive skill to another. For example even though they know what to do while crawling, they will keep falling for weeks while walking the same situation.

So locomotion is not hardwired or reflexive, but rather extremely plastic and responsive to caregiving practices, as well as creative. Every infant discovers unique solutions for locomotion, given their own particular environment.

Manual and Facial control

Infants reach with both hands and feet (actually earlier with their feet but of course that disappears). Their control improves over time and with practice. They try to judge where a moving object will be and flap out at it. However hand control doesn't develop till later of course. Once infants can hold objects, they flap their arms to make a sound with hard objects and move soft ones across surfaces. In the beginning they only bring object up to face and mouth it, but later move it from hand to hand and palpate and so on. At first arm and hand movements are random and exploratory, and they become more goal directed as they grow.

Facial muscle coordination is really marvelous because newborns need to suck, swallow and breathe once they are out of the amniotic fluid and need to suck for sustenance! Because solid foods require more than just lateral movement of the jaw and also experience with food of different consistency and texture, there is real danger of choking etc.

Facial expressions are similar to adult ones like wrinkling of nose and furrowed brows to noxious environment. Many parts of the face are used to show expressions, perhaps because those are so important for social interaction. So even infants with severe developmental or structural problems are still able to produce recognizable smiles, cries and interest expressions.

Coordinating looking movements have been calculated and studied by researchers. Infants and toddlers tend to engage more in opportunistic looking so in this sense arrangement of the environment also influences what they are more likely to see. Researchers have studied where infants look, and how they track objects and how that becomes smoother with infant age and practice. Infants are also closer to the floor so they tend to look more at it while they are smaller.

"The developmental systems perspective encourages researchers also to consider a larger context that includes the physical and social/cultural environment and to view motor behaviors as potentially both cause and consequence of developmental change in other psychological domains"

A different perspective on reflexes and culture

Theorists like McGraw, Fiorini, Forssberg and Gesell (as cited in Pimentel, 1996) believed that infants are born with reflexes that are controlled by subcortical regions of their brains. They further theorized that as the infant cortex matures, these reflexes necessarily disappear and more controlled movement becomes possible, giving way to external circumstances rather than strict subcortical CNS control. This is called the traditional view of reflexes.

On the other hand, Milani-Comparetti and Connolly (as cited in Pimentel 1996) believe that there is simply a gradual development of locomotion through an integrated escalation of abilities. According to Milani-Comparetti and Connolly, the fetus becomes ready to get into position prenatally, and those abilities of movement become affected by gravity and finally develop into creeping and walking.

Fukuda and other researchers (as cited in Pimentel, 1996) suggested that the reflexive behaviors continue to underlie behavior into adulthood, and are activated by environmental demands when greater force is necessary. This is to say that those reflexes never disappear but are simply covered up by greater cortical development. The idea here is that the CNS builds volitional movement out of reflexes (Easton as cited in Pimentel, 1996). This is the transitional view.

However, the systems view incorporates the role of the environment more centrally using training studies with infants, comparisons of full term and preterm infants, and cross cultural studies. As reported by Pimentel, Zelazo et al found that when they exercised infants' stepping reflex for 8 weeks of training, the reflex did not disappear, and that these infants walked at 10 months as opposed to controls who walked at 12 months. In line with the transitional view, the idea is that those earlier reflexes are simply built upon for future volitional movement. Zelazo also suggested that it is because of infants in Western societies (those who are largely studied) being given things to hold and suck that we see a cephalocaudal pattern of development – not that there is anything maturational or universal about that pattern.

Super, Konner, and Hopkins & Westra's studies (as cited in Pimentel, 1996) performed in Kenya, Botswana and Jamaica show quite conclusively that in these cultures parents practice infants' reflexive stepping and upright behaviors, and that those infants sit, stand and walk earlier – while often completely missing the creeping/crawling phase because this is not encouraged. This suggests that child rearing practices very much influence both the timing and sequence of skills thought to be universal in humans, and that the reflexes are not simply maturational blips that occur on a specific timetable and always disappear when the cortex matures and takes over.

Thelen and Heriza's research (as cited in Pimentel, 1996) with preterm and full term infants (in water) suggest that as infants grow and their body mass increases, the amount of energy needed to produce the stepping reflex increases which is the reason for the disappearance/timing of the reflex. Thelen et al concluded with a dynamic systems approach suggesting that volitional movement development is influenced by multiple subsystems – "arousal levels, neuromuscular activation, body build characteristics such as limb weight and length, muscle strength, passive viscoeleastic properties of muscles, balance, posture or position of the infant with respect to gravity, the infant's perceptual processes and social environment, and dynamically changing forces that act on the limbs as they move." (Pimentel, 1996)… "the system can be said to be self organizing" not organized at some higher level.

All of these ideas challenge the idea of an invariant sequence of movement development. We need to consider the demands of the environment more thoroughly and provide opportunities for all infants taking into account their specific abilities, characteristics and experiences.

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7.6: Exercise, Physical Fitness and Sports

Physical Education and Recess

Recess is a time for free play and Physical Education (PE) is a structured program that teaches skills, rules, and games. They're a big part of physical fitness for school age children. For many children, PE and recess are the key components in introducing children to sports. After years of schools cutting back on recess and PE programs, there has been a turn-around, prompted by concerns over childhood obesity and the related health issues. Despite these changes, currently only the state of Oregon and the District of Columbia meet PE guidelines of a minimum of 150 minutes per week of physical activity in elementary school and 225 minutes in middle school (SPARC, 2016). There is more information about organized sports and development in another sub section.

Organized sports

Middle childhood seems to be a great time to introduce children to organized sports, and in fact, many parents do. Nearly 3 million children play soccer in the United States (United States Youth Soccer, 2012).



Figure **7.6.1**: Many children participate in organized sports like track and field events.[1]

Organized Sports: Pros and Cons

Activities like soccer promise to help children build social skills, improve athletically and learn a sense of competition. However, the emphasis on competition and athletic skill can be counterproductive and lead children to grow tired of the game and want to quit. In many respects, it appears that children's activities are no longer children's activities once adults become involved and approach the games as adults rather than children. The U. S. Soccer Federation recently advised coaches to reduce the amount of drilling engaged in during practice and to allow children to play more freely and to choose their own positions. The hope is that this will build on their love of the game and foster their natural talents.

Sports are important for children. Children's participation in sports has been linked to:

- Higher levels of satisfaction with family and overall quality of life in children
- Improved physical and emotional development
- Better academic performance

Yet, a study on children's sports in the United States (Sabo & Veliz, 2008) has found that gender, poverty, location, ethnicity, and disability can limit opportunities to engage in sports. Girls were more likely to have never participated in any type of sport.



Figure **7.6.2**: Community sports are important for children's development, especially for those children with special needs.[3]

The World of E-Sports

The recent Sport Policy and Research Collaborative (SPARC, 2016) report on the "State of Play" in the United States highlights a disturbing trend. One in four children between the ages of 5 and 16 rate playing computer games with their friends as a form of exercise. In addition, **e-sports**, which as SPARC writes is about as much a sport as poker, involves children watching other children play video games. Over half of males, and about 20% of females, aged 12-19, say they are fans of e-sports.



Figure **7.6.3**: A group of boys playing video sports illustrating a whole new type of sport that is now part of child development.[5]

Play is an important part of childhood and physical activity has been proven to help children develop and grow. Adults and caregivers should look at what children are doing within their day to prioritize the activities that should be focused on.[4]

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7.7: Elimination – urination and defecation

Infants urinate as often as every 1 to 3 hours or as infrequently as every 4 to 6 hours. In case of sickness or if the weather is very hot, urine output might drop by half and still be normal. If an infant shows any signs of distress while urinating or if any blood is found in a wet diaper medical care should be sought.

Toilet Training

Toilet training typically occurs after the second birthday. Mota and Barros (2008) did a meta analytic review and found that the age at which toilet training is initiated has been increasing the world over. However, in most developing countries (as seen in deVries and deVries, 1977; and anecdotal personal experience) toilet training starts and is completed much earlier than in the US. However, most experts suggest that to prevent frustration, encourage healthy parent child relationships and to prevent disorders associated with elimination, it is better to watch for signs from the child (Mota & Barros, 2008, Kiddoo, 2012). Some children show interest by age 2, but others may not be ready until months later. The average age for girls to be toilet trained is 29 months and for boys it is 31 months, and 98% of children are trained by 36 months in the Western world (Boyse & Fitzgerald, 2010). The child's age is not as important as his/her physical and emotional readiness. If started too early, it might take longer to train a child.

According to The Mayo Clinic (2016b) the following questions can help parents determine if a child is ready for toilet training:

- Does your child seem interested in the potty chair or toilet, or in wearing underwear?
- Can your child understand and follow basic directions?
- Does your child tell you through words, facial expressions or posture when he or she needs to go?
- Does your child stay dry for periods of two hours or longer during the day?
- Does your child complain about wet or dirty diapers?
- Can your child pull down his or her pants and pull them up again?
- Can your child sit on and rise from a potty chair?

If a child resists being trained or it is not successful after a few weeks, it is best to take a break and try again when they show more significant interest in the process. Most children master daytime bladder control first, typically within two to three months of consistent toilet training. However, nap and nighttime training might take months or even years.



Figure **7.7.1**: A child learning to be toilet trained using foot stools, potty covers and toys.[1]

Elimination Disorders

Some children experience elimination disorders that may require intervention by the child's pediatrician or a trained mental health practitioner. Elimination disorders include **enuresis**, or the repeated voiding of urine into bed or clothes (involuntary or intentional) and **encopresis**, the repeated passage of feces into inappropriate places (involuntary or intentional) (DSM5) The prevalence of enuresis is 5%-10% for 5 year-olds, 3%-5% for 10 year-olds, and approximately 1% for those 15 years of age or older. Around 1% of 5 year- olds have encopresis, and it is more common in males than females.

Some children experience elimination disorders including:

- **enuresis** - the repeated voiding of urine into bed or clothes (involuntary or intentional) after age 5
- **encopresis** - the repeated passage of feces into inappropriate places (involuntary or intentional).

The prevalence of enuresis is 5%-10% for 5 year-olds, 3%-5% for 10 year-olds and approximately 1% for those 15 years of age or older. Around 1% of 5 year- olds have encopresis, and it is more common in males than females. These are diagnosed by a medical professional and may require treatment.[2]

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7.8: Sleep



Figure **7.8.1**: Newborns sleep for more than half the day.[2]



Figure **7.8.2**: Infants sleep for many hours each day

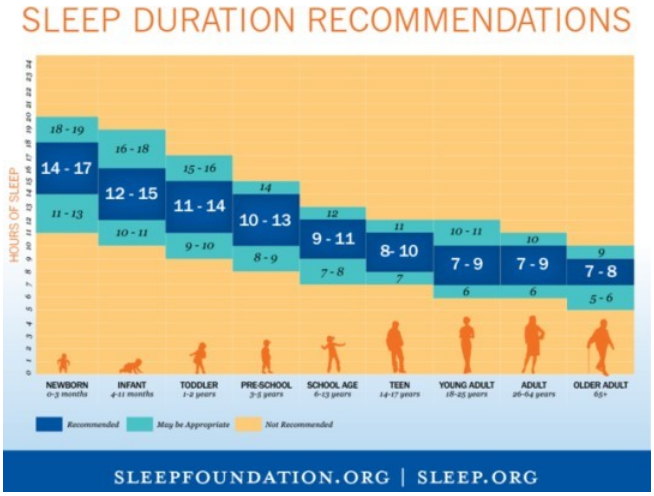


Figure **7.8.3**: Sleepfoundation.org recommends at least 7-8 hours of sleep in older adulthood, 7-9 in adulthood and younger adulthood, 8-10 in adolescence, 9-11 in middle childhood, 10-13 in early childhood, 11-14 in toddlerhood, 12-15 in infancy, and 14-17 for newborns (with between 1-3 hours above or below each of these as appropriate in some circumstances).

SIDS and bed sharing issues



Figure **7.8.4**: A baby sleeping safely in a bed that has nothing in it other than the mattress.[2]

Risk Factors

- Babies are at higher risk for SIDS if they:
- Sleep on their stomachs
- Sleep on soft surfaces, such as an adult mattress, couch, or chair or under soft coverings
- Sleep on or under soft or loose bedding
- Get too hot during sleep
- Are exposed to cigarette smoke in the womb or in their environment, such as at home, in the car, in the bedroom, or other areas
- Sleep in an adult bed with parents, other children, or pets; this situation is especially dangerous if:
  - The adult smokes, has recently had alcohol, or is tired.
  - The baby is covered by a blanket or quilt.
  - The baby sleeps with more than one bed-sharer.
  - The baby is younger than 11 to 14 weeks of age.

Reducing the Risks

There have been dramatic improvements in reducing baby deaths during sleep since the 1990s, when recommendations were introduced to place babies on their back for sleep. However, since the late 1990s, declines have slowed.

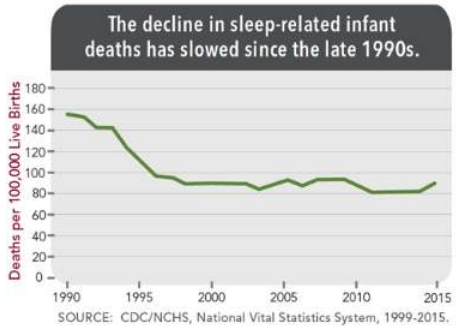


Figure **7.8.5**: Sleep-related infant deaths have declined from 160 per 100,000 live births in 1990 to just over 80 per 100,000 live births in 2015 according to CDC/NCHS data.[3]

In 2012, the Back to Sleep campaign became the Safe to Sleep campaign. Safe to Sleep aims to educate all caregivers about SIDS and safe sleep practices. Current recommendations to reduce the risk of SIDS and other sleep related causes of infant death:

- Always place baby on their back to sleep (for naps and at night).
- Use a firm and flat surface.
- Use only a tight fitting sheet on the sleep surface; no other bedding or soft items in the sleep area.
- Breastfeed.
- Share your room with a baby, but on a separate surface designed for infants (not your bed).
- Do not put soft objects, toys, crib bumpers, or loose bedding under, over, or anywhere near baby's sleep area.
- Do no smoke during pregnancy or allow smoking around baby.
- Consider giving baby a pacifier.
- Do not let baby get too hot during sleep.

- Get regular health care (including vaccines).
- Avoid products that go against safe sleep recommendations, especially those that claim to prevent or reduce the risk of SIDS.
- Do not use heart or breathing monitors to reduce the risk of SIDS.[4]

Colvin, Collie-Akers, Schunn, and Moon (2014) analyzed a total of 8207 deaths from 24 states during 2004–2012 that were contained in the National Center for the Review and Prevention of Child Deaths Case Reporting System, a database of death reports from state child death review teams.[6] The results indicated that younger victims (0-3 months) were more likely to die by bed-sharing and sleeping in an adult bed/on a person. A higher percentage of older victims (4 months to 364 days) rolled into objects in the sleep environment and changed position from side/back to prone. Carpenter et al. (2013) compared infants who died of SIDS with a matched control and found that infants younger than three months old who slept in bed with a parent were five times more likely to die of SIDS compared to babies who slept separately from the parents, but were still in the same room.

They concluded that bed-sharing, even when the parents do not smoke or take alcohol or drugs, is related to an increased risk of SIDS. However, when combined with parental smoking and maternal alcohol consumption and/or drug use, risks associated with bed-sharing greatly increased. (Lang)

The two studies discussed above were based on American statistics. What about the rest of the world? Co-sleeping occurs in many cultures, primarily because of a more collectivist perspective that encourages a close parent-child bond and interdependent relationship (Morelli et al, 1992). In countries where co- sleeping is common, however, parents and infants typically sleep on floor mats and other hard surfaces which minimize the suffocation that can occur with bedding and mattresses (Nelson et al, 2000).

There exists a lot of controversy about bed-sharing or co-sleeping during infancy. On the one hand there are distinctly different cultural, historical and geographical opinions and practices with regard to co-sleeping (Mileva-Seitz et al, 2017). On the other hand, there are numerous studies that suggest that bed-sharing increases the risk of SIDS (Carpenter et al, 2013). This risk is greatly increased if parents also use tobacco and alcohol, and depending on the location they sleep in (Blair et al, 2014). Of course, the practice also reflects families' socioeconomic conditions (having the space to sleep separately – in a separate room or at least a crib) (Ward, 2015). Another factor that is interrelated is that bed-sharing is related to greater likelihood of breastfeeding (Das et al, 2013).

Sleep and Early Childhood

Along with food and water, sleep is one of the human body's most important physiological needs—we cannot live without it. Extended sleeplessness (i.e., lack of sleep for longer than a few days) has severe psychological and physical effects. Research on rats has found that a week of no sleep leads to loss of immune function, and two weeks of no sleep leads to death.

Recently, neuroscientists have learned that at least one vital function of sleep is related to learning and memory. New findings suggest that sleep plays a critical role in flagging and storing important memories, both intellectual and physical, and perhaps in making subtle connections that were invisible during waking hours.[5]

How Much Sleep Do We Need?

The amount of sleep an individual needs varies depending on multiple factors including age, physical condition, psychological condition, and energy exertion. Just like any other human characteristic, the amount of sleep people need to function best differs among individuals, even those of the same age and gender.

Though there is no magic sleep number, there are general rules for how much sleep certain age groups need. For instance, children need more sleep per day in order to develop and function properly: up to 18 hours for newborn babies, with a declining rate as a child ages. A newborn baby spends almost 9 hours a day in REM sleep. By the age of five, only slightly over two hours is spent in REM. Studies show that young children need about 10 to 11 hours of sleep, adolescents need between 8.5 and 9.25, and adults generally need between 7 and 9 hours.



Figure 7.8.6: Younger children need more sleep than older children, teens and adults do.[6]

Parasomnias

Evolutionarily sleep is a very interesting phenomemon, given that animals are much more likely to be preyed upon while they are sleeping and yet all animals appear to need sleep and sleep in different ways and for different amounts of time. Neurologically the brain coordinates sleep much like an orchestra is conducted through complex musical pieces. As the brain is developing in childhood, there is a greater likelihood of sleep disorders like sleepwalking, night terrors in children and most people outgrow these as they reach adulthood.

Sleepwalking (Somnambulism)

Sleepwalking (sometimes called sleepwalking disorder, **somnambulism**, or noctambulation) causes a person to get up and walk during the early hours of sleep. The person may sit up and look awake (though they're actually asleep), get up and walk around, move items, or dress or undress themselves. They will have a blank stare and still be able to perform complex tasks. Some individuals also talk while in their sleep, saying meaningless words and even having arguments with people who are not there. A person who sleepwalks will be confused upon waking up and may also experience anxiety and fatigue.

Sleepwalking can be dangerous—people have been known to seriously hurt themselves during sleepwalking episodes. It is most common in children, but it also occurs occasionally in adults. For adults, alcohol, sedatives, medications, medical conditions and mental disorders are all associated with sleepwalking.

Sleep Terrors and Nightmare Disorder

Sleep terrors are characterized by a sudden arousal from deep sleep with a scream or cry, accompanied by some behavioral manifestations of intense fear. Sleep terrors typically occur in the first few hours of sleep, during stage 3 NREM sleep. Night terrors tend to happen during periods of arousal from delta sleep (i.e., slow-wave sleep). They are worse than nightmares, causing significant disorientation, panic, and anxiety. They can last up to 10 minutes, and the person may be screaming and difficult to wake. In some cases, sleep terrors continue into adulthood.

Distinct from sleep terrors is nightmare disorder. Also known as "dream anxiety disorder," nightmare disorder is characterized by frequent nightmares. The nightmares, which often portray the individual in a situation that jeopardizes their life or personal safety, usually occur during the second half of the sleeping process, called the REM stage. Though many people experience nightmares, those with nightmare disorder experience them more frequently.[7]

Adolescent Sleep Health

According to the National Sleep Foundation (NSF) (2016), adolescents need about 8 to 10 hours of sleep each night to function best. The most recent Sleep in America poll in 2006 indicated that adolescents between sixth and twelfth grade were not getting the recommended amount of sleep. For the older adolescents, only about one in ten (9%) get an optimal amount of sleep, and they are more likely to experience negative consequences the following day. These include feeling too tired or sleepy, being cranky or irritable, falling asleep in school, having a depressed mood, and drinking caffeinated beverages (NSF, 2016). Additionally, they are at risk for substance abuse, car crashes, poor academic performance, obesity, and a weakened immune system (Weintraub, 2016).

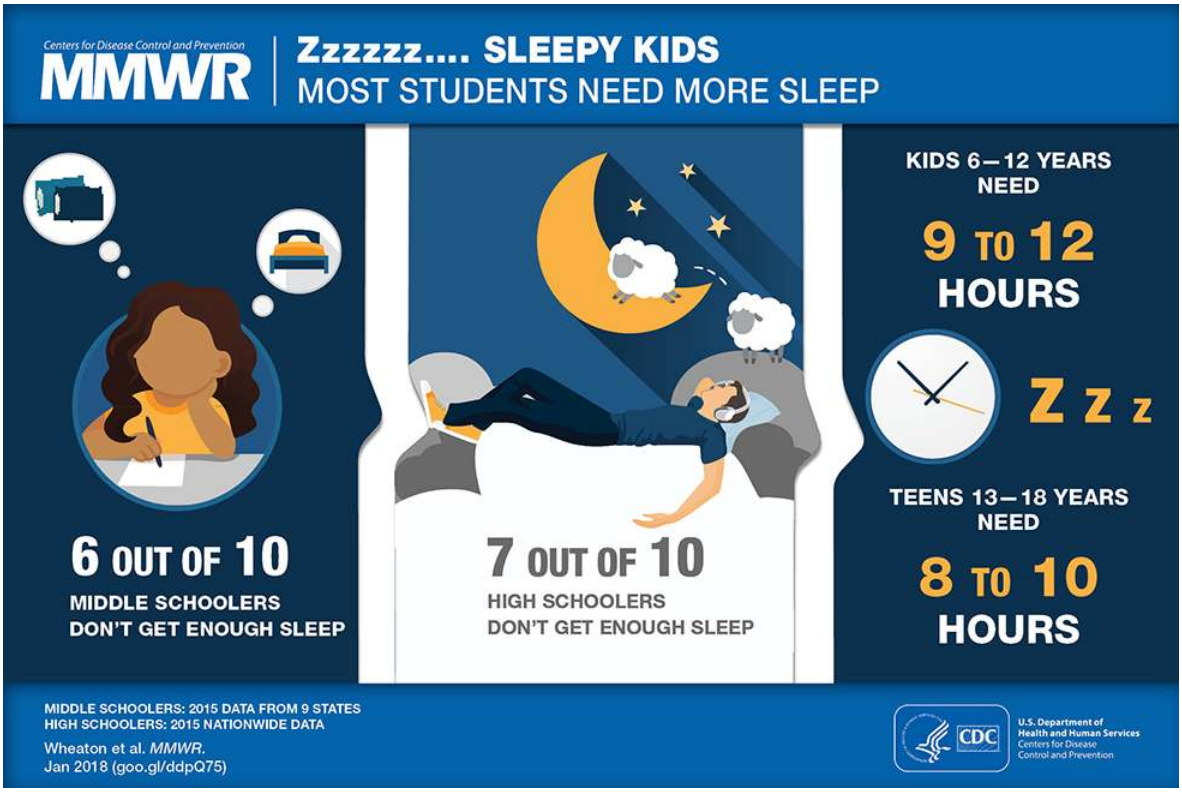


Figure 7.8.7: Most teenagers aren't sleeping enough according to the CDC in this infographic, which shows 2015 data that 60% of middle schoolers and 70% of high schoolers don't get enough sleep where the former need 9-12 and teens need 8-10 hours each night.[8]

Why don't adolescents get adequate sleep? In addition to known environmental and social factors, including work, homework, media, technology, and socializing, the adolescent brain development is also a factor. As adolescents go through puberty, their circadian rhythms change and push back their sleep time until later in the evening (Weintraub, 2016). This biological change not only keeps adolescents awake at night, it makes it difficult for them to get up in the morning. When they are awake too early, their brains do not function optimally. Impairments are noted in attention, behavior, and academic achievement, while increases in tardiness and absenteeism are also demonstrated. Psychologists and other professionals have been advocating for later school times, and they have produced research demonstrating better student outcomes for later start times. More middle and high schools have changed their start times to better reflect the sleep research.[9]

In Sept 2019 California was the first state in the US mandating that no high school start before 8:30 am, and no middle school before 8 am went into effect based on this research and American Academy of Pediatrics research. Other states like New York went even further by suggesting that no school start before 8:30 am (Walker, 2022).



Figure **7.8.8**: If adolescents get too little sleep, their brain doesn't function optimally.[10]

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7.9: Puberty

Adolescence is often defined as the period that begins with puberty and ends with the transition to adulthood. The commonly accepted beginning age for this period of development is age 12. When adolescence ends is harder to pin down. When does adulthood truly begin? Are we an adult at 18 years of age? Or 20? Or 26 when the brain is said to be fully developed?

Adolescence physical development has evolved historically, with evidence indicating that this stage is lengthening as individuals start puberty earlier and transition to social adulthood later than in the past. Puberty today begins, on average, at age 10–11 years for girls and 11–12 years for boys. This average age of onset has decreased gradually over time since the 19th century by 3–4 months per decade, which has been attributed to a range of factors including better nutrition, obesity, increased father absence, and other environmental factors (Steinberg, 2013). Completion of formal education, financial independence from parents, marriage, and parenthood have all been markers of the end of adolescence and beginning of adulthood, and all of these transitions happen, on average, later now than in the past.

Before puberty, there are nearly no differences between males and females in the distribution of fat and muscle. During puberty, males grow muscle much faster than females, and females experience a higher increase in body fat. An adolescent's heart and lungs increase in both size and capacity during puberty; these changes contribute to increased strength and tolerance for exercise.



Figure **7.9.1**: An adolescent boy[1]



Figure 7.9.2: An adolescent girl[2]

Physical Changes in Adolescence

Adolescence begins with the onset of **puberty**, a developmental period in which hormonal changes cause rapid physical alterations in the body, culminating in sexual maturity (Lerner & Steinberg, 2009). For both boys and girls, these changes include a growth spurt in height, growth of pubic and underarm hair, and skin changes (e.g., pimples). Hormones drive these pubescent changes, particularly the increase in testosterone for boys and estrogen for girls.[3]

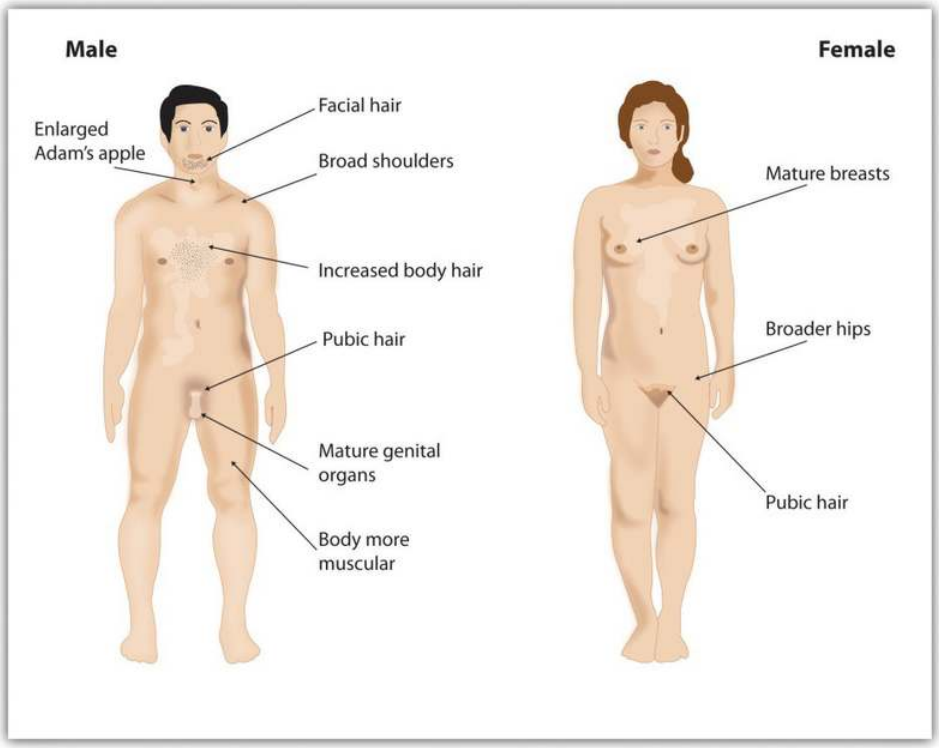


Figure **7.9.3**: Puberty brings dramatic changes in the body, including the development of primary and secondary sex characteristics such as enlarged adam's apple, facial hair, broad shoulders, increased body hair, mature genital organs and more muscular body in males; and mature breasts, broader hips in females; and pubic hair in both.[5]

Typically, the growth spurt is followed by the development of sexual maturity. Sexual changes are divided into two categories: Primary sexual characteristics and secondary sexual characteristics. Primary sexual characteristics are changes in the reproductive organs. For males, this includes growth of the testes, penis, scrotum, and spermarche or first ejaculation of semen. This occurs around 9-14 years old (Breehl & Caban, 2020). For females, primary characteristics include growth of the uterus and menarche or the first menstrual period. The female gametes, which are stored in the ovaries, are present at birth, but are immature. Each ovary contains about 400,000 gametes, but only 500 will become mature eggs (Crooks & Baur, 2007). Beginning at puberty, one ovum ripens and is released about every 28 days during the menstrual cycle. Stress and a higher percentage of body fat can bring menstruation at younger ages. According to , puberty begins on average for girls around 8-13 years old with African American girls starting puberty earlier at around 6 years old.



Figure 7.9.4:Males often start shaving during puberty.[6]

Hormones that are also responsible for sexual development can also wreak havoc on the teenage skin. Acne is an unpleasant consequence of the hormonal changes in puberty. **Acne** is defined as pimples on the skin due to overactive sebaceous (oil-producing) glands (Dolgin, 2011). These glands develop at a greater speed than the skin ducts that discharge the oil. Consequently, the ducts can become blocked with dead skin and acne will develop. According to the University of California at Los Angeles Medical Center (2000), approximately 85% of adolescents develop acne, and boys develop acne more than girls because of greater levels of testosterone in their systems (Dolgin, 2011). [7]

A major milestone in puberty for girls is **menarche**, the first menstrual period, typically experienced at around 12 or 13 years of age (Anderson, Dannal, & Must, 2003). The age of menarche varies substantially and is determined by genetics, as well as by diet and lifestyle, since a certain amount of body fat is needed to attain menarche. Girls who are very slim, who engage in strenuous athletic activities, or who are malnourished may begin to menstruate later. Even after menstruation begins, girls whose level of body fat drops below the critical level may stop having their periods.

The sequence of events for puberty is more predictable than the age at which they occur. Some girls may begin to grow pubic hair at age 10 but not attain menarche until age 15.[8]

Male Anatomy

Males have both internal and external genitalia that are responsible for procreation and sexual intercourse. Males produce their sperm on a cycle (that for an individual sperm takes 64 days), and unlike the female's ovulation cycle, the male sperm production cycle is constantly producing millions of sperm daily. The male sex organs are the penis and the testicles, the latter of which produce semen and sperm. The semen and sperm, as a result of sexual intercourse, can fertilize an ovum in the female's body; the fertilized ovum (zygote) develops into a fetus, which is later born as a child.

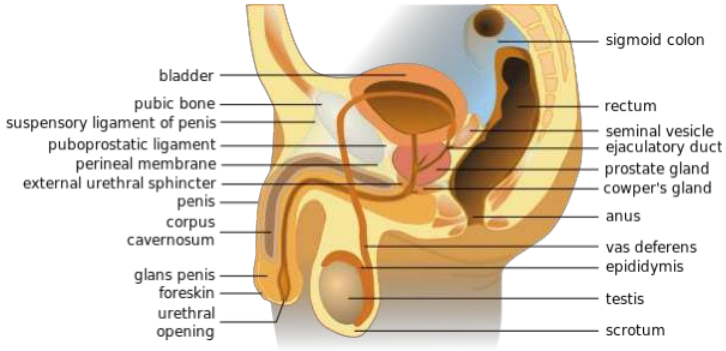


Figure **7.9.5**: The male reproductive system consists of ligaments (suspensory of penis, puboprostatic), perineal membrane, external urethral sphincter, penis, corpus cavernosum, glans penis, foreskin, urethral opening, seminal vesicles, ejaculatory duct, prostate and cowpers glands, vas deferens, testes and scrotum.[9]

Female Anatomy

Female external genitalia is collectively known as the vulva, which includes the mons veneris, labia majora, labia minora, clitoris, vaginal opening, and urethral opening. Female internal reproductive organs consist of the vagina, uterus, fallopian tubes, and ovaries. The uterus hosts the developing fetus, produces vaginal and uterine secretions, and passes the male's sperm through to the fallopian tubes while the ovaries release the eggs. A female is born with all her eggs already produced. The vagina is attached to the uterus through the cervix, while the uterus is attached to the ovaries via the fallopian tubes. Females have a monthly reproductive cycle; at certain intervals the ovaries release an egg, which passes through the fallopian tube into the uterus. If, in this transit, it meets with sperm, the sperm might penetrate and merge with the egg, fertilizing it. If not fertilized, the egg and the tissue that was lining the uterus is flushed out of the system through **menstruation** (around every 28 days).

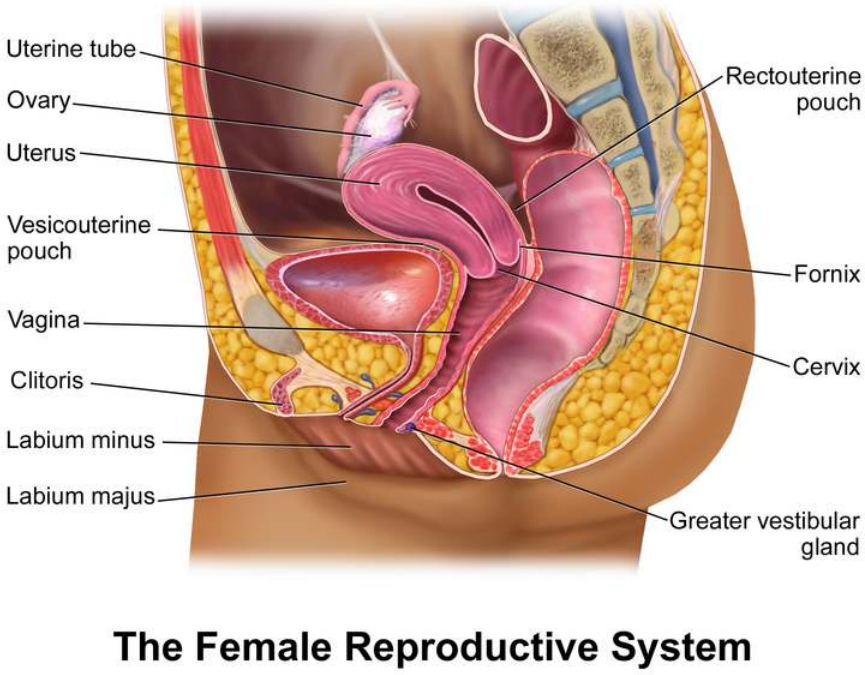


Figure **7.9.6**: The female reproductive system is primarily internal and includes the ovaries, uterus, fornix, cervix, vagina, clitoris, labium minus, labium majus and greater vestibular gland.[10]

Effects of Puberty on Development

The age of puberty is getting younger for children throughout the world. A century ago the average age of a girl’s first period in the United States and Europe was 16, while today it is around 13. Because there is no clear marker of puberty for boys, it is harder to

determine if boys are maturing earlier, too. In addition to better nutrition, the less positive reasons associated with early puberty for girls include increased stress, obesity, and endocrine disrupting.

Because rates of physical development vary so widely among teenagers, puberty can be a source of pride or embarrassment. Girls and boys who develop more slowly than their peers may feel self-conscious about their lack of physical development; some research has found that negative feelings are particularly a problem for late maturing boys, who are at a higher risk for depression and conflict with parents (Graber et al., 1997) and more likely to be bullied (Pollack & Shuster, 2000). Additionally, problems are also more likely to occur when the child is among the first in his or her peer group to develop. Because the preadolescent time is one of not wanting to appear different, early developing children stand out among their peer group and gravitate toward those who are older (Weir, 2016).

Early maturing boys tend to be physically stronger, taller, and more athletic than their later maturing peers; this can contribute to differences in popularity among peers, which can in turn influence the teenager's confidence. Some studies show that boys who mature earlier tend to be more popular and independent but are also at a greater risk for substance abuse and early sexual activity (Flannery, Rowe, & Gulley, 1993; Kaltiala-Heino, Rimpela, Rissanen, & Rantanen, 2001).

Early maturing girls may face increased teasing and sexual harassment related to their developing bodies, which can contribute to self-consciousness and place them at a higher risk for anxiety, depression, substance abuse, and eating disorders (Ge, Conger, & Elder, 2001; Graber, Lewinsohn, Seeley, & Brooks-Gunn, 1997; Striegel-Moore & Cachelin, 1999).[11]

Stress and elevated levels of cortisol are associated with earlier puberty, especially in girls (Belsky et al., 2015). Racial microaggressions and minority stress take a toll on the body and influence mental and physical health at the intersection of race and gender (Lewis et al., 2017). In addition to most research being conducted on White girls and when they reach puberty, other health outcomes that disproportionately impact Black girls have not been researched enough (Salsbury et al., 2009). While puberty for girls of all races and ethnicities has been decreasing over the past several years, Black girls "have the lowest median age of menarche and the highest rate of childhood obesity" (Salsbury et al., 2009, p. 2). Latina youth also start puberty earlier due to similar impacts of stress and higher body mass indexes (BMIs) at a younger age (Jean et al., 2009). Something to keep in mind, research based on race and ethnic differences in pubertal timing are still very limited and it is important to question the notion of what constitutes normative BMI, especially when studies are conducted on mostly White populations. Additionally, while the timing of puberty has significant social implications which then impacts self-esteem, this interaction is also context-dependent and based on many intersecting and complex factors. Every single person may have a different experience related to puberty due to the way peers treat them and the messages they receive from the media, teachers, family, religious institutions, and more about this process.

Precocious and Delayed Puberty

If a girl begins puberty before age 8 and boys before age 9, then they would be considered to have precocious (or early) puberty (National Institute of Child Health and Human Development [NICHD], 2016). Some children may experience psychological and social problems related to feeling different than their peers (NICHD, 2016). Boys are less likely to experience negative consequences, such as bullying, if they develop earlier. Individuals who develop earlier may be perceived by others as more mature and older than they are developmentally. Thus, girls may face greater levels of sexualization earlier and boys may experience reduced levels of bullying due to their size and increased body mass.

Delayed puberty is when a girl experiences a lack of breast growth by age 13 or the lack of a period (menarche) by age 16 (Tang et al., 2020). For boys, this is when testicular enlargement has not occurred by age 14 (Tang et al., 2020). Girls and boys may experience bullying from peers due to their smaller and more child-like appearance. Boys in particular may face heightened levels of bullying and negative self-esteem consequences.

Context is Important

According to the literature review conducted by Seaton & Carter (2018), "Given ethnic/racial variations in standards of physical attractiveness, being a member of a racial group can influence body image norms. African American girls tend to describe their beauty ideals in terms of personality characteristics such as style, attitude, pride, and confidence; whereas White girls tend to describe their beauty ideals in terms of fixed physical attributes such as tall, thin, and high cheekbones… Researchers have speculated that adolescent girls who adopt body ideals in terms of personality characteristics are less vulnerable to the distress

generated by puberty" (p. 42). Seaton & Carter (2018) found in their research that Black girls who view their racial identity as more central to their sense of self will experience more distress if they enter puberty later, especially if they attend a school that is predominately White. Late developing Black girls also may be further bullied by peers, so earlier puberty could act as a protection against racialized microaggressions since early maturing girls are perceived as more mature and advanced by peers within the school context (Seaton & Carter, 2018).

Jean et al. (2009) explored family dynamics and differences in acculturation between younger and older generations of Mexican Americans. The researchers found that mothers who immigrated to the United States in adulthood viewed their body size more favorably compared to their daughters who grew up attending school in the United States. Fathers were also generally very supportive of their daughters' weight and size. Based on interviews with the girls compared to their parents, acculturation caused internalized beauty ideals that favored thinness and height more than that of their mothers and fathers. The length of time in the United States was associated with peer influence shaping standards of beauty more than family. Therefore, generational differences and acculturation can also influence body image and self-esteem. The girls who resisted acculturation actually showed more body satisfaction as their bodies began to change due to puberty when compared to the girls who internalized more American beauty standards (Jean et al., 2009).

Hormone Blockers for Transgender Individuals

An area of debate is whether transgender youth should be able to take hormone blockers prior to and during puberty in conjunction with hormone therapy in order to prevent unwanted changes during puberty and to bring about a puberty that more closely matches that of their gender identity because our society heavily correlates physical features with gender. For example, testosterone acts on the vocal cords to deepen the voice and body mass begins to redistribute which can be distressing to some transgender girls. Hormone blockers would prevent this process from occurring. However, some people argue that children cannot make such serious decisions for themselves and legally parents or guardians are the ones who consent to medical care on their youths' behalf. This commonly results in a person needing to wait until they can consent to medical care for themselves before they can receive hormone therapy. At this point, puberty has already made lasting changes to the body that will take greater levels of medical intervention to alter.

Turban et al. (2020) and Achille et al. (2020) found that transgender youth who wanted and were provided with pubertal suppression hormones experienced a significant decrease in suicidal ideation, depression, and anxiety and reported improved overall mental health. According to Turban et al. (2020), the Endocrine Society guidelines and the World Professional Association for Transgender Health (WPATH) Standards of Care both recommend that transgender adolescents be offered puberty blockers, which are formally called gonadotropin-releasing hormone analogues (GnRHas).

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7.10: Sexuality

"Sexuality is the total expression of who we are as human beings. It is the most complex human attribute and encompasses our whole psychosocial development—our values, attitudes, physical appearance, beliefs, emotions, attractions, our likes/dislikes, our spiritual selves. This is all influenced by our values, culture, socialization, politics, and laws." (Goerling & Wolfe, 2022).

Sexual Development

Infancy

Boys and girls are capable of erections and vaginal lubrication even before birth (Martinson, 1981). Arousal can signal overall physical contentment and stimulation that accompanies feeding or warmth. Infants begin to explore their bodies and touch their genitals as soon as they have the sufficient motor skills. This stimulation is for comfort or to relieve tension rather than to reach orgasm (Carroll, 2007).

Early Childhood

Self-stimulation is common in early childhood for both boys and girls. Curiosity about the body and about others' bodies is a natural part of early childhood as well. Consider this example. A girl asks her mother: "So it's okay to see a boy's privates as long as it's the boy's mother or a doctor?" The mother hesitates a bit and then responds, "Yes. I think that's alright." "Hmmm," the girl begins, "When I grow up, I want to be a doctor!" While this subject can feel uncomfortable to deal with, caregivers can teach children to be safe and know what is appropriate without frightening them or causing shame.

As children grow, they are more likely to show their genitals to siblings or peers, and to take off their clothes and touch each other (Okami et al., 1997). Masturbation is common for both boys and girls. Boys are often shown by other boys how to masturbate. But girls tend to find out accidentally. And boys masturbate more often and touch themselves more openly than do girls (Schwartz, 1999).

Caregivers should respond to this without undue alarm and without making the child feel guilty about their bodies. Instead, messages about what is going on and the appropriate time and place for such activities help the child learn what is appropriate.[1]

Middle Childhood

With regard to sexual development, children this age may not experience the wide-eyed curiosity of their earlier years, but they also may not have entered puberty yet. Interestingly, in one survey men and women, regardless of sexual orientation, reported that the average age of their first sexual attraction was around 10 years old (Lehmiller, 2018), which reflects that there are more factors impacting school-aged children than early theory suggests.

In many western societies, school-aged children are often given their first set of educational information about their upcoming changing bodies, puberty and reproduction. For trans youth, this time can be challenging based on concerns around physical changes at the onset of puberty. Early messages about bodies, sex and sexuality can have important effects on later attitudes and behavior. There is ongoing evidence that comprehensive sex education before young people become sexually active results in a delay in the onset of sexual activity AND an increase in sexual well being (O'Donovan, 2010). Additionally, support for trans youth in terms of available health options is imperative for their ongoing physical and mental health outcomes (Turban, King, Carswell, & Keuroghlian, 2020).

Adolescence

By about age ten or eleven, most children experience increased sexual attraction to others that affects social life, both in school and out (McClintock & Herdt, 1996). By the end of high school, more than half of boys and girls report having experienced sexual intercourse at least once, though it is hard to be certain of the proportion because of the sensitivity and privacy of the information. (Center for Disease Control, 2004; Rosenbaum, 2006). The birth rate for teenagers has declined by 58% since 2007 and 72% since 1991, the most recent peak (Hamilton, Joyce, Martin, & Osterman, 2019). It appears that adolescents seem to be less sexually active than in previous years, and those who are sexually active seem to be using birth control (CDC, 2016).

Romantic Relationships

Adolescence is the developmental period during which romantic relationships typically first emerge. By the end of adolescence, most American teens have had at least one romantic relationship (Dolgin, 2011). However, culture does play a role as Asian Americans and Latinas are less likely to date than other ethnic groups (Connolly, Craig, Goldberg, & Pepler, 2004). Dating serves many purposes for teens, including having fun, companionship, status, socialization, sexual experimentation, intimacy, and partner selection for those in late adolescence (Dolgin, 2011). There are several stages in the dating process beginning with engaging in mixed-sex group activities in early adolescence (Dolgin, 2011). The same-sex peer groups that were common during childhood expand into mixed-sex peer groups that are more characteristic of adolescence. Straight romantic relationships often form in the context of these mixed-sex peer groups (Connolly, Furman, & Konarski, 2000). Interacting in mixed-sex groups is easier for teens as they are among a supportive group of friends, can observe others interacting, and are kept safe from a too early intimate relationship.

By middle adolescence, teens are engaging in brief, casual dating or in group dating with established couples (Dolgin, 2011). Then, in late adolescence, dating involves exclusive, intense relationships. These relationships tend to be long-lasting and continue for a year or longer, however, they may also interfere with friendships.



Figure **7.10.1**: “teens” by NineInk Studio is licensed under CC BY-NC-ND 2.0.

Although romantic relationships during adolescence are often short-lived rather than long-term committed partnerships, their importance should not be minimized. Adolescents spend a great deal of time focused on romantic relationships, and their positive and negative emotions are more tied to romantic relationships, or lack thereof, than to friendships, family relationships, or school (Furman & Shaffer, 2003).

According to the Pew Research Center (2013), individuals who identify as gay, lesbian and bisexual first realized they may not be straight around age 12, knew for sure they weren’t straight by about 17, and first told someone at about age 20. LGB+ individuals may face discrimination and bullying if they date openly depending on the specific culture and acceptance found at their school site. The prevalence of Gay-Straight Alliances and other types of supportive clubs at school sites mixed with administration and teacher support can serve as protective forces. Younger generations are also coming out much sooner compared to older generations due to society becoming more accepting overall.

Romantic relationships contribute to adolescents’ identity formation, changes in family and peer relationships, and emotional and behavioral adjustment. Furthermore, romantic relationships are centrally connected to adolescents’ emerging sexuality. Parents, policymakers, and researchers have devoted a great deal of attention to adolescents’ sexuality, in large part because of concerns related to sexual intercourse, contraception, and preventing teen pregnancies. However, sexuality involves more than this narrow focus. For example, adolescence is often when individuals who are lesbian, gay, bisexual, or transgender come to perceive themselves as such (Russell, Clarke, & Clary, 2009).

Thus, romantic relationships are a domain in which adolescents’ experiment with new behaviors and identities. However, a negative dating relationship can adversely affect an adolescent’s development. Soller (2014) explored the link between relationship inauthenticity and mental health. Relationship inauthenticity refers to an incongruence between thoughts/feelings and actions within a relationship. Desires to gain partner approval and demands in the relationship may negatively affect an adolescent’s sense of authenticity. Soller found that relationship inauthenticity was positively correlated with poor mental health, including depression, suicidal ideation and suicide attempts, especially for females.

Sexual Attraction and Sexual Identity Development in adolescence

In Erikson’s terms, the time during adolescence is marked by the formation of identity versus role confusion. According to Carroll (2016), by age 14 most adolescents become interested in intimate relationships, and they may begin sexual experimentation. Many

adolescents feel pressure to express interest in opposite-sex relationships, even if they are not ready to do so. This pressure can be especially stressful for those adolescents who are gay, lesbian, bisexual or questioning their sexual identity. Many adolescents who are LGB+ struggle with negative peer and family reactions during their exploration. A lack of parental acceptance especially can adversely affect the gay, lesbian or bisexual adolescent's emerging sexual identity and can result in feelings of depression. In contrast, adolescents whose families support their sexual identity have better health outcomes.

In terms of sexual exploration with their peers, there is a fairly typical progression of behavior patterns that exists. Among Americans, the average of kissing is between 12-14, heavy petting and genital fondling occurs between 15 and 16 and average of first intercourse typically occurring between ages 16 and 18 (Lehmiller, 2018). Of course, there are numerous factors that may vary these averages (biopsychosocial factors, such as onset of puberty, physical abilities, sense of identity and/or acceptance of sexual engagement, social standing, safety, etc). Research demonstrates that the earlier teens engage in penile-vagina sex, the less likely they are to use contraception, more likely to contract a sexually transmitted infection (STI) or experience unplanned, teen pregnancy (Lehmiller, 2018). Two important notes here: First, early sexual debut doesn't always result in negative health consequences (especially when comprehensive sex education is available). And, secondly, one of the challenges of translating sexual behaviors among all teens is that research has often limited its' scope of inquiry to penile-vagina intercourse. Certainly, this information is relevant, yet more research into LGB+ sexual behavior, as well as cultural and societal influences in teen attitudes, are important considerations.

The Brain and Sex

The brain is the structure that translates the nerve impulses from the skin into pleasurable sensations. It controls nerves and muscles used during sexual behavior. The brain regulates the release of hormones, which are believed to be the physiological origin of sexual desire. The cerebral cortex, which is the outer layer of the brain that allows for thinking and reasoning, is believed to be the origin of sexual thoughts and fantasies. Beneath the cortex is the limbic system, which consists of the amygdala, hippocampus, cingulate gyrus, and septal area. These structures are where emotions and feelings are believed to originate, and are important for sexual behavior.

The **hypothalamus** is the most important part of the brain for sexual functioning. This is the small area at the base of the brain consisting of several groups of nerve-cell bodies that receives input from the limbic system. Studies with lab animals have shown that destruction of certain areas of the hypothalamus causes complete elimination of sexual behavior. One of the reasons for the importance of the hypothalamus is that it controls the pituitary gland, which secretes hormones that control the other glands of the body.

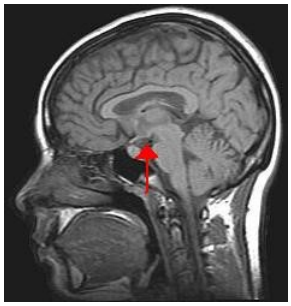


Figure 7.10.2: Hypothalamus controls the pituitary gland.[2]

Hormones

Several important sexual hormones are secreted by the pituitary gland. Oxytocin**,** also known as the hormone of love, is released during sexual intercourse when an orgasm is achieved. Oxytocin is also released in females when they give birth or are breast-feeding; it is believed that oxytocin is involved with maintaining close relationships. Both prolactin and oxytocin stimulate milk production in females. Follicle-stimulating hormone (FSH) is responsible for ovulation in females by triggering egg maturity; it also stimulates sperm production in males. Luteinizing hormone (LH) triggers the release of a mature egg in females during the process of ovulation.

In males, testosterone appears to be a major contributing factor to sexual motivation. Vasopressin is involved in the male arousal phase, and the increase of vasopressin during erectile response may be directly associated with increased motivation to engage in

sexual behavior.

The relationship between hormones and female sexual motivation is not as well understood, largely due to the overemphasis on male sexuality in Western research. Estrogen and progesterone typically regulate motivation to engage in sexual behavior for females, with estrogen increasing motivation and progesterone decreasing it. The levels of these hormones rise and fall throughout a woman's menstrual cycle. Research suggests that testosterone (van Anders, 2012), oxytocin, and vasopressin are also implicated in female sexual motivation in similar ways as they are in males, but more research is needed to understand these relationships.



Figure **7.10.3**: By the end of high school, more than half of boys and girls report engaging in sexual behaviors.[3]



Figure **7.10.4**: Many teens report becoming sexual in adolescence (Attribution: LGBT Pride by Upslon licensed CC-BY

Sexual Orientation

Sexual Orientation is an umbrella term that is used to refer to patterns of attraction—sexual, romantic, or both. Under this umbrella, individuals may assort themselves into categories such as homosexual, heterosexual, bisexual, pansexual, and asexual. It is important to realize that sexuality is multifaceted and also that it exists on a continuum (nonbinary).

Heteronormativity and homophobia have laid very strong and highly inaccurate and harmful groundwork for the questions we might ask about sexual orientation. For example, if we apply the nature v. nurture question to sexual orientation, many people take a deficit viewpoint asking "What causes homosexuality?" Imagine if someone were to ask you what caused you to have such long arms? There are other subtexts to this question that are equally problematic. "This question can be problematic for some, because

the motivation for asking the question may not be scientific. For example, individuals who have a social problem with homosexuality may be motivated to see sexual orientation as a choice, making homosexuality a characteristic one could choose not to exhibit. And in recent history, eugenicists (individuals who promote selective reproduction among “favored” types of humans) used a presumed genetic basis for homosexuality as an argument in favor of sterilizing gay people. The question can also be problematic because the stated or implied focus is typically on the cause of homosexuality, rather than heterosexuality." (Goerling & Wolfe, 2022)

Everyone agrees that there certainly isn't a single gene for sexual orientation. But there might be some genetic basis because identical twins are more similar in their sexual orientation than are fraternal twins. Prenatal androgens might also play a role. There is some research about correlation between finger length and sexual orientation (indicating biological bases), as well as research that shows that having more older brothers (fraternal birth order effect) increases the likelihood of males reporting greater homosexual behaviors. Environmental studies have shown that growing up with gay relatives, and being raised in urban contexts raises the possibility of homosexual orientations. But this correlation might simply be an artifact of the greater acceptance people are willing to come out to.

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7.11: Systems approach

An increasingly popular view in developmental psychology that has been used to understand how developmental changes emerge is the Dynamic Systems Approach (DSA) (e.g., Thelen and Smith, 1994; Lewis, 2011; Molenaar et al., 2014; Blumberg et al., 2017). The hallmark of the DSA is its emphasis on all components of the system including genes, environment and the task. The DSA has provided lasting changes in understanding development in a variety of fields but started with the work of Thelen in motor development. Systems approach suggests that interacting motor, perception and cognition changes occur as a child develops. Consider that in the infancy the developmental requirements are to overcome gravity (from the prenatal stages where all movements were possible until space constricted them). Once posture is stable, the infant can move and it gives them new vantage points for perception and exploration.

As posture control changes, arms and hands become available for reaching, holding and manipulating objects so that the infant can develop more knowledge about textures, sizes and 3-dimensionality.

Posture also influences perception because the infant develops newly changed vantage points as they go from the prone to the sitting to the standing.

On the other hand, posture is also influenced by perception, for example when walls sway, we move our muscles to counteract that swaying and maintain balance. Infants do that also, but not as smoothly as adults do.

Stepping has been believed to be a reflex that appears at 2 months, later disappears, and then walking develops even later. But the claim is that if the infant gets upright practice, the stepping reflex never would disappear. In Western culture infants spend a lot of time supine, they do kick in the air – which is the same as the stepping movement – but they develop more fat than muscle in their legs making it difficult to walk. So, in contrast to the reflex proponents who claim that changes in cortical control drive the changes in motor coordination, DSA proponents claim that changes in the body (driven by culture and environment) explain the development of walking.

Infants use various strategies for locomotion. Motivated by their caregiver, for example, and the initial position they are put in (tummy down for example), they try out various ways to move including log rolling, pivoting, turning etc to look at and get to where they want to. When they have to get off steep places they try out different things like sliding or backing down (which is harder because they have to coordinate backward movements and have no visual feedback). They also use (or choose not to use) handrails when trying to maintain balance in creative ways.

Walking is very much influenced by practice (massage and exercise of the kind in African and Caribbean cultures). Infants learn the balance issues – first walk with feet wider apart, more time standing, less time with one foot in the air, etc. With practice in those cultures, children learn to walk and run much faster than in Western cultures. In East Africa women, and in Nepal both genders learn to walk with much larger than own body weight loads with reduced energetic cost.

The visual cliff apparatus has been used in original studies of depth perception but infants learn after the first encounter that there is glass at that drop off. So now many studies have been done to test locomotion with deep drop offs as well. What is found is that infants don't generalize the perceptual information from one locomotive skill to another. For example, even though they know what to do while crawling, they will keep falling for weeks while walking in the same situation.

So, locomotion is not hardwired or reflexive, but rather extremely plastic and responsive to caregiving practices. Locomotion is also creative. Every infant discovers unique solutions for locomotion, given their own particular environment.

Manual control

Infants reach with both hands and feet. Their control improves over time and with practice. They try to judge where a moving object will be and flap out at it. However, more specific hand control doesn't develop till later of course. Once infants can hold objects, they flap their arms to make a sound with hard objects and move soft ones across surfaces. In the beginning, they only bring objects up to their face and mouth them, but later move it from hand to hand and palpate it and so on. At first arm and hand movements are random and exploratory, and they become more goal directed as infants grow.

Facial muscle coordination is really marvelous because newborns need to suck, swallow and breathe once they are out of the amniotic fluid, and need to suck for sustenance! Because solid foods require more than just lateral movement of the jaw and also experience with food of different consistency and texture, there is real danger of choking.

Facial expressions in infancy are similar to adult ones like wrinkling of nose and furrowed brows to noxious environment. Many parts of the face are used to show expressions, perhaps because those are so important for social interaction. So even infants with severe developmental or structural problems are still able to produce recognizable smiles, cries and interest expressions.

Coordinating looking movements have been calculated and studied by researchers. Infants and toddlers tend to engage more in opportunistic looking so in this sense arrangement of the environment also influences what they are more likely to see. Researchers have studied where infants look, and how they track objects and how that becomes smoother with infant age and practice. Infants are also closer to the floor so they tend to look more at it while they are smaller.

"The developmental systems perspective encourages researchers also to consider a larger context that includes the physical and social/cultural environment and to view motor behaviors as potentially both cause and consequence of developmental change in other psychological domains"

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CHAPTER OVERVIEW

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8.1: Nutrition in infancy

Breastmilk and breast feeding

Newborn infants receive all their nutrition from breastmilk or formula. The demand and supply of breastmilk is a positive feedback loop – the more the infant sucks on the breast, the more milk is produced. Therefore at the start, there is often very little supply of actual milk and in breastfed infants, regular sucking in the first week (or pumping/expressing breastmilk) is essential for setting up the breasts to produce milk. Cow's milk is too fatty for human infants to digest but infant formula is a viable alternative. However, many culture wars have erupted over whether infants are better off being breastfed or bottle fed, though the American Association of Pediatrics suggests that it supports the unequivocal evidence that breast milk buffers infants against a variety of diseases and conditions (AAP, 2021).

At the start of this discussion we need to differentiate between breast milk and breast feeding, as well as formula and bottle feeding. Of course the source of breast milk is the human breast, and if the infant is being breastfed, they are likely getting breast milk. However, it is entirely possible for parents to express/pump breast milk and feed the infant using a bottle. In fact, I have two family members who did exactly that for up to eight months after their babies were born. The point of drawing this distinction is that there are many confounding variables here. Those who claim that breastfeeding is better because breast milk is more nutritious, less allergenic, better for babies' immune systems, and easier for babies to digest, and serve health benefits for the lactating individual are correct in claiming these facts about breast milk, but whether it comes directly from a breast or is pumped into a bottle and then fed to baby shouldn't be at issue. On the other hand, breastfeeding might be better because it leads to greater jaw and tooth development for baby than regular artificial nipples (orthodontic ones can overcome some of those problems). Certainly, there are situations where breastmilk (and breastfeeding) needs to be ruled out if the lactating individual has an illness that might be passed down in breastmilk, is taking medication that might be passed on, or is taking other drugs or alcohol. In such cases, or if for other personal or health reasons breastfeeding and breastmilk are not an option, formula is a very reasonable and healthy alternative.

Solid foods

Humans are the only primates where caregivers supplement breastfeeding with solid foods, and have multiple children at different developmental stages to feed and take care of. Most of the world's health authorities recommend that infants not be fed solids before 4 or 6 months, but worldwide studies done before 2010 indicate that many parents feed their infants solids even as early as 4 weeks of age. However especially in the last decade there has been greater emphasis on advising breastfeeding and that might have influenced the rate and timing of early solid food introduction (Borowitz, 2021).

The flavor of what pregnant and lactating individuals eat is recognized and preferred by infants (and even as late as eight years of age). There also seems to be a sensitive period for acceptance of different flavors and tastes. Infants who taste bitter before four months of age are more likely to continue to accept bitter foods even at five years of age, and are more willing to try and to accept other varied flavors later in development. Infants who are exposed to different food textures also do better than those who are not (Borowitz, 2021).

It has been suggested that if infants are fed solids too early they are more likely to develop allergies. However, studies have shown that early exposure (at 4 months) to cow's milk, wheat, peanut, cooked egg, sesame and whitefish were less likely to be allergic to one or more food at 3 years than those who were exclusively breastfed until 6 months (Borowitz, 2021).

There is also no association between early introduction to solids and increased risk of obesity later in childhood. Borowitz (2021) concludes that as long as there is uncontaminated water and adequate nutrition available, it is not a problem to introduce solids into an infant's diet at any age.

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8.2: Nutrition in early childhood

While preschoolers are becoming more and more independent, they depend on their caregivers to keep protecting and promoting their health. [1]

That slower rate of growth is accompanied by a reduced appetite between the ages of 2 and 6. This change can sometimes be surprising to parents and lead to the development of poor eating habits. However, children between the ages of 2 and 3 need 1,000 to 1,400 calories, while children between the ages of 4 and 8 need 1,200 to 2,000 calories (Mayo Clinic, 2016a).[2]

Caregivers who have established a feeding routine with their child can find the reduction in appetite a bit frustrating and become concerned that the child is going to starve. However, by providing adequate, sound nutrition, and limiting sugary snacks and drinks, the caregiver can be assured that 1) the child will not starve; and 2) the child will receive adequate nutrition. Preschoolers can experience iron deficiencies if not given well-balanced nutrition or if they are given too much milk as calcium interferes with the absorption of iron in the diet as well.

Caregivers need to keep in mind that they are setting up taste preferences at this age. Young children who grow accustomed to high fat, very sweet and salty flavors may have trouble eating foods that have more subtle flavors such as fruits and vegetables. Consider the following advice about establishing eating patterns for years to come (Rice, F.P., 1997). Notice that keeping mealtime pleasant, providing sound nutrition and not engaging in power struggles over food are the main goals.[3]

Tips for Establishing Healthy Eating Habits

1. **Don’t try to force your child to eat or fight over food.** Of course, it is impossible to force someone to eat. But the real advice here is to avoid turning food into a power struggle so that food doesn’t become a way to gain favor with or express anger toward someone else.
2. **Recognize that appetite varies.** Children may eat well at one meal and have no appetite at another. Rather than seeing this as a problem, it may help to realize that appetites do vary. Continue to provide good nutrition at each mealtime (even if children don’t choose to eat the occasional meal).
3. **Keep it pleasant.** This tip is designed to help caregivers create a positive atmosphere during mealtime. Mealtimes should not be the time for arguments or expressing tensions. You do not want the child to have painful memories of mealtimes together or have nervous stomachs and problems eating and digesting food due to stress.
4. **No short order chefs.** While it is fine to prepare foods that children enjoy, preparing a different meal for each child or family member sets up an unrealistic expectation from others. Children probably do best when they are hungry and a meal is ready. Limiting snacks rather than allowing children to “graze” continuously can help create an appetite for whatever is being served.
5. **Limit choices.** If you give your preschool aged child choices, make sure that you give them one or two specific choices rather than asking “What would you like for lunch?” If given an open choice, children may change their minds or choose whatever their sibling does not choose!
6. **Serve balanced meals.** Meals prepared at home tend to have better nutritional value than fast food or frozen dinners. Prepared foods tend to be higher in fat and sugar content as these ingredients enhance taste and profit margin because fresh food is often more costly and less profitable. However, preparing fresh food at home is not costly. It does, however, require more activity. Including children in meal preparation can provide a fun and memorable experience.
7. **Don’t bribe.** Bribing a child to eat vegetables by promising dessert is not a good idea. First, the child will likely find a way to get the dessert without eating the vegetables (by whining or fidgeting, perhaps, until the caregiver gives in). Secondly, it teaches the child that some foods are better than others. Children tend to naturally enjoy a variety of foods until they are taught that some are considered less desirable than others. A child, for example, may learn the broccoli they have enjoyed is seen as yucky by others unless it’s smothered in cheese sauce![4]



Figure 8.2.1: Learning to make good nutritional choices and cooking early is a good investment in children's future health.[5]

USDA Meal Patterns for Young Children

The United States Department of Agriculture Food and Nutrition Service provides the following guidance for the daytime feeding of children age 3 to 5

Table 8.2.1: Suggestions for early childhood meals [6]

Meal	Ages 3-5
Breakfast	• 3/4 cup milk • 1/2 cup vegetables, fruit, or both • ½ ounce equivalent grains
Lunch or Supper	• 3/4 cup milk • 1½ ounces meat or meat alternative • 1/4 cup vegetables • 1/4 cup fruits • ½ ounce equivalent of grains
Snack	*Select two of the following:* • ½ cup of milk • ½ ounce meat or meat alternative • ½ cup vegetables • ½ cup fruit • ½ ounce equivalent of grains

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[6] https://fns-prod.azureedge.net/sites/default/files/cacfp/CACFP_MealBP.pdf

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8.3: Nutrition in middle childhood

A number of factors can influence children's eating habits and attitudes toward food. Family environment, societal trends, taste preferences, and messages in the media all impact the emotions that children develop in relation to their diet. Television commercials can entice children to consume sugary products, fatty fast foods, excess calories, refined ingredients, and sodium. Therefore, it is critical that parents and caregivers direct children toward healthy choices. [1]

Parents greatly impact their child's nutritional choices. This time in a child's life provides an opportunity for parents and other caregivers to reinforce good eating habits and to introduce new foods into the diet, while remaining mindful of a child's preferences. Parents should also serve as role models for their children, who will often mimic their behavior and eating habits. Parents must continue to help their school-aged child establish healthy eating habits and attitudes toward food. Their primary role is to bring a wide variety of health-promoting foods into the home, so that their children can make good choices.[2]

Let's think for a moment about what our parents and grandparents used to eat? What are some of the differences that you may have experienced as a child?

One hundred years ago in the US, as families sat down to dinner, they might have eaten boiled potatoes or corn, leafy vegetables such as cabbage or collards, fresh-baked bread, and, if they were fortunate, a small amount of beef or chicken. Young and old alike benefitted from a sound diet that packed a real nutritional punch. Times have changed. Many families today fill their dinner plates with fatty foods, such as french fries cooked in vegetable oil, a hamburger that contains several ounces of ground beef, and a white-bread bun, with a single piece of lettuce and a slice or two of tomato as the only vegetables served with the meal.



Figure **8.3.1**: A modern meal that is full of protein and fat calories.[3]

Our diet has changed drastically as processed foods, which did not exist a century ago, and animal-based foods now account for a large percentage of our calories. Not only has what we eat changed, but the amount of it that we consume has greatly increased as well, as plates and portion sizes have grown much larger. All of these choices impact our health, with short- and long-term consequences as we age. Possible effects in the short-term include excess weight gain and constipation. The possible long-term effects, primarily related to obesity, include the risk of cardiovascular disease, diabetes, hypertension, as well as other health and emotional problems for children.(Centers for Disease Control and Prevention. "Overweight and Obesity: Health Consequences.)[4]

During middle childhood, a healthy diet facilitates physical and mental development and helps to maintain health and wellness. School-aged children experience steady, consistent growth, but at a slower rate than they did in early childhood. This slowed growth rate can have lasting a lasting impact if nutritional, caloric, and activity levels aren't adjusted in middle childhood which can lead to excessive weight gain early in life and can lead to obesity into adolescence and adulthood.[5]

Making sure that children have proper nutrients will allow for optimal growth and development. Look at the figure below to familiarize yourself with food and the place setting for healthy meals.



Figure 8.3.2: Nutrition guidelines from the USDA shows that at least half the meal should consist of fruits and vegetables (more vegetables than fruits), more than a quarter grains, and less than a quarter protein, with only a small portion of dairy.[6]

One way to encourage children to eat healthy foods is to make meal and snack time fun and interesting. Parents should include children in food planning and preparation, for example selecting items while grocery shopping or helping to prepare part of a meal, such as making a salad. At this time, parents can also educate children about kitchen safety. It might be helpful to cut sandwiches, meats, or pancakes into small or interesting shapes. In addition, parents should offer nutritious desserts, such as fresh fruits, instead of calorie-laden cookies, cakes, salty snacks, and ice cream. Studies show that children who eat family meals on a frequent basis consume more nutritious foods.[7]

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8.4: Healthy eating esp in adolescence

The ***Dietary Guidelines*** define late adolescence, as the period from ages fourteen to eighteen. After puberty, the rate of physical growth slows down. Girls stop growing taller around age sixteen, while boys continue to grow taller until ages eighteen to twenty. One of the psychological and emotional changes that take place during this life stage includes the desire for independence as adolescents develop individual identities apart from their families. As teenagers make more of their dietary decisions, parents, caregivers, and authority figures should guide them toward appropriate, nutritious choices.



Figure **8.4.1**: Adolescent food choices may not be healthy.[1]

Some adolescents don't have all the food necessary for proper development and may be food insecure. Most people have access to fresh water in all except the most extreme situations; the need for food is the most fundamental and important human need. More than 1 in 10 U.S. households contain people who live without enough nourishing food and this lack of proper nourishment has profound effects on their abilities to lead lives that will allow them to develop to their fullest potential. (Hunger Notes, n.d.).

When people are extremely hungry, their motivation to attain food completely changes their behavior. Hungry people become listless and apathetic to save energy and then become completely obsessed with food. Ancel Keys and his colleagues (Keys, Brožek, Henschel, Mickelsen, & Taylor, 1950) found that volunteers who were placed on severely reduced-calorie diets lost all interest in sex and social activities, becoming preoccupied with food. According to Maslow, meeting one's basic needs is vital for proper growth and development. [2]

Abraham Maslow's Hierarchy of Needs

Maslow's theory is based on a simple premise: human beings have needs that are hierarchically ranked. There are some needs that are basic to all human beings, and in their absence, nothing else matters. We are ruled by these needs until they are satisfied. After we satisfy our basic needs, they no longer serve as motivators and we can begin to satisfy higher-order needs.

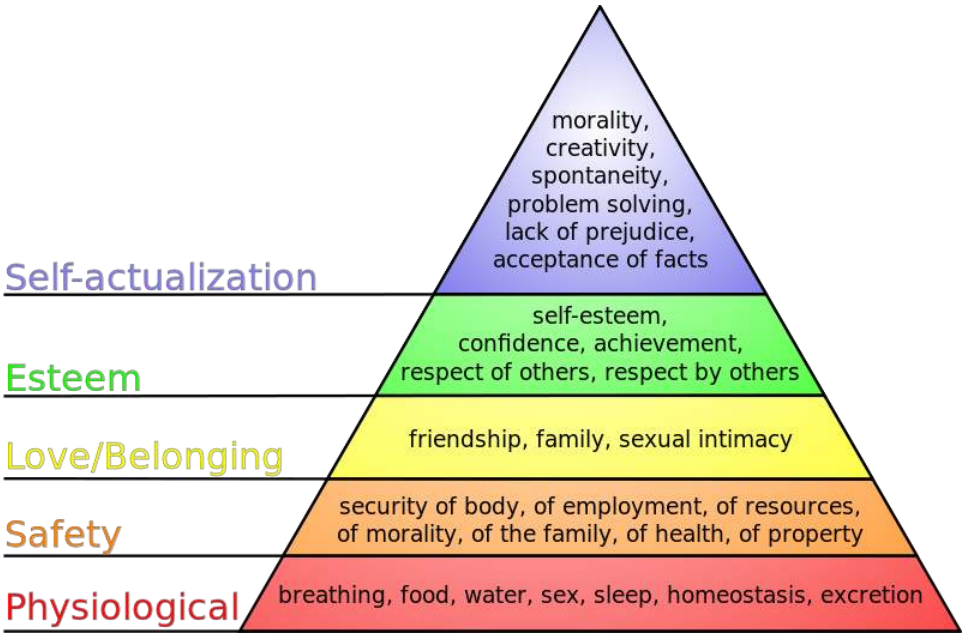


Figure **8.4.2**: Maslow's Hierarchy of Needs showing that only when basic physiological needs like hunger and thirst are met does one worry about safety needs. After those are met, one begins to worry about love and belongingness and only then about esteem. Only a few people worry reach the highest point of the hierarchy and become self actualizing – realizing their full potential.[3]

Maslow organized human needs into a pyramid that includes (from lowest-level to highest-level) physiological, safety, love/belonging, esteem, and self-actualization needs. According to Maslow, one must satisfy lower-level needs before addressing needs that occur higher in the pyramid. For example, if someone is starving, it is quite unlikely that he will spend a lot of time, or any time at all, wondering whether other people think he is a good person. Instead, all of his energies are geared toward finding something to eat.[4]

Weight Management

Forming good eating habits and engaging in fitness or exercise programs will help maintain a healthy weight and develop lifelong habits. Research says that the best way to control weight is: eat less (consume fewer calories) and exercise (burn more calories). To maintain a healthy weight, restricting your diet alone is difficult and can be substantially improved when it is accompanied by increased physical activity.

The energy (calorie) requirements for preteens differ according to gender, growth, and activity level. For ages nine to thirteen, girls should consume about 1,400 to 2,200 calories per day and boys should consume 1,600 to 2,600 calories per day. Physically active preteens who regularly participate in sports or exercise need to eat a greater number of calories to account for increased energy expenditures.[5]

People who exercise regularly, and in particular those who combine exercise with dieting, are less likely to be obese (Borer, 2008).Borer, K. T. (2008). Exercise not only improves our waistline, but also improves our overall mental health by lowering stress and improving feelings of well-being. Exercise also increases cardiovascular capacity, lowers blood pressure, and helps improve diabetes, joint flexibility, and muscle strength (American Heart Association, 1998).

For long lasting change, it's important to plan healthy meals, limit snacking, and to schedule exercise into our daily lives.[6]

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8.5: Energy, nutrition and vegetarianism

Children's energy needs vary, depending on their growth and level of physical activity. Energy requirements also vary according to gender. Girls require 1,200 to 1,400 calories a day from age 2 to 8 and 1,400-1,800 for age 9 to 13. Boys also need 1,200 to 1.400 calories daily from age 4 to 8 but their daily caloric needs go up to 1,600-2,000 from age 9 to 13. This range represents individual differences, including how active the child is.[1]

Recommended intakes of **macronutrients** (protein, carbohydrates, and fats) and most **micronutrients** (vitamins and minerals) are higher relative to body size, compared with nutrient needs during adulthood. Therefore, children should be provided nutrient-dense food at meal- and snack-time. However, it is important not to overfeed children, as this can lead to childhood obesity, which is discussed in the next section.

Children and Vegetarianism

Another issue that some parents face with school-aged children is the decision to encourage a child to become a vegetarian or a vegan. Some parents and caregivers decide to raise their children as vegetarians for health, cultural, religious or other reasons. Preteens and teens may make the choice to pursue vegetarianism on their own, due to concerns about animals or the environment. No matter the reason, parents with vegetarian children must take care to ensure vegetarian children get healthy, nutritious foods that provide all the necessary nutrients.

There are several types of vegetarians, each with certain restrictions in terms of diet:

- **Ovo-vegetarians** eat eggs, but do not eat any other animal products.
- **Lacto-ovo-vegetarians** eat eggs and dairy products, but do not eat any meat.
- **Lacto-vegetarians** eat dairy products, but do not eat any other animal products.
- Vegans eat food only from plant sources, no animal products at all.



Figure **8.5.1**: An example of a school lunch including carbs, proteins, fruit, and some dessert.[2]

Children who consume some animal products, such as eggs, cheese, or other forms of dairy, can meet their nutritional needs. For a child following a strict vegan diet, planning is needed to ensure adequate intake of protein, iron, calcium, vitamin B_{12}, and vitamin D. Legumes and nuts can be eaten in place of meat, soy or almond milk fortified with calcium and vitamins D and B_{12} can replace cow's milk. Parents must be informed and knowledgeable in order to support proper development for children with a vegetarian or vegan diet.[3]

School lunch programs

Many school age children eat breakfast, snacks, and lunch at their schools. Therefore, it is important for schools to provide meals that are nutritionally sound. In the United States, more than thirty-one million children from low-income families are given meals provided by the National School Lunch Program. This federally funded program offers low-cost or free breakfast, snacks, and lunches to school facilities. School districts that take part receive subsidies from the US Department of Agriculture (USDA) for every meal they serve that must meet 2015 Dietary Guidelines for Americans.

Knowing that many children in the United States buy or receive free lunches in the school cafeteria, it might be worthwhile to look at the nutritional content of school lunches. You can obtain this information through your local school district's website. An example of a school menu from a school district in north central Texas is a meal consisting of pasta alfredo, bread stick, peach cup, tomato soup, a brownie, and 2% milk which is in compliance with Federal Nutritional Guidelines. Consider another menu from an elementary school in the state of Washington. This sample meal consists of chicken burger, tater tots, fruit, veggies, and 1% or nonfat milk. This meal is also in compliance with Federal Nutrition Guidelines but has about 300 fewer calories than the menu in Texas. This is a big difference in calories and nutritional value of these prepared lunches that are chosen and approved of by officials on behalf of children in these districts.



Figure **8.5.1**: Children eating lunch together at a school cafeteria table.[2]

Healthy School Lunch Campaigns helps to promote children's health. This is done by educating government officials, school officials, food-service workers, and parents and is sponsored by the Physicians Committee for Responsible Medicine. They educate and encourage schools to offer low-fat, cholesterol-free options in school cafeterias and in vending machines and work to improve the food served to children at school. Unfortunately, many school districts in the nation allow students to purchase chips, cookies, and ice cream along with their meals. These districts rely on the sale of these items in the lunchrooms to earn additional revenues. Not only are they making money off of children and families with junk food, they are also adding additional empty calories to their daily intake. These districts need to look at the menus and determine the rationale for offering additional snacks and desserts for children at their schools. Whether children receive free lunches, buy their own, or bring their lunch from home, quality nutrition is what is best for these growing bodies and minds.

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8.6: Malnutrition

Many may not know that malnutrition is a problem that many children face, in both developing nations and the developed world. Even with the wealth of food in North America, many children grow up malnourished, or even hungry. The US Census Bureau characterizes households into the following groups:

- food secure
- food insecure without hunger
- food insecure with moderate hunger
- food insecure with severe hunger

Millions of children grow up in food-insecure households with inadequate diets due to both the amount of available food and the quality of food. In the United States, about 20 percent of households with children are food insecure to some degree. In half of those, only adults experience food insecurity, while in the other half both adults and children are considered to be food insecure, which means that children did not have access to adequate, nutritious meals at times.[1]

Growing up in a food-insecure household can lead to a number of problems. Deficiencies in iron, zinc, protein, and vitamin A can result in stunted growth, illness, and limited development. Federal programs, such as the National School Lunch Program, the School Breakfast Program, and Summer Feeding Programs, work to address the risk of hunger and malnutrition in school-aged children. They help to fill the gaps and provide children living in food-insecure households with greater access to nutritious meals. [2]

Internationally, World Health Organization (WHO, 2019) reported that 822 million people did not have sufficient food in 2018, and that this represented a rise of 11 million from the previous year. The largest number of undernourished people live in Asia. This affects child development in myriad ways, from being born low birth weight (20.5 million), to being affected by stunting under age 5 (149 million), and wasting under age 5 (almost 50 million).

There can be serious effects for children when there are deficiencies in their nutrition. Let's explore a few types of nutritional concerns.

Wasting

Children in developing countries and countries experiencing the harsh conditions of war are at risk for two major types of malnutrition, also referred to as wasting. Infantile **marasmus** refers to starvation due to a lack of calories and protein. Children who do not receive adequate nutrition lose fat and muscle until their bodies can no longer function. Babies who are breastfed are much less at risk of malnutrition than those who are bottle-fed.

After weaning, children who have diets deficient in protein may experience **kwashiorkor** or the "disease of the displaced child," often occurring after another child has been born and taken over breastfeeding. This results in a loss of appetite and swelling of the abdomen as the body begins to break down the vital organs as a source of protein.

Around the world the rates of wasting have been dropping. However, according to the World Health Organization and UNICEF, in 2018 there were 49.5 million children under the age of five that experienced these forms of wasting, (50 million in 2014 and 16 million were severely wasted according to UNICEF, 2015). Worldwide, these figures indicate that nearly one child in every 13 suffers from some form of wasting. The majority (about two third) of these children live in Asia, and almost all the rest in Africa. Wasting can occur as a result of severe food shortages, regional diets that lack certain proteins and vitamins, or infectious diseases that inhibit appetite (Latham, 1997).

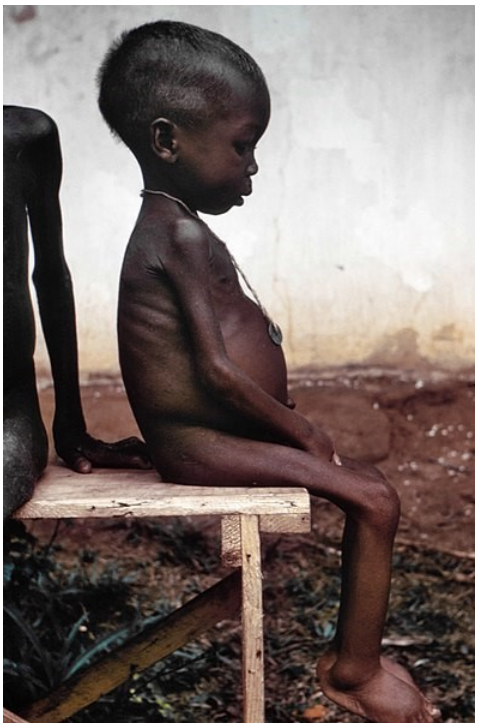


Figure **8.6.1**: A child suffering from wasting.[3]

The consequences of wasting depend on how late in the progression of the disease parents and guardians seek medical treatment for their children. Unfortunately, in some cultures families can not seek treatment early, and as a result by the time a child is hospitalized the child often dies within the first three days after admission (Latham, 1997). Several studies have reported long- term cognitive effects of early malnutrition (Galler & Ramsey, 1989; Galler, Ramsey, Salt & Archer, 1987; Richardson, 1980), even when home environments were controlled (Galler, Ramsey, Morley, Archer & Salt, 1990). Lower IQ scores (Galler et al., 1987), poor attention (Galler & Ramsey, 1989), and behavioral issues in the classroom (Galler et al., 1990) have been reported in children with a history of serious malnutrition in the first few years of life.[4]

Milk Anemia

About 9 million children in the United States are malnourished (Children's Welfare, 1998). More still suffer from milk anemia, a condition in which milk consumption leads to a lack of iron in the diet. This can be due to the practice of giving toddlers milk as a pacifier-when resting, when riding, when waking, and so on. Appetite declines somewhat during toddlerhood and a small amount of milk (especially with added chocolate syrup) can easily satisfy a child's appetite for many hours. The calcium in milk interferes with the absorption of iron in the diet as well.[5]

Failure to Thrive

Failure to thrive (FTT) occurs in children whose nutritional intake is insufficient for supporting normal growth and weight gain. FTT typically presents before two years of age, when growth rates are highest. Parents may express concern about picky eating habits, poor weight gain, or smaller size compared relative to peers of similar age. Physicians often identify FTT during routine office visits, when a child's growth parameters are not tracking appropriately on growth curves.

FTT can be caused by physical or mental issues within the child (such as errors of metabolism, acid reflux, anemia, diarrhea, Cystic fibrosis, Crohn's disease, celiac disease, cleft palate, tongue tie, milk allergies, hyperthyroidism, congenital heart disease, etc.) It can also be caused by caregiver's actions (environmental), including inability to produce enough breastmilk, inadequate food supply, providing an insufficient number of feedings, and neglect. These causes may also co-exist. For instance, a child who is not getting sufficient nutrition may act content so that caregivers do not offer feedings of sufficient frequency or volume, and a child with severe acid reflux who appears to be in pain while eating may make a caregiver hesitant to offer sufficient feedings.[6]

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World hunger is still not going down after three years and obesity is still growing – UN report, a press release in WHO

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8.7: Food allergies and intolerance

It is important to consider that certain foods or food groups can cause particular issues.

Allergies

A **food allergy** occurs when the body has a specific and reproducible immune response to certain foods. The body's immune response can be severe and life threatening, such as anaphylaxis. Although the immune system normally protects people from germs, in people with food allergies, the immune system mistakenly responds to food as if it were harmful.

Eight foods or food groups account for 90% of serious allergic reactions in the United States: milk, eggs, fish, crustacean shellfish, wheat, soy, peanuts, and tree nuts.

The symptoms and severity of allergic reactions to food can be different between individuals, and can also be different for one person over time. Anaphylaxis is a sudden and severe allergic reaction that may cause death.[4] Not all allergic reactions will develop into anaphylaxis. The following statistics are remarkable -

- Children with food allergies are two to four times more likely to have asthma or other allergic conditions than those without food allergies.
- The prevalence of food allergies among children increased 18% during 1997-2007, and allergic reactions to foods have become the most common cause of anaphylaxis in community health settings.
- Although difficult to measure, research suggests that approximately 4% of children and adolescents are affected by food allergies. Food intolerance and food allergies are also an issue for some school-aged children. Recent studies show that three million children under age eighteen are allergic to at least one type of food.

The CDC recommends that as part of maintaining a healthy and safe environment for children, caregivers should:

- Be aware of any food allergies.
- Educate other children and all adults that care for a child with food allergies.
- Ensure the daily management of food allergies.
- Prepare for food allergy emergencies,[1] by knowing how to use, and having an epipen.

An allergy occurs when a protein in food triggers an immune response, which results in the release of antibodies, histamine, and other defenders that attack foreign bodies. Possible symptoms include itchy skin, hives, abdominal pain, vomiting, diarrhea, and nausea. Symptoms usually develop within minutes to hours after consuming a food allergen. Children can outgrow a food allergy, especially allergies to wheat, milk, eggs, or soy.[2]

Anaphylaxis is a life-threatening reaction that results in difficulty breathing, swelling in the mouth and throat, decreased blood pressure, shock, or even death. Milk, eggs, wheat, soybeans, fish, shellfish, peanuts, and tree nuts are the most likely to trigger this type of response. A dose of the drug epinephrine is often administered via a "pen" to treat a person who goes into anaphylactic shock.[3]



Figure 8.7.1: An EpiPen used as first aid to anaphylactic shock of allergy.[4]

Intolerance

Some children experience a **food intolerance**, which does not involve an immune response. A food intolerance is marked by unpleasant symptoms that occur after consuming certain foods. An intolerance is best managed by making dietary changes and avoiding any foods that trigger the reaction.[5]

Lactose intolerance, though rare in very young children, is one example. Children who suffer from this condition experience an adverse reaction to the lactose in milk products. It is a result of the small intestine's inability to produce enough of the enzyme lactase. Symptoms of lactose intolerance usually affect the gastro-intestinal tract and can include bloating, abdominal pain, gas,

nausea, and diarrhea. It is interesting to note that as a child grows from infancy into early and middle childhood, the amount of lactase (the enzyme used to digest lactose in milk) produced by the body decreases. As the child is weaned from breastfeeding, tolerance to dairy decreases. A majority of the world's adults are lactose intolerant. However there are some genetic mutations (Handwerk, 2022) and cultural differences that might cause differences between different nationalities.

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8.8: Obesity

The current measurement for determining excess weight is the **Body Mass Index (BMI)** which expresses the relationship of height to weight. According to the Centers for Disease Control and Prevention (CDC), children's whose BMI is at or above the 85th percentile for their age are considered **overweight**, while children who are at or above the 95th percentile are considered **obese**.

In general, **childhood obesity** is a complex health issue. It occurs when a child is well above the normal or healthy weight for his or her age and height. Childhood obesity is a serious problem in the United States putting children at risk for poor health. For children and adolescents aged 2-19 years in 2017-2020[1]:

- The prevalence of obesity was 19.7% and affected about 14.7 million children and adolescents.
- Obesity prevalence was 12.7% among 2- to 5-year-olds, 20.7% among 6- to 11-year-olds, and 22.2% among 12- to 19-year-olds. Childhood obesity is also more common among certain populations.
- Obesity prevalence was 26.2% among Hispanic children, 24.8% among non-Hispanic Black children, 16.6% among non-Hispanic White children, and 9.0% among non-Hispanic Asian children.

Where people live can affect their ability to make healthy choices. As seen in the statistics above, obesity disproportionally affects children from low-income families.

Causes of Obesity

The causes of excess weight gain in young people are similar to those in adults, including factors such as a person's behavior and genetics. Behaviors that influence excess weight gain include:

- larger portion sizes
- limited access to nutrient-rich foods
- increased access to fast foods and vending machines
- lack of breastfeeding support
- declining physical education programs in schools
- insufficient physical activity and a sedentary lifestyle
- media messages encouraging the consumption of unhealthy foods
- sedentary activities (such as watching television or other screen devices)
- medication use
- sleep routines

The decreased participation in school physical education and youth sports is just one of many factors that has led to an increase in children being overweight or obese.

Consequences of obesity

Excess weight and obesity in children are associated with a variety of medical and cognitive conditions including high blood pressure, insulin resistance, inflammation, depression, and lower academic achievement (Lu, 2016)

Being overweight has also been linked to impaired brain functioning, which includes deficits in executive functioning, working memory, mental flexibility, and decision making (Liang et al, 2014). Children who ate more saturated fats performed worse on relational memory tasks while eating a diet high in omega-3 fatty acids promoted relational memory skills (Davidson, 2014). Using animal studies, Davidson et al. (2013) found that large amounts of processed sugars and saturated fat weakened the blood-brain barrier, especially in the hippocampus. This can make the brain more vulnerable to harmful substances that can impair its functioning. Another important executive functioning skill is controlling impulses and delaying gratification. Children who are overweight show less inhibitory control than normal- weight children, which may make it more difficult for them to avoid unhealthy foods (Lu, 2016). Overall, being overweight as a child increases the risk for cognitive decline as one ages.

Children who are overweight tend to be rejected, ridiculed, teased and bullied by others more than their peer counterparts (stopbulling.gov) This can certainly be damaging to their self-image and popularity. In addition, children who are obese run the risk of suffering orthopedic problems such as knee injuries, and they have an increased risk of heart disease and stroke in adulthood. It

is hard for a child who is obese to become a non-obese adult. In addition, the number of cases of pediatric diabetes has risen dramatically in recent years.



Figure 8.8.1: A child watching TV instead of playing – children spend a lot more time in front of devices than running around playing.[2]

The consequences of childhood obesity are both immediate and long term. It can affect physical as well as social and emotional well-being.

- More Immediate Health Risks
  - High blood pressure and high cholesterol, which are risk factors for cardiovascular disease (CVD).
  - Increased risk of impaired glucose tolerance, insulin resistance, and type 2 diabetes.
  - Breathing problems, such as asthma and sleep apnea.
  - Joint problems and musculoskeletal discomfort.
  - Fatty liver disease, gallstones, and gastro-esophageal reflux (i.e., heartburn).
- Childhood obesity is also related to
  - Psychological problems such as anxiety and depression.
  - Low self-esteem and lower self-reported quality of life.
  - Social problems such as bullying and stigma.
- Future Health Risks
  - Children who have obesity are more likely to become adults with obesity.[11]Adult obesity is associated with increased risk of a number of serious health conditions including heart disease, type 2 diabetes, and cancer.
  - If children have obesity, their obesity and disease risk factors in adulthood are likely to be more severe.[3]



Figure **8.8.2**: There are certainly many health risks associated with being overweight.[4]

Being Overweight Can Be a Lifelong Struggle

A growing concern is the lack of recognition from parents that children are overweight or obese. Katz (2015) referred to this as "**oblivobesity**".

Black et al. (2015) found that parents in the United Kingdom (UK) only recognized their children as obese when they were above the 99.7th percentile while the official cut-off for obesity is at the 85th percentile. Oude Luttikhuis, Stolk, and Sauer (2010) surveyed 439 parents and found that 75% of parents of overweight children said the child had a normal weight and 50% of parents of obese children said the child had a normal weight. For these parents, overweight was considered normal and obesity was considered normal or a little heavy. Doolen, Alpert, and Miller (2009) reported on several studies from the United Kingdom, Australia, Italy, and the United States, and in all locations parents were more likely to misperceive their children's weight. Black, Park, and Gregson (2015) concluded that as the average weight of children rises, what parents consider normal also rises. If parents cannot identify if their children are overweight they will not be able to intervene and assist their children with proper weight management.

An added concern is that the children themselves are not accurately identifying if they are overweight. In a United States sample of 8-15 year-olds, more than 80% of overweight boys and 70% of overweight girls misperceived their weight as normal (Sarafrazi, Hughes, & Borrud, 2014). Also noted was that as the socioeconomic status of the children rose, the frequency of these misconceptions decreased. It appeared that families with more resources were more conscious of what defines a healthy weight.

Interventions

Behavioral interventions, including training children to overcome impulsive behavior, are being researched to help children achieve and maintain a healthy weight (Lu, 2016). Practicing inhibition has been shown to strengthen the ability to resist unhealthy foods. Parents can help their children the best when they are warm and supportive without using shame or guilt. Parents can also act like the child's frontal lobe until it is developed by helping them make correct food choices and praising their efforts (Liang et al, 2014). Research also shows that exercise, especially aerobic exercise, can help improve cognitive functioning in children (Lu, 2016). Parents should take caution against emphasizing diet alone to avoid the development of any obsession about dieting that can lead to eating disorders. Instead, increasing a child's activity level is most helpful.

Dieting is not really the answer. If you diet, your basal metabolic rate tends to decrease thereby making the body burn even fewer calories in order to maintain the weight. Increased activity is much more effective in lowering the weight and improving the child's

health and psychological well-being. Exercise reduces stress and being an overweight child, subjected to the ridicule of others can certainly be stressful. Parents should take caution against emphasizing diet alone to avoid the development of any obsession about dieting that can lead to eating disorders as teens. Again, helping children to make healthy food choices and increasing physical activity will help prevent childhood obesity.[5]

Weight Management

Forming good eating habits and engaging in fitness or exercise programs will help maintain a healthy weight and develop lifelong habits. Research says that the best way to control weight is: eat less (consume fewer calories) and exercise (burn more calories). To maintain a healthy weight, restricting your diet alone is difficult and can be substantially improved when it is accompanied by increased physical activity.

The energy (calorie) requirements for preteens differ according to gender, growth, and activity level. For ages nine to thirteen, girls should consume about 1,400 to 2,200 calories per day and boys should consume 1,600 to 2,600 calories per day. Physically active preteens who regularly participate in sports or exercise need to eat a greater number of calories to account for increased energy expenditures.[7]

People who exercise regularly, and in particular those who combine exercise with dieting, are less likely to be obese (Borer, 2008).Borer, K. T. (2008). Exercise not only improves our waistline, but also improves our overall mental health by lowering stress and improving feelings of well-being. Exercise also increases cardiovascular capacity, lowers blood pressure, and helps improve diabetes, joint flexibility, and muscle strength (American Heart Association, 1998).

For long lasting change, it's important to plan healthy meals, limit snacking, and to schedule exercise into our daily lives.[8]

Programs to address childhood obesity can include behavior modification, exercise counseling, psychological support or therapy, family counseling, and family meal-planning advice. [9]

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8.9: Eating disorders

Although eating disorders can occur in children and adults, they frequently appear during the teen years or young adulthood (National Institute of Mental Health (NIMH), 2016). Eating disorders affect both genders, although rates among women are 2 1⁄2 times greater than among men. Similar to women who have eating disorders, men also have a distorted sense of body image, including body dysmorphia or an extreme concern with becoming more muscular. (Hudson, Hiripi, Pope, & Kessler, 2007; Wade, Keski-Rahkonen, & Hudson, 2011).

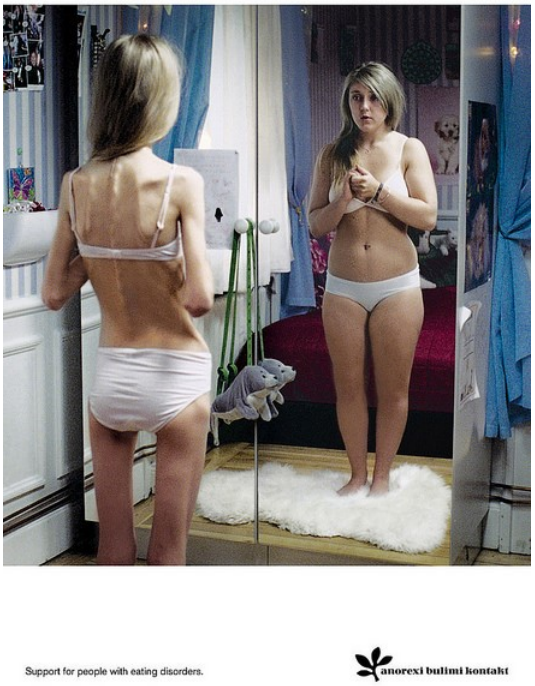


Figure **8.9.1**: This image portrays anorexia. No matter how thin she is, she will perceive herself being heavier.[1]

Risk Factors for Eating Disorders

Researchers are finding that eating disorders are caused by a complex interaction of genetic, biological, behavioral, psychological, and social factors (NIMH, 2016). Eating disorders appear to run in families, and researchers are working to identify DNA variations that are linked to the increased risk of developing eating disorders. Researchers have also found differences in patterns of brain activity in women with eating disorders in comparison with healthy women.

The main criteria for the most common eating disorders: **Anorexia nervosa**, **bulimia nervosa**, and **binge-eating disorder** are described in the Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (DSM-5)(American Psychiatric Association, 2013) and listed in the following table

Table **8.9.1**: DSM-5 Eating Disorders [2]

Eating Disorder	Description
Anorexia Nervosa	• Restriction of energy intake leading to a significantly low body weight • Intense fear of gaining weight • Disturbance in one's self-evaluation regarding body weight
Bulimia Nervosa	• Recurrent episodes of binge eating • Recurrent inappropriate compensatory behaviors to prevent weight gain, including purging, laxatives, fasting or excessive exercise • Self-evaluation is unduly affected by body shape and weight
Binge-Eating Disorder	• Recurrent episodes of binge eating • Marked distress regarding binge eating • The binge eating is not associated with the recurrent use of inappropriate compensatory behavior

Health Consequences of Eating Disorders

For those suffering from anorexia, health consequences include an abnormally slow heart rate and low blood pressure, which increases the risk for heart failure. Additionally, there is a reduction in bone density (osteoporosis), muscle loss and weakness, severe dehydration, fainting, fatigue, and overall weakness. Individuals with this disorder may die from complications associated with Anorexia nervosa, which has the highest mortality rate of any psychiatric disorder.

The binge and purging cycle of bulimia can affect the digestives system and lead to electrolyte and chemical imbalances that can affect the heart and other major organs. Frequent vomiting can cause inflammation and possible rupture of the esophagus, as well as tooth decay and staining from stomach acids. Lastly, binge eating disorder results in similar health risks to obesity, including high blood pressure, high cholesterol levels, heart disease, Type II diabetes, and gall bladder disease (National Eating Disorders Association, 2016).

Eating Disorders Treatment



Figure 8.9.2: Counseling, including group therapy, is often a form of treatment for eating disorders.[4]

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8.10: Oral health

Tooth decay (cavities) is one of the most common chronic conditions of childhood in the United States. Untreated tooth decay can cause pain and infections that may lead to problems with eating, speaking, playing, and learning. The good news is that tooth decay is preventable.

Fluoride varnish, a high concentration fluoride coating that is painted on teeth, can prevent about one-third (33%) of decay in the primary (baby) teeth. Children living in communities with fluoridated tap water have fewer decayed teeth than children who live in areas where their tap water is not fluoridated. Similarly, children who brush daily with fluoride toothpaste will have less tooth decay.

Applying dental sealants to the chewing surfaces of the back teeth is another way to prevent tooth decay. Studies in children show that sealants reduce decay in the permanent molars by 81% for 2 years after they are placed on the tooth and continue to be effective for 4 years after placement.[1]



Figure 8.10.1: Regular oral checkups are important even before temporary teeth fall out and permanent teeth come in.[3]

Middle Childhood Dental Health

Children in middle childhood will start or continue to lose teeth. They experience the loss of deciduous, or “baby,” teeth and the arrival of permanent teeth, which typically begins at age six or seven. It is important for children to continue seeing a dentist twice a year to be sure that these teeth are healthy.

The foods and nutrients that children consume are also important for dental health. Offer healthy foods and snacks to children and when children do eat sugary or sticky foods, they should brush their teeth afterward.



Figure 8.10.2: Setting up good habits like brushing and flossing daily is important for good health overall.[4]

Children should floss daily and brush their teeth at least twice daily: in the morning, at bedtime, and preferably after meals. Younger children need help brushing their teeth properly. Try brushing their teeth first and letting them finish. You might try using a timer or a favorite song so that your child learns to brush for 2 minutes. Parents or caregivers are encouraged to supervise brushing until your child is 7 or 8 years old to avoid tooth decay.

The best defense against tooth decay is flossing, brushing and adding fluoride; a mineral found in most tap water. If your water doesn't have fluoride, ask a dentist about fluoride drops, gel or varnish. Also ask your child's dentist about sealants—a simple, pain-free way to prevent tooth decay. These thin plastic coatings are painted on the chewing surfaces of permanent back teeth. They quickly harden to form a protective shield against germs and food. If a small cavity is accidentally covered by a sealant, the decay won't spread because germs trapped inside are sealed off from their food supply.

Children's dental health needs continuous monitoring as children lose teeth and new teeth come in. Many children have some malocclusion (when the way upper teeth aren't correctly positioned slightly over the lower teeth, including under- and overbites) or malposition of their teeth, which can affect their ability to chew food, floss, and brush properly. Dentists may recommend that it's time to see an orthodontist to maintain proper dental health. Dental health is exceedingly important as children grow more independent by making food choices and as they start to take over flossing and brushing. Parents can ease this transition by promoting healthy eating and proper dental hygiene.[5]

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8.11: Immunizations

People all over the world have become more aware of vaccinations and how they help increase health, since the COVID 19 pandemic that started in 2020. The world heaved a collective sigh when emergency approvals were given to pharmaceutical companies to produce and market these. Governments fought over vaccine supplies, and culture wars erupted. While some of the wars were over vaccine hoarding by economically privileged countries like the US, some were about individual choice, religious freedom, justified wariness of minoritized groups about testing, reliability and government responsibility, and political identity groups.

While the CDC recommends vaccines for newborns and in infancy, it is important for children to receive additional doses of vaccines to keep them protected. These boosters, given between ages 4 and 6, are doses of the vaccines they received earlier in life to help them maintain the best protection against vaccine-preventable diseases.



Figure **8.11.1**: Governments in most industrialized countries support childhood vaccination programs to keep populations healthy.[1]

Many states in the United States require children to be fully vaccinated (unless they have a medical reason to be exempt) before they can enroll in licensed child care or public school. If vaccinations were missed, a health care provider can help the child's caregivers to create a catch up schedule to ensure the child correctly "catches up" with the recommended childhood vaccination schedule.[2]

One way we can protect a child's health (and those around them) is through immunization. The vaccines (given through injection) may hurt a little…but the diseases they can prevent can hurt a lot more! Immunization shots, or vaccinations, are essential. They protect against things like measles, mumps, rubella, hepatitis B, polio, diphtheria, tetanus and pertussis (whooping cough). Immunizations are important for adults as well as for children. Here's why:

The immune system helps the human body fight germs by producing substances to combat them. Once it does, the immune system "remembers" the germ and can fight it again. Vaccines contain germs that have been killed or weakened. When given to a healthy person, the vaccine triggers the immune system to respond and thus build immunity.

Before vaccines, people became immune only by actually getting a disease and surviving it. Immunizations are an easier and less risky way to become immune.

Vaccines are the best defense we have against serious, preventable, and sometimes deadly contagious diseases. Vaccines are some of the safest medical products available, but like any other medical product, there may be risks. Accurate information about the value of vaccines as well as their possible side effects helps people to make informed decisions about vaccination.



Figure **8.11.2**: There are a list of childhood vaccines that are available in most countries of the world to keep populations healthy.[3]

Potential Side Effects

Vaccines, like all medical products, may cause side effects in some people. For the most part these are minor (for example, a sore arm or low-grade fever) and go away within a few days.[4] Serious side effects after vaccination, such as severe allergic reaction, are very rare.[5]

Remember, vaccines are continually monitored for safety, and like any medication, vaccines can cause side effects. However, a decision not to immunize a child involves a much greater risk. It could put the child and others who come into contact with him or her at risk of contracting a potentially deadly disease. Measles, polio, chickenpox, meningococcal virus and many of the other routinely vaccinated against diseases caused a lot of illness, disability and harm that is now mostly eradicated from the world, though in developing nations like India there is still much work to be done. Especially the COVID pandemic caused much backslide in the number of children who received no vaccinations at all. For example in India between 2005 and 2015, there was a 33% reduction in the gaps in vaccine coverage, and by 2016 the number of 0-dose children dropped to 10.1%. However, since the start of the pandemic, BCG vaccine coverage dropped from 92 to 85% and DTP-1 from 94 to 87%.

The controversies about vaccines

Vaccines work really well. No medicine is perfect, of course, but most childhood vaccines produce immunity about 90–100% of the time. When people do get breakthrough infections (get the disease despite being vaccinated) the symptoms are much less harsh, and the harm is much less. For example, people died of COVID-19 in the hundreds before the vaccine became available. I did get COVID

in November 2022 after being vaccinated and boosted, but the symptoms were relatively mild. I had a fever for about two days and felt a bit lousy for a week. My friend who contracted the disease in May 2020, before the vaccines were available, had to be hospitalized for about 3 weeks and took months to recuperate. An older friend who contracted the disease in Jan 2021 had to be hospitalized, put on a ventilator and finally passed away.

What about the argument made by some people that vaccines don't work that well . . . that diseases would be going away on their own because of better hygiene or sanitation, even if there were no vaccines? That simply isn't true. Certainly better hygiene and sanitation can help prevent the spread of disease, but the germs that cause disease will still be around, and as long as they are they will continue to make people sick. Further, the viruses will also continue to mutate within human hosts making the disease harder to treat.

All vaccines must be licensed (approved) by the Food and Drug Administration (FDA) before being used in the United States, and a vaccine must go through extensive testing to show that it works and that it is safe before the FDA will approve it. Among these tests are clinical trials, which compare groups of people who get a vaccine with groups of people who get a control. A vaccine is approved only if FDA makes the determination that it is safe and effective for its intended use.

If you look at the history of any vaccine-preventable disease, you will virtually always see that the number of cases of disease starts to drop when a vaccine is licensed. Vaccines are the most effective tool we have to prevent infectious diseases. I was born in 1969 in India and grew up there till I was 20 years old. I did get chickenpox and therefore got shingles when I was under a lot of stress a few years ago. I am glad that my kids have gotten the varicella vaccine and will therefore not have to worry about getting shingles when they are older. I also remember the horror of people getting small pox, and being vaccinated against it myself. I remember the celebration and jubilation in the streets of my city when small pox vaccines caused the disease to be eradicated. You are welcome -- from my generation to yours!

Opposition to Vaccines in the US

In 2010, a pertussis (whooping cough) outbreak in California sickened 9,143 people and resulted in 10 infant deaths: the worst outbreak in 63 years (Centers for Disease Control 2011b). Researchers, suspecting that the primary cause of the outbreak was the waning strength of pertussis vaccines in older children, recommended a booster vaccination for 11–12-year-olds and also for pregnant women (Zacharyczuk 2011). Pertussis is most serious for babies; one in five needs to be hospitalized, and since they are too young for the vaccine themselves, it is crucial that people around them be immunized (Centers for Disease Control 2011b). Several states, including California, have been requiring the pertussis booster for older children in recent years with the hope of staving off another outbreak.

But what about people who do not want their children to have this vaccine, or any other? That question is at the heart of a debate that has been simmering for years. Vaccines are biological preparations that improve immunity against a certain disease. Vaccines have contributed to the eradication and weakening of numerous infectious diseases, including smallpox, polio, mumps, chicken pox, and meningitis.



Figure **8.11.3**: These two young children contracted polio – but these scenes are highly uncommon in most countries since the wide availability and dispensation of the polio vaccine.[6]

However, many people express concern about potential negative side effects from vaccines. These concerns range from fears about overloading the child's immune system to controversial reports about devastating side effects of the vaccines.[7]

Although children continue to get several vaccines up to their second birthday, these vaccines do not overload the immune system. Every day, an infant's healthy immune system successfully fights off thousands of antigens – the parts of germs that cause their immune system to respond. Even if your child receives several vaccines in one day, vaccines contain only a tiny amount of antigens compared to the antigens your baby encounters every day in the normal world.

This is the case even if your child receives combination vaccines. Combination vaccines take two or more vaccines that could be given individually and put them into one shot. Children get the same protection as they do from individual vaccines given separately—but with fewer shots.[8]

One misapprehension is that the vaccine itself might cause the disease it is supposed to be immunizing against.[9] Vaccines help develop immunity by imitating an infection, but this "imitation" infection does not cause illness. Instead it causes the immune system to develop the same response as it does to a real infection so the body can recognize and fight the vaccine-preventable disease in the future. Sometimes, after getting a vaccine, the imitation infection can cause minor symptoms, such as fever and pain at the site of the injection. Such minor symptoms are normal and should be expected as the body builds immunity.[10]

Another commonly circulated concern is that vaccinations, specifically the MMR vaccine (MMR stands for measles, mumps, and rubella), are linked to autism. The autism connection has been particularly controversial and caused a great deal of public harm. In 1998, a British physician named Andrew Wakefield published a study in Great Britain's Lancet magazine that linked the MMR vaccine to autism. The report received a lot of media attention, resulting in British immunization rates decreasing from 91 percent in 1997 to almost 80 percent by 2003, accompanied by a subsequent rise in measles cases (Devlin 2008). A prolonged investigation by the British Medical Journal proved that not only was the link in the study nonexistent, but that Dr. Wakefield had falsified data in order to support his claims (CNN 2011). Dr. Wakefield was discredited and stripped of his license, but the doubt still lingers in many parents' minds.

In the United States, many parents still believe in the now discredited MMR-autism link and refuse to vaccinate their children. Other parents choose not to vaccinate for various reasons like religious or health beliefs. In one instance, a boy whose parents opted not to vaccinate returned home to the U.S. after a trip abroad; no one yet knew he was infected with measles. The boy exposed 839 people to the disease and caused 11 additional cases of measles, all in other unvaccinated children, including one infant who had to be hospitalized.



Figure **8.11.4**: The MMR vaccine has made this picture fairly uncommon until a rash of people in Western countries started anti-vaxer movements - A baby with measles[11]

According to a study published in Pediatrics (2010), the outbreak cost the public sector $10,376 per diagnosed case. The study further showed that the intentional non-vaccination of those infected occurred in students from private schools, public charter schools, and public schools in upper-socioeconomic areas (Sugerman et al. 2010).[12]

The Immunization Schedule

On-time vaccination throughout childhood is essential because it helps provide immunity before children are exposed to potentially life-threatening diseases. Vaccines are tested to ensure that they are safe and effective for children to receive at the recommended ages.[13]

Fully vaccinated children in the U.S. are protected against sixteen potentially harmful diseases. Vaccine-preventable diseases can be very serious, may require hospitalization, or even be deadly — especially in infants and young children.[14]

Here is the schedule from the CDC to ensure a child is fully vaccinated:

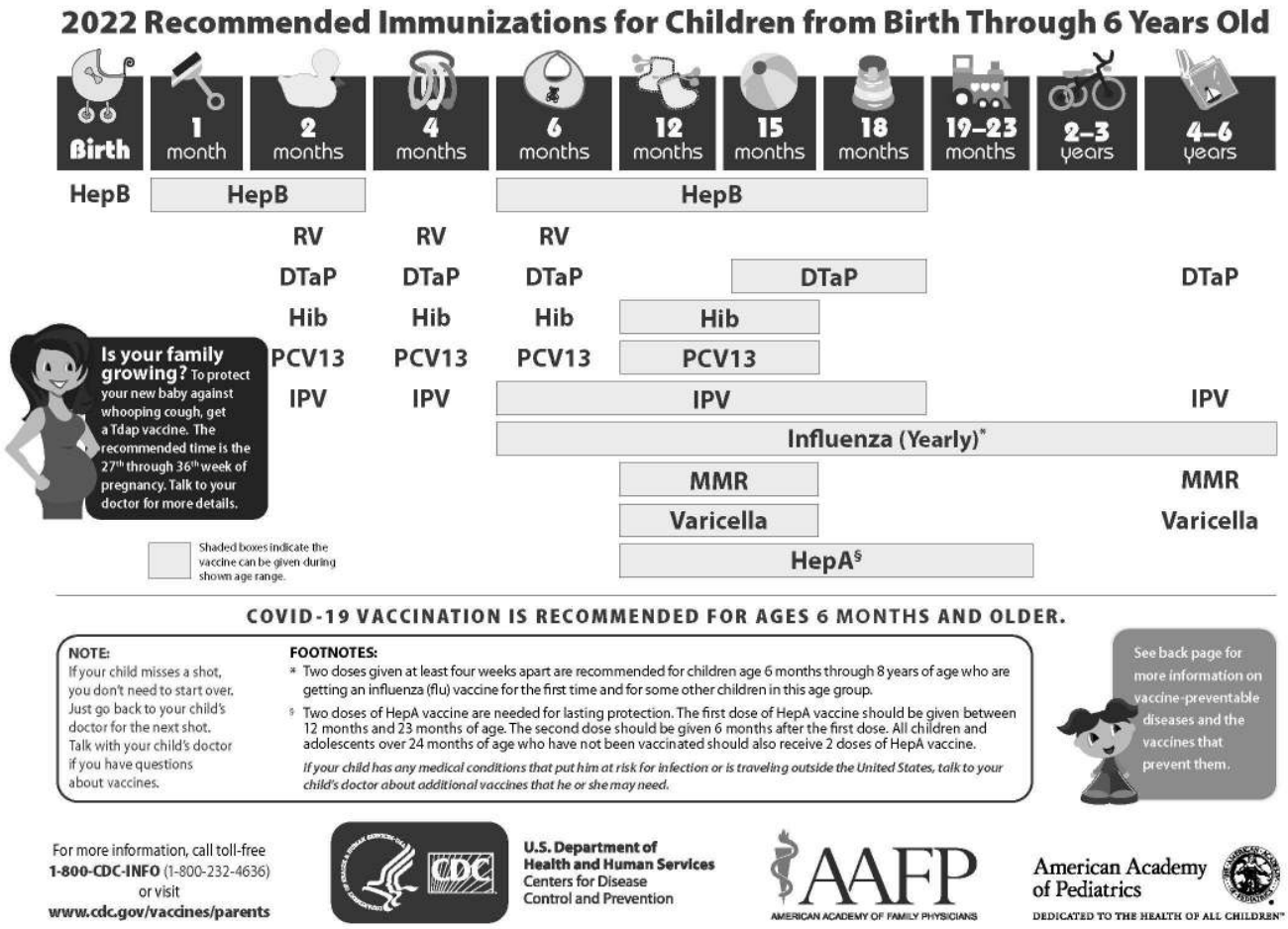


Table **8.11.1**: Vaccine-Preventable Diseases - chickenpox, diphtheria, HiB, Hepatitis A and B, flu, measles, mumps, pertussis, polio, pneumococcal, rotavirus, rubella and tetanus - how they are transmitted through direct contact, air, or skin contact, their main symptoms and complications.[16]

Disease	Vaccine	Disease spread by	Disease symptoms	Disease complications
Chickenpox	Varicella vaccine protects against chickenpox.	Air, direct contact	Rash, tiredness, headache, fever	Infected blisters, bleed pneumonia (infection in
Diphtheria	DTaP* vaccine protects against diphtheria.	Air, direct contact	Sore throat, mild fever, weakness, swollen glands in neck	Swelling of the heart mu
Hib	Hib vaccine protects against *Haemophilus influenzae type* b.	Air, direct contact	May be no symptoms unless bacteria enter the blood	Meningitis (infection o cord), intellectual disa that can blockthe windp pneumonia (infection in
Hepatitis A	HepA vaccine protects against hepatitis A.	Direct contact, contaminated food or water	May be no symptoms, fever, stomach pain, loss of appetite, fatigue, vomiting, jau ndice (yellowing of skin and eyes), dark urine	Liverfailure,arthralgia (disorders, death
Hepatitis B	HepB vaccine protects against hepatitis B.	Contact with blood or body fluids	May be no symptoms, fevei, headache, weakness, vomiting, jaundice (yellowing of skin and eyes), joint pain	Chronic liver infection,
Influenza (Flu)	Flu vaccine protects against influenza.	Air, direct contact	Fever, muscle pain, sore throat, cough, extreme fatigue	Pneumonia (infection i infections, death
Measles	MMR** vaccine protects against measles.	Air, direct contact	Rash, fever, cough, runny nose, pinkeye	Encephalitis (brain swe death
Mumps	MMR**vaccine protects against mumps.	Air, direct contact	Swollen salivary glands (under the jaw), fever, headache, tiredness, muscle pain	Meningitis (infection o cord), encephalitis (br ovaries, deafness, death
Pertussis	DTaP* vaccine protects against pertussis (whooping cough).	Air, direct contact	Severe cough, runny nose, apnea (a pause in breathing in infants)	Pneumonia (infection in
Polio	IPV vaccine protects against polio.	Air, direct contact, through the mouth	May be no symptoms, sore throat, fever, nausea, headache	Paralysis, death
Pneumococcal	PCV13 vaccine protects against pneumococcus.	Air, direct contact	May be no symptoms, pneumonia (infection in the lungs)	Bacteremia (blood infe around the brain and spi
Rotavirus	RV vaccine protects against rotavirus.	Through the mouth	Diarrhea, fever, vomiting	Severe dianhea, dehydra
Rubella	MMR** vaccine protects against rubella.	Air, direct contact	Sometimes rash, fever, swollen lymph nodes	Very serious in pregnan premature delivery, birtl
Tetanus	DTaP* vaccine protects against tetanus.	Exposure through cuts in skin	Stiffness in neckand abdominal muscles, difficulty swallowing, muscle spasms, fever	Broken bones, breathing

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8.12: Handwashing

Handwashing is one of the best ways to prevent the spread of illness. It's important for children (and adults) to wash their hands often, especially when they are likely to get and spread germs, including:

- Before, during, and after preparing food.
- Before eating food.
- After blowing nose, coughing, or sneezing.
- After using the toilet.
- After touching an animal, animal feed, or animal waste.
- After touching garbage.

It's important for children to learn how to properly wash their hands. When washing hands children (and adults) should follow these five steps every time.

1. Wet your hands with clean, running water (warm or cold), turn off the tap, and apply soap.
2. Lather your hands by rubbing them together with the soap. Lather the backs of your hands, between your fingers, and under your nails.
3. Scrub your hands for at least 20 seconds. Need a timer? Hum or sing the *Happy Birthday* song or *ABCs* from beginning to end twice.
4. Rinse your hands well under clean, running water.
5. Dry your hands using a clean towel or air dry them.[1]



Figure 8.12.1: Children need to be taught how to wash their hands correctly, but the current pandemic has shown that all of us might benefit from learning this.[2]

Caregivers can help keep children healthy by:

- Teaching them good handwashing techniques.
- Reminding their kids to wash their hands.
- Washing their own hands with the children.[3]

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8.13: Injuries

Injuries are a big part of child safety, and preventable accidents in childhood.

Infancy

There are different risks to infant safety. According to the CDC, nonfatal injury rates varied by age group.

- Nonfatal suffocation rates were highest for those less than 1 year of age.
- Rates for fires or burns, and drowning were highest for children 4 years and younger.
- Children 1 to 4 years of age had the highest rates of nonfatal falls and poisoning.

And the leading causes of injury death also differed by age group.

- For children less than 1 year of age, two–thirds of injury deaths were due to suffocation.
- Drowning was the leading cause of injury or death for those 1 to 4 years of age.[1]

Car seat safety

Motor vehicle injuries are a leading cause of death among children in the United States. But many of these deaths can be prevented.

- In the United States, 723 children ages 12 years and younger died as occupants in motor vehicle crashes during 2016, and more than 128,000 were injured in 2016.
- One CDC study found that, in one year, more than 618,000 children ages 0-12 rode in vehicles without the use of a child safety seat or booster seat or a seat belt at least some of the time.
- Of the children ages 12 years and younger who died in a crash in 2016 (for which restraint use was known), 35% were not buckled up.[2]

Buckling children in age- and size-appropriate car seats, booster seats, and seat belts reduces the risk of serious and fatal injuries:

- Car seat use reduces the risk for injury in a crash by 71-82% for children when compared to seat belt use alone.
- Booster seat use reduces the risk for serious injury by 45% for children aged 4–8 years when compared with seat belt use alone.
- For older children and adults, seat belt use reduces the risk for death and serious injury by approximately half.[3]

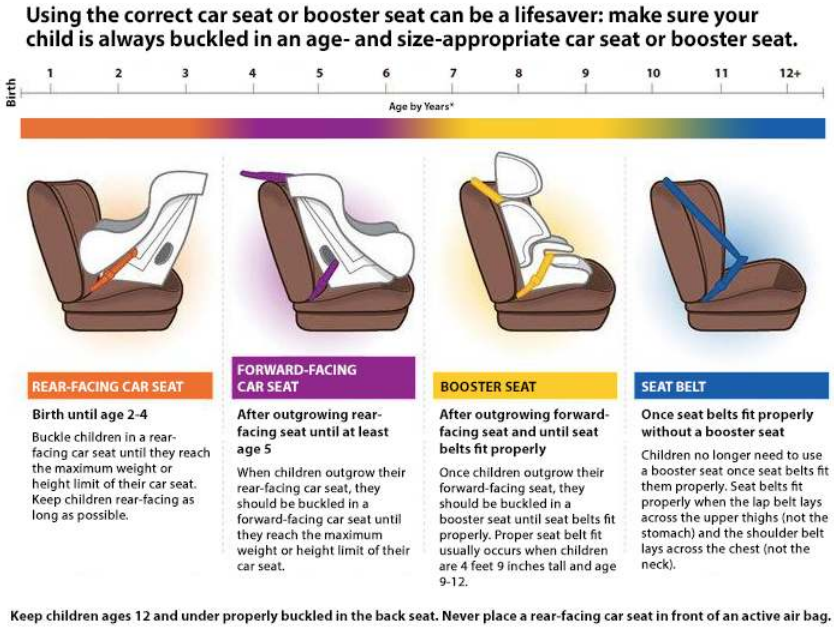


Figure 8.13.1: The different types of car seats based on age – from 0-24/48 months a rear facing car seat is best, forward facing carseats to be used till at least age 5, and then a booster seat to be used till age 9-12 years or until a seat belt fits properly.[4]

Early childhood

Child injuries are preventable, yet more than 9,000 children (from 0-19 years) died from injuries in the US in 2009. Car crashes, suffocation, drowning, poisoning, fires, and falls are some of the most common ways children are hurt or killed. The number of children dying from injury dropped nearly 30% over the last decade. However, injury is still the number 1 cause of death among children.[5]

Children during early childhood are more at risk for certain injuries. Using data from 2000-2006, the CDC determined that:

- Drowning was the leading cause of injury death between 1 and 4 years of age.
- Falls were the leading cause of nonfatal injury for all age groups less than 15.
- For children ages 0 to 9, the next two leading causes were being struck by or against an object and animal bites or insect stings.
- Rates for fires or burns, and drowning were highest for children 4 years and younger.[6]

Here is a table summarizing some tips from the CDC to protect children from these injuries:

Preventing childhood injuries

Type of Injury	Prevention Tips
Burns	• Have smoke alarms on every floor and in all rooms people sleep in • Involve children in creating and practicing an escape plan • Never leave food cooking on the stove unattended; supervise any use of microwave • Make sure the water heater is set to 120 degrees or lower[7]
Drowning	• Make sure caregivers are trained in CPR • Fence off pools; gates should be self-closing and self-latching • Have children wear life jackets in and around natural bodies of water • Supervise children in or near water (including the bathtub)[8]
Falls	• Make sure playground surfaces are safe, soft, and made of impact absorbing material (such as wood chips or sand) at an appropriate depth and are well maintained • Use safety devices (such as window guards) • Make sure children are wearing protective gear during sports and recreation (such as bicycle helmets) • Supervise children around fall hazards at all times[9]
Poisoning	• Lock up all medications and toxic products (such as cleaning solutions and detergents) in original packaging out of sight and reach of children • Know the number to poison control (1-800-222-1222) • Read and follow labels of all medications • Safely dispose of unused, unneeded, or expired prescription drugs and over the counter drugs, vitamins, and supplements[10]
Motor-accident, in vehicle	• Children should still be safely restrained in a five point harnessed car seat • Children should be in back seat • Children should not be seated in front of an airbag
Motor-accident, pedestrian	• Teach children about safety including: • o Walking on the sidewalk • o Not assuming vehicles see you or will stop • o Crossing only in crosswalks • o Looking both ways before crossing • o Never playing in the road • o Not crossing a road without an adult • Supervise children near all roadways and model safe behavior[11]



Figure 8.13.2: Park equipment needs to be tested for safety of small children who might play there.[12]

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8.14: Other infant health considerations

Infants depend on the adults that care for them to promote and protect their health. Some physical conditions and issues are very common during infancy. Many are normal, and the infant's caregivers can deal with them if they occur. Mostly, it is a matter of the caregivers learning about what is normal for their infant and getting comfortable with the new routine in the household. New parents and caregivers often have questions about many of these regular issues (NIH information - some basics about infant health)

Bowel movements

Infants' bowel movements go through many changes in color and consistency, even within the first few days after birth. While the color, consistency, and frequency of stool will vary, hard or dry stools may indicate dehydration and increased frequency of watery stools may indicate diarrhea.



Figure **8.14.1**: Diaper changes assure parents of the child's nutritional intake and also help children stay warm, dry and comfortable. [1]

Diaper Rash

A rash on the skin covered by a diaper is quite common. It is usually caused by irritation of the skin from being in contact with stool and urine. It can get worse during bouts of diarrhea. Diaper rash usually can be prevented by frequent diaper changes.

Colic

Many infants are fussy in the evenings, but if the crying does not stop and gets worse throughout the day or night, it may be caused by colic. According to the American Academy of Pediatrics, about one-fifth of all infants develop colic, usually starting between 2 and 4 weeks of age. They may cry inconsolably or scream, extend or pull up their legs, and pass gas. Their stomachs may be enlarged. The crying spells can occur anytime, although they often get worse in the early evening.

The colic will likely improve or disappear by the age of 3 or 4 months. There is no definite explanation for why some infants get colic. Health care providers can help ensure there is no medical reason behind the crying.

Some infants seem to be soothed by being held, rocked, or wrapped snugly in a blanket. Some like a pacifier.



Figure 8.14.2: A father holding a crying infant in a "football" hold putting pressure on the infant's abdomen helps some children with colic calm down.[2]

Shaken Baby Syndrome

Here is a PSA from the Center for Disease Control (CDC)

The crying.

The late-night feedings.

The diaper changes.

The exhaustion.

If you've ever been around a baby who won't stop crying, you know there's potential to get frustrated. Focus on calming yourself and understand that you may not be able to calm your baby. It's not your fault or your baby's.[3]

It's normal for healthy babies to cry and some babies cry much more than others. And they cannot always be consoled and caregivers can feel pushed to the limit. When caregivers lose control and shake a baby it can have devastating effects.

Shaken Baby Syndrome (SBS) is a severe form of physical child abuse. SBS may be caused from vigorously shaking an infant by the shoulders, arms, or legs. The "whiplash" effect can cause intracranial (within the brain) or intraocular (within the eyes) bleeding. Often there is no obvious external head trauma. Still, children with SBS may display some outward signs:

- Change in sleeping pattern or inability to be awakened
- Confused, restless, or agitated state
- Convulsions or seizures
- Loss of energy or motivation
- Slurred speech
- Uncontrollable crying
- Inability to be consoled
- Inability to nurse or eat

SBS can result in death, mental retardation or developmental delays, paralysis, severe motor dysfunction, spasticity, blindness, and seizures.

Who's at Risk?

Small children are especially vulnerable to this type of abuse. Their heads are large in comparison to their bodies, and their neck muscles are weak. Children under one year of age are at highest risk, but SBS has been reported in children up to five years of age. Shaking often occurs in response to a baby crying or having a toilet-training accident. The perpetrator tends to be male and is primarily the biological father or the mother's boyfriend or partner. Caregivers are responsible for about 9%-21% of cases. The

explanation typically provided by the caregiver—"I was playing with the baby"—does not begin to account for the severity of trauma. Many times there is also a history of child abuse.

Can It Be Prevented?

SBS is completely preventable. However, it is not known whether educational efforts will effectively prevent this type of abuse. Home visitation programs are shown to prevent child abuse in general. Because the child's father or the mother's partner often causes SBS, they should be included in home visitation programs. Home visits bring community resources to families in their homes. Health professionals provide information, healthcare, psychological support, and other services that can help people to be more effective parents and care-givers.

The Bottom Line

- Shaking a baby can cause death or permanent brain damage. It can result in life-long disability.
- Healthy strategies for dealing with a crying baby include:
  - finding the reason for the crying
  - checking for signs of illness or discomfort, such as diaper rash, teething, tight clothing;
  - feeding or burping;
  - soothing the baby by rubbing its back; gently rocking; offering a pacifier; singing or talking;
  - taking a walk using a stroller or a drive in a properly-secured car seat;
  - or calling the doctor if sickness is suspected
- All babies cry. Caregivers often feel overwhelmed by a crying baby. Calling a friend, relative, or neighbor for support or assistance lets the caregiver take a break from the situation. If immediate support is not available, the caregiver could place the baby in a crib (making sure the baby is safe), close the door, and check on the baby every five minutes.[4]



Figure 8.14.3: Medical professionals caring for an infant in what appears to be a trauma unit.[5]

Abusive Head Trauma

Shaken baby syndrome is part abusive head trauma (AHT), severe form of physical child abuse that results in an injury to the brain of a child. This is important to note because:

- Abusive head trauma is a leading cause of physical child abuse deaths in children under 5 in the United States.
- Abusive head trauma accounts for approximately one third of all child maltreatment deaths.
- The most common trigger for abusive head trauma is inconsolable crying.
- Babies less than one year old are at greatest risk of injury from abusive head trauma.[6]

Jaundice

Jaundice can cause an infant's skin, eyes, and mouth to turn a yellowish color. The yellow color is caused by a buildup of bilirubin, a substance that is produced in the body during the normal process of breaking down old red blood cells and forming new ones.

Normally the liver removes bilirubin from the body. But, for many infants, in the first few days after birth, the liver is not yet working at its full power. As a result, the level of bilirubin in the blood gets too high, causing the infant's color to become slightly yellow—this is jaundice.

Although jaundice is common and usually not serious, in some cases, high levels of bilirubin could cause brain injury. All infants with jaundice need to be seen by a health care provider.

Many infants need no treatment. Their livers start to catch up quickly and begin to remove bilirubin normally, usually within a few days after birth. For some infants, health care providers prescribe phototherapy—a treatment using a special lamp—to help break down the bilirubin in their bodies.



Figure **8.14.4**: An infant receiving treatment for jaundice which includes exposure to white light.[7]

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8.15: Illnesses and conditions in childhood

Childhood illnesses and conditions can impede the quality of life of children. An understanding and access to healthcare can improve children's lives significantly.

Vision and Hearing

The most common vision problem in middle childhood is being nearsighted, otherwise known as Myopia. 25% of children will be diagnosed by the end of middle childhood. Being nearsighted can be corrected by wearing glasses with corrective lenses.



Figure **8.15.1**: Children need to receive eye exams as part of their regular well child visits.[1]

Children may have many ear infections in early childhood, but it’s not as common within the 6-12 year age range. Numerous ear infections during middle childhood may lead to headaches and migraines, which may result in hearing loss.[2]

Diabetes in Childhood

Los and Wilt (2023) describe childhood onset diabetes (Type 1 diabetes) as an autoimmune condition where individuals (often between 5 to puberty) are diagnosed with high blood and urine sugar levels because their bodies are not producing enough insulin to allow their body cells to use the sugar they ingest. The diagnosis often involves symptoms that include major weight loss, peeing a lot, and drinking a lot of water. If diagnosis is delayed, other symptoms, even life threatening ones can result. While there is no cure, treatment involves managing insulin levels for the rest of one's life through testing, medication and careful diet adjustments.

While type 2 diabetes used to be called adult onset diabetes there are more diagnoses of this type as well in children now. This type is related to overweight and high sugar intake.

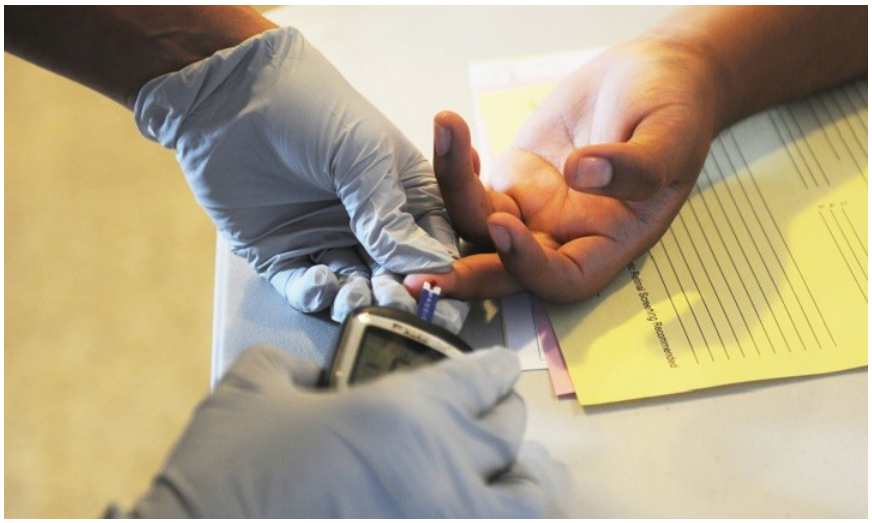


Figure **8.15.2**: The finger-prick test is used to measure blood sugar and anemia.[4]

Asthma

Childhood asthma that is unmanaged may make it difficult for children to develop to their fullest potential. Asthma is a chronic lung disease that inflames and narrows the airways. Asthma causes recurring periods of wheezing (a whistling sound when you breathe), chest tightness, shortness of breath, and coughing. The coughing often occurs at night or early in the morning. Asthma affects people of all ages, but it most often starts during childhood. In the United States, more than 25 million people are known to have asthma. About 7 million of these people are children.

To understand asthma, it helps to know how the airways work. The airways are tubes that carry air into and out of your lungs. People who have asthma have inflamed airways. The inflammation makes the airways swollen and very sensitive. The airways tend to react strongly to certain inhaled substances. When the airways react, the muscles around them tighten. This narrows the airways, causing less air to flow into the lungs. The swelling also can worsen, making the airways even narrower. Cells in the airways might make more mucus than usual. Mucus is a sticky, thick liquid that can further narrow the airways. This chain reaction can result in asthma symptoms. Symptoms can happen each time the airways are inflamed.

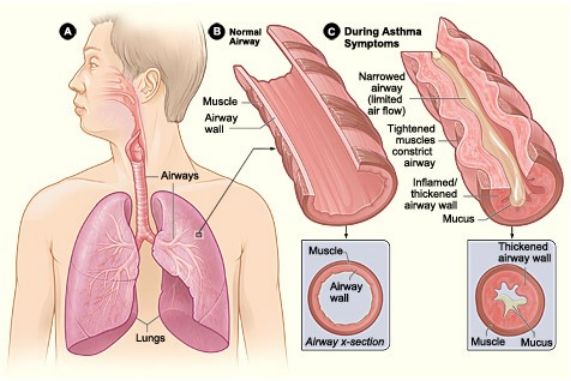


Figure **8.15.3**: **Figure A** shows the location of the lungs and airways in the body. **Figure B** shows a cross-section of a normal airway. **Figure C** shows a cross-section of an airway during asthma symptoms when airways are blocked, tightened muscles constrict airways and airway walls are inflamed or thickened with mucus.[5]

Sometimes asthma symptoms are mild and go away on their own or after minimal treatment with asthma medicine. Other times, symptoms continue to get worse. When symptoms get more intense and/or more symptoms occur, you're having an asthma attack. Asthma attacks also are called flare-ups or exacerbations (eg-zas-er-BA-shuns).



Figure 8.15.4: The different things that can trigger asthma include stress, anger, pollution, strong odors, smoke, dust, fungus spores, cold air, chemical fumes, bugs in the home, pollen, exercise and pets.[6

Treating symptoms when you first notice them is important. This will help prevent the symptoms from worsening and causing a severe asthma attack. Severe asthma attacks may require emergency care, and they can be fatal. Asthma has no cure. Even when you feel fine, you still have the disease and it can flare up at any time.

However, with today's knowledge and treatments, most people who have asthma are able to manage the disease. They have few, if any, symptoms. They can live normal, active lives and sleep through the night without interruption from asthma. If you have asthma, you can take an active role in managing the disease. For successful, thorough, and ongoing treatment, build strong partnerships with your doctor and other health care providers.[7]

References:

Los, E. & Wilt, A. S. (2023). Type 1 Diabetes in Children. StatPearls: NIH.

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8.16: Managing symptoms, Staying healthy

Being healthy is important for all children and can be especially important for children with mental health disorders. In addition to getting the right treatment, leading a healthy lifestyle can play a role in managing symptoms. Here are some healthy behaviors that may help:

- Eating a healthful dietcentered on fruits, vegetables, whole grains, legumes (for example, beans, peas, and lentils), lean protein sources, and nuts and seeds
- Participating in physical activityfor at least 60 minutes each day
- Getting the recommended amount of sleepeach night based on age
- Practicing mindfulness or relaxation techniques[1]



Figure **8.16.1**: Staying healthy is critical for all children, especially those who may have mental health disorders.[2]

Stress and COVID 19

We all went through an unprecedented period starting in March 2020 that lasted for almost three years in many parts all over the world. The lockdown imposed by governments in the interest of larger public health had health consequences of its own. In the early days, Toppe et al (2021) conducted an exploratory online survey with parents of preschool and school-aged children to examine the levels of stress parents reported and how they correlated with parents' education levels, housing situations, SES, national cultural values and children's stress. The survey respondents were from 17 countries, but most of them were from Germany, Iran, UK and the US. It was a strange and unique time, but one that people everywhere were experiencing. Not surprisingly, it was found that SES helps to increase resilience to stress. But there were some surprising findings such as increased parental stress among parents with Ph.D.s with preschool children, as opposed to parents of preschoolers with lower education levels. On the other hand, many findings were in line with already established research findings such as having more space - particularly outdoors - mitigated stress levels for both parents and their children, particularly preschool aged children. Also unsurprisingly digital media use increased, and most parents were worried about this use. But they also experienced greater stress in relation to this with having to juggle their own occupational demands while supervising their children. In line with how multiple stressors might have an additive (or even an escalative) effect, parents who had children who were preschool aged and school aged reported greater stress than parents with children in either one age group. This latter effect held no matter the number of children indicating that parents perceive (rightly) that children of these different ages demand different types of support, caregiving and educational opportunities.

As the lockdowns abate, mask mandates stop and testing eases, children have emerged from their homes. Certainly the age of the child when the pandemic started will differentially affect so many outcomes. The term "cohort effect" takes on poignant particular meaning as we continue to study the effects long after the actual pandemic has ended.

References:

Toppe, T., Stengelin, R., Schmidt, L.S., Amini, N. & Schuhmacher, N. (2021). Explaining variation in parents' and their children's stress during COVID-19 lockdowns. *Front. Psychol.* 12:645266. doi: 10.3389/fpsyg.2021.645266

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CHAPTER OVERVIEW

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9.1: Overview of child mental health

Emotional regulation is the ability to successfully control our emotions, which takes effort, but the ability to do so can have important positive health outcomes**.** Emotional responses such as the stress reaction are useful in warning us about potential danger and in mobilizing our response to it, so it is a good thing that we have them. However, we also need to learn how to control and regulate our emotions, to prevent them from letting our behavior get out of control.[1]

Stress may not be a disorder, but if it continues and becomes more intense and debilitating, it may lead to a disorder. We experience stress in our everyday lives, including daily hassles. People who experience strong negative emotions as a result of these hassles, exhibit negative stress responses. Stress can be managed by using coping strategies and by becoming better at emotional regulation. The best antidote for stress is to think positively, have fun, and enjoy the company of others. People who express optimism, self-efficacy, and grit tend to cope better with stress and experience better health overall.[2]

Childhood Stress

Take a moment to think about how you deal with and how stress affects you. Now think about what the impact of stress may have on a child and their development?

Of course children experience stress and different types of stressors differently. Not all stress is bad. Normal, everyday stress can provide an opportunity for young children to build coping skills and poses little risk to development. Even more long-lasting stressful events such as changing schools or losing a loved one can be managed fairly well. But children who experience toxic stress or who live in extremely stressful situations of abuse over long periods of time can suffer long-lasting effects. The structures in the midbrain or limbic system such as the hippocampus and amygdala can be vulnerable to prolonged stress during early childhood (Middlebrooks and Audage, 2008). High levels of the stress hormone cortisol can reduce the size of the hippocampus and affect the child's memory abilities. Stress hormones can also reduce immunity to disease. If the brain is exposed to long periods of severe stress it can develop a low threshold making the child hypersensitive to stress in the future. Whatever the effects of stress, it can be minimized if a child learns to deal with stressors and develop coping strategies with the support of caring adults. It's easy to know when your child has a fever or other physical symptoms. However, a child's mental health problems may be harder to identify. In the next section, we'll look at childhood Mental Health Disorders.[3]

Disorders and Syndromes

A psychological disorder is an unusual, distressing, and dysfunctional pattern of thought, emotion, or behavior. Psychological disorders are often **co-occurring** or **comorbid**, meaning that a given person suffers from more than one disorder. Psychologists diagnose a disorder using the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM*). When diagnosed, people feel that a mental disorder is a stigma, but mental illness is not a "fault," and it is important to work to help overcome the stigma associated with disorder. The following are various disorders that may affect children, adolescence, and adults.

Childhood Mental Health

Mental health problems can disrupt daily life at home, at school or in the community. Without help, mental health problems can lead to school failure, alcohol or other drug abuse, family discord, violence or even suicide. However, help is available. Talk to your health care provider if you have concerns about your child's behavior.

Mental health disorders are diagnosed by a qualified professional using the Diagnostic and Statistical Manual of Mental Disorders (DSM). This is a manual that is used as a standard across the profession for diagnosing and treating mental disorders.[5]

Labels?

Children are continually evaluated as they enter and progress through school. If a child is showing a need, they should be assessed by a qualified professional who would make a recommendation or diagnosis of the child and give the type of instruction, resources, accommodations, and support that they should receive.

Ideally, a proper diagnosis or label is extremely beneficial for children who have educational, social, emotional, or developmental needs. Once their difficulty, disorder, or disability is labeled then the child will receive the help they need from parents, educators and any other professionals who will work as a team to meet the student's individual goals and needs.

However, it's important to consider that children that are labeled without proper support and accommodations or worse they may be misdiagnosed will have negative consequences. A label can also influence the child's self-concept, for example, if a child is misdiagnosed as having a learning disability; the child, teachers, and family member interpret their actions through the lens of that label. Labels are powerful and can be good for the child or they can go detrimental for their development all depending on the accuracy of the label and if they are accurately applied.

A team of people who include parents, teachers, and any other support staff will look at the child's evaluation assessment in a process called an Individualized Education Plan (IEP). The team will discuss the diagnosis, recommendations, and the accommodations or help and a decisions will be made regarding what is the best for the child. This is time when parents or caregivers decide if they would like to follow this plan or they can dispute any part of the process. During an IEP, the team is able to voice concerns and questions. Most parents feel empowered when they leave these meetings. They feel as if they are a part of the team and that they know what, when, why, and how their child will be helped.

Childhood Mental Health Disorders

Social and Emotional Disorders

- Anxiety
- Phobias
- Post-Traumatic Stress Syndrome - PTSD
- Obsessive Compulsive Disorder –OCD
- Depression

Developmental Disorders

- Autism Spectrum Disorder (ASD)
- Attention Deficit Disorder (ADHD)
- Pervasive Developmental Disorder (PDD)[7]

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9.2: Childhood anxiety and phobias

Anxiety

Many children have fears and worries, and will feel sad and hopeless from time to time. Strong fears will appear at different times during development. For example, toddlers are often very distressed about being away from their parents, even if they are safe and cared for. Although fears and worries are typical in children, persistent or extreme forms of fear and sadness feelings could be due to anxiety disorders or depression. Because the symptoms primarily involve thoughts and feelings, they are called **internalizing disorders**.



Figure **9.2.1**: An anxious child.[1]

When children do not outgrow the fears and worries that are typical in young children, or when there are so many fears and worries that interfere with school, home, or play activities, the child may be diagnosed with an anxiety disorder. Examples of different types of anxiety disorders include:

- Being very afraid when away from parents (separation anxiety)
- Having extreme and unreasonable fear about a specific thing or situation, such as dogs, insects, or going to the doctor (phobias)
- Being very afraid of school and other places where there are people (social anxiety)
- Being very worried about the future and about bad things happening (general anxiety)
- Having repeated episodes of sudden, unexpected, intense fear that come with symptoms like heart pounding, having trouble breathing, or feeling dizzy, shaky, or sweaty (panic disorder)

Anxiety may present as fear or worry, but can also make children irritable and angry. Anxiety symptoms can also include trouble sleeping, as well as physical symptoms like fatigue, headaches, or stomachaches. Some anxious children keep their worries to themselves and, thus, the symptoms can be missed.

Phobias

When a child who has a **phobia** (an extreme or irrational fear of or aversion to something) is exposed to the phobic stimulus (the stimuli varies), it almost invariably provokes an immediate anxiety response, which may take the form of a situational bound or situational predisposed panic attack. Children can show effects and characteristics when it comes to specific phobias. The effects of anxiety show up by crying, throwing tantrums, experiencing freezing, or clinging to the parent that they have the most connection with.

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9.3: OCD and PTSD

Obsessive Compulsive Disorder (OCD)

Although a diagnosis of OCD requires only that a person either has obsessions or compulsions, not both, approximately 96% of people diagnosed with OCD experience both. For almost all people with OCD, being exposed to a certain stimuli (internal or external) will then trigger an upsetting or anxiety-causing obsession, which can only be relieved by doing a compulsion. For example, a person touches a doorknob in a public building, which causes an obsessive thought that they will get sick from the germs, which can only be relieved by compulsively washing their hands to an excessive degree. Some of the most common obsessions include unwanted thoughts of harming loved ones, persistent doubts that one has not locked doors or switched off electrical appliances, intrusive thoughts of being contaminated, and morally or sexually repugnant.[1]

Many children occasionally have thoughts that bother them, and they might feel like they have to do something about those thoughts, even if their actions don't actually make sense. For example, they might worry about having bad luck if they don't wear a favorite piece of clothing. For some children, the thoughts and the urges to perform certain actions persist, even if they try to ignore them or make them go away. Children may have an obsessive-compulsive disorder (OCD) when unwanted thoughts, and the behaviors they feel they must do because of the thoughts, happen frequently, take up a lot of time (more than an hour a day), interfere with their activities, or make them very upset. The thoughts are called obsessions. The behaviors are called compulsions.

Symptoms of OCD

Having OCD means having obsessions, compulsions, or both.

Examples of obsessive or compulsive behaviors include:

- Having unwanted thoughts, impulses, or images that occur over and over and which cause anxiety or distress.
- Having to think about or say something over and over (for example, counting, or repeating words over and over silently or out loud)
- Having to do something over and over (for example, handwashing, placing things in a specific order, or checking the same things over and over, like whether a door is locked)
- Having to do something over and over according to certain rules that must be followed exactly in order to make an obsession go away.

Children do these behaviors because they have the feeling that the behaviors will prevent bad things from happening or will make them feel better. However, the behavior is not typically connected to actual danger of something bad happening, or the behavior is extreme, such as washing hands multiple times per hour.

A common myth is that OCD means being really neat and orderly. Sometimes, OCD behaviors may involve cleaning, but many times someone with OCD is too focused on one thing that must be done over and over, rather than on being organized. Obsessions and compulsions can also change over time.

Treatment of OCD

The first step to treatment is to talk with a healthcare provider to arrange an evaluation. A comprehensive evaluation by a mental health professional will determine if the anxiety or distress involves memories of a traumatic event that actually happened, or if the fears are based on other thoughts or beliefs. The mental health professional should also determine whether someone with OCD has a current or past tic disorder. Anxiety or depression and disruptive behaviors may also occur with OCD.

Treatments can include behavior therapy and medication. Behavior therapy, specifically cognitive-behavioral therapy, helps the child change negative thoughts into more positive, effective ways of thinking, leading to more effective behavior. Behavior therapy for OCD can involve gradually exposing children to their fears in a safe setting; this helps them learn that bad things do not really occur when they don't do the behavior, which eventually decreases their anxiety. Behavior therapy alone can be effective, but some children are treated with a combination of behavior therapy and medication. Families and schools can help children manage stress by being part of the therapy process and learning how to respond supportively without accidentally making obsessions or compulsions more likely to happen again.

Prevention of OCD

It is not known exactly why some children develop OCD. There is likely to be a biological and neurological component, and some children with OCD also have Tourette syndrome or other tic disorders. There are some studies that suggest that health problems during pregnancy and birth may make OCD more likely, which is one of many important reasons to support the health of women during pregnancy (cdc.gov)

Post-Traumatic Stress Syndrome (PTSD)

Exposure to traumatic events can have major developmental influences on children. While the majority of children will not develop PTSD after a trauma, best estimates from the literature are that around a third of them will, higher than adult estimates. Some reasons for this could include more limited knowledge about the world, differential coping mechanisms employed, and the fact that children's reactions to trauma are often highly influenced by how their parents and caregivers react.

The impact of PTSD on children weeks after a trauma, show that up to 90% of children may experience heightened physiological arousal, diffuse anxiety, survivor guilt, and emotional liability. These are all normal reactions and should be understood as such (similar things are seen in adults). Those children still having these symptoms three or four months after a disaster, however, may be in need of further assessment, particularly if they show the following symptoms as well. For older children, warning signs of problematic adjustment include: repetitious play reenacting a part of the disaster; preoccupation with danger or expressed concerns about safety; sleep disturbances and irritability; anger outbursts or aggressiveness; excessive worry about family or friends; school avoidance, particularly involving somatic complaints; behaviors characteristic of younger children; and changes in personality, withdrawal, and loss of interest in activities.[2]

All children may experience very stressful events that affect how they think and feel. Most of the time, children recover quickly and well. However, sometimes children who experience severe stress, such as from an injury, from the death or threatened death of a close family member or friend, or from violence, will be affected long-term. The child could experience this trauma directly or could witness it happening to someone else. When children develop long term symptoms (longer than one month) from such stress, which are upsetting or interfere with their relationships and activities, they may be diagnosed with post-traumatic stress disorder (PTSD).

Symptoms of PTSD

- Reliving the event over and over in thought or in play
- Nightmares and sleep problems
- Becoming very upset when something causes memories of the event
- Lack of positive emotions
- Intense ongoing fear or sadness
- Irritability and angry outbursts
- Constantly looking for possible threats, being easily startled
- Acting helpless, hopeless or withdrawn
- Denying that the event happened or feeling numb
- Avoiding places or people associated with the event

Because children who have experienced traumatic stress may seem restless, fidgety, or have trouble paying attention and staying organized, the symptoms of traumatic stress can be confused with symptoms of attention-deficit/hyperactivity disorder (ADHD). Read a guide for clinicians on deciding if it is ADHD or child traumatic stress.external icon

Examples of events that could cause PTSD include

- Physical, sexual, or emotional maltreatment
- Being a victim or witness to violence or crime
- Serious illness or death of a close family member or friend
- Natural or manmade disasters
- Severe car accidents

Treatment for PTSD

The first step to treatment is to talk with a healthcare provider to arrange an evaluation. For a PTSD diagnosis, a specific event must have triggered the symptoms. Because the event was distressing, children may not want to talk about the event, so a health provider who is highly skilled in talking with children and families may be needed. Once the diagnosis is made, the first step is to make the child feel safe by getting support from parents, friends, and school, and by minimizing the chance of another traumatic event to the extent possible. Psychotherapy in which the child can speak, draw, play, or write about the stressful event can be done with the child, the family, or a group. Behavior therapy, specifically cognitive-behavioral therapy, helps children learn to change thoughts and feelings by first changing behavior in order to reduce the fear or worry. Medication may also be used to decrease symptoms.

Prevention of PTSD

It is not known exactly why some children develop PTSD after experiencing stressful and traumatic events, and others do not. Many factors may play a role, including biology and temperament. But preventing risks for trauma, like maltreatment, violence, or injuries, or lessening the impact of unavoidable disasters on children, can help protect a child from PTSD.

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9.4: Childhood depression

Occasionally being sad or feeling hopeless is a part of every child's life. However, some children feel sad or uninterested in things that they used to enjoy, or feel helpless or hopeless in situations where they could do something to address the situations. When children feel persistent sadness and hopelessness, they may be diagnosed with depression.



Figure **9.4.1**: Persistent sadness is a symptom of depression.[1]

Symptoms

We now know that youth who have depression may show signs that are slightly different from the typical adult symptoms of depression. Children who are depressed may complain of feeling sick, refuse to go to school, cling to a parent or caregiver, feel unloved, hopelessness about the future, or worry excessively that a parent may die. Older children and teens may sulk, get into trouble at school, be negative or grouchy, are irritable, indecisive, have trouble concentrating, or feel misunderstood. Because normal behaviors vary from one childhood stage to another, it can be difficult to tell whether a child who shows changes in behavior is just going through a temporary "phase" or is suffering from depression.

Examples of behaviors often seen in children with depression include

- Feeling sad, hopeless, or irritable a lot of the time
- Not wanting to do or enjoy doing fun things
- Showing changes in eating patterns – eating a lot more or a lot less than usual
- Showing changes in sleep patterns – sleeping a lot more or a lot less than normal
- Showing changes in energy – being tired and sluggish or tense and restless a lot of the time
- Having a hard time paying attention
- Feeling worthless, useless, or guilty
- Showing self-injury and self-destructive behavior

Extreme depression can lead a child to think about suicide or plan for suicide. For youth ages 10-24 years, suicide is among the leading causes of death. Read about youth suicide prevention.

Some children may not talk about their helpless and hopeless thoughts, and may not appear sad. Depression might also cause a child to make trouble or act unmotivated, causing others not to notice that the child is depressed or to incorrectly label the child as a trouble-maker or lazy.

Treatment

With medication, psychotherapy, or combined treatment, most youth with depression can be effectively treated. Youth are more likely to respond to treatment if they receive it early in the course of their illness.[2]

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9.5: Autism spectrum disorder



Figure 9.5.1: Temple Grandin is a spokesperson for ASD (TaurusEmerald, CC BY-SA 4.0 <https://creativecommons.org/licenses/by-sa/4.0>, via Wikimedia Commons)

Autism spectrum disorder (ASD) is a developmental disorder that affects communication and behavior.

Autism is known as a "spectrum" disorder because there is wide variation in the type and severity of symptoms people experience. ASD occurs in all ethnic, racial, and economic groups. Although ASD can be a lifelong disorder, treatments and services can improve a person's symptoms and ability to function. The American Academy of Pediatrics recommends that all children be screened for autism.

Changes to the diagnosis of ASD

In 2013, a revised version of the *Diagnostic and Statistical Manual of Mental Disorders (DSM)* was released. This revision changed the way autism is classified and diagnosed. Using the previous version of the *DSM*, people could be diagnosed with one of several separate conditions:

- Autistic disorder
- Asperger's' syndrome
- Pervasive developmental disorder not otherwise specified (PDD-NOS)

In the current revised version of the *DSM* (the *DSM-5*), these separate conditions have been combined into one diagnosis called "autism spectrum disorder." Using the *DSM-5*, for example, people who were previously diagnosed as having Asperger's syndrome would now be diagnosed as having autism spectrum disorder. Although the "official" diagnosis of ASD has changed, there is nothing wrong with continuing to use terms such as Asperger's syndrome to describe oneself or to identify with a peer group.

Signs and Symptoms of ASD

People with ASD have difficulty with social communication and interaction, and restricted interests, and repetitive behaviors. The list below gives some examples of the types of behaviors that are seen in people diagnosed with ASD. Not all people with ASD will show all behaviors, but most will show several.

Social communication / interaction behaviors may include:

- Making little or inconsistent eye contact
- Tending not to look at or listen to people
- Rarely sharing enjoyment of objects or activities by pointing or showing things to others
- Failing to, or being slow to, respond to someone calling their name or to other verbal attempts to gain attention
- Having difficulties with the back and forth of conversation

- Often talking at length about a favorite subject without noticing that others are not interested or without giving others a chance to respond
- Having facial expressions, movements, and gestures that do not match what is being said
- Having an unusual tone of voice that may sound sing-song or flat and robot-like
- Having trouble understanding another person's point of view or being unable to predict or understand other people's actions

Restrictive / repetitive behaviors may include:

- Repeating certain behaviors or having unusual behaviors. For example, repeating words or phrases, a behavior called *echolalia*
- Having a lasting intense interest in certain topics, such as numbers, details, or facts
- Having overly focused interests, such as with moving objects or parts of objects
- Getting upset by slight changes in a routine
- Being more or less sensitive than other people to sensory input, such as light, noise, clothing, or temperature

This information can be found at cdc.gov

People with ASD may also experience sleep problems and irritability. Although people with ASD experience many challenges, they may also have many strengths, including:

- Being able to learn things in detail and remember information for long periods of time
- Being strong visual and auditory learners
- Excelling in math, science, music, or art

Causes and Risk Factors

While scientists don't know the exact causes of ASD, research suggests that genes can act together with influences from the environment to affect development in ways that lead to ASD. Although scientists are still trying to understand why some people develop ASD and others don't, some risk factors include:

- Having a sibling with ASD
- Having older parents
- Having certain genetic conditions—people with conditions such as Down syndrome, fragile X syndrome, and Rett syndrome are more likely than others to have ASD
- Very low birth weight

Currently, estimates indicate that nearly 1 in 88 children in the United States has autism spectrum disorder; the disorder is 5 times more common in boys (1 out of 54) than girls (1 out of 252) (CDC, 2012). Rates of autistic spectrum disorder have increased dramatically since the 1980s. Although it is difficult to interpret this increase, it is possible that the rise in prevalence is the result of the broadening of the diagnosis, increased efforts to identify cases in the community, and greater awareness and acceptance of the diagnosis. In addition, mental health professionals are now more knowledgeable about autism spectrum disorder and are better equipped to make the diagnosis, even in subtle cases (Novella, 2008)

The exact causes of autism spectrum disorder remain unknown despite massive research efforts over the last two decades (Meek et al, 2013). Autism appears to be strongly influenced by genetics, as identical twins show concordance rates of 60%– 90%, whereas concordance rates for fraternal twins and siblings are 5%–10% (Autism Genome Project Consortium, 2007). Many different genes and gene mutations have been implicated in autism (Meek et al, 2013). Among the genes involved are those important in the formation of synaptic circuits that facilitate communication between different areas of the brain (Gauthier et al, 2011). A number of environmental factors are also thought to possibly be associated with increased risk for autism spectrum disorder, at least in part, because they contribute to new mutations. These factors include exposure to pollutants, such as plant emissions and mercury, urban versus rural residence, and vitamin D deficiency (Kinney et al, 2009).

No link to vaccinations

There is no scientific evidence that a link exists between autism and vaccinations (Hughes, 2007). Indeed, a recent study compared the vaccination histories of 256 children with autism spectrum disorder with that of 752 control children across three time periods during their first two years of life (birth to 3 months, birth to 7 months, and birth to 2 years) (DeStefano et al, 2013). At the time of the study, the children were between 6 and 13 years old, and their prior vaccination records were obtained. Because vaccines

contain immunogens (substances that fight infections), the investigators examined medical records to see how many immunogens children received to determine if those children who received more immunogens were at greater risk for developing autism spectrum disorder. The results of this study clearly demonstrated that the quantity of immunogens from vaccines received during the first two years of life were **not at all** related to the development of autism spectrum disorder.

Treatments and Therapies

Treatment for ASD should begin as soon as possible after diagnosis. Early treatment for ASD is important as proper care can reduce individuals' difficulties while helping them learn new skills and make the most of their strengths.

The wide range of issues facing people with ASD means that there is no single best treatment for ASD. Working closely with a doctor or health care professional is an important part of finding the right treatment program.

CDC has funded and conducted a study to explore early development (SEED) since 2007 and that is scheduled to continue till 2026 with information about the COVID pandemic etc.[1]

A doctor may use medication to treat some symptoms that are common with ASD. With medication, a person with ASD may have fewer problems with:

- Irritability
- Aggression
- Repetitive behavior
- Hyperactivity
- Attention problems
- Anxiety and depression

People with ASD may be referred to doctors who specialize in providing behavioral, psychological, educational, or skill-building interventions. These programs are typically highly structured and intensive and may involve parents, siblings, and other family members. Programs may help people with ASD:

- Learn life-skills necessary to live independently
- Reduce challenging behaviors
- Increase or build upon strengths
- Learn social, communication, and language skills[2]



Figure 9.5.1: Rich and Nubia Quick have put their autistic 8-year-old son, Matthew, through therapy to help him open up and relate more to others. The Quicks maintain a structured environment so Matthew can better adjust to the world around him.[3]

Figure - Rich and Nubia Quick have put their autistic 8-year-old son, Matthew, through therapy to help him open up and relate more to others. The Quicks maintain a structured environment so Matthew can better adjust to the world around him.[3]

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9.6: ADHD and PDD

Attention Deficit/Hyperactivity Disorder (AD/HD)

The exact causes of AD/HD are unknown; however, research has demonstrated that factors that many people associate with the development of AD/HD do not cause the disorder including, minor head injuries, damage to the brain from complications during birth, food allergies, excess sugar intake, too much television, poor schools, or poor parenting. Research has found a number of significant risk factors affecting neurodevelopment and behavior expression. Events such as maternal alcohol and tobacco use that affect the development of the fetal brain can increase the risk for AD/HD. Injuries to the brain from environmental toxins such as lack of iron have also been implicated.

Symptoms of AD/HD

People with AD/HD show a persistent pattern of inattention and/or hyperactivity–impulsivity that interferes with functioning or development:

1. **Inattention: Six or more symptoms of inattention for children up to age 16, or five or more for adolescents 17 and older and adults; symptoms of inattention have been present for at least 6 months, and they are inappropriate for developmental level:**

- Often fails to give close attention to details or makes careless mistakes in schoolwork, at work, or with other activities.
- Often has trouble holding attention on tasks or play activities.
- Often does not seem to listen when spoken to directly.
- Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (e.g., loses focus, side-tracked).
- Often has trouble organizing tasks and activities.
- Often avoids, dislikes, or is reluctant to do tasks that require mental effort over a long period of time (such as schoolwork or homework).
- Often loses things necessary for tasks and activities (e.g. school materials, pencils, books, tools, wallets, keys, paperwork, eyeglasses, mobile telephones).
- Is often easily distracted
- Is often forgetful in daily activities.



Figure **9.6.1**: This child is exhibiting inattention while his classmates are focused in the class activities.[1]

2. **Hyperactivity and Impulsivity: Six or more symptoms of hyperactivity-impulsivity for children up to age 16, or five or more for adolescents 17 and older and adults; symptoms of hyperactivity-impulsivity have been present for at least 6 months to an extent that is disruptive and inappropriate for the person's developmental level:**

- Often fidgets with or taps hands or feet, or squirms in seat.
- Often leaves seat in situations when remaining seated is expected.
- Often runs about or climbs in situations where it is not appropriate (adolescents or adults may be limited to feeling restless).

- Often unable to play or take part in leisure activities quietly.
- Is often “on the go” acting as if “driven by a motor”.
- Often talks excessively.
- Often blurts out an answer before a question has been completed.
- Often has trouble waiting his/her turn.
- Often interrupts or intrudes on others (e.g., butts into conversations or games)

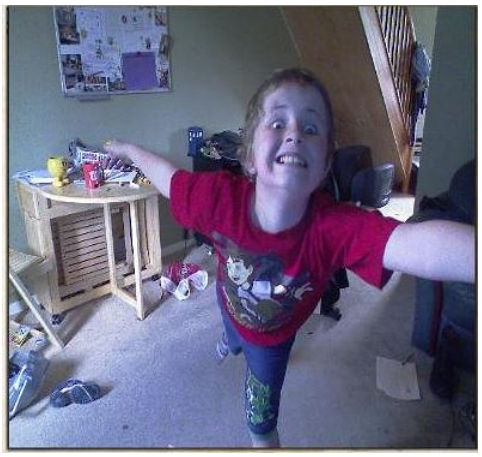


Figure **9.6.2**: This child is exhibiting hyperactivity and impulsivity.[2]

In addition, the following conditions must be met:

- Several inattentive or hyperactive-impulsive symptoms were present before age 12 years.
- Several symptoms are present in two or more settings, (such as at home, school or work; with friends or relatives; in other activities).
- There is clear evidence that the symptoms interfere with, or reduce the quality of, social, school, or work functioning.
- The symptoms are not better explained by another mental disorder (such as a mood disorder, anxiety disorder, dissociative disorder, or a personality disorder). The symptoms do not happen only during the course of schizophrenia or another psychotic disorder.

Based on the types of symptoms, three kinds (presentations) of AD/HD can occur:

- **Combined Presentation**: if enough symptoms of both criteria inattention and hyperactivity-impulsivity were present for the past 6 months
- **Predominantly Inattentive Presentation**: if enough symptoms of inattention, but not hyperactivity-impulsivity, were present for the past six months
- **Predominantly Hyperactive-Impulsive Presentation**: if enough symptoms of hyperactivity-impulsivity, but not inattention, were present for the past six months.

Because symptoms can change over time, the presentation may change over time as well.[3]

The diagnosis of AD/HD can be made reliably using well-tested diagnostic interview methods. However, as of yet, there is no independent valid test for ADHD.

Among children, AD/HD frequently occurs along with other learning, behavior, or mood problems such as learning disabilities, oppositional defiant disorder, anxiety disorders, and depression.

Treatment

A variety of medications and behavioral interventions are used to treat AD/HD. The most widely used medications are methylphenidate (Ritalin), D-amphetamine, and other amphetamines. These drugs are stimulants that affect the level of the neurotransmitter dopamine at the synapse. Nine out of 10 children improve while taking one of these drugs.

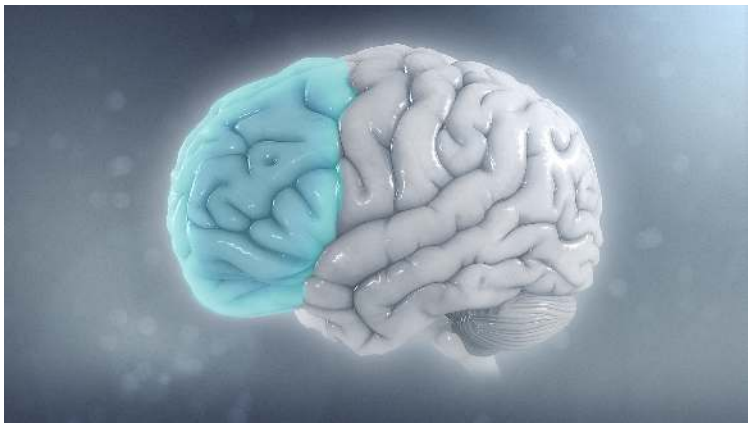


Figure **9.6.3**: Brain scan showing affected area of brain in ADHD.[4]

In addition to the well-established treatments described above, some parents and therapists have tried a variety of nutritional interventions to treat AD/HD. A few studies have found that some children benefit from such treatments. Nevertheless, no well-established nutritional interventions have consistently been shown to be effective for treating AD/HD.[5]

Pervasive Developmental Disorder (PDD) or PPD (NOS) Not Otherwise Specified PDD –NOS

Pervasive developmental disorder (PDD) is a term used to refer to difficulties in socialization and delays in developing communicative skills. This is usually recognized before 3 years of age. A child with PDD may interact in unusual ways with toys, people, or situations, and may engage in repetitive movement. PDD is diagnosed and treatment is similar to ADHA and ASD. In 2013 the DSM- 5 discontinued using this as a diagnosis, however it is still used informally.[6]

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9.7: Substance abuse

Drug use and the possibility of abuse and addiction primarily manifest as physical problems. However, the effects of these substances are not only physical, but also have long lasting consequences on cognitive development as well as effect social emotional development in a variety of ways. In the next section we'll learn about what drugs are, the different kinds of drugs, and what the effects are of each.

Drug Experimentation



Figure **9.7.1**: Social norms and peers influence adolescents' drug use.[2]

What Are Drugs?

A **psychoactive drug** is a chemical that changes our states of consciousness, and particularly our perceptions and moods. These drugs are commonly found in everyday foods and beverages, including chocolate, coffee, and soft drinks, as well as in alcohol and in over-the-counter drugs, such as aspirin, Tylenol, and cold and cough medication. Psychoactive drugs are also frequently prescribed as sleeping pills, tranquilizers, and antianxiety medications, and they may be taken, illegally, for recreational purposes. The four primary classes of psychoactive drugs are stimulants, depressants, opioids, and hallucinogens.

Stimulants

A **stimulant** is a psychoactive drug that operates by blocking the reuptake of dopamine, norepinephrine, and serotonin in the synapses of the central nervous system (CNS). Because more of these neurotransmitters remain active in the brain, the result is an increase in the activity of the sympathetic division of the autonomic nervous system (ANS). Effects of stimulants include increased heart and breathing rates, pupil dilation, and increases in blood sugar accompanied by decreases in appetite. For these reasons, stimulants are frequently used to help people stay awake and to control weight.

Used in moderation, some stimulants may increase alertness, but used in an irresponsible fashion they can quickly create dependency. A major problem is the "crash" that results when the drug loses its effectiveness and the activity of the neurotransmitters returns to normal. The withdrawal from stimulants can create profound depression and lead to an intense desire to repeat the high.

Table **9.7.1**: Stimulants

Drug	Dangers and Side Effects	Psychological Dependence	Physical Dependence	Addiction Potential
Caffeine	May create dependence	Low	Low	Low
Nicotine	Has major negative health effects if smoked or chewed	High	High	High
Cocaine	Decreased appetite, headache	Low	Low	Moderate
Amphetamines	Possible dependence, accompanied by severe "crash" with depression as drug effects wear off, particularly if smoked or injected	Moderate	Low	Moderate to High

A Closer Look at the Danger of Adolescence Use of Nicotine

Nicotine is a psychoactive drug found in the nightshade family of plants, where it acts as a natural pesticide. Nicotine is the main cause for the dependence-forming properties of tobacco use, and tobacco use is a major health threat. Nicotine creates both psychological and physical addiction and it is one of the hardest addictions to break. Nicotine content in cigarettes has slowly increased over the years, making quitting smoking more and more difficult. Nicotine is also found in smokeless (chewing) tobacco and electronic cigarettes (vaping).

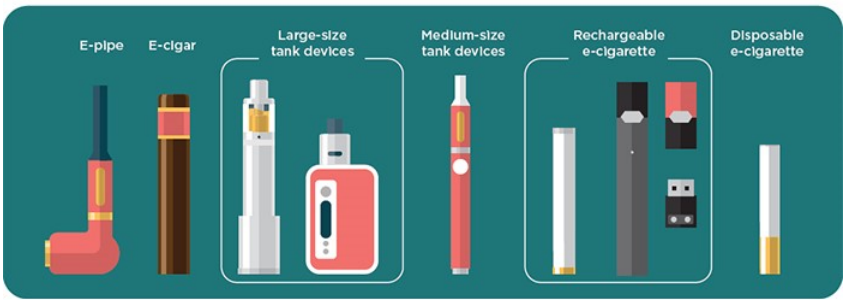


Figure 9.7.2: Electronic devices - large, medium, rechargeable and disposable - are now common ways to consume nicotine.[3]

Nicotine exposure can harm adolescent brain development by changing the way synapses form, which continues into the early to mid-20s. Using nicotine in adolescence may also increase risk for future addictions to other drugs. E-cigarette aerosol and cigarettes contain chemicals that are harmful to the lungs and chewing tobacco.

In many cases, people are able to get past the physical dependence, allowing them to quit using nicotine containing products at least temporarily. In the long run, however, the psychological enjoyment of smoking may lead to relapse.[4]

Depressants

In contrast to stimulants, which work to increase neural activity, a depressant slows down consciousness. A **depressant** is a psychoactive drug that reduces the activity of the CNS. Depressants are widely used as prescription medicines to relieve pain, to lower heart rate and respiration, and as anticonvulsants. The outcome of depressant use (similar to the effects of sleep) is a reduction in the transmission of impulses from the lower brain to the cortex (Csaky & Barnes, 1984).

Table 9.7.2: Depressants

Drug	Dangers and Side Effects	Psychological Dependence	Physical Dependence	Addiction Potential
Alcohol	Impaired judgment, loss of coordination, dizziness, nausea, and eventually a loss of consciousness	Moderate	Moderate	Moderate
Barbiturates and benzo-diazepines	Sluggishness, slowed speech, drowsiness, in severe cases, coma or death	Moderate	Moderate	Moderate
Toxic inhalants	Brain damage and death	High	High	High

A Closer Look at the Danger of Adolescent Alcohol Use

Alcohol is the most commonly used of the depressants and is a colorless liquid, produced by the fermentation of sugar or starch that is the intoxicating agent in fermented drinks. Alcohol is the oldest and most widely used drug of abuse in the world. In low to moderate doses, alcohol first acts to remove social inhibitions by slowing activity in the sympathetic nervous system. In higher doses, alcohol acts on the cerebellum to interfere with coordination and balance, producing the staggering gait of drunkenness. At high blood levels, further CNS depression leads to dizziness, nausea, and eventually a loss of consciousness. High enough blood levels such as those produced by “guzzling” large amounts of hard liquor at parties can be fatal. Alcohol is not a “safe” drug by any means.[5]

Short-Term Health Risks

Excessive alcohol use has immediate effects that increase the risk of many harmful health conditions. These are most often the result of **binge drinking** (drinking 4-5 drinks during a single occasion) and include the following:

- Injuries, such as motor vehicle crashes (1 in 5 teen drivers involved in fatal crashes had some alcohol in their system in 2010), falls, drownings, and burns.
- Violence, including homicide, suicide, sexual assault, and intimate partner violence.
- Alcohol poisoning, a medical emergency that results from high blood alcohol levels.
- Risky sexual behaviors, including unprotected sex or sex with multiple partners. These behaviors can result in unintended pregnancy or sexually transmitted diseases, including HIV.
- Miscarriage and stillbirth or fetal alcohol spectrum disorders (FASDs) among pregnant women.

Long-Term Health Risks

Over time, excessive alcohol use can lead to the development of chronic diseases and other serious problems including:

- High blood pressure, heart disease, stroke, liver disease, and digestive problems.
- Cancer of the breast, mouth, throat, esophagus, liver, and colon.
- Learning and memory problems, including dementia and poor school performance.
- Mental health problems, including depression and anxiety.
- Social problems, including lost productivity, family problems, and unemployment.
- Alcohol dependence, or alcoholism.[6]



Figure **9.7.3**: Adolescent alcohol use poses many health risks.[7]

Opioids

Opioids are chemicals that increase activity in opioid receptor neurons in the brain and in the digestive system, producing euphoria, analgesia, slower breathing, and constipation. Their chemical makeup is similar to the endorphins, the neurotransmitters that serve as the body's "natural pain reducers." Natural opioids are derived from the opium poppy, which is widespread in Eurasia, but they can also be created synthetically.

Table **9.7.3**: Opioids

Drug	Dangers and Side Effects	Psychological Dependence	Physical Dependence	Addiction Potential
Opium	Side effects include nausea, vomiting, tolerance, and addiction.	Moderate	Moderate	Moderate
Morphine	Restlessness, irritability, headache and body aches, tremors, nausea, vomiting, and severe abdominal pain	High	Moderate	Moderate
Heroin	All side effects of morphine but about twice as addictive as morphine	High	Moderate	High

Hallucinogens

The drugs that produce the most extreme alteration of consciousness are the **hallucinogens**, psychoactive drugs that alter sensation and perception and that may create hallucinations. The hallucinogens are frequently known as "psychedelics." Drugs in this class include lysergic acid diethylamide (LSD, or "Acid"), mescaline, and phencyclidine (PCP), as well as a number of natural plants including cannabis (marijuana), peyote, and psilocybin. The hallucinogens may produce striking changes in perception through one or more of the senses. The precise effects a user experiences are a function not only of the drug itself but also of the user's preexisting mental state and expectations of the drug experience. In large part, the user tends to get out of the experience what he or she brings to it. The hallucinations that may be experienced when taking these drugs are strikingly different from everyday experience and frequently are more similar to dreams than to everyday consciousness.

Table **9.7.4**: Hallucinogens

Drug	Dangers and Side Effects	Psychological Dependence	Physical Dependence	Addiction Potential
Marijuana	Mild intoxication; enhanced perception	Low	Low	Low
LSD, mescaline, PCP, and peyote	Hallucinations; enhanced perception	Low	Low	Low

A Closer Look at the Danger of Adolescent Marijuana Use

Marijuana (cannabis) is the most widely used hallucinogen. Until it was banned in the United States under the Marijuana Tax Act of 1938, it was widely used for medical purposes. While medical and recreational marijuana is now legal in several American states, it is still banned under federal law, putting those states in conflict with the federal government. Marijuana also acts as a stimulant, producing giggling, laughing, and mild intoxication. It acts to enhance perception of sights, sounds, and smells, and may produce a sensation of time slowing down, and is much less likely to lead to antisocial acts than that other popular intoxicant, alcohol.

Using marijuana—can have harmful and long-lasting effects on an adolescent's health and well-being.[8]

Marijuana and the teen brain

Unlike adults, the teen brain is actively developing and often will not be fully developed until the mid 20s. Marijuana use during this period may harm the developing teen brain.

- Negative effects include:
- Difficulty thinking and problem solving.
- Problems with memory and learning.
- Impaired coordination.
- Difficulty maintaining attention.



Figure **9.7.4**: Marijuana is a commonly used hallucinogen and is often smoked by teens, but can also be eaten.[9]

Negative effects on school and social life

Marijuana use in adolescence or early adulthood can have a serious impact on an adolescent's life.

- **Decline in school performance**. Students who smoke marijuana may get lower grades and may be more likely to drop out of high school than their peers who do not use.

- **Increased risk of mental health issues**. Marijuana use has been linked to a range of mental health problems in teens such as depression or anxiety. Psychosis has also been seen in teens at higher risk like those with a family history.
- **Impaired driving**. Driving while impaired by any substance, including marijuana, is dangerous. Marijuana negatively affects a number of skills required for safe driving, such as reaction time, coordination, and concentration.
- **Potential for addiction**. Research shows that about 1 in 6 teens who repeatedly use marijuana can become addicted, which means that they may make unsuccessful efforts to quit using marijuana or may give up important activities with friends and family in favor of using marijuana.

Psychoactive drug effects

In some cases, the effects of psychoactive drugs mimic other naturally occurring states of consciousness. For instance, sleeping pills are prescribed to create drowsiness, and benzodiazepines are prescribed to create a state of relaxation. In other cases psychoactive drugs are taken for recreational purposes with the goal of creating states of consciousness that are pleasurable or that help us escape our normal consciousness.

The use of psychoactive drugs, and especially those that are used illegally, has the potential to create very negative side effects. This does not mean that all drugs are dangerous, but rather that all drugs can be dangerous, particularly if they are used regularly over long periods of time. Psychoactive drugs create negative effects not so much through their initial use but through the continued use, accompanied by increasing doses, that ultimately may lead to drug abuse.

Substance Abuse

Many drugs create **tolerance**: an increase in the dose required to produce the same effect, which makes it necessary for the user to increase the dosage or the number of times per day that the drug is taken. As the use of the drug increases, the user may develop a **dependence**, defined as a need to use a drug or other substance regularly. Dependence can be psychological, in which the drug is desired and has become part of the everyday life of the user, but no serious physical effects result if the drug is not obtained; or physical, in which serious physical and mental effects appear when the drug is withdrawn. Cigarette smokers who try to quit, for example, experience physical withdrawal symptoms, such as becoming tired and irritable, as well as extreme psychological cravings to enjoy a cigarette in particular situations, such as after a meal or when they are with friends. Users may wish to stop using the drug, but when they reduce their dosage they experience **withdrawal**—negative experiences that accompany reducing or stopping drug use, including physical pain and other symptoms. When the user powerfully craves the drug and is driven to seek it out, over and over again, no matter what the physical, social, financial, and legal cost, we say that he or she has developed an **addiction** to the drug.

It is a common belief that addiction is an overwhelming, irresistibly powerful force, and that withdrawal from drugs is always an unbearably painful experience. But the reality is more complicated and in many cases less extreme. For one, even drugs that we do not generally think of as being addictive, such as caffeine, nicotine, and alcohol, can be very difficult to quit using, at least for some people. On the other hand, drugs that are normally associated with addiction, including amphetamines, cocaine, and heroin, do not immediately create addiction in their users. Even for a highly addictive drug like cocaine, only about 15% of users become addicted (Robinson & Berridge, 2003; Wagner & Anthony, 2002). Furthermore, the rate of addiction is lower for those who are taking drugs for medical reasons than for those who are using drugs recreationally. Patients who have become physically dependent on morphine administered during the course of medical treatment for a painful injury or disease are able to be rapidly weaned off the drug afterward, without becoming addicts.[10]

People have used, and often abused, psychoactive drugs for thousands of years. Perhaps this should not be surprising, because many people find using drugs to be enjoyable. Even when we know the potential costs of using drugs, we may engage in them anyway because the pleasures of using the drugs are occurring right now, whereas the potential costs are abstract and occur in the future.[11]

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9.8: Mental illness in general, harm and suicide

Table 9.8.1: Descriptions of disorders[1]

Disorder/Syndrome	Description
Anxiety Disorders	Psychological disturbances marked by irrational fears, often of everyday objects and situations. They include generalized anxiety disorder (GAD), panic disorder, phobia, obsessive-compulsive disorder (OCD), and posttraumatic stress disorder (PTSD). Anxiety disorders affect about 57 million Americans every year.
Dissociative Disorders	Conditions that involve disruptions or breakdowns of memory, awareness, and identity. They include dissociative amnesia, dissociative fugue, and dissociative identity disorder.
Mood Disorders	Psychological disorders in which the person's mood negatively influences his or her physical, perceptual, social, and cognitive processes. They include dysthymia, major depressive disorder, and bipolar disorder. Mood disorders affect about 30 million Americans every year.
Schizophrenia	A serious psychological disorder marked by delusions, hallucinations, loss of contact with reality, inappropriate affect, disorganized speech, social withdrawal, and deterioration of adaptive behavior. About 3 million Americans have schizophrenia.
Personality Disorder	A long-lasting but frequently less severe disorder characterized by inflexible patterns of thinking, feeling, or relating to others that causes problems in personal, social, and work situations. They are characterized by odd or eccentric behavior, by dramatic or erratic behavior, or by anxious or inhibited behavior. Two of the most important personality disorders are borderline personality disorder (BPD) and antisocial personality disorder (APD).
Somatization Disorder	A psychological disorder in which a person experiences numerous long-lasting but seemingly unrelated physical ailments that have no identifiable physical cause. Somatization disorders include conversion disorder, body dysmorphic disorder (BDD), and hypochondriasis.
Factitious Disorder	When patients fake physical symptoms in large part because they enjoy the attention and treatment that they receive in the hospital.
Sexual Disorders	A variety of problems revolving around performing or enjoying sex. Sexual dysfunctions include problems relating to loss of sexual desire, sexual response or orgasm, and pain during sex.
Paraphilia	A sexual deviation where sexual arousal is obtained from a consistent pattern of inappropriate responses to objects or people, and in which the behaviors associated with the feelings are distressing and dysfunctional.
Depression	When symptoms cause serious distress and negatively influence physical, perceptual, social, and cognitive processes. Teens with depression were often dismissed as being moody or difficult. About 11 percent of adolescents have a depressive disorder by age 18 according to the National Comorbidity Survey-Adolescent Supplement (NCS-A). Depressed teens with coexisting (comorbid) disorders such as substance abuse problems are less likely to respond to treatment for depression. Studies focusing on conditions that frequently co-occur and how they affect one another may lead to more targeted screening tools and interventions. With medication, psychotherapy, or combined treatment, most youth with depression can be effectively treated. Youth are more likely to respond to treatment if they receive it early in the course of their illness.

The Importance of Maintaining Mental Health and Wellness

Most people don't think twice before going to a doctor if they have an illness such as bronchitis, asthma, diabetes, or heart disease. However, many people who have a mental illness don't get the treatment that would alleviate their suffering. Studies estimate that two-thirds of all young people with mental health problems are not receiving the help they need and that less than one-third of the children under age 18 who have a serious mental health problem receive any mental health services. Mental illness in adults often goes untreated, too.

Consequences of Mental Illness

The consequences of mental illness in children and adolescents can be substantial. Many mental health professionals speak of accrued deficits that occur when mental illness in children is not treated. To begin with, mental illness can impair a student's ability to learn. Adolescents whose mental illness is not treated rapidly and aggressively tend to fall further and further behind in school. They are more likely to drop out of school and are less likely to be fully functional members of society when they reach adulthood.

We also now know that depressive disorders in young people confer a higher risk for illness and interpersonal and psychosocial difficulties that persist after the depressive episode is over. Furthermore, many adults who suffer from mental disorders have problems that originated in childhood. Depression in youth may predict more severe illness in adult life. Attention deficit hyperactivity disorder, once thought to affect children and adolescents only, may persist into adulthood and may be associated with social, legal, and occupational problems. Mental illness impairs a student's ability to learn.

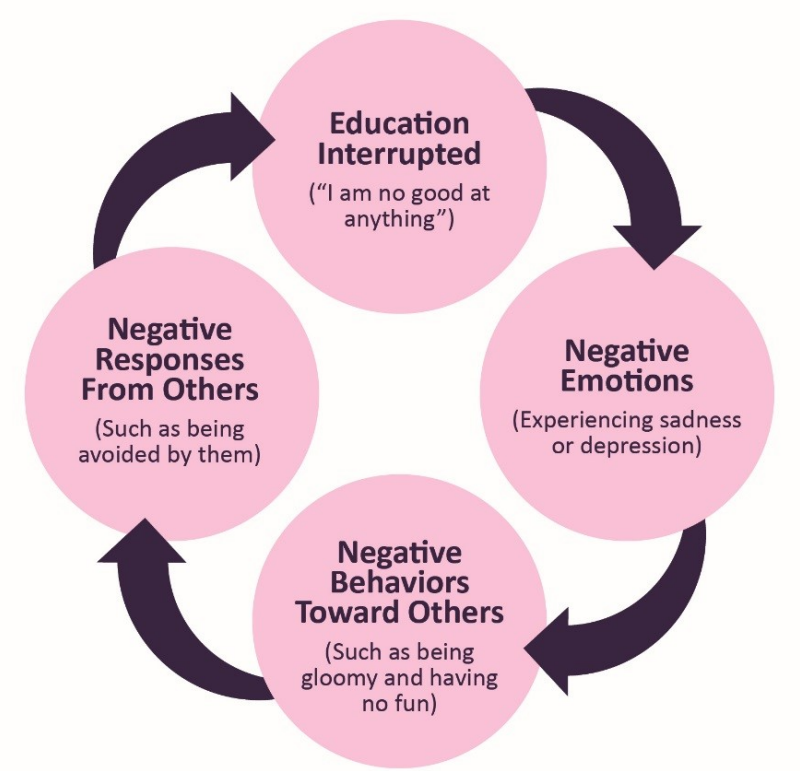


Figure **9.8.1**: Cycle of Depression: Negative emotions create negative behaviors, which lead people to respond negatively to the individual, creating even more depression. If this cycle continues the child's education is usually interrupted as the fall into feeling of inferiority and self-doubt.[2]

Self-Harm or Self-Injury

Adolescents struggling with their mental health may engage in **self-harm,** or thinking about harming oneself. They may be distressed and have difficult feelings as well as the urge to hurt themselves. Some unhealthy ways people may try to relieve emotional pain include cutting, burning, or hitting themselves. These self-harm behaviors can be difficult to detect and are usually kept a secret by covering the wounds with clothing or jewelry. Self-injury is a sign that someone is struggling. People who are anxious, depressed, or have an eating disorder are also more likely to turn to self-injuring behaviors.

Indicators of self-harm include:

- frequent unexplained injuries
- clues like bandages in trash cans.
- clothing inappropriate for the weather (long pants or sleeves when it's hot)

Figure **9.8.2**: Self-injury can be difficult to detect because it can be hidden under clothing.[4]

Suicidal Behavior

Adolescence who feel like there is no possible resolution to their mental health struggles may consider, attempt, or commit suicide. **Suicidal behavior** causes immeasurable pain, suffering, and loss to individuals, families, and communities nationwide. On average, 112 Americans die by suicide each day. Suicide is the second leading cause of death among 15-24 year olds and more than 9.4 million adults in the United States had serious thoughts of suicide within the past 12 months. But suicide is preventable.

Warning Signs of Suicide

If someone is showing one or more of the following behaviors, he or she may be thinking about suicide. The following warning signs should not be ignored. Help should be sought immediately.

- Talking about wanting to die or to kill oneself
- Looking for a way to kill oneself
- Talking about feeling hopeless or having no reason to live
- Talking about feeling trapped or in unbearable pain
- Talking about being a burden to others
- Increasing the use of alcohol or drugs
- Acting anxious or agitated
- Behaving recklessly
- Sleeping too little or too much
- Withdrawing or feeling isolated
- Showing rage or talking about seeking revenge
- Displaying extreme mood swings[5]

GET HELP

If you or someone you know needs help, call the National Suicide Prevention Lifeline at 1-800-273-TALK (8255). Trained crisis workers are available to talk 24 hours a day, 7 days a week.

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9.9: Domestic and child abuse

What is the impact of stress on child development? Children experience different types of stressors. Normal, everyday stress can provide an opportunity for young children to build coping skills and poses little risk to development. Even more long-lasting stressful events such as changing schools or losing a loved one can be managed fairly well. But children who experience **toxic stress** or who live in extremely stressful situations of abuse over long periods of time can suffer long-lasting effects. The structures in the midbrain or limbic system such as the hippocampus and amygdala can be vulnerable to prolonged stress during early childhood (Middlebrooks and Audage, 2008). High levels of the stress hormone cortisol can reduce the size of the hippocampus and effect the child's memory abilities. Stress hormones can also reduce immunity to disease. The brain exposed to long periods of severe stress can develop a low threshold making the child hypersensitive to stress in the future. However, the effects of stress can be minimized if the child has the support of caring adults. Let's take a look at childhood stressors.

Effects of Domestic Abuse

Domestic violence is witnessed by 3.3 million children each year in the US. There has been an increase in acknowledgment that children exposed to domestic abuse during their upbringing will suffer in their developmental and psychological welfare. Because of the awareness of domestic violence that some children have to face, it also generally impacts how the child develops emotionally, socially, behaviorally as well as cognitively. Some emotional and behavioral problems that can result due to domestic violence include increased aggressiveness, anxiety, and changes in how a child socializes with friends, family, and authorities. Bruises, broken bones, head injuries, lacerations, and internal bleeding are some of the acute effects of a domestic violence incident that require medical attention and hospitalization.

Child Maltreatment

Child abuse is the physical, sexual, or emotional mistreatment or neglect of a child or children. Different jurisdictions have developed their own definitions of what constitutes child abuse for the purposes of removing a child from his/her family and/or prosecuting a criminal charge. There are four major categories of child abuse: neglect, physical abuse, psychological/emotional abuse, and sexual abuse. Neglect is the most common type of abuse in the United States and accounts for over 60 percent of child abuse cases.



Figure **9.9.1**: Young children who experience abuse suffer much emotional stress.[1]

Physical Abuse

Physical abuse involves physical aggression directed at a child by an adult. Most nations with child-abuse laws consider the deliberate infliction of serious injuries, or actions that place the child at obvious risk of serious injury or death, to be illegal.

Beyond this, there is considerable variation. The distinction between child discipline and abuse is often poorly defined. Cultural norms about what constitutes abuse vary widely among professionals as well as the wider public. Some professionals claim that cultural norms that sanction physical punishment are one of the causes of child abuse, and have undertaken campaigns to redefine such norms.

Sexual Abuse

Child sexual abuse is a form of child abuse in which an adult or older adolescent abuses a child for sexual stimulation. Effects of child sexual abuse include guilt and self-blame, flashbacks, nightmares, insomnia, and fear of things associated with the abuse. Approximately 15 percent to 25 percent of women and 5 percent to 15 percent of men were sexually abused when they were children.

Emotional Abuse

Out of all the possible forms of abuse, emotional abuse is the hardest to define. It could include name-calling, ridicule, degradation, destruction of personal belongings, torture or killing of a pet, excessive criticism, inappropriate or excessive demands, withholding communication, and routine labeling or humiliation.

Neglect

Neglect is a passive form of abuse in which a perpetrator is responsible to provide care for a victim who is unable to care for himself or herself, but fails to provide adequate care. Neglect may include the failure to provide sufficient supervision, nourishment, or medical care, or the failure to fulfill other needs for which the victim is helpless to provide for himself or herself. The term is also applied when necessary care is withheld by those responsible for providing it from animals, plants, and even inanimate objects. Neglect can have many long-term side effects, such as physical injuries, low self-esteem, attention disorders, violent behavior, and even death. In the U.S., neglect is defined as the failure to meet the basic needs of children: housing, clothing, food, and access to medical care. Researchers found over 91,000 cases of neglect in one year using information from a database of cases verified by protective services agencies.[2]

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9.10: Sexual health

By the end of high school, more than half of boys and girls report having experienced sexual intercourse at least once, though it is hard to be certain of the proportion because of the sensitivity and privacy of the information. (Center for Disease Control, 2004; Rosenbaum, 2006).

Teen Pregnancy

Although adolescent pregnancy rates have declined since 1991, teenage birth rates in the United States are higher than most industrialized countries. Teen birth rates continued to decline from 17.4 per 1,000 females in 2018 to 16.7 per 1,000 females in 2019. This is another record low for US teens and a decrease of 4% from 2018. Birth rates fell 7% for females aged 15 to 17 years and 4% for females aged 18 to 19 years. (Centers for Disease Control, 2021)

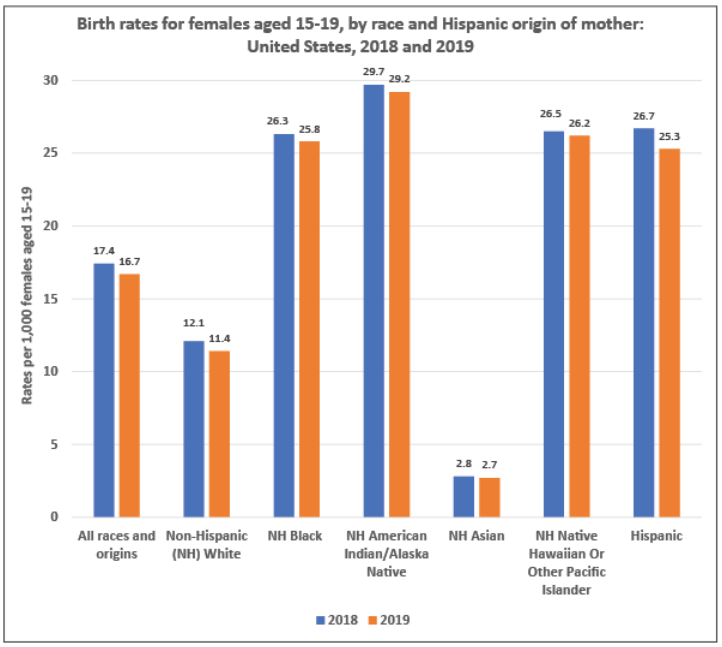


Figure **9.10.1**: Birth Rates for Females Aged 15 to 19 Years, by Race and Hispanic Origin of Mother: United States, 2018 and 2019. From https://www.cdc.gov/teenpregnancy/about/index.htm Data source: Martin JA, Hamilton BE, Osterman MJK, Driscoll AK. Births: final data for 2019. Natl Vital Stat Rep. 2021;70(2):1–50.

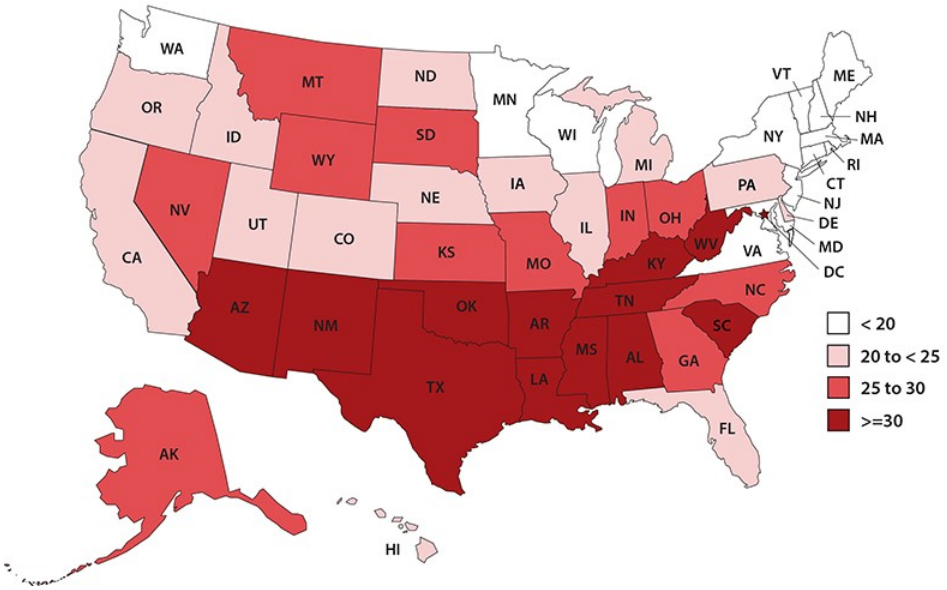


Figure **9.10.1**: United States map with state teen birth rates (births per 1,000 females ages 15-19) by quartile. https://www.cdc.gov/teenpregnancy/about/alt-text/map-state-text.htm (page last updated Oct 2018)

Risk Factors for Adolescent Pregnancy

Miller, Benson, and Galbraith (2001) found that parent/child closeness, parental supervision, and parents' values against teen intercourse (or unprotected intercourse) decreased the risk of adolescent pregnancy. In contrast, residing in disorganized/dangerous neighborhoods, living in a lower SES family, living with a single parent, having older sexually active siblings or pregnant/parenting teenage sisters, early puberty, and being a victim of sexual abuse place adolescents at an increased risk of adolescent pregnancy.

Consequences of Adolescent Pregnancy



Figure **9.10.3**: Teenage pregnancy can lead to academic education being interrupted, health risks, maternal mortality, and stillbirth. [2]

Sexually Transmitted Infections

Sexually transmitted infections (STIs), also referred to as sexually transmitted diseases (STDs) or venereal diseases (VDs), are illnesses that have a significant probability of transmission by means of sexual behavior, including vaginal intercourse, anal sex, and oral sex. It's important to mention that some STIs can also be contracted by sharing intravenous drug needles with an infected person, through childbirth, or breastfeeding. Common STIs include:

- chlamydia;
- herpes (HSV-1 and HSV-2);
- human papillomavirus (HPV);
- gonorrhea;
- syphilis;
- trichomoniasis;
- HIV (human immunodeficiency virus) and AIDS (acquired immunodeficiency syndrome).

According to the Centers for Disease Control and Prevention (CDC) (2014), there was an increase in the three most common types of STDs in 2014. The reporting of STI incidences were impacted in many ways by COVID 19 and the resulting lockdowns, access to testing, healthcare and so on. For example, in March and April of 2020, incidences of gonorrhea and syphilis dropped but began to increase after that throughout the rest of the year (CDC, 2023) Those most affected by STDS include younger, gay/bisexual males, and females. The most effective way to prevent transmission of STIs is to practice **abstinence**, *(*not participating in sexual intercourse*)*, safe sex, and to avoid direct contact of skin or fluids which can lead to transfer with an infected partner. Proper use of safe-sex supplies (such as male condoms, female condoms, gloves, or dental dams) reduces contact and risk and can be effective in limiting exposure; however, some disease transmission may occur even with these barriers.[3]

Practicing safe sex is important to one's physical health.

Contraceptive Methods and Protection from Sexually Transmitted Infection

There are many methods of **contraception** that sexually active adolescents can use to reduce the chances of pregnancy.

Table **9.10.4**: Reversible Methods of Birth Control[4]

Method	Description	Failure Rate
Intrauterine Contraception (IUD)	An IUD is a small device that is shaped in the form of a “T” placed inside the uterus	0.1-0.8%
Implant	A single, thin rod that is inserted under the skin of a woman’s upper arm.	0.01%
Injection	Injections or shots of hormones to prevent pregnancy are given in the buttocks or arm every three months.	4%
Oral contraceptives	Also called “the pill,” contain the hormones to prevent pregnancy. A pill is taken at the same time each day.	7%
Patch	This skin patch is worn on the lower abdomen, buttocks, or upper body and releases hormones to prevent pregnancy into the bloodstream. A new patch once a week for three weeks and then left off for a week.	7%
Hormonal vaginal contraceptive ring	The ring is placed in the vagina and releases the hormones to prevent pregnancy. It is worn for three weeks. A week after it is removed a new ring is placed.	7%
Spermicide	These kill sperm and come in several forms—foam, gel, cream, film, suppository, or tablet. They are placed in the vagina before intercourse.	21%
Diaphragm or cervical cap	A cup that is placed inside the vagina to cover the cervix to block sperm. It is inserted with spermicide before sexual intercourse.	17%
Sponge	This contains spermicide and is placed in the vagina where it fits over the cervix.	14-27%
Male condom	Worn (single use) by the man over the penis to keep sperm from getting into a woman’s body.	13%
Female condom	Worn (single use) by the woman inside the vagina to keep sperm from getting into a woman’s body.	21%
Natural Family Planning	During a regular menstrual cycle, fertile days can be predicted. Sexual intercourse can be avoided on those days.	2-23%
Copper IUD	Can be inserted up to 5 days after sexual intercourse	<1%[5]
Emergency contraceptive pills	Can be taken up to 5 days after sexual intercourse and may be available over-the-counter.	1-10%[6]

In choosing a birth control method, dual protection from the simultaneous risk for HIV and other STIs also should be considered. Although hormonal contraceptives and IUDs are highly effective at preventing pregnancy, they do not protect against STIs, including HIV. Consistent and correct use of the male latex condom reduces the risk for HIV infection and other STIs, including chlamydial infection, gonococcal infection, and trichomoniasis.

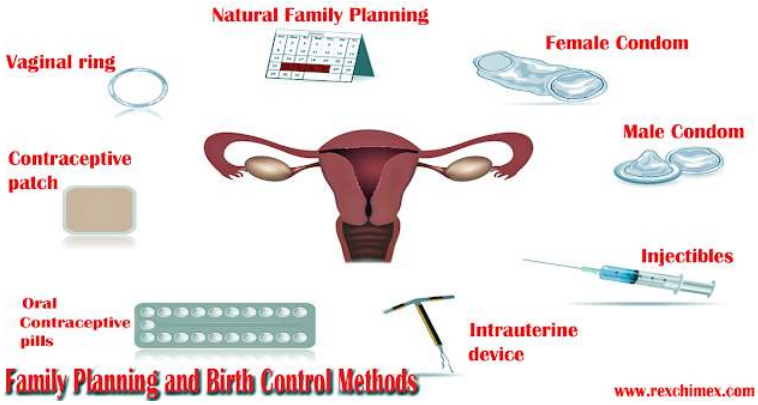


Figure **9.10.4**: There are many types of birth control methods - natural family planning, female and male condoms, injectibles, IUDs, oral contraceptive pills, contraceptive patch, and vaginal ring.[7]

References:

Centers for Disease Control (2023). Impact of COVID 19 on STDs. Sexually transmitted disease surveillance, 2021.

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[4] Contraception by the CDC is in the public domain

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CHAPTER OVERVIEW

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10.5: Piaget overall critique
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10.1: Piaget sensorimotor stage

Jean Piaget is the most noted theorist when it comes to children's cognitive development. He believed that children's cognition develops in stages. He explained this growth in the following stages:

1. Sensory Motor Stage (Birth through 2 years old)
2. Preoperational Stage (2-7 years old)
3. Concrete Operational Stage (7-11 years old)
4. Formal Operational Stage (12 years old- adulthood)[1]

Piaget and Sensorimotor Intelligence

Piaget describes intelligence in infancy as sensorimotor or based on direct, physical contact. Infants taste, feel, pound, push, hear, and move in order to experience the world. Let's explore the transition infants make from responding to the external world reflexively as newborns to solving problems using mental strategies as two years old.

Table **10.1.1**: Substages of the sensorimotor stage[2]

Substage	Age	Description
Substage One: Simple Reflexes	Birth to 1 month	This active learning begins with automatic movements or reflexes. A ball comes into contact with an infant's cheek and is automatically sucked on and licked.
Substage Two: Primary Circular Reactions	1 to 4 months	The infant begins to discriminate between objects and adjust responses accordingly as reflexes are replaced with voluntary movements. An infant may accidentally engage in a behavior and find it interesting such as making a vocalization. This interest motivates trying to do it again and helps the infant learn a new behavior that originally occurred by chance. At first, most actions have to do with the body, but in months to come, will be directed more toward objects.
Substage Three: Secondary Circular Reactions	4 to 8 months	The infant becomes more and more actively engaged in the outside world and takes delight in being able to make things happen. Repeated motion brings particular interest as the infant is able to bang two lids together from the cupboard when seated on the kitchen floor.
Substage Four: Coordination of circular reactions	8 to 12 months	The infant can engage in behaviors that others perform and anticipate upcoming events. Perhaps because of continued maturation of the prefrontal cortex, the infant becomes capable of having a thought and carrying out a planned, goal-directed activity such as seeking a toy that has rolled under the couch. The object continues to exist in the infant's mind even when out of sight and the infant now is capable of making attempts to retrieve it. This is an important milestone Piaget called "object permanence."
Substage Five: Tertiary Circular Reactions	12 to 18 months	The infant more actively engages in experimentation to learn about the physical world. Gravity is learned by pouring water from a cup or pushing bowls from high chairs. The caregiver tries to help the child by picking it up again and placing it on the tray. And what happens? Another experiment! The child pushes it off the tray again causing it to fall and the caregiver to pick it up again!
Substage Six: Internalization of Schemes and Early Representational thought	18 months to 2 years	The child is now able to solve problems using mental strategies, to remember something heard days before and repeat it, to engage in pretend play, and to find objects that have been moved even when out of sight. Take for instance, the child who is upstairs in a room with the door closed, supposedly taking a nap. The doorknob has a safety device on it that makes it impossible for the child to turn the knob. After trying several times in vain to push the door or turn the doorknob, the child carries out a mental strategy learned from prior experience to get the door opened-he knocks on the door! The child is now better equipped with mental strategies for problem-solving.



Figure 10.1.1: According to Piaget in infancy children only learn by sensory and motor manipulation of objects.[3]

Evaluating Piaget's Sensorimotor Stage

Piaget opened up a new way of looking at infants with his view that their main task is to coordinate their sensory impressions with their motor activity. However, the infant's cognitive world is not as neatly packaged as Piaget portrayed it, and some of Piaget's explanations for the cause of change are debated. In the past several decades, sophisticated experimental techniques have been devised to study infants, and there have been a large number of research studies on infant development. Much of the new research suggests that Piaget's view of sensorimotor development needs to be modified (Baillargeon, 2014; Brooks & Meltzoff, 2014; Johnson & Hannon, 2015) and that Piaget might have underestimated children's abilities.

Object Permanence

One necessary modification would be to when children develop object permanence. Infants seem to be able to recognize that objects have permanence at much younger ages than Piaget proposed (even as young as 3.5 months of age).

The A-not-B Error

The data does not always support Piaget's claim that certain processes are crucial in transitions from one stage to the next. For example, in Piaget's theory, an important feature in the progression into substage 4, *coordination of secondary circular reactions*, is an infant's inclination to search for a hidden object in a familiar location rather than to look for the object in a new location. Thus, if a toy is hidden twice, initially at location A and subsequently at location B, 8- to 12-month-old infants search correctly at location A initially. But when the toy is subsequently hidden at location B, they make the mistake of continuing to search for it at location A. **A-not-B error** is the term used to describe this common mistake. Older infants are less likely to make the A-not-B error because their concept of object permanence is more complete.

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10.2: Piaget preoperational stage

Piaget's stage that coincides with early childhood is the **preoperational stage.** The word operational means logical or able to carry out mental operations, so these children were thought to be illogical. However, they were learning to use language or to think of the world symbolically. Let's examine some of Piaget's assertions about children's cognitive abilities at this age.

Pretend Play

According to Piaget, the main characteristic of sensorimotor stage is that children are unable to use symbolic representation in their thinking. Once they are able to use symbols in their thought they are considered preoperational. In the preoperational stage, pretending is a favorite activity. A toy has qualities beyond the way it was designed to function and can now be used to stand for a character or object unlike anything originally intended. A teddy bear, for example, can be a baby or the queen of a faraway land!



Figure **10.2.1**: After age 2 children are very interested in pretend play and using their newly acquired symbolic representation skills according to Piaget.[1]

According to Piaget, children's pretend play helps them solidify new schemes they were developing cognitively. This play, then, reflects changes in their conceptions or thoughts. However, children also learn as they pretend and experiment. Their play does not simply represent what they have learned (Berk, 2007).

Egocentrism

Egocentrism in early childhood refers to the tendency of young children to think that everyone sees things in the same way as the child. Piaget's classic experiment on egocentrism involved showing children a 3-dimensional model of a mountain and asking them to describe what a doll that is looking at the mountain from a different angle might see. Children tend to choose a picture that represents their own view, rather than that of the doll.

However, children tend to use different sentence structures and vocabulary when addressing a younger child or an older adult. This indicates some awareness of the views of others.



Figure **10.2.2**: Piaget's egocentrism experiment – according to Piaget this preoperational child will describe what she herself sees instead of being able to take the doll's perspective into account.[2]

Syncretism

Syncretism refers to a tendency to think that if two events occur simultaneously, one caused the other. An example of this is a child putting on their bathing suit to turn it to summertime.

Animism

Attributing lifelike qualities to objects is referred to as **animism**. The cup is alive, the chair that falls down and hits the child's ankle is mean, and the toys need to stay home because they are tired. Cartoons frequently show objects that appear alive and take on lifelike qualities. Young children do seem to think that objects that move may be alive but after age 3, they seldom refer to objects as being alive (Berk, 2007).

Classification Errors

Preoperational children have difficulty understanding that an object can be classified in more than one way. For example, if shown three white buttons and four black buttons and asked whether there are more black buttons or buttons, the child is likely to respond that there are more black buttons. As the child's vocabulary improves and more schemes are developed, the ability to classify objects improves.[3]

Conservation Errors

Conservation refers to the ability to recognize that moving or rearranging matter does not change the quantity. Let's look at an example. A father gave a slice of pizza to 10-year-old Keiko and another slice to 3-year-old Kenny. Kenny's pizza slice was cut into five pieces, so Kenny told his sister that he got more pizza than she did. Kenny did not understand that cutting the pizza into smaller pieces did not increase the overall amount. This was because Kenny exhibited **Centration,** or focused on only one characteristic of an object to the exclusion of others.

Kenny focused on the five pieces of pizza to his sister's one piece even though the total amount was the same. Keiko was able to consider several characteristics of an object than just one. Because children have not developed this understanding of conservation, they cannot perform mental operations.

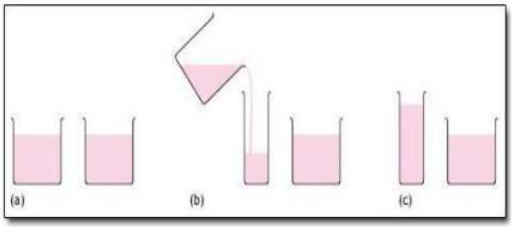


Figure **10.2.3**: Piagetian liquid conservation experiments. In the first pair, a, two containers of the same size are filled with the same amount of liquid. In the second pair, b, one of the containers is poured into a taller container. In the third pair, c, the taller container sits next to the original container from the first and second pairs. The containers look like they contain different amounts of liquid because of their size difference but they actually contain the same amount of liquid.[5]

Evaluating the preoperational stage

Similar to the critique of the sensorimotor period, several psychologists have attempted to show that Piaget also underestimated the intellectual capabilities of the preoperational child. For example, children's specific experiences can influence when they are able to conserve. Children of pottery makers in Mexican villages know that reshaping clay does not change the amount of clay at much younger ages than children who do not have similar experiences (Price-Williams et al, 1969). Crain (2005) indicated that preoperational children can think rationally on mathematical and scientific tasks, and they are not as egocentric as Piaget implied.[13] Research on Theory of Mind (discussed later in the chapter) has demonstrated that children overcome egocentrism by 4 or 5 years of age, which is sooner than Piaget indicated.

Both Piaget and Vygotsky believed that children actively try to understand the world around them. More recently, developmentalists have added to this understanding by examining how children organize information and develop their own theories about the world.

Theory of mind refers to the ability to think about other people's thoughts. This mental mind reading helps humans to understand and predict the reactions of others, thus playing a crucial role in social development. One common method for determining if a child has reached this mental milestone is the false belief task, described below.

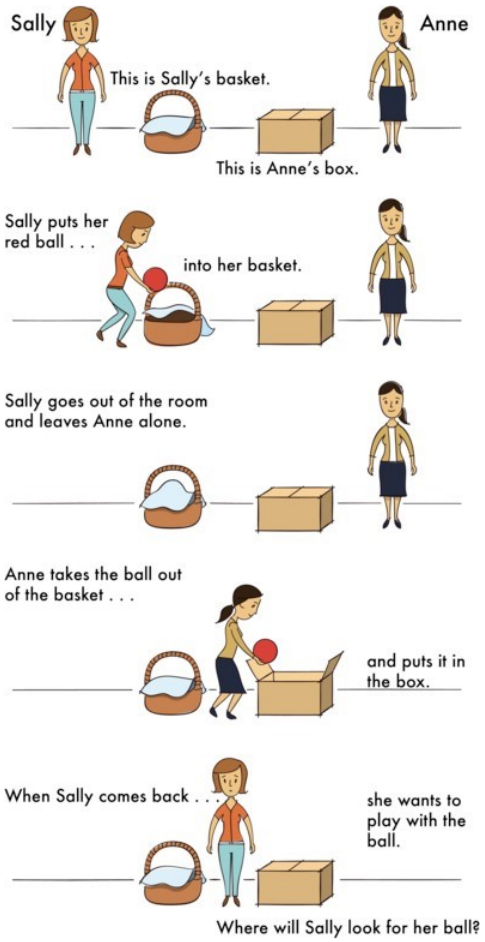


Figure **10.2.4**

The research began with a clever experiment by Wimmer and Perner (1983), who tested whether children can pass a false-belief test.[14] The child is shown a picture story of Sally, who puts her ball in a basket and leaves the room. While Sally is out of the room, Anne comes along and takes the ball from the basket and puts it inside a box. The child is then asked *where* Sally thinks the ball is located when she comes back to the room. Is she going to look first *in the box* or *in the basket*? The right answer is that she will look in the basket, because that's where she put it and thinks it is; but we have to infer this *false belief* against our own better knowledge that the ball is in the box. This is very difficult for children before the age of four because of the cognitive effort it takes. Three- year-olds have difficulty distinguishing between what they once thought was true and what they now know to be true. They feel confident that what they know now is what they have always known (Birch and Bloom, 2003).

Even adults need to think through this task (Epley et al, 2004) To be successful at solving this type of task the child must separate what he or she "knows" to be true from what someone else might "think" is true. In Piagetian terms, they must give up a tendency toward egocentrism. The child must also understand that what guides people's actions and responses are what they "believe" rather than what is reality. In other words, people can mistakenly believe things that are false and will act based on this false knowledge. Consequently, prior to age four children are rarely successful at solving such a task (Wellman et al, 2001). But this is quite different from Piaget's ideas that a child remains in the preoperational stage from 2 until 7 years old!

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10.3: Piaget concrete operational stage



Figure **10.3.1**: Non-Western children studying in a classroom share some similarities and some differences with Western schoolrooms.[2]

The concrete operational stage is defined as the third in Piaget's theory of cognitive development. This stage takes place around 7 years old to 11 years of age, and is characterized by the development of organized and rational thinking. Piaget (1954a) considered the concrete stage a major turning point in the child's cognitive development, because it marks the beginning of logical or operational thought. The child is now mature enough to use logical thought or operations (i.e. rules) but can only apply logic to physical objects (hence concrete operational). Children gain the abilities of conservation (number, area, volume, orientation) and reversibility.[3]

Let's look at the following cognitive skills that children typically master during Piaget's concrete operational stage.[4] :



Figure **10.3.2**: The cognitive skills developed during the concrete operational stage are seriation, classification, reversibility, conservation, decentering, identity, transitivity.[5]

Seriation:

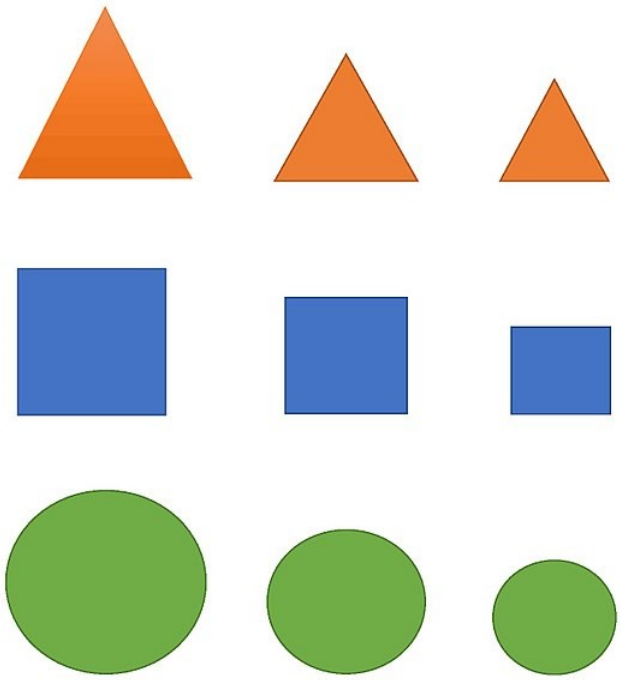


Figure **10.3.3**: Sorting these shapes from smallest to largest is seriation.[7]

Classification

As children's experiences and vocabularies grow, they build **schema** and are able to organize objects in many different ways. They also understand classification hierarchies and can arrange objects into a variety of classes and subclasses.



Figure **10.3.4**: This child might use classification if she sorts these toys by color or by shape.[8]

Reversibility

The child learns that some things that have been changed can be returned to their original state. Water can be frozen and then thawed to become liquid again. But eggs cannot be unscrambled. Arithmetic operations are reversible as well: 2 + 3 = 5 and 5 – 3 = 2. Many of these cognitive skills are incorporated into the school's curriculum through mathematical problems and in worksheets about which situations are reversible or irreversible.



Figure **10.3.5**: Understanding that ice cubes melt is an example of reversibility.[9]

Conservation

An example of the preoperational child's thinking; if you were to fill a tall beaker with 8 ounces of water this child would think that it was "more" than a short, wide bowl filled with 8 ounces of water? Concrete operational children can understand the concept of conservation, which means that changing one quality (in this example, height or water level) can be compensated for by changes in another quality (width). Consequently, there is the same amount of water in each container, although one is taller and narrower and the other is shorter and wider.

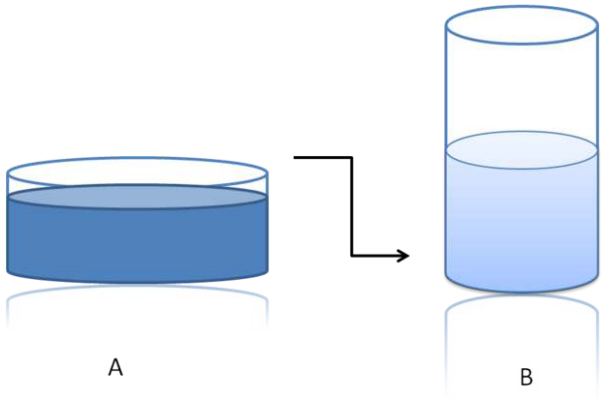


Figure **10.3.6**: Beakers displaying the idea of conservation.[10]

Decentration

Concrete operational children no longer focus on only one dimension of any object (such as the height of the glass) and instead consider the changes in other dimensions too (such as the width of the glass). This allows for conservation to occur.



Figure **10.3.7**: Children looking at these glasses demonstrate decentration when looking at more than one attribute i.e. tall, short, and wide narrow.[11]

Identity



Figure **10.3.8**: A broken egg is still an egg.[13]



Figure **10.3.9**: A deflated balloon is still a balloon.[14]



Figure **10.3.10**: Broken chalk is still chalk.[15]

Transitivity



Figure **10.3.11**: Transitivity allows children to understand that this boxer puppy, is a dog *and* a mammal.[17]

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10.4: Piaget formal operational stage

During the formal operational stage, adolescents are able to understand abstract principles**.** They are no longer limited by what can be directly seen or heard, and are able to contemplate such constructs as beauty, love, freedom, and morality. Additionally, while younger children solve problems through trial and error, adolescents demonstrate **hypothetical-deductive reasoning**, which is developing hypotheses based on what might logically occur. They are able to think about all the possibilities in a situation beforehand, and then test them systematically, (Crain, 2005) because they are able to engage in true scientific thinking.



Figure **10.4.1**: Teenage thinking is characterized by the ability to reason logically and solve hypothetical problems such as how to design, plan, and build a structure.[1]

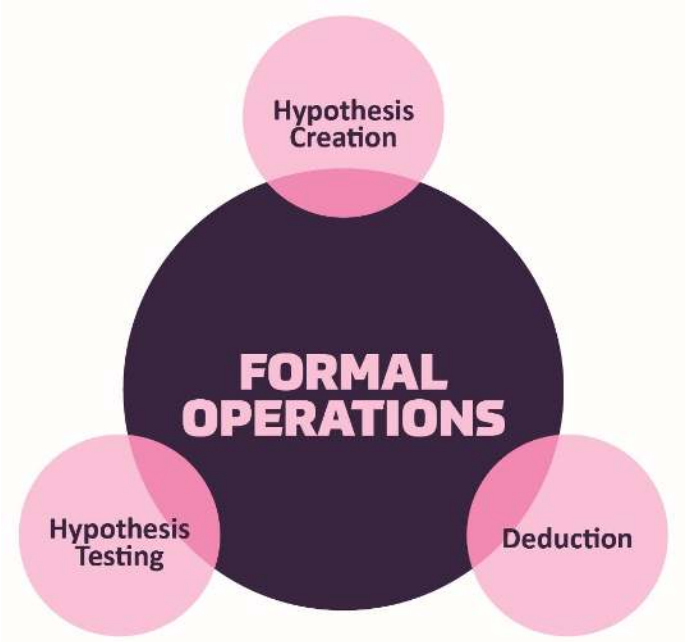


Figure **10.4.2**: Piaget proposed that formal operational thinking - hypothesis creation, testing and deduction - is the last stage in cognitive development.[2]

Does everyone reach formal operations?

According to Piaget, most people attain some degree of formal operational thinking, but use formal operations primarily in the areas of their strongest interest (Crain, 2005). In fact, most adults do not regularly demonstrate formal operational thought. A

possible explanation is that an individual's thinking has not been sufficiently challenged to demonstrate formal operational thought in all areas.

Adolescent Egocentrism

Once adolescents can understand abstract thoughts, they enter a world of hypothetical possibilities and demonstrate **egocentrism,** a heightened self-focus. The egocentricity comes from attributing unlimited power to their own thoughts (Crain, 2005). Piaget believed it was not until adolescents took on adult roles that they would be able to learn the limits to their own thoughts.

David Elkind: On Piaget's Theory

David Elkind (1967) expanded on the concept of Piaget's adolescent egocentricity. Elkind theorized that the physiological changes that occur during adolescence result in adolescents being primarily concerned with themselves. Additionally, since adolescents fail to differentiate between what others are thinking and their own thoughts, they believe that others are just as fascinated with their behavior and appearance. This belief results in the adolescent anticipating the reactions of others, and consequently constructing an imaginary audience. The **imaginary audience** is the adolescent's belief that those around them are as concerned and focused on their appearance as they themselves are (Schwartz, Maynard, & Uzelac, 2008, p. 441). Elkind thought that the imaginary audience contributed to the self-consciousness that occurs during early adolescence. The desire for privacy and the reluctance to share personal information may be a further reaction to feeling under constant observation by others.



Figure **10.4.3**: This teen is likely thinking, "they must be whispering about me."[3]

Another important consequence of adolescent egocentrism is the **personal fable** or belief that one is unique, special, and invulnerable to harm. Elkind (1967) explains that because adolescents feel so important to others (imaginary audience) they regard themselves and their feelings as being special and unique. Adolescents believe that only they have experienced strong and diverse emotions, and therefore others could never understand how they feel. This uniqueness in one's emotional experiences reinforces the adolescent's belief of invulnerability, especially to death. Adolescents will engage in risky behaviors, such as drinking and driving or unprotected sex, and feel they will not suffer any negative consequences. Elkind believed that adolescent egocentricity emerged in early adolescence and declined in middle adolescence, however, recent research has also identified egocentricity in late adolescence (Schwartz, et al., 2008).

Consequences of Formal Operational Thought

As adolescents are now able to think abstractly and hypothetically, they exhibit many new ways of reflecting on information (Dolgin, 2011). For example, they demonstrate greater **introspection** or thinking about one's thoughts and feelings. They begin to imagine how the world could be, which leads them to become **idealistic** or insisting upon high standards of behavior. Because of their idealism, they may become critical of others, especially adults in their life. Additionally, adolescents can demonstrate **hypocrisy**, or pretend to be what they are not. Since they are able to recognize what others expect of them, they will conform to

those expectations for their emotions and behavior seemingly hypocritical to themselves. Lastly, adolescents can exhibit **pseudostupidity,** which is when they approach problems at a level that is too complex and they fail because the tasks are too simple. Their new ability to consider alternatives is not completely under control and they appear "stupid" when they are in fact bright, just inexperienced.[4]

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10.5: Piaget overall critique

Researchers have obtained findings indicating that cognitive development is considerably more continuous than Piaget claimed. Thus, the debate between those who emphasize discontinuous, stage-like changes in cognitive development and those who emphasize gradual continuous changes remains a lively one.[1]

Researchers have found, also, that the A-not-B error does not show up consistently (Sophian, 1985). The evidence indicates that A-not-B errors are sensitive to the delay between hiding the object at B and the infant's attempt to find it (Diamond, 1985). Thus, the A-not-B error might be due to a failure in memory. Another explanation is that infants tend to repeat a previous motor behavior (Clearfield & others, 2006; Smith, 1999).

Piaget thought that children's ability to understand objects, such as learning that a rattle makes a noise when shaken, was a cognitive skill that develops slowly as a child matures and interacts with the environment. Today, developmental psychologists think Piaget was incorrect. Researchers have found that even very young children understand objects and how they work long before they have experience with those objects (Baillargeon, 1987, Baillargeon et al, 2011). For example, Piaget believed that infants did not fully master object permanence until substage 5 of the sensorimotor period (Thomas, 1979). However, infants seem to be able to recognize that objects have permanence at much younger ages. Diamond (1985) found that infants show earlier knowledge if the waiting period is shorter. At age 6 months, they retrieved the hidden object if their wait for retrieving the object is no longer than 2 seconds, and at 7 months if the wait is no longer than 4 seconds. Even earlier, children as young as 3 months old demonstrated knowledge of the properties of objects that they had only viewed and did not have prior experience with them. In one study, 3-month-old infants were shown a truck rolling down a track and behind a screen. The box, which appeared solid but was actually hollow, was placed next to the track. The truck rolled past the box as would be expected. Then the box was placed on the track to block the path of the truck. When the truck was rolled down the track this time, it continued unimpeded. The infants spent significantly more time looking at this impossible event (See Figure).

Baillargeon (1987) concluded that they knew solid objects cannot pass through each other. Baillargeon's findings suggest that very young children have an understanding of objects and how they work, which Piaget (1954) would have said is beyond their cognitive abilities due to their limited experiences in the world (Piaget, 1954).

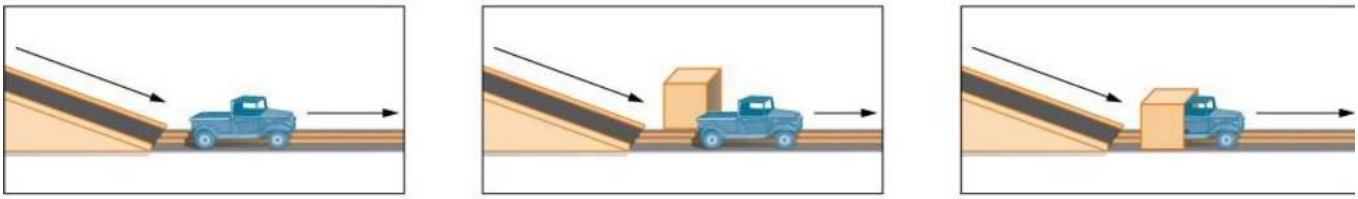


Figure **10.5.1**: Baillargeon used apparatus like this and found that infants look longer and more surprised at (c) when a truck appears to be able to move through a solid block (as seen in (b) the middle pane), illustrating core physical knowledge that two objects cannot occupy the same space at the same time.

Neo-Piagetians

As previously discussed, Piaget's theory has been criticized on many fronts, and updates to reflect more current research have been provided by the **Neo-Piagetians**, *or* those theorists who provide "new" interpretations of Piaget's theory. Morra, Gobbo, Marini and Sheese (2008) reviewed Neo-Piagetian theories, which were first presented in the 1970s, and identified how these "new" theories combined Piagetian concepts with those found in Information Processing. Similar to Piaget's theory, Neo-Piagetian theories believe in constructivism, assume cognitive development can be separated into different stages with qualitatively different characteristics, and advocate that children's thinking becomes more complex in advanced stages. Unlike Piaget, Neo-Piagetians believe that aspects of information processing change the complexity of each stage, not logic as determined by Piaget.

Neo-Piagetians propose that working memory capacity is affected by biological maturation, and therefore restricts young children's ability to acquire complex thinking and reasoning skills. Increases in working memory performance and cognitive skills development coincide with the timing of several neurodevelopmental processes. These include myelination, axonal and synaptic pruning, changes in cerebral metabolism, and changes in brain activity (Morra et al., 2008).

Myelination especially occurs in waves between birth and adolescence, and the degree of myelination in particular areas explains the increasing efficiency of certain skills. Therefore, brain maturation, which occurs in spurts, affects how and when cognitive skills develop. Additionally, all Neo-Piagetian theories support that experience and learning interact with biological maturation in shaping cognitive development.[2]

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10.6: Vygotsky

As introduced in the section on theories, Lev Vygotsky was a Russian psychologist who argued that culture has a major impact on a child's cognitive development. He believed that the social interactions with adults and more knowledgeable peers can facilitate a child's potential for learning. Without this interpersonal instruction, he believed children's minds would not advance very far as their knowledge would be based only on their own discoveries. Let's review some of Vygotsky's key concepts.

Piaget set the tone for much of current-day research but his theory has also received a great deal of criticism. Many believe that Piaget ignored the huge influence that society and culture have in shaping a child's development. At a similar time, another researcher named Lev Vygotsky (1896–1934) had come to similar conclusions as Piaget about children's development, in thinking that children learned about the world through physical interaction with it. However, where Piaget felt that children moved naturally through different stages of development, based on biological predispositions and their own individual interactions with the world, Vygotsky claimed that adult or peer intervention was a much more important part of the developmental process.

Environment influences



Figure **10.6.1**: Vygotsky suggested that adults scaffold the abilities that are valued in a culture so children can further their zone of proximal development.[2]

Zone of Proximal Development and Scaffolding

Vygotsky's best known concept is the zone of proximal development (ZPD). Vygotsky stated that children should be taught in the ZPD, which occurs when they can perform a task with assistance, but not quite yet on their own. With the right kind of teaching, however, they can accomplish it successfully. A good teacher identifies a child's ZPD and helps the child stretch beyond it. Then the adult (teacher) gradually withdraws support until the child can then perform the task unaided. Researchers have applied the metaphor of scaffolds (the temporary platforms on which construction workers stand) to this way of teaching. Scaffolding is the temporary support that parents or teachers give a child to do a task.

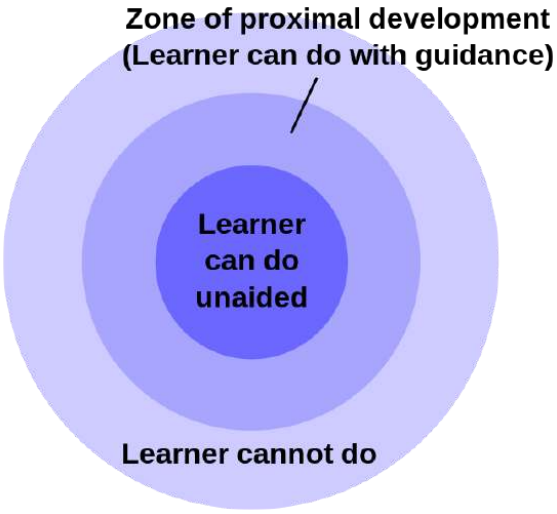


Figure **10.6.2**: Zone of proximal development is what a more experienced member of society can help a child achieve with some scaffolding to go beyond what they can do unaided.[3]

Private Speech

Do you ever talk to yourself? Why? Chances are, this occurs when you are struggling with a problem, trying to remember something, or feel very emotional about a situation. Children talk to themselves too. Piaget interpreted this as **egocentric speech** or a practice engaged in because of a child's inability to see things from another's point of view. Vygotsky, however, believed that children talk to themselves in order to solve problems or clarify thoughts. As children learn to think in words, they do so aloud before eventually closing their lips and engaging in **private speech** or inner speech.

Thinking out loud eventually becomes thought accompanied by internal speech, and talking to oneself becomes a practice only engaged in when we are trying to learn something or remember something. This inner speech is not as elaborate as the speech we use when communicating with others (Vygotsky, 1962).[4]

Contrast with Piaget

Piaget was highly critical of teacher-directed instruction, believing that teachers who take control of the child's learning place the child into a passive role (Crain, 2005). Further, teachers may present abstract ideas without the child's true understanding, and instead they just repeat back what they heard. Piaget believed children must be given opportunities to discover concepts on their own.

As previously stated, Vygotsky did not believe children could reach a higher cognitive level without instruction from more learned individuals. Who is correct? Both theories certainly contribute to our understanding of how children learn.

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10.7: Information Processing

Information processing researchers have focused on several issues in cognitive development, including improvements in attention skills, changes in the capacity, and the emergence of executive functions in working memory. Early childhood is seen by many researchers as a crucial time period in memory development (Posner & Rothbart, 2007). Additionally, in early childhood memory strategies, memory accuracy, and autobiographical memory emerge.

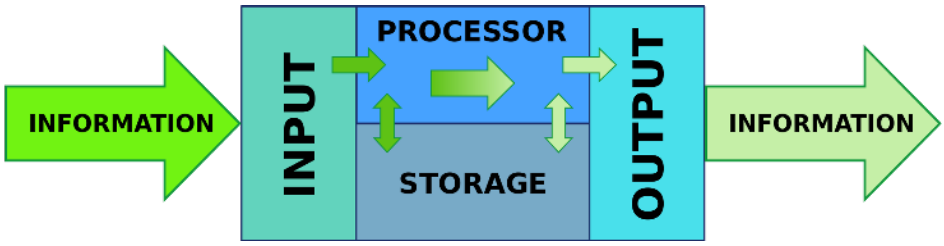


Figure **10.7.1**: How information is processed from information input to storage and output (similar to a computer system)[1]

Children's Understanding of the World

Both Piaget and Vygotsky believed that children actively try to understand the world around them. More recently information processing developmentalists have added to this understanding by examining how children organize information and develop their own theories about the world.

Theory-Theory

The tendency of children to generate theories to explain everything they encounter is called **theory-theory**. This concept implies that humans are naturally inclined to find reasons and generate explanations for why things occur. Children frequently ask question about what they see or hear around them. When the answers provided do not satisfy their curiosity or are too complicated for them to understand, they generate their own theories. In much the same way that scientists construct and revise their theories, children do the same with their intuitions about the world as they encounter new experiences (Gopnik & Wellman, 2012). One of the theories they start to generate in early childhood centers on the mental states; both their own and those of others.



Figure **10.7.2**: What theories might this boy be creating?[2]

Theory of Mind

Theory of mind refers to the ability to think about other people's thoughts as discussed in the section on Piagetian egocentrism. This mental mind reading helps humans to understand and predict the reactions of others, thus playing a crucial role in social development. One common method for determining if a child has reached this mental milestone is the false belief task, described below.

The research began with a clever experiment by Wimmer and Perner (1983), who tested whether children can pass a false-belief test (see Figure). The child is shown a picture story of Sally, who puts her ball in a basket and leaves the room. While Sally is out of the room, Anne comes along and takes the ball from the basket and puts it inside a box. The child is then asked *where* Sally thinks the ball is located when she comes back to the room. Is she going to look first in the box or in the basket? The right answer is that she will look in the basket, because that's where she put it and thinks it is; but we have to infer this **false belief** against our own better knowledge that the ball is in the box. See section on Piaget with theory of mind picture and explanation.

This is very difficult for children before the age of four because of the cognitive effort it takes. Three-year-olds have difficulty distinguishing between what they once thought was true and what they now know to be true. They feel confident that what they know now is what they have always known (Birch & Bloom, 2003). Even adults need to think through this task (Epley, Morewedge, & Keysar, 2004).

To be successful at solving this type of task the child must separate what he or she "knows" to be true from what someone else might "think" is true. In Piagetian terms, they must give up a tendency toward egocentrism. The child must also understand that what guides people's actions and responses are what they "believe" rather than what is reality. In other words, people can mistakenly believe things that are false and will act based on this false knowledge. Consequently, prior to age four children are rarely successful at solving such a task (Wellman, Cross & Watson, 2001).

Researchers examining the development of theory of mind have been concerned by the overemphasis on the mastery of false belief as the primary measure of whether a child has attained theory of mind. Wellman and his colleagues (Wellman, Fang, Liu, Zhu & Liu, 2006) suggest that theory of mind is comprised of a number of components, each with its own developmental timeline (see Table).

Two-year-olds understand the diversity of desires, yet as noted earlier it is not until age four or five that children grasp false belief, and often not until middle childhood do they understand that people may hide how they really feel. In part, because children in early childhood have difficulty hiding how they really feel.

Cultural Differences in Theory of Mind

Those in early childhood in the US, Australia, and Germany develop theory of mind in the sequence outlined above. Yet, Chinese and Iranian preschoolers acquire knowledge access before diverse beliefs (Shahaeian, Peterson, Slaughter & Wellman, 2011). Shahaeian and colleagues suggested that cultural differences in childrearing may account for this reversal.

Parents in collectivistic cultures, such as China and Iran, emphasize conformity to the family and cultural values, greater respect for elders, and the acquisition of knowledge and academic skills more than they do autonomy and social skills (Frank, Plunkett & Otten, 2010). This could reduce the degree of familial conflict of opinions expressed in the family. In contrast, individualistic cultures encourage children to think for themselves and assert their own opinion, and this could increase the risk of conflict in beliefs being expressed by family members.



Figure **10.7.3**: A family from a non-Western culture.[6]

As a result, children in individualistic cultures would acquire insight into the question of diversity of belief earlier, while children in collectivistic cultures would acquire knowledge access earlier in the sequence. The role of conflict in aiding the development of theory of mind may account for the earlier age of onset of an understanding of false belief in children with siblings, especially older siblings (McAlister & Petersen, 2007; Perner, Ruffman & Leekman, 1994.

This awareness of the existence of theory of mind is part of social intelligence, such as recognizing that others can think differently about situations. It helps us to be self-conscious or aware that others can think of us in different ways and it helps us to be able to be understanding or be empathetic toward others. Moreover, this mind reading ability helps us to anticipate and predict people's actions. The awareness of the mental states of others is important for communication and social skills.[7]

During middle and late childhood children make strides in several areas of cognitive function including the capacity of working memory, their ability to pay attention, and their use of memory strategies. Both changes in the brain and experience foster these abilities.

Influence of Culture

Information processing theory takes into account the biological and environmental factors – neurons, myelination, synaptic pruning, acquisition of strategies, developing body of knowledge, and flexible use of strategies to explain memory development.

Culture and geography influences cognitive development in a variety of different ways – wealth of beliefs, customs, arts etc. Vai people of Liberia learn English, Arabic and Vai – this last is broken up into phonetic syllables. So when those who have learned Vai are taught sentences using parts of words, they outperform the others. However, when they are taught sentences using whole words, their performance is no different from the others. Physical geography also influences children's development for example in cultures where there are fewer straight angles, the Muller Lyer illusion is less likely to be upheld.

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10.8: Core Knowledge theory

The theory of core knowledge proposes that infants are born with 'core knowledge systems' that support basic intuitions about the world (Spelke & Kinzler, 2007). Whereas Piaget claimed that children construct knowledge by engaging with the world and Vygotsky claimed children develop cognitively by participating with others in culturally-relevant activities, the theory of core knowledge claims that children are born with basic knowledge. Supporters of this theory suggest that the many studies documenting cognitive abilities in just the first few months of infancy, provide evidence for this theory. For example, Renée Baillargeon's early work discovered that object permanence is developed in infants at a much younger age than Piaget proposed--already by 3 to 4 months of age (Baillargeon, 1987)! The fact that infants have an understanding of object permanence already, in only the first few months of life, suggests that this knowledge might be inborn. [1]

In one experiment on object permanence, young infants were familiarized with a display in which a screen lying flat and facing the infant rotated up and away from the infant 180° in the manner of a drawbridge (Baillargeon, 1987). During the test phase, a new object was then placed at the far edge of the screen, which either did or did not impede the rotating screen (see Figure for a depiction of the experimental scenarios). In the "impossible" scenario, the screen moved exactly as during familiarization, appearing to rotate right through the object. In the "possible" scenario, the screen rotated only to the point where it would be expected to make contact with the object and then stopped moving. Infants looked longer at the "impossible" scenario than the 'possible' scenario – which was interpreted in terms of a violation of infants' expectations regarding object permanence. In another experiment on object permanence (see Figure for a visual depiction of the scenarios), 3 to 4 month old infants looked longer at an impossible event (tall carrot moving behind a box with a section cut out near the top of the box that should have shown the green top of the carrot as it moved behind the box) than the possible event (short carrot moving behind a box with a section cut out near the top of the box that should not have shown the green top of the carrot as it moved behind the box) (Baillargeon & DeVos, 1991).

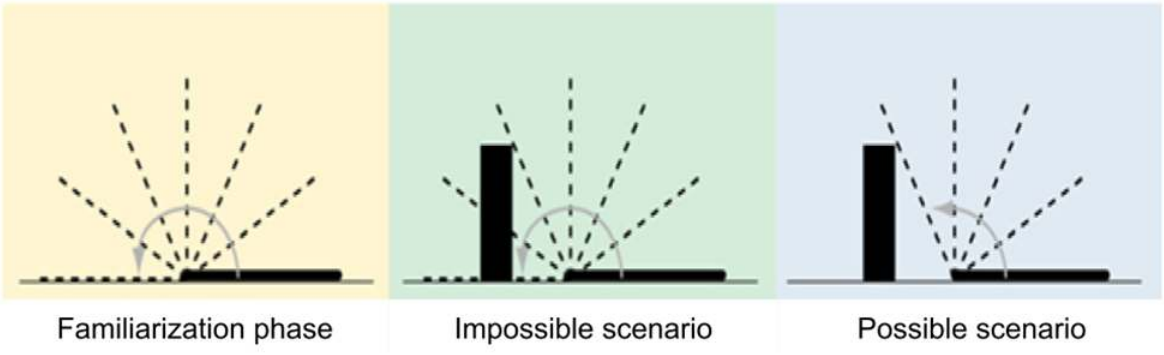


Figure **10.8.1**: Depiction of the object permanence stimuli from Baillargeon (1987). Side view of habituation and test displays. In both conditions, infants were habituated to a 180° drawbridge-like motion. The decline and plateau of looking times during habituation are depicted. In the Experimental Condition, infants completed two types of test trials, both of which contained a new object on the far side of the display. The *Impossible Test* involved the same full 180° rotation from habituation, but now the screen surprisingly passed through the box as it completed its rotation (with the box disappearing as it became obscured). The *Possible Test* involved a novel shorter rotation of screen up to the point where it would contact the box, where it stopped; this motion was "possible" in terms of solidity and object permanence, but was more *perceptually novel* than the Impossible Test. infants dishabituated to the Impossible Test but not the Possible Test. However, in the Control Condition no preference was observed. These results were interpreted as reflecting the violation of infants' expectations regarding solidity and/or object permanence.. ([2])

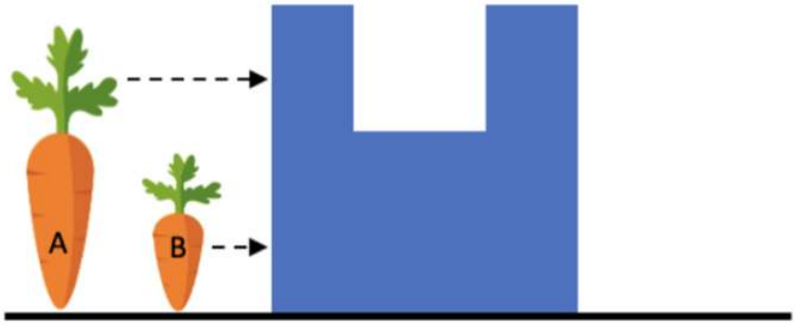


Figure **10.8.2**: Depiction of the object permanence stimuli ([3])

Building on Baillargeon's early research, many studies have since continued to document a range of abilities that are collectively described as 'core systems of knowledge' and suggest basic inborn knowledge about the physical world (Hamlin, Wynn & Bloom, 2010; Spelke, 1998; Spelke et al., 1992; Spelke & Kinzler, 2007; Wang & Feigenson, 2021). Unlike Piaget's and Vygotsky's theories, the theory of core knowledge suggests that some aspects of early knowledge do not need to be learned with experience or from more knowledgeable others because children are instead born with this knowledge. [1]

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10.9: Memory

Memory is an information processing system that we often compare to a computer. Memory is the set of processes used to encode, store, and retrieve information over different periods of time.



Figure **10.9.1**: The memory process consists of encoding, storage and retrieval.[1]

Memory processes

Encoding involves the input of information into the memory system. Storage is the retention of the encoded information. Retrieval, or getting the information out of memory and back into awareness, is the third function.

Encoding (Input of Information to Memory)

We get information into our brains through a process called **encoding**, which is the input of information into the memory system. Once we receive sensory information from the environment, our brains label or code it. We organize the information with other similar information and connect new concepts to existing concepts. Encoding information occurs through both automatic processing and effortful processing. For example, if someone asks you what you ate for lunch today, more than likely you could recall this information quite easily. This is known as **automatic processing**, or the encoding of details like time, space, frequency, and the meaning of words. Automatic processing is usually done without any conscious awareness.

Recalling the last time you studied for a test is another example of automatic processing. But what about the actual test material you studied? It probably required a lot of work and attention on your part to encode that information; this is known as **effortful processing.** When you first learn new skills such as driving a car, you have to put forth effort and attention to encode information about how to start a car, how to brake, how to handle a turn, and so on. Once you know how to drive, you can encode additional information about this skill automatically.

Storage (Retaining Information in Memory)

Once the information has been encoded, we have to retain it. Our brains take the encoded information and place it in storage. Storage is the creation of a permanent record of information. In order for a memory to go into storage (i.e., long-term memory), it has to pass through three distinct stages: Sensory Memory, Short-Term Memory, and finally Long-Term Memory. These stages were first proposed by Richard Atkinson and Richard Shiffrin (1968). Their model of human memory, called Atkinson-Shiffrin (A-S), is based on the belief that we process memories in the same way that a computer processes information.

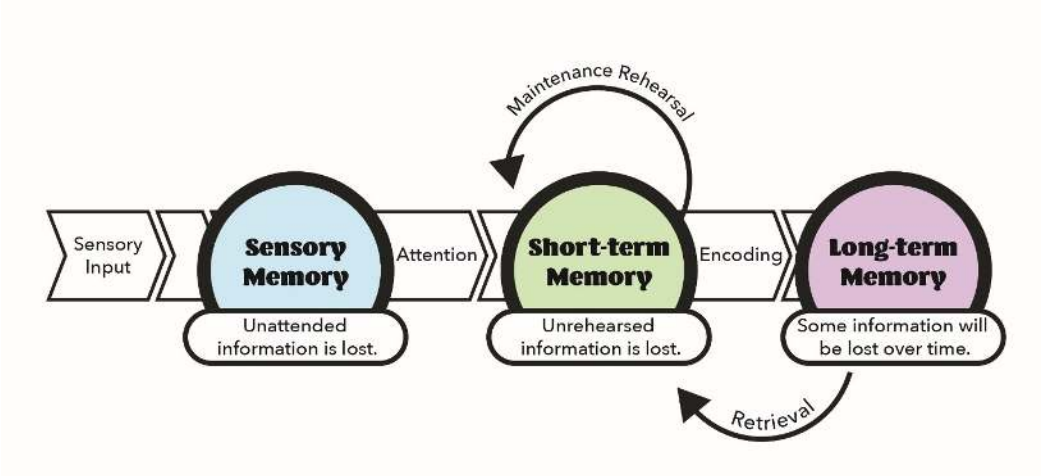


Figure **10.9.2**: According to the Atkinson-Shiffrin model of memory, information passes through three distinct stages in order for it to be stored in long-term memory: from sensory memory unattended information is lost, but attended information goes into short term memory where it stays if it is rehearsed, and can be consolidated into long term memory. This last loses some information over time, but retrieval from here brings information back into short term memory.[2]

Sensory Memory (First Stage of Storage)

In the Atkinson-Shiffrin model, stimuli from the environment are processed first in **sensory memory**, storage of brief sensory events, such as sights, sounds, and tastes. It is very brief storage—up to a couple of seconds. We are constantly bombarded with sensory information. We cannot absorb all of it, or even most of it. And most of it has no impact on our lives. For example, what was your professor wearing the last class period? As long as the professor was dressed appropriately, it does not really matter what they were wearing. Sensory information about sights, sounds, smells, and even textures, which we do not view as valuable information, we discard. If we view something as valuable, the information will move into our short-term memory system.

One study of sensory memory researched the significance of valuable information on short-term memory storage. J. R. Stroop discovered a memory phenomenon in the 1930s: you will name a color more easily if it appears printed in that color, which is called the Stroop effect.

The Stroop Effect describes why it is difficult for us to name a color when the word and the color of the word are different. To test this out a person is instructed not to read the words below, but to say the color the word is printed in. For example, upon seeing the word “yellow” in green print, they should say “green,” not “yellow.” This experiment is fun, but it’s not as easy as it seems.

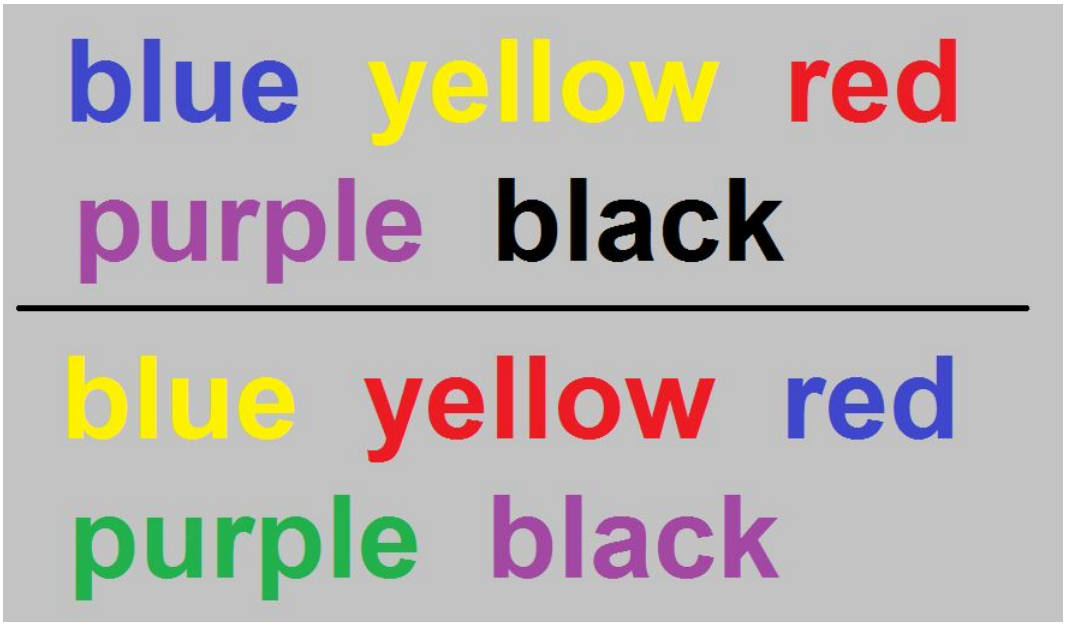


Figure 10.9.3: The color words in the top frame correspond with the color they are written in. Therefore when participants are asked to name the color of the print, they respond faster than when asked to do the same for the second/lower frame. When the word blue is written in yellow (the word yellow in red, the word red in blue, the word purple in green and the word black in purple), it takes people longer to say what color the ink is. (Stroop test by Xiaozhu89 (2012) licensed CC-BY SA 3.0 via wikimedia)

Short-Term Memory or Working Memory (Second Stage of Storage)

Short-term memory is a temporary storage system that processes incoming sensory memory; sometimes it is called working memory. Short-term memory takes information from sensory memory and sometimes connects that memory to something already in long-term memory. Short-term memory storage lasts about 20 seconds. Think of short-term memory as the information you have displayed on your computer screen—a document, a spreadsheet, or a web page. Information in short-term memory either goes to long-term memory (when you save it to your hard drive) or it is discarded (when you delete a document or close a web browser).

George Miller (1956), in his research on the capacity of memory, found that most people can retain about seven items in short-term memory. Some remember five, some nine, so he called the capacity of short-term memory the range of seven items plus or minus two.

To explore the capacity and duration of short-term memory, two people can try this activity. One person reads the strings of random numbers below out loud to the other, beginning each string by saying, “Ready?” and ending each by saying, “Recall.” Then the second person should try to write down the string of numbers from memory.

9754

6519

68259

67148

913825

648327

5316842

5963827

86951372

51739826

719384273

163875942

This can be used to determine the longest string of digits that you can store. For most people, this will be close to seven, Miller's famous seven plus or minus two. Recall is somewhat better for random numbers than for random letters (Jacobs, 1887) and is also often slightly better for information we hear (**acoustic encoding,** which is the encoding of sounds) rather than what we see (**visual encoding,** which is the encoding of images and words in particular) (Anderson, 1969).

The capacity of working memory expands during middle and late childhood, research has suggested that both an increase in processing speed and the ability to inhibit irrelevant information from entering memory are contributing to the greater efficiency of working memory during this age (de Ribaupierre, 2002). Changes in **myelination** and **synaptic pruning** in the **cortex** are likely behind the increase in processing speed and ability to filter out irrelevant stimuli (Kail, McBride-Chang, Ferrer, Cho, & Shu, 2013).

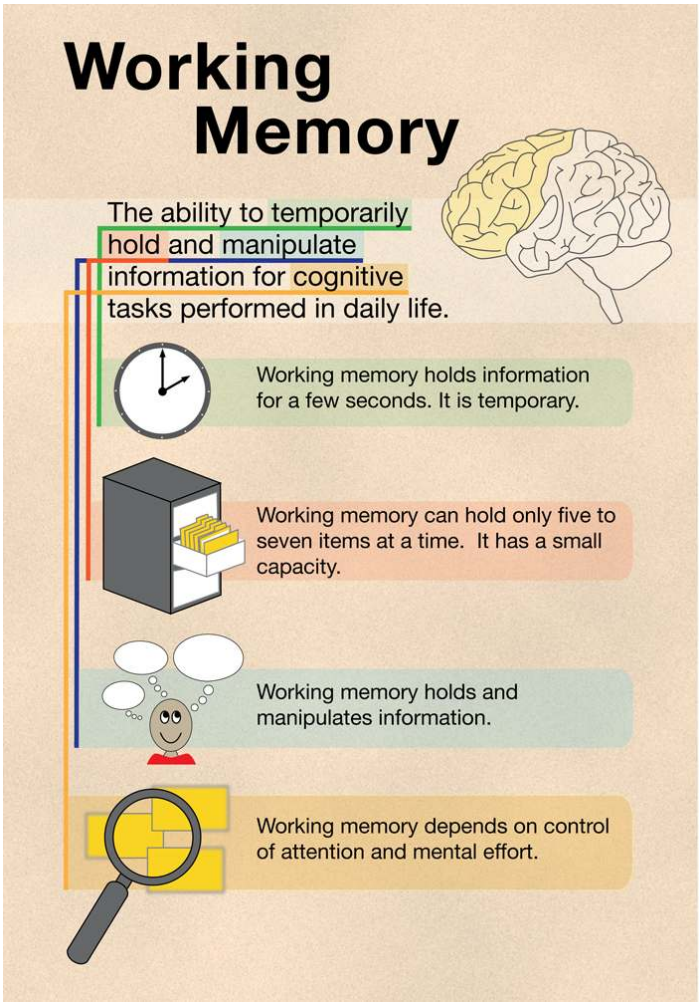


Figure **10.9.4**: Working memory expands during middle and late childhood. The ability to temporarily hold and manipulate information for cognitive tasks performed in daily life. Working memory holds information for a few seconds. It is temporary. Working memory can hold only five to seven items at a time. It has a small capacity. Working memory holds and manipulates information. Working memory depends on control of attention and mental effort.[3]

Long-Term Memory (Third and Final Stage of Storage)

Long-term memory is the continuous storage of information. Unlike short-term memory, the storage capacity of long-term memory has no limits. It encompasses all the things you can remember that happened more than just a few minutes ago to all of the things that you can remember that happened days, weeks, and years ago. In keeping with the computer analogy, the information in your long-term memory would be like the information you have saved on the hard drive. It isn't there on your desktop (your short-term memory), but you can pull up this information when you want it, at least most of the time. Not all long-term memories are strong memories. Some memories can only be recalled through prompts. For example, you might easily recall a fact— "What is the capital of the United States?"—or a procedure—"How do you ride a bike?"—but you might struggle to recall the name of the

restaurant you had dinner at when you were on vacation in France last summer. A prompt, such as that the restaurant was named after its owner, who spoke to you about your shared interest in soccer, may help you recall (retrieve) the name of the restaurant.

Retrieval (Finding Memories)

So you have worked hard to encode via effortful processing (a lot of work and attention on your part in order to encode that information) and store some important information for your upcoming final exam. How do you get that information back out of storage when you need it? The act of getting information out of memory storage and back into conscious awareness is known as **retrieval.** This would be similar to finding and opening a paper you had previously saved on your computer's hard drive. Now it's back on your desktop, and you can work with it again. Our ability to retrieve information from long-term memory is vital to our everyday functioning. You must be able to retrieve information from memory in order to do everything from knowing how to brush your hair and teeth, to driving to work, to knowing how to perform your job once you get there.

Long-Term Memory Retrieval (Storage System): Recall, Recognition, Relearning, and Forgetting

There are three ways you can retrieve information out of your long-term memory storage system: recall, recognition, and relearning. **Recall** is what we most often think about when we talk about memory retrieval: it means you can access information without cues. For example, you would use recall for an essay test. **Recognition** happens when you identify information that you have previously learned after encountering it again. It involves a process of comparison. When you take a multiple-choice test, you are relying on recognition to help you choose the correct answer. The third form of retrieval is **relearning**, and it's just what it sounds like, it involves learning information that you previously learned. Whitney took Spanish in high school, but after high school she did not have the opportunity to speak Spanish. Whitney is now 31, and her company has offered her an opportunity to work in their Mexico City office. In order to prepare herself, she enrolls in a Spanish course at the local community college. She's surprised at how quickly she's able to pick up the language after not speaking it for 13 years; this is an example of relearning.

Forgetting (It Wasn't Locked In)

As we just learned, your brain must do some work (effortful processing) to encode information and move it into short-term, and ultimately long-term memory. This has strong implications for a student, as it can impact their learning – if one doesn't work to encode and store information, it will likely be forgotten. Research indicates that people forget 80 percent of what they learn only a day later. This statistic may not sound very encouraging, given all that you're expected to learn and remember as a college student. Really, though, it points to the importance of a study strategy other than waiting until the night before a final exam to review a semester's worth of readings and notes. When you learn something new, the goal is to "lock it in" sooner rather than later, and move it from short-term memory to long-term memory, where it can be accessed when you need it (like at the end of the semester for your final exam or maybe years from now). The next section will explore a variety of strategies that can be used to process information more deeply and help improve retrieval.[4]

Memory Strategies

Bjorklund (2005) describes a developmental progression in the acquisition and use of memory strategies. Such strategies are often lacking in younger children, but increase in frequency as children progress through elementary school. Examples of memory strategies include rehearsing information you wish to recall, visualizing and organizing information, creating rhymes, such as "i" before "e" except after "c", or inventing acronyms, such as "roygbiv" to remember the colors of the rainbow. Schneider, Kron-Sperl, and Hünnerkopf (2009) reported a steady increase in the use of memory strategies from ages six to ten in their longitudinal study. Moreover, by age ten many children were using two or more memory strategies to help them recall information. Schneider and colleagues found that there were considerable individual differences at each age in the use of strategies, and that children who utilized more strategies had better memory performance than their same aged peers.

Knowing What to Know

How can you decide what to study and what you need to know? The answer is to prioritize what you're trying to learn and memorize, rather than trying to tackle all of it. Below are some strategies to help you do this:

- **Think about concepts rather than facts:** Most of the time instructors are concerned about you learning about the key concepts in a subject or course rather than specific facts.

- **Take cues from your instructor**: Pay attention to what your instructor writes on the board, mentions repeatedly in class, or includes in study guides and handouts, they are likely core concepts that you'll want to focus on.
- **Look for key terms**: Textbooks will often put key terms in bold or italics.
- **Use summaries**: Read end of chapter summaries, or write your own, to check your understanding of the main elements of the reading.

Transferring Information from Short-Term Memory to Long-Term Memory

In the previous discussion of how memory works, the importance of making intentional efforts to transfer information from short-term to long-term memory was noted. Below are some strategies to facilitate this process:

- **Start reviewing new material immediately**: Remember that people typically forget a significant amount of new information within 24 hours of learning it.
- **Study frequently for shorter periods of time**: If you want to improve the odds of recalling course material by the time of an exam or in future class, try reviewing it a little bit every day.

Strengthening your Memory

How can you work to strengthen your overall memory? Some people have stronger memories than others but memorizing new information takes work for anyone. Below are some strategies that can aid memory:

- **Rehearsal:** One strategy is rehearsal, or the conscious repetition of information to be remembered (Craik & Watkins, 1973). Academic learning comes with time and practice, and at some point the skills become second nature.
- **Incorporate visuals:** Visual aids like note cards, concept maps, and highlighted text are ways of making information stand out. These aids make the information to be memorized seem more manageable and less daunting.
- **Create mnemonics:** Memory devices known as **mnemonics** can *help you retain information while only needing to remember a unique phrase or letter pattern that stands out*. They are especially useful when we want to recall larger bits of information such as steps, stages, phases, and parts of a system (Bellezza, 1981). There are different types of mnemonic devices:
  - **Acronym:** An **acronym** is a word formed by the first letter of each of the words you want to remember. Such as HOMES for the Great Lakes (Huron, Ontario, Michigan, Erie, and Superior)
  - **Acrostic:** In an **acrostic**, you make a phrase of all the first letters of the words. For example, if you need to remember the order of mathematical operations, recalling the sentence "Please Excuse My Dear Aunt Sally" will help you, because the order of mathematical operations is Parentheses, Exponents, Multiplication, Division, Addition, Subtraction.
  - **Jingles:** Rhyming tunes that contain key words related to the concept, such as "i before e, except after c" are jingles.
  - **Visual**: Using a visual to help you remember is also useful. Such as the knuckle mnemonic shown in the image below to help you remember the number of days in each month. Months with 31 days are represented by the protruding knuckles and shorter months fall in the spots between knuckles.

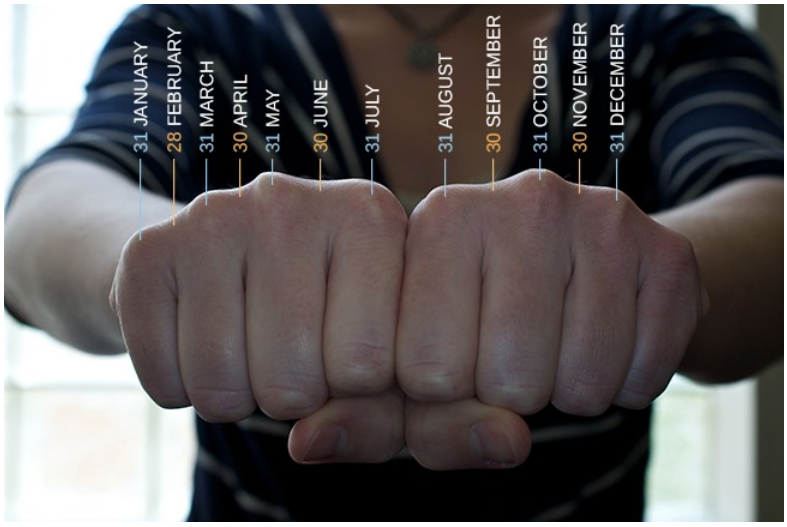


Figure **10.9.5**: You might use a mnemonic device to help you remember someone's name, a mathematical formula, or the six levels of Bloom's taxonomy.[6]

- **Chunking:** Another strategy is chunking, where you organize information into manageable bits or chunks, such as turning a phone number you remember into chunks.
- **Connect new information to old information:** It's easier to remember new information if you can connect it to old information, a familiar frame of reference, or a personal experience.
- **Get quality sleep:** Although some people require more or less sleep than the recommended amount, most people should aim for six to eight hours every night.

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CHAPTER OVERVIEW

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11.2: Attention

11.3: Cognitive milestones in infancy and early childhood

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11.6: Wisdom and risk taking in adolescence

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11.1: Memory and executive function development

If we want to remember something tomorrow, we have to consolidate it into long-term memory today. **Long-term memory** is the final, semi-permanent stage of memory. Unlike sensory and short-term memory, long-term memory has a theoretically infinite capacity, and information can remain there indefinitely. Long-term memory has also been called reference memory, because an individual must refer to the information in long-term memory when performing almost any task. Long-term memory can be broken down into two categories: explicit and implicit memory.

Explicit Memory

Explicit memory, also known as conscious or **declarative memory**, involves memory of facts, concepts, and events that require conscious recall of the information. In other words, the individual must actively think about retrieving the information from memory. This type of information is *explicitly* stored and retrieved—hence its name. Explicit memory can be further subdivided into **semantic memory**, which concerns facts, and episodic memory, which concerns primarily personal or autobiographical information.

Semantic Memory

Semantic memory refers to the facts that a child begins to acquire in the form of language and other knowledge. When I used to ask our youngest child how they knew some fact they had spouted off they would say "I just knowed it mommy!" This is certainly an example of explicit memory since they could declare it was something they knew (therefore declarative or explicit memory). Also it is an example of semantic memory if it was something like a description of a fact like "Airplanes are big and blue"

Episodic Memory

Episodic memory is used for more contextualized memories. They are generally memories of specific moments, or episodes, in one's life. As such, they include sensations and emotions associated with the event, in addition to the who, what, where, and when of what happened. An example of an episodic memory would be recalling your family's trip to the beach. Autobiographical memory (memory for particular events in one's own life) is generally viewed as either equivalent to, or a subset of, episodic memory. One specific type of autobiographical memory is a flashbulb memory, which is a highly detailed, exceptionally vivid "snapshot" of the moment and circumstances in which a piece of surprising and consequential (or emotionally arousing) news was heard. For example, many people remember exactly where they were and what they were doing when they heard of the terrorist attacks on September 11, 2001. This is because it is a flashbulb memory.

Semantic and episodic memory are closely related; memory for facts can be enhanced with episodic memories associated with the fact, and vice versa. For example, the answer to the factual question "Are all apples red?" might be recalled by remembering the time you saw someone eating a green apple. Likewise, semantic memories about certain topics, such as football, can contribute to more detailed episodic memories of a particular personal event, like watching a football game. A person that barely knows the rules of football will remember the various plays and outcomes of the game in much less detail than a football expert.

Implicit Memory

In contrast to explicit (conscious) memory, **implicit** (also called "unconscious" or "procedural") **memory** involves procedures for completing actions. These actions develop with practice over time. Athletic skills are one example of implicit memory. You learn the fundamentals of a sport, practice them over and over, and then they flow naturally during a game. Rehearsing for a dance or musical performance is another example of implicit memory. Everyday examples include remembering how to tie your shoes, drive a car, or ride a bicycle. These memories are accessed without conscious awareness—they are automatically translated into actions without us even realizing it. As such, they can often be difficult to teach or explain to other people. Implicit memories differ from the semantic scripts described above in that they are usually actions that involve movement and motor coordination, whereas scripts tend to emphasize social norms or behaviors.



Figure **11.1.1**: A normal toddler's experiences walking outdoors and playing may not necessarily be remembered for long.[1]

Short-Term Memory Storage

Short-term memory is the ability to hold information for a short duration of time (on the order of seconds). In the process of encoding, information enters the brain and can be quickly forgotten if it is not stored further in the short-term memory. George A. Miller suggested that the capacity of short-term memory storage is approximately seven items plus or minus two, but modern researchers are showing that this can vary depending on variables like the stored items' phonological properties. When several elements (such as digits, words, or pictures) are held in short-term memory simultaneously, their representations compete with each other for recall, or degrade each other. Thereby, new content gradually pushes out older content, unless the older content is actively protected against interference by rehearsal or by directing attention to it.

Information in the short-term memory is readily accessible, but for only a short time. It continuously decays, so in the absence of rehearsal (keeping information in short-term memory by mentally repeating it) it can be forgotten.

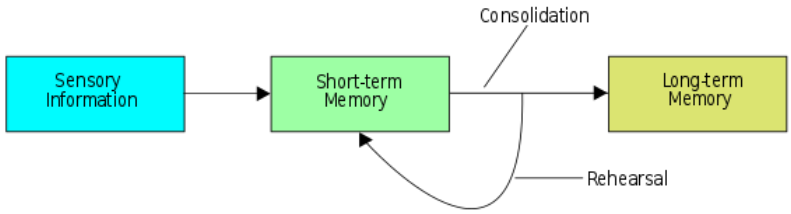


Figure **11.1.2**: Diagram of the memory storage process – where sensory information is transferred to short term memory, and retained there through rehearsal, but also moved into longterm memory in a process called consolidation.[2]

Long-Term Memory Storage

In contrast to short-term memory, **long-term memory** is the ability to hold semantic information for a prolonged period of time. Items stored in short-term memory move to long-term memory through rehearsal, processing, and use. The capacity of long-term memory storage is much greater than that of short-term memory, and perhaps unlimited. However, the duration of long-term memories is not permanent; unless a memory is occasionally recalled, it may fail to be recalled on later occasions. This is known as forgetting.

Long-term memory storage can be affected by traumatic brain injury or lesions. Amnesia, a deficit in memory, can be caused by brain damage. Anterograde amnesia is the inability to store new memories; retrograde amnesia is the inability to retrieve old memories. These types of amnesia indicate that memory does have a storage process[3].

Infantile amnesia

Autobiographical memory is our personal narrative. Adults rarely remember events from the first few years of life. In other words, we lack autobiographical memories from our experiences as an infant, toddler and very young preschooler. Several factors

contribute to the emergence of autobiographical memory including brain maturation, improvements in language, opportunities to talk about experiences with parents and others, the development of theory of mind, and a representation of "self" (Nelson & Fivush, 2004). Two-year-olds do remember fragments of personal experiences, but these are rarely coherent accounts of past events (Nelson & Ross, 1980). Between 2 and 2 1⁄2 years of age children can provide more information about past experiences. However, these recollections require considerable prodding by adults (Nelson & Fivush, 2004). Over the next few years children will form more detailed autobiographical memories and engage in more reflection of the past.

Memory in early childhood

Based on studies of adults, people with amnesia, and neurological research on memory, researchers have proposed several "types" of memory (see Figure). **Sensory memory** (also called the sensory register) is the first stage of the memory system, and it stores sensory input in its raw form for a very brief duration; essentially long enough for the brain to register and start processing the information. Studies of auditory sensory memory show that it lasts about one second in 2 year-olds, two seconds in 3-year-olds, more than two seconds in 4-year-olds, and three to five seconds in 6-year-olds (Glass, Sachse, & von Suchodoletz, 2008). Other researchers have also found that young children hold sounds for a shorter duration than do older children and adults, and that this deficit is not due to attentional differences between these age groups, but reflects differences in the performance of the sensory memory system (Gomes et al., 1999). The second stage of the memory system is called short-term or **working memory**. Working memory is the component of memory in which current conscious mental activity occurs.

Working memory often requires conscious effort and adequate use of attention to function effectively. In early childhood, children struggle with many aspects of attention and this greatly diminishes their ability to consciously juggle several pieces of information in memory. The capacity of working memory, that is the amount of information someone can hold in consciousness, is smaller in young children than in older children and adults. The typical adult and teenager can hold a 7 digit number active in their short-term memory. The typical 5-year-old can hold only a 4 digit number active. This means that the more complex a mental task is, the less efficient a younger child will be in paying attention to, and actively processing, information in order to complete the task.



Figure **11.1.3**: Much research has examined the elements and processes of children's thinking.[4]

Executive function

Changes in attention and the working memory system also involve changes in executive function. **Executive function (EF)** refers to self-regulatory processes, such as the ability to inhibit a behavior or cognitive flexibility, that enable adaptive responses to new situations or to reach a specific goal.

"EF covers a set of both unique and overlapping cognitive processes which are required for problem solving and goal achievement (Miyake et al., 2000; Diamond et al., 2007). The core components of EF are *working memory* (mentally holding and using

information), *inhibitory control* (deliberate, controlled suppression of prepotent responses), and *cognitive flexibility* (adjusting to change and shifting of mental sets)." (Spiegler & Leyendecker, 2017)

Executive function skills gradually emerge during early childhood and continue to develop throughout childhood and adolescence. Like many cognitive changes, brain maturation, especially the prefrontal cortex, along with experience influence the development of executive function skills.

A child shows higher executive functioning skills when the parents are more warm and responsive, use scaffolding when the child is trying to solve a problem, and provide cognitively stimulating environments for the child (Fay-Stammbach, Hawes & Meredith, 2014). For instance, scaffolding was positively correlated with greater cognitive flexibility at age two and inhibitory control at age four (Bibok, Carpendale & Müller, 2009). In Schneider, Kron-Sperl and Hunnerkopf's (2009) longitudinal study of 102 kindergarten children, the majority of children used no strategy to remember information, a finding that was consistent with previous research. As a result, their memory performance was poor when compared to their abilities as they aged and started to use more effective memory strategies.

The role of culture

Both bilingualism, and biculturalism require the ability to effectively alternate the use of culturally appropriate behaviors (LaFromboise et al., 1993). Therefore, Spiegler and Leyendecker (2027) assumed that biculturals who endorse both cultures with equal strength will perform better on EF tasks than individuals who favor one culture over the other. In addition, we expect performance differences to be most pronounced in tasks that require cognitive flexibility as the successful navigation of cultures involves the ability to switch between different mind sets (Hong et al., 2000).

Their study's focus was on Turkish-German children of immigrant origin. This allowed them to investigate the consequences of immersion into two markedly distant cultures in terms of interdependence—independence, family obligations, religious values and traditions, and gender role expectations. The acculturation complexity model argues that the immersion into conflicting and dissonant cultures is most likely to promote cognitive skills (Tadmor and Tetlock, 2006). Their focus on children is of immediate societal relevance as Turkish-German children are the largest immigrant-origin group in Germany and among the least successful in the German school system compared to native Germans and other immigrant groups, and because EF performance is strongly correlated with academic achievement (Best et al., 2011).

Their study is the first to demonstrate that immigrant-origin children who identify equally strong with their ethnic heritage and host-national groups perform better on a switching task that demands cognitive flexibility than their peers who prefer one culture over the other. The immersion into two cultures is highly demanding, especially if both cultures are markedly distinct. Individuals who endorse such distinct cultures with relatively equal strength are expected to switch more often between cultural mindsets and behavioral repertoires than individuals who make a commitment to one of the cultures (Hong et al., 2000). Their results indicate that the more frequent cultural frame switching experiences of biculturals can generalize to greater switching abilities in non-cultural tasks. This complements research on the positive effects of bilingualism and is a valuable contribution to prior research on biculturals' advanced cognitive complexity.

It is of interest to note that children who reported relatively low identity as both Turkish and German also performed well. Similar findings were reported by Tadmor et al. (2009) who studied cognitive complexity among Asian American college students and Israelis in the United States. They argued that it is the equal preference for two cultures, rather than high levels of identification, that creates dissonance, an internal conflict due to respected, discordant cultural values, and cognitions. Resolving this conflict repeatedly increases cognitive ability.

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11.2: Attention

Changes in attention have been described by many as the key to changes in human memory (Nelson & Fivush, 2004; Posner & Rothbart, 2007). However, attention is not a unified function; it is comprised of sub-processes. The ability to switch our focus between tasks or external stimuli is called **divided attention** or **multitasking.** This is separate from our ability to focus on a single task or stimulus, while ignoring distracting information, called **selective attention**. Different from these is **sustained attention**, or the ability to stay on task for long periods of time. Moreover, we also have attention processes that influence our behavior and enable us to inhibit a habitual or dominant response, and others that enable us to distract ourselves when upset or frustrated.

Divided Attention

Young children (age 3-4) have considerable difficulties in dividing their attention between two tasks, and often perform at levels equivalent to our closest relative, the chimpanzee, but by age five they have surpassed the chimp (Hermann, Misch, Hernandez-Lloreda & Tomasello, 2015; Hermann & Tomasello, 2015). Despite these improvements, 5-year-olds continue to perform below the level of school-age children, adolescents, and adults.

Selective Attention

Children's ability with selective attention tasks improve as they age. However, this ability is also greatly influenced by the child's temperament (Rothbart & Rueda, 2005), the complexity of the stimulus or task (Porporino, Shore, Iarocci & Burack, 2004), and along with whether the stimuli are visual or auditory (Guy, Rogers & Cornish, 2013). Guy et al. (2013) found that children's ability to selectively attend to visual information outpaced that of auditory stimuli. This may explain why young children are not able to hear the voice of the teacher over the cacophony of sounds in the typical preschool classroom (Jones, Moore & Amitay, 2015). Jones and his colleagues found that 4 to 7 year-olds could not filter out background noise, especially when its frequencies were close in sound to the target sound. In comparison, 8- to 11-year-old children often performed similar to adults.



Figure **11.2.1**: Craft making illustrates the growth of motor skills in these young children, but also their burgeoning cognitive abilities including paying attention and planning.[1]

Sustained Attention

Most measures of sustained attention typically ask children to spend several minutes focusing on one task, while waiting for an infrequent event, while there are multiple distractors for several minutes. Berwid, Curko-Kera, Marks & Halperin (2005) asked children between the ages of 3 and 7 to push a button whenever a "target" image was displayed, but they had to refrain from pushing the button when a non-target image was shown. The younger the child, the more difficulty he or she had maintaining their attention.



Figure **11.2.2**: A child playing a game that measures her sustained attention.[2]

The ability to inhibit irrelevant information improves during middle childhood, with there being a sharp improvement in selective attention from age six into adolescence (Vakil, Blachstein, Sheinman, & Greenstein, 2009). Children also improve in their ability to shift their attention between tasks or different features of a task (Carlson, Zelazo, & Faja, 2013). A younger child who is asked to sort objects into piles based on type of object, car versus animal, or color of object, red versus blue, would likely have no trouble doing so. But if you ask them to switch from sorting based on type to now having them sort based on color, they would struggle because this requires them to suppress the prior sorting rule. An older child has less difficulty making the switch, meaning there is greater flexibility in their intentional skills. These changes in attention and working memory contribute to children having more strategic approaches to challenging tasks.

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11.3: Cognitive milestones in infancy and early childhood

Children are actively learning about the world as they perceive it from the time they are in the womb. Here is a table of some of the cognitive milestones infants and toddlers typically develop.

Table **11.3.1**: Cognitive milestones in infancy and toddlerhood[1]

https://socialsci.libretexts.org/@go/page/180277

Typical Age	What Most Children Do by This Age
2 months	• Pays attention to faces • Begins to follow things with eyes and recognize people at a distance • Begins to act bored (cries, fussy) if activity doesn't change
4 months	• Lets you know if she is happy or sad • Responds to affection • Reaches for toy with one hand • Uses hands and eyes together, such as seeing a toy and reaching for it • Follows moving things with eyes from side to side • Watches faces closely • Recognizes familiar people and things at a distance
6 months	• Looks around at things nearby • Brings things to mouth • Shows curiosity about things and tries to get things that are out of reach • Begins to pass things from one hand to the other
9 months	• Watches the path of something as it falls • Looks for things he sees you hide • Plays peek-a-boo • Puts things in mouth • Moves things smoothly from one hand to the other • Picks up things like cereal o's between thumb and index finger
1 year	• Explores things in different ways, like shaking, banging, throwing • Finds hidden things easily • Looks at the right picture or thing when it's named • Copies gestures • Starts to use things correctly; for example, drinks from a cup, brushes hair • Bangs two things together • Puts things in a container, takes things out of a container • Lets things go without help • Pokes with index (pointer) finger • Follows simple directions like "pick up the toy"
18 months	• Knows what ordinary things are for; for example, telephone, brush, spoon • Points to get the attention of others • Shows interest in a doll or stuffed animal by pretending to feed • Points to one body part • Scribbles on own • Can follow 1-step verbal commands without any gestures; for example, sits when you say "sit down"
2 years	• Finds things even when hidden under two or three covers • Begins to sort shapes and colors • Completes sentences and rhymes in familiar books • Plays simple make-believe games • Builds towers of 4 or more blocks • Might use one hand more than the other • Follows two-step instructions such as "Pick up your shoes and put them in the closet." • Names items in a picture book such as a cat, bird, or dog



Figure **11.3.1**: While children learn many things through the experiences of bubbles and baths, it is also normal for them to be afraid of water and drains.[3]

A child might protest if told that something will happen “tomorrow” but be willing to accept an explanation that an event will occur “today after we sleep.” Or the young child may ask, “How long are we staying? From here to here?” while pointing to two points on a table. Concepts such as tomorrow, time, size and distance are not easy to grasp at this young age. Understanding size, time, distance, fact and fiction are all tasks that are part of cognitive development in the preschool years.[4]

The many theories of cognitive development and the different research that has been done about how children understand the world, has allowed researchers to study the milestones that children who are typically developing experience in early childhood. Here is a table that summarizes those.

Table **11.3.2**: Cognitive milestones in early childhood[5]

Typical Age	What Most Children Do by This Age
3 years	• Can work toys with buttons, levers, and moving parts • Plays make-believe with dolls, animals, and people • Does puzzles with 3 or 4 pieces • Understands what “two” means
4 years	• Names some colors and some numbers • Understands the idea of counting • Starts to understand time • Remembers parts of a story • Understands the idea of “same” and “different” • Plays board or card games • Tells you what he thinks is going to happen next in a book
5 years	• Counts 10 or more things • Knows about things used every day, like money and food

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11.4: Cognitive processes in middle childhood

As children enter school and learn more about the world, they develop more categories for concepts and learn more efficient strategies for storing and retrieving information.

Knowledge base

One significant reason is that they continue to have more experiences on which to tie new information. In other words, their **knowledge base**, knowledge in particular areas that makes learning new information easier, expands (Berger, 2014).



Figure **11.4.1**: As children learn more about the world, their knowledge base grows.[1]

Metacognition

refers to the knowledge we have about our own thinking and our ability to use this awareness to regulate our own cognitive processes (Bruning, Schraw, Norby, & Ronning, 2004). Children in this developmental stage also have a better understanding of how well they are performing a task, and the level of difficulty of a task. As they become more realistic about their abilities, they can adapt studying strategies to meet those needs. Young children spend as much time on an unimportant aspect of a problem as they do on the main point, while older children start to learn to prioritize and gauge what is significant and what is not. As a result, they develop metacognition.

Critical thinking

Critical thinking is a detailed examination of beliefs, courses of action, and evidence, involves teaching children how to think. The purpose of critical thinking is to evaluate information in ways that help us make informed decisions. Critical thinking involves better understanding a problem through gathering, evaluating, and selecting information, and also by considering many possible solutions. Ennis (1987) identified several skills useful in critical thinking. These include: Analyzing arguments, clarifying information, judging the credibility of a source, making value judgments, and deciding on an action. Metacognition is essential to critical thinking because it allows us to reflect on the information as we make decisions.

Children differ in their cognitive process and these differences predict both their readiness for school, academic performance, and testing in school. (Prebler, Krajewski, & Hasselhorn, 2013).[2]

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11.5: Cognitive processes in adolescence

During adolescence, teenagers move beyond concrete thinking and become capable of abstract thought. Teen thinking is also characterized by the ability to consider multiple points of view, imagine hypothetical situations, debate ideas and opinions (e.g., politics, religion, and justice), and form new ideas. In addition, it's not uncommon for adolescents to question authority or challenge established societal norms.

Cognitive empathy/ theory-of-mind

This relates to the ability to take the perspective of others and feel concern for others (Shamay-Tsoory, Tomer, & Aharon-Peretz, 2005). Cognitive empathy begins to increase in adolescence and is an important component of social problem solving and conflict avoidance. According to one longitudinal study, levels of cognitive empathy begin rising in girls around 13 years old, and around 15 years old in boys (Van der Graaff et al., 2013).[1]

Cognitive Changes in the Brain

Early in adolescence, changes in **Dopamine**, a chemical in the brain that is a neurotransmitter and produces feelings of pleasure, can contribute to increases in adolescents' sensation-seeking and reward motivation. During adolescence, people tend to do whatever activities produce the most dopamine without fully considering the consequences of such actions. Later in adolescence, the **prefrontal cortex**, the area of the brain responsible for outcomes, forming judgments, controlling impulses and emotions, also continues to develop (Goldberg, 2001). The difference in timing of the development of these different regions of the brain contributes to more risk taking during middle adolescence because adolescents are motivated to seek thrills (Steinberg, 2008). One of the world's leading experts on adolescent development, Laurence Steinberg, likens this to engaging a powerful engine before the braking system is in place. The result is that adolescents are prone to risky behaviors more often than children or adults.



Figure **11.5.1**: A simulation of the risky behavior of drinking and driving.[2]

Although the most rapid cognitive changes occur during childhood, the brain continues to develop throughout adolescence, and even into the 20s (Weinberger, Elvevåg, & Giedd, 2005). The brain continues to form new neural connections and becomes faster and more efficient because it **prunes**, or casts off unused neurons and connections (Blakemore, 2008), and produces **myelin**, the fatty tissue that forms around axons and neurons, which helps speed transmissions between different regions of the brain (Rapoport et al., 1999). This time of rapid cognitive growth for teens, making them more aware of their potential and capabilities, causes a great amount of disequilibrium for them. Theorists have researched cognitive changes and functions and have formed theories based on this developmental period.[3]

We've learned that major changes in the structure and functioning of the brain occur during adolescence and result in the theories about cognitive and behavioral developments (Steinberg, 2008). These cognitive changes include how information is processed, and are fostered by improvements in cognitive function during early adolescence such as in memory, encoding, and storage as well as ability to think about thinking, therefore becoming better at information processing functions.[4]

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11.6: Wisdom and risk taking in adolescence

Whether it is a sense heightened of ability (we've learned a lot about the egocentrism, personal fable, imaginary audience, or the lack of development of prefrontal cortex), or just poor decision making, many teens tend to take unnecessary risks. **Wisdom**, or the capacity for insight and judgment that is developed through experience, increases between the ages of 14 and 25, and increases with maturity, life experiences, and cognitive development. Wisdom increases gradually and is not the same as intelligence, and adolescents do not improve substantially on IQ tests since their scores are relative to others in their age group, as everyone matures at approximately the same rate. Adolescents must be monitored because they are more likely to take risks than adults. The behavioral decision-making theory proposes that adolescents and adults both weigh the potential rewards and consequences of an action. However, adolescents seem to give more weight to rewards, particularly social rewards, than do adults. Scaffolding adolescents until they show consistent and appropriate judgment will likely allow for fewer negative consequences.[1]

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CHAPTER OVERVIEW

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12.6: Bilingualism
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12.1: Linguistics

Language is such a special topic that there is an entire field, linguistics, devoted to its study. Linguistics views language in an objective way, using the **scientific method** and rigorous research to form **theories** about how humans acquire, use, and sometimes abuse language. There are a few major branches of linguistics, which it is useful to understand in order to learn about language from a psychological perspective.

Major Branches of Linguistics

This diagram outlines the various subfields of linguistics, the study of language. These include phonetics, phonology, morphology, syntax, semantics, and pragmatics.

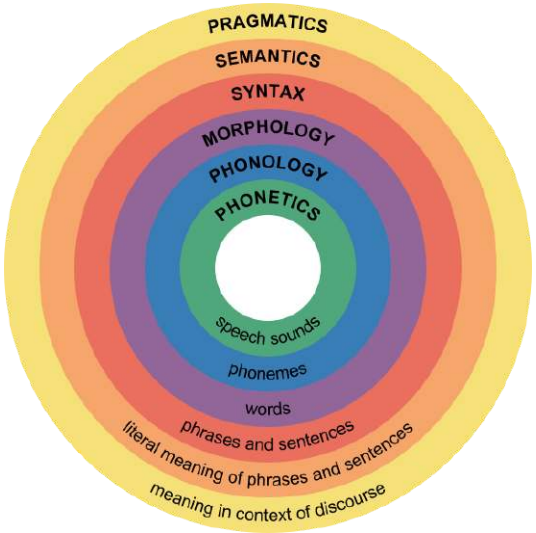


Figure **12.1.1**: Major branches of linguistics include phonetics (speech sounds), phonology (phonemes), morphology (words), syntax (phrases and sentences), semantics (literal meaning of phrases and sentences) and pragmatics (meaning of discourse in context).[1]

Phonetics and Phonology

A **phoneme** is the smallest unit of sound that makes a meaningful difference in a language. The word “bit” has three phonemes, /b/, /i/, and /t/ (in transcription, phonemes are placed between slashes), and the word “pit” also has three: /p/, /i/, and /t/. In spoken languages, phonemes are produced by the positions and movements of the vocal tract, including our lips, teeth, tongue, vocal cords, and throat, whereas in sign languages phonemes are defined by the shapes and movement of the hands. English contains about 45 phonemes.

Whereas phonemes are the smallest units of sound in language, **phonetics** is the study of individual speech sounds; **phonology** is the study of phonemes, which are the speech sounds of an individual language. These two heavily overlapping subfields cover all the sounds that humans can make, as well as which sounds make up different languages.

Morpheme and Morphology

A **morpheme** is a string of one or more phonemes *that* makes up the smallest units of meaning in a language. Some morphemes, such as one-letter words like “I” and “a,” are also phonemes, but most morphemes are made up of combinations of phonemes. Some morphemes are prefixes and suffixes used to modify other words. For example, the syllable “re-” as in “rewrite” or “repay” means “to do again,” and the suffix “-est” as in “happiest” or “coolest” means “to the maximum.”

Morphology is the study of words and other meaningful units of language like suffixes and prefixes. A morphologist would be interested in the relationship between words like “dog” and “dogs” or “walk” and “walking,” and how people figure out the differences between those words.

Syntax

Syntax is the set of rules of a language by which we construct sentences. Each language has a different syntax. The syntax of the English language requires that each sentence have a noun and a verb, each of which may be modified by adjectives and adverbs. Some syntaxes make use of the order in which words appear, while others do not.

Syntax is the study of sentences and phrases, or how people put words into the right order so that they can communicate meaningfully. All languages have underlying rules of syntax, which, along with morphological rules, make up every language's grammar. An example of syntax coming into play in language is "Eugene walked the dog" versus "The dog walked Eugene." The order of words is not arbitrary—in order for the sentence to convey the intended meaning, the words must be in a certain order.[2]

Semantics and Pragmatics

Semantics, generally, is about the meaning of sentences. Someone who studies semantics is interested in words and what real-world object or concept those words denote, or point to. **Pragmatics** refers to the context of language and how it is used - such as how turn-taking occurs, or how text is organized.



Figure **12.1.2**: As speakers of Chinese, these boys would understand the importance of pitch.[4]

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12.2: Theories of language development

Humans, especially children, have an amazing ability to learn language. Within the first year of life, children will have learned many of the necessary concepts to have functional language, although it will still take years for their capabilities to develop fully. As we just explained, some people learn two or more languages fluently and are bilingual or multilingual. Here is a recap of the theorists and theories that have been proposed to explain the development of language, and related brain structures, in children.

We are not born with language because computer learning models show that language like capacity can develop. So it is true that language and cognition are not separate. In general language development entails early neural networks, particularly in Broca's area, becoming dedicated to language ability. However, Broca's area is damaged at birth, other brain areas can compensate pretty easily. Language is cognition.

Language is embodied – for example researchers have found that brain areas representing the sensorimotor aspects of words get activated when a child is stimulated with the word (or another word taught to represent that activity). However, it could also be that that depends on the environment. The language that is merely symbolic might remain symbolic in the brain as well, whereas the part that is embodied becomes embodied in the brain. But there is no agreement about the connection between language, cognition and our sensorimotor systems.

There is also the thought that language influences cognition and how we think about space and navigation. In some cultures, language giving directions does not use personal orientation but rather only cardinal directions. Those languages force people to be better at knowing where they are in space etc.

The following two theories of language development represent two extremes in the level of interaction required for language to occur (Berk, 2007).

Chomsky and the Language Acquisition Device

The view known as **nativism** advocated by Noam Chomsky suggests that infants are equipped with a neurological construct referred to as the **language acquisition device** or LAD that makes infants ready for language. Language develops as long as the infant is exposed to it. No teaching, training, or reinforcement is required for language to develop.

Noam Chomsky's work discusses the biological basis for language and claims that children have innate abilities to learn language. Chomsky terms this innate ability the "language acquisition device." He believes children instinctively learn language without any formal instruction. He also believes children have a natural need to use language, and that in the absence of formal language children will develop a system of communication to meet their needs. He has observed that all children make the same type of language errors, regardless of the language they are taught. Chomsky also believes in the existence of a "universal grammar," which posits that there are certain grammatical rules all human languages share. However, his research does not identify areas of the brain or a genetic basis that enables humans' innate ability for language.

Skinner: Operant Conditioning

B.F. Skinner believed that children learn language through **operant conditioning**; in other words, children receive "rewards" for using language in a functional manner. For example, a child learns to say the word "drink" when she is thirsty; she receives something to drink, which reinforces her use of the word for getting a drink, and thus she will continue to do so. This follows the four-term contingency that Skinner believed was the basis of language development—motivating operations, discriminative stimuli, response, and reinforcing stimuli. Skinner also suggested that children learn language through imitation of others, prompting, and shaping.

Social Pragmatics

Another view emphasizes the child's active engagement in learning language out of a need to communicate. The child seeks information, memorizes terms, imitates the speech heard from others and learns to conceptualize using words as language is acquired. Many would argue that all three of these dynamics foster the acquisition of language (Berger, 2004)[1].

Piaget: Assimilation and Accommodation

Jean Piaget's theory of language development suggests that children use both assimilation and accommodation to learn language. **Assimilation** is the process of changing one's environment to place information into an already-existing schema (or idea). **Accommodation** is the process of changing one's schema to adapt to the new environment. Piaget believed children need to first develop mentally before language acquisition can occur. According to him, children first create mental structures within the mind (schemas) and from these schemas, language development happens.

Vygotsky: Zone of Proximal Development

Lev Vygotsky's theory of language development focused on social learning and **the zone of proximal development (ZPD).** The ZPD is a level of development obtained when children engage in social interactions with others; it is the distance between a child's *potential* to learn and the *actual learning* that takes place. Vygotsky's theory also demonstrated that Piaget underestimated the importance of social interactions in the development of language.

Piaget's and Vygotsky's theories are often compared with each other, and both have been used successfully in the field of education.



Figure **12.2.1**: This park ranger is using the ZPD to increase these boys understanding.[2]

The support for Vygotsky's theory about the importance of social interaction in cognitive development can be further supported by the data showing the effects of SES on language acquisition as illustrated by this section from Arduini-VanHoose's work[3]

Psychologists Betty Hart and Todd Risley (2006) spent their careers looking at early language ability and progression of children in various income levels. In one longitudinal study, researchers found that although all the parents in the study engaged and interacted with their children, middle- and high-income parents interacted with their children differently than low-income parents. The researchers found that middle- and high-income parents talk to their children significantly more, starting when the children are infants. By age 3, high-income children knew almost double the number of words known by low-income children, and they heard about 30 million more words than the low-income counterparts (Hart & Risley, 2003). These gaps become more pronounced by kindergarten, with high- income children scoring 60% higher on achievement tests than their low-income peers (Lee & Burkam, 2002).

The achievement gap refers to the persistent difference in grades, test scores, and graduation rates that exist among students of different ethnicities, races, and—in certain subjects—sexes (Winerman, 2011). Research suggests that these achievement gaps are

strongly influenced by differences in socioeconomic factors that exist among the families of these children. Low-income children perform significantly worse than their middle- and high-income peers on a number of educational variables: They have significantly lower standardized test scores, graduation rates, and college entrance rates, and they have much higher school dropout rates. Many of these problems start before the children even enter school.

There are solutions to this problem. Experts are working with low-income families to encourage them to speak more to their children and designing preschools in which students from diverse economic backgrounds are placed in the same classroom (Schechter & Byeb, 2007).

Critique of these theories

These different theories of language acquisition might seem disparate and irreconciliable, while on the other hand it is pretty clear that each of them are very correct in the claims that they make when we look at the fact that an overwhelming majority of people communicate using language. Patricia Kuhl (2007)[4] has conducted a lot of research on the neuroscience of language and suggests that infants' brains are wired to recognize and produce language, but that those brain areas go through developmental stimulation where the wiring changes in response to the sounds that babies hear. So infants under 6 months old are able to hear and produce all of the phonemes (about 600 consonants and about 200 vowels) that all human languages use collectively. However, between 6-8 months of age, infants become better at recognizing the phonemes of the language/s that they are hearing around them (about 40 in most languages), and become worse at distinguishing between the sounds of other languages that are not being used in their environment. This falls in line with the idea of a critical or sensitive period for language acquisition. The idea is that neural networks are have a potential or are ripe for developing. Then depending on the auditory stimulation that the child receives, the networks "commit" to the language/s heard. But Kuhl also points out that it is not only auditory stimulation – such as heard through a television monitor, but rather a person interacting with the child that influences these networks to form and stabilize. She theorizes that this requirement of human interaction as a basis for language acquisition might be mediated by emotional arousal and motivation, in addition to the information gained by a live tutor who shares attention, points at objects and so on while providing the auditory stimulation necessary for language acquisition.

Much of the early research on this was done using sucking on pacifiers that were attached to computers recording the sucks, or noting when infants turned their heads in response to sensory discrimination (when the sound changed from ra to la for example). Current research can be done using EEG and ERP recordings, as well as MEG to note whether and which parts of the brain are responding to language. MEG studies have shown that in infants as young as 6 months, Broca's area is activated in response to language sounds, perhaps in a mirror neuron type of response.

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12.3: Language development in infancy

Do newborns initiate communication? Absolutely! However, they do not communicate with the use of language. Instead, they communicate their thoughts and needs with body posture (being relaxed or still), gestures, cries, and facial expressions. A person who spends adequate time with an infant can learn which cries indicate pain and which ones indicate hunger, discomfort, or frustration as well as translate their vocalizations, movements, gestures and facial expressions.



Figure **12.3.1**: From infancy, humans communicate by looking, facial expressions and sound.[1]

Stages of Language Development in Infancy and Toddlerhood

1. Crying: Initially an infant cries when they experience any kind of discomfort. They cry when they are hungry or uncomfortable, or in pain. Many caregivers say that they are able to distinguish between the different stimuli that are eliciting the discomfort, and respond to the particular situation that the child is crying about. While not all caregivers are equally adept in this manner, ethologists would say that we, human adults, are biologically programmed to respond with concern when we hear a baby cry.
2. Intentional Vocalizations: Cooing and taking turns: Infants begin to vocalize and repeat vocalizations within the first couple of months of life. That gurgling, musical vocalization called cooing can serve as a source of entertainment to an infant who has been laid down for a nap or seated in a carrier on a car ride. Cooing serves as practice for vocalization as well as the infant hears the sound of his or her own voice and tries to repeat sounds that are entertaining. Infants also begin to learn the pace and pause of conversation as they alternate their vocalization with that of someone else and then take their turn again when the other person's vocalization has stopped. Cooing initially involves making vowel sounds like "oooo". Later, consonants are added to vocalizations such as "nanananananana".
3. Babbling and gesturing: At about four to six months of age, infants begin making even more elaborate vocalizations that include the sounds required for any language. Guttural sounds, clicks, consonants, and vowel sounds stand ready to equip the child with the ability to repeat whatever sounds are characteristic of the language heard. Eventually, these sounds will no longer be used as the infant grows more accustomed to a particular language. Deaf babies also use gestures to communicate wants, reactions, and feelings. Because gesturing seems to be easier than vocalization for some toddlers, sign language is sometimes taught to enhance one's ability to communicate by making use of the ease of gesturing. The rhythm and pattern of language is used when deaf babies sign just as it is when hearing babies babble.
4. Understanding: At around ten months of age, the infant can understand more than he or she can say. You may have experienced this phenomenon as well if you have ever tried to learn a second language. You may have been able to follow a conversation more easily than to contribute to it.
5. Holophrastic speech: Children begin using their first words at about 12 or 13 months of age and may use partial words to convey thoughts at even younger ages. These one word expressions are referred to as **holophrastic speech**. For example, the child may say "ju" for the word "juice" and use this sound when referring to a bottle. The listener must interpret the meaning of the holophrase and when this is someone who has spent time with the child, interpretation is not too difficult. They know that "ju" means "juice" which means the baby wants some milk! But, someone who has not been around the child will have trouble knowing what is meant. Imagine the parent who to a friend exclaims, "Ezra's talking all the time now!" The friend hears only "ju da ga" which, the parent explains, means "I want some milk when I go with Daddy."



Figure **12.3.2**: Two children playing with toys – infants and toddlers communicate while playing with adults.[2]

6. Underextension/Overextension: A child who learns that a word stands for an object may initially think that the word can be used for only that particular object. Only the family's Irish Setter is a "doggie". This is referred to as underextension. More often, however, a child may think that a label applies to all objects that are similar to the original object. In overextension all animals become "doggies", for example.
7. First words and cultural influences: First words if the child is using English tend to be nouns. The child labels objects such as cup or ball. In a verb-friendly language such as Chinese, however, children may learn more verbs. This may also be due to the different emphasis given to objects based on culture. Chinese children may be taught to notice action and relationship between objects while children from the United States may be taught to name an object and its qualities (color, texture, size, etc.). These differences can be seen when comparing interpretations of art by older students from China and the United States.
8. Vocabulary growth spurt: One year olds typically have a vocabulary of about 50 words. But by the time they become toddlers, they have a vocabulary of about 200 words and begin putting those words together in telegraphic speech (I think of it now as 'text message' speech because texting is more common and is similar in that text messages typically only include the minimal amount of words to convey the message).
9. Two word sentences and **telegraphic speech**: Words are soon combined and 18 month old toddlers can express themselves further by using expressions such as "baby bye-bye" or "doggie pretty". Words needed to convey messages are used, but the articles and other parts of speech necessary for grammatical correctness are not yet used. These expressions sound like a telegraph (or perhaps a better analogy today would be that they read like a text message) where unnecessary words are not used. "Give baby ball" is used rather than "Give the baby the ball." Or a text message of "Send money now!" rather than "Dear Mother. I really need some money to take care of my expenses."[3]



Figure 12.3.3: Toddlers use toys and symbols to focus on their burgeoning communication skills.[4]

Language Milestones

In the first two years of life, children go from communicating by crying to being able to express themselves with words. Here is a table of common language milestones for infants and toddlers.

Language Milestones in Infancy[5]

Table 12.3.1: Language milestones in infancy

Typical Age	What Most Children Do By This Age
2 months	• Coos, makes gurgling sounds • Turns head toward sounds
4 months	• Begins to babble • Babbles with expression and copies sounds he hears • Cries in different ways to show hunger, pain, or being tired
6 months	• Responds to sounds by making sounds • Strings vowels together when babbling (“ah,” “eh,” “oh”) and likes taking turns with parent while making sounds • Responds to own name • Makes sounds to show joy and displeasure • Begins to say consonant sounds (jabbering with “m,” “b”)
9 months	• Understands “no” • Makes a lot of different sounds like “mamamama” and “bababababa” • Copies sounds and gestures of others • Uses fingers to point at things
1 year	• Responds to simple spoken requests • Uses simple gestures, like shaking head “no” or waving “bye-bye” • Makes sounds with changes in tone (sounds more like speech) • Says “mama” and “dada” and exclamations like “uh-oh!” • Tries to say words you say
18 months	• Says several single words • Says and shakes head now • Points to show others what is wanted
2 years	• Points to things or pictures when they are named • Knows names of familiar people and body parts • Says sentences with 2 to 4 words • Follows simple instructions • Repeats words overheard in conversation • Points to things in a book

Child-Directed Speech

Why is a horse a “horsie”? Have you ever wondered why adults tend to use “baby talk” or that sing-song type of intonation and exaggeration used when talking to children? This represents a universal tendency and is known as **child-directed speech** or parentese (historically referred to as motherese). It involves exaggerating the vowel and consonant sounds, using a high-pitched voice, and delivering the phrase with great facial expression (Clark, 2009). Why is this done? Infants are frequently more attuned to the tone of voice of the person speaking than to the content of the words themselves and are aware of the target of speech. Werker, Pegg, and McLeod (1994) found that infants listened longer to a woman who was speaking to a baby than to a woman who was speaking to another adult. It may be in order to clearly articulate the sounds of a word so that the child can hear the sounds involved. Or it may be because when this type of speech is used, the infant pays more attention to the speaker and this sets up a pattern of interaction in which the speaker and listener are in tuned with one another.[6]

Culture

While there are cultural differences in what languages are used, child rearing practices (and their influence on other motor development), and use of child directed speech, the basic trajectory of language development in infancy - for example, going from cooing to babbling by about 7-10 months - is common across cultures (Cychosz et al., 2021). Cychosz et al. (2021) also found that there were no socioeconomic differences in the sequence of this development. However their sample was small, and there were

some indications that medical underserving of some communities might lead to delays. Other research (Cristia et al., 2019) has found that there is certainly a cultural difference in the amount of child directed speech used in different communities.

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12.4: Language development in early childhood

Vocabulary Growth

A child's vocabulary expands between the ages of 2 to 6 from about 200 words to over 10,000 words through a process called fast-mapping. Words are easily learned by making connections between new words and concepts already known. The parts of speech that are learned depend on the language and what is emphasized. Children speaking verb-friendly languages such as Chinese and Japanese, tend to learn nouns more readily. But, those learning less verb-friendly languages such as English, seem to need assistance in grammar to master the use of verbs (Imai, et al, 2008).



Figure **12.4.1**: Direct instruction from adults helps increase children's vocabulary.[1]

Literal Meanings

Children can repeat words and phrases after having heard them only once or twice. But they do not always understand the meaning of the words or phrases. This is especially true of expressions or figures of speech which are taken literally. For example, two preschool-aged girls began to laugh loudly while listening to a tape-recording of Disney's "Sleeping Beauty" when the narrator reports, "Prince Phillip lost his head!" They imagine his head popping off and rolling down the hill as he runs and searches for it. Or a classroom full of preschoolers hears the teacher say, "Wow! That was a piece of cake!" The children began asking "Cake? Where is my cake? I want cake!"

Overregularization

Children learn rules of grammar as they learn language but may apply these rules inappropriately at first. For instance, a child learns to add "ed" to the end of a word to indicate past tense. Then form a sentence such as "I goed there. I doed that." This is typical at ages 2 and 3. They will soon learn new words such as "went" and "did" to be used in those situations.

The Impact of Training

Remember Vygotsky and the zone of proximal development? Children can be assisted in learning language by others who listen attentively, model more accurate pronunciations and encourage elaboration. The child exclaims, "I goed there!" and the adult responds, "You went there? Say, 'I went there.' Where did you go?" Children may be ripe for language as Chomsky suggests, but active participation in helping them learn is important for language development as well. The process of scaffolding is one in which the adult (or more skilled peer) provides needed assistance to the child as a new skill is learned.

Language Milestones in early childhood

The prior aspects of language development in early childhood can also be summarized into the progression of milestones children typically experience from ages 3 to 5. Here is a table of those:

Table **12.4.1**: Language milestones in early childhood[2]

Typical Age	What Most Children Do By This Age
3 years	• Follows instructions with 2 or 3 steps • Can name most familiar things • Understands words like “in,” “on,” and “under” • Says first name, age, and sex • Names a friend • Says words like “I,” “me,” “we,” and “you” and some plurals (cars, dogs, cats) • Talks well enough for strangers to understand most of the time • Carries on a conversation using 2 to 3 sentences
4 years	• Knows some basic rules of grammar, such as correctly using “he” and “she” • Sings a song or says a poem from memory such as the “Itsy Bitsy Spider” or the “Wheels on the Bus” • Tells stories • Can say first and last name
5 years	• Speaks very clearly • Tells a simple story using full sentences • Uses future tense; for example, “Grandma will be here.” • Says name and address

Culture

Many of our research paradigms are based on ideas that talking to babies and children increases their language and cognitive skills (Weber, Fernald & Diop, 2017). However, the yardsticks we use to measure stimulation in child rearing and child language development are based on a very narrow perspective we use in psychological science. Morelli et al (2017) have shown how cultures differ widely in adult initiated speech and activities and the resultant optimal outcomes for children. Even at the biological level, they show the connection between genome and cultural relativity. At a more granular level, who is considered primary caregiver (the mother in Western industrialized nuclear families, but not in a wide range of global contexts), how much that caregiver initiates speech (which is very much influenced by childrearing ideas), and child to child language vary greatly. There is no doubt that these different beliefs and practices need to be examined within their cultural contexts and should not be generalized for all.

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12.5: Language development in middle childhood

When learning one or more languages in middle childhood, children are able to understand that there are many complex parts including comprehension, fluency, and meaning when communicating. The following are areas of cognitive language and communication.

Lexicon

Every language has its rules, which act as a framework for meaningful communication. But what do people fill that framework up with? The answer is, of course, words. Every human language has a **lexicon**—the sum total of all of the words in that language. By using grammatical rules to combine words into logical sentences, humans can convey an infinite number of concepts.

Grammar

Because all language obeys a set of combinatory rules, we can communicate an infinite number of concepts. While every language has a different set of rules, all languages do obey rules. These rules are known as grammar. Speakers of a language have internalized the rules and exceptions for that language's grammar. There are rules for every level of language—word formation (for example, native speakers of English have internalized the general rule that -ed is the ending for past-tense verbs, so even when they encounter a brand-new verb, they automatically know how to put it into past tense); phrase formation (for example, knowing that when you use the verb "buy," it needs a subject and an object; "She buys" is wrong, but "She buys a gift" is okay); and sentence formation.

Older children are also able to learn new rules of grammar with more flexibility. While younger children are likely to be reluctant to give up saying "I goed there", older children will learn this rather quickly along with other rules of grammar.

Vocabulary

One of the reasons that children can classify objects in so many ways is that they have acquired a vocabulary to do so. By fifth grade, a child's vocabulary has grown to 40,000 words. It grows at a rate that exceeds that of those in early childhood. This language explosion, however, differs from that of younger children because it is facilitated by being able to associate new words with those already known, so that the more one knows, the easier it becomes to know even more. The language explosion in middle childhood is also accompanied by a more sophisticated understanding of the meanings of a word.

Context

Context gives meaning to spoken and paralanguage.



Figure **12.5.1**: Context and facial expression help us understand meaning.[2]

New Understanding

Those in middle and late childhood are also able to think of objects in less literal ways. For example, if asked for the first word that comes to mind when one hears the word "pizza", the younger child is likely to say "eat" or some word that describes what is done with a pizza. However, the older child is more likely to place pizza in the appropriate category and say "food". This sophistication of vocabulary is also evidenced by the fact that older children tell jokes and delight in doing so. They may use jokes that involve plays on words such as "knock- knock" jokes or jokes with punch lines. Young children do not understand play on words and tell "jokes" that are literal or slapstick, such as "A man fell down in the mud! Isn't that funny?"[3]

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12.6: Bilingualism

Although **monolingual** speakers (those that only speak one language) often do not realize it, the majority of children – 66% - around the world are **bilingual**, (they understand and use two languages)(Smith & Meek, 2018)[1]. Even in the United States, which is a relatively monolingual society, more than 59.5 million people speak a language other than English at home, and many of these people are children or youth in public schools, and 43.5% of Californians – the largest percent in any US state – speak a language other than English at home (Rumbaut & Massey, 2013)[2]. The large majority of bilingual students (75%) are Latinx, but the rest represent more than a hundred different language groups from around the world. In larger communities throughout the United States, it is therefore common for a single classroom to contain students from several language backgrounds at once. For example in Los Angeles Unified School District (LAUSD), other than English, there are 94 languages spoken, and close to 158,000 students were English language learners (LAUSD, 2017)[3]. In classrooms, as in other social settings, bilingualism exists in different forms and degrees.

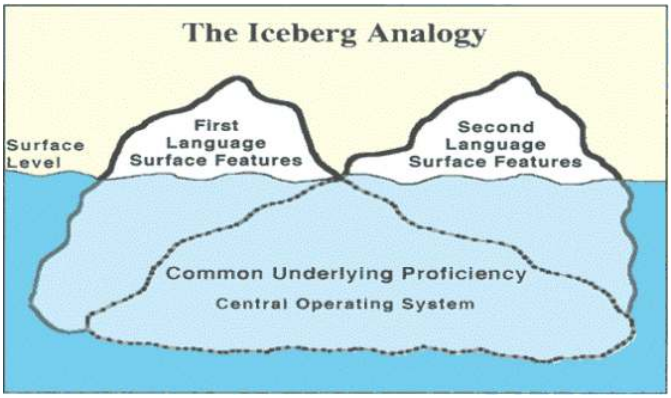


Figure **12.6.1**: The Iceberg analogy was given by the famous bilingual and second language researcher Jim Cummins to explain the workings of the mind with regard to bilingual acquisition... two languages with surface features and a common underlying proficiency with a central operating system.[4]

The student who speaks both languages fluently has a definite cognitive advantage. As you might suspect and as research has confirmed, a fully fluent bilingual student is in a better position to express concepts or ideas in more than one way, and to be aware of doing so (Jimenez, Garcia, & Pearson, 1995; Francis, 2006). Having a large vocabulary in a first language has been shown to save time in learning vocabulary in a second language (Hansen, Umeda & McKinney, 2002).[5]

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12.7: Literacy development

While language is a human capacity, a large portion of the world's people are not literate. Emergent literacy in early childhood begins with sound awareness and exposure to print. When we read we are doing two things - decoding and understanding the meaning of the symbols. It may appear that children learn these in sequence and that the process is bottom up - meaning they learn the alphabet, the sounds that the shapes make, and then the sound of the word and finally the meaning. However, consider that my children were able to identify McDonald's, Jack in the Box and Burger King signs by two and half years of age - not something I claim to be proud of as a parent of course! They were not reading the letters at all. This was logographic recognition. Further, English is not an orthographically transparent language. My dad would often like to play with letters and sounds - he would claim that the correct spelling of the word fish was "ghoti!" - GH can be sounded out as 'F' in words like rough or tough, O represents the sound 'I' in women, and there are many words like diction where TI represents the 'SH' sound - hence GHOTI can be read as 'FISH'. English is unique in that we use 26 letters, the language uses 44 phonemes and there are over a thousand written combinations and variations to obtain those phonemes.

A huge milestone in middle childhood is learning to read and write. While the foundations of this were laid in infancy and early childhood (emergent literacy), formal instruction on this process usually happens during the school-age years. There isn't always complete agreement on how children are best taught to read. The following approaches to teaching reading are separated by their methodology, but today, models of reading strive for a balance between the two types of reading methods because they are both recognized as essential for learning to read.

- A p**honics-based approach** teaches reading by making sure children can understand letter-sound correspondences (how letters sound), automatically recognize familiar words, and decode unfamiliar words. This ability to break the code of reading allows children to read words they have never heard spoken before.
- The **whole-language approach** attempts to teach reading as naturally as possible. As the sounds of words don't have meaning, the focus is on reading words and sentences in context (such as real books), rather than learning the sounds and phonemes that make up words.[1]

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12.8: Language disorders

- Aphasia - Loss of language - expressive and receptive
- Articulation Disorder - An articulation disorder
- Fluency Disorders - Fluency disorders
- Voice Disorders - Disorders of the voice[1]

Aphasia

A loss of the ability to produce or understand language is referred to as **aphasia**. Without the brain, there would be no language. The human brain has a few areas that are specific to language processing and production. When these areas are damaged or injured, capabilities for speaking or understanding can be lost, a disorder known as aphasia. These areas must function together in order for a person to develop, use, and understand language.

Articulation disorder

An articulation disorder refers to the inability to correctly produce speech sounds (phonemes) because of imprecise placement, timing, pressure, speed, or flow of movement of the lips, tongue, or throat (NIDCD, 2016). Sounds can be substituted, left off, added or changed. These errors may make it hard for people to understand the speaker. They can range from problems with specific sounds, such as lisping to severe impairment in the phonological system. Most children have problems pronouncing words early on while their speech is developing. However, by age three, at least half of what a child says should be understood by a stranger. By age five, a child's speech should be mostly intelligible. Parents should seek help if by age six the child is still having trouble producing certain sounds. It should be noted that accents are not articulation disorders (Medline Plus, 2016a).

Fluency disorders

Fluency disorders affect the rate of speech. Speech may be labored and slow, or too fast for listeners to follow. The most common fluency disorder is stuttering.

Stuttering is a speech disorder in which sounds, syllables, or words are repeated or last longer than normal. These problems cause a break in the flow of speech, which is called dysfluency (Medline Plus, 2016b). About 5% of young children, aged two-five, will develop some stuttering that may last from several weeks to several years (Medline Plus, 2016c). Approximately 75% of children recover from stuttering. For the remaining 25%, stuttering can persist as a lifelong communication disorder (National Institute on Deafness and other Communication Disorders, NIDCD, 2016). This is called developmental stuttering and is the most common form of stuttering.

Brain injury, and in very rare instances, emotional trauma may be other triggers for developing problems with stuttering. In most cases of developmental stuttering, other family members share the same communication disorder. Researchers have recently identified variants in four genes that are more commonly found in those who stutter (NIDCD, 2016).

Voice disorders

Hoarseness is the most common voice symptom in children. While surgery can be used to treat voice disorders, voice training is used far more often and with considerable success (Yi & Yang, 2023).



Figure **12.8.1**: Speech therapy.[3]

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CHAPTER OVERVIEW

13: Intelligence and Academics

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13.1: Overview

Like other topics in psychology, the diversity lens has been applied to this chapter. Intelligence is a topic that has been researched extensively by psychologists and developmentalists. However, it is also a topic fraught with controversy about cultural diversity. One could say it is a topic that has arguably been one that has been most weaponized by racist ideology. In fact, in 2021 the APA issued a multipage apology for our role in furthering harmful racist practices in applied and research areas. Much of this racism was based on the way in which intelligence was researched, tested and how the findings were applied in therapy, education and developmental practices.

I believe that to make sure that you can get an idea of this racist history, it is important to know the background and so I will include the usual information and then antiracism information.

- Conceptualizing intelligence
- Testing intelligence and some concepts of testing in general
- Cultural bias
- Education
- Learning differences and neurodivergence

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13.2: Cognitive theories of intelligence

Cognitive psychologists have long been interested in defining and measuring intelligence. Piaget came up with the theory of how thinking develops. In Western psychological theory, there has been much debate about how to conceptualize intelligence and Sternberg and Gardner's theories are two ways of doing so.



Figure **13.2.1**: Jean Piaget standing in the upper right quadrant.[1]

General Intelligence

Spearman was a British psychologist who first coined the idea that all cognitive abilities come from one latent ability. He was a statistician (and in fact one of the main proponents of factor analysis methods). He found that children who did well in one subject in school often did well in other subjects as well. He theorized that the high correlation in performance between different tasks comes from some underlying pool of latent potential. He thought of this latent potential as some kind of mental energy. He called that latent potential G. (Spearman, 1927)

Today when we talk about IQ, one number that tells us how smart someone is, we are buying into Spearman's G. But the controversy over whether intelligence is one basic potential or many specific ones has continued in a variety of different ways. For example, there is research looking at intelligence and cognitive abilities in other animals as well as cognitive neuroscience findings about which areas of the brain are responsible for what cognitive skill (Serpico & Frasnelli, 2018).

Triarchic Theory of Intelligence

An alternative view of intelligence is presented by Sternberg (1997; 1999). Sternberg offers three types of intelligences. Sternberg provided background information about his view of intelligence in a conference, where he described his frustration as a committee member charged with selecting graduate students for a program in psychology. He was concerned that there was too much emphasis placed on aptitude test scores (we will discuss this later in the chapter) and believed that there were other, less easily measured, qualities necessary for success in a graduate program and in the world of work. Aptitude test scores indicate the first type of intelligence, which is mainly academic in nature.

1. **Analytical** (componential) sometimes described as academic: includes the ability to solve problems of logic, verbal comprehension, vocabulary, and spatial abilities.
2. **Creative** (experiential): the ability to apply newly found skills to novel situations
3. **Practical** (contextual): the ability to use common sense and to know what is called for in a situation. [2]



Figure **13.2.2**: Reading supports analytical intelligence[3]



Figure **13.2.3**:- Building with shows creative intelligence [4]

Figure



Figure **13.2.4**: Navigating social settings is practical intelligence[5]

Yet more recently, Sternberg has come up with the concept of Adaptive intelligence - "the intelligence one needs to adapt to current problems and anticipate future problems of real-world environments". He suggested that adaptive intelligence is a better composite of the triarchic intelligences and wisdom based knowledge and skills than G is. The following table compares those two composite ideas of intelligence.

Table **13.2.1**: Sixteen Key Differences between General Intelligence (Standardized Test) Problems and Adaptive Intelligence Problems.

Difference	Issue	General Intelligence	Adaptive Intelligence
1	Type of Answer Required	Right vs. Wrong (sometimes with partial credit)	More Adaptive vs. Less Adaptive to the Environment
2	Structure of Problem	Well-structured: Clear, Well-defined Path to Unique Solution	Ill-structured: Multiple Ill-defined Paths to Solutions that Are Differentially Adaptive
3	Emotional Arousal	Low Emotional Arousal, Encouraging Clear Thinking	High Emotional Arousal, Discouraging Clear Thinking
4	Stakes for Adaptation in Life	Usually Low; Thus, Low Stakes if a Solution is Wrong	Often High; Thus High Stakes if a Solution is Wrong
5	Contextualization with Regard to Everyday Life	Largely Decontextualized Problems; Weakly Related or Unrelated to Everyday Life Events	Highly Contextualized Problems; Often Strongly Related to Everyday Life Events
6	Need for Recognition of the Existence of the Problem	None: Problems are Given by Standardized Test	Great: One Has to Figure Out for Oneself that the Problem Even Exists
7	Need for Definition of the Problem, Once Recognized	Low: Problems are Usually Partially or Completely Defined by Test	High: Problems are Poorly Defined or Not Seriously Defined at All
8	Time Allowed for Solution	Low: Problems Generally Must be Solved in a Few Seconds to, at Most, a Few Minutes	High: Problems Are Addressed Over Time and Often Unfold Over Time Rather than All at Once
9	Need to Search for Information	Low: Much or Most Information Needed for Solution is Presented in the Test Problem	High: Information Needed for Problem Solution Has to be Located in Available Reference Material
10	Need to Evaluate Information for Relevance and Validity	Information Given in Test Problem is Generally Viewed as Relevant and Valid	Information Sources Are Often Low in Relevance and Validity; Often They Are Mutually Contradictory
11	Role of Individual vs.Collective	Individual	Both Individual and Necessarily Collective
12	Motivation for Solution	Motivation (for Some) is to Receive aHigh Score on a Test	Motivation (for almost All) is to Resolve an Important Life Problem
13	Structural Complexity of Problems	Problems Tend to Be Structurally Rather Simple	Problems Tend to Be Structurally Quite Complex
14	Number of Steps to Solution	Problems Tend to Have Relatively Few Steps to Solution	Problems Tend to Have Many Steps to Solution
15	Intrinsic Interest of Problems	Tend to Be Relatively Boring	Tend to Be Relatively Engaging
16	Knowledge Needed to Solve	Tends to Be Formal Knowledge	Tends to be Informal

Difference	Issue	General Intelligence	Adaptive Intelligence
	Problems	of the Type Learned Inside of School	Knowledge of the Type Learned Outside of School

Table from Sternberg (2021)

In this more recent conceptualization, Sternberg suggests that the idea of adaptive intelligence can and should be operationalized in schools.

Howard Gardner's Theory of Multiple Intelligences

Another champion of the idea of specific types of intelligences rather than one overall intelligence is the psychologist Howard Gardner (1983, 1999). Gardner argued that it would be evolutionarily functional for different people to have different talents and skills, and proposed that there are nine intelligences that can be differentiated from each other.



Figure **13.2.5**: Howard Gardner who talked about specific intelligences.[6]

Gardner contends that a high IQ does not always ensure success in life or necessarily indicate that a person has common sense, good interpersonal skills, or other abilities important for success. Gardner investigated intelligences by focusing on children who were talented in one or more areas. He identified these 9 intelligences based on other criteria including a set developmental history and psychometric findings.[7]

Howard Gardner (1983, 1998, 1999) suggests that there are not one, but nine domains of intelligence. The first three are skills that are measured by IQ tests:

Table - Howard Gardner's Multiple Intelligences[8]

Table **13.2.2**: Descriptions of Gardner's Multiple intelligences

Intelligence	Description
Linguistic	The ability to speak and write well
Logical- mathematical	The ability to use logic and mathematical skills to solve problems
Spatial	The ability to think and reason about objects in three dimensions
Musical	The ability to perform and enjoy music
Kinesthetic (body)	The ability to move the body in sports, dance, or other physical activities
Interpersonal	The ability to understand and interact effectively with others
Intrapersonal	The ability to have insight into the self
Naturalistic	The ability to recognize, identify, and understand animals, plants, and other living things
Existential	The ability to understand and have concern from life's larger questions, the meaning of life, and other spiritual matters

The concept of multiple intelligences has been influential in the field of education, and teachers have used these ideas to try to teach differently for individual students. For instance, to teach math problems to students who have particularly good kinesthetic intelligence, a teacher might encourage the students to move their bodies or hands according to the numbers. On the other hand, some have argued that these "intelligences" sometimes seem more like "abilities" or "talents" rather than real intelligence. There is no clear conclusion about how many intelligences there are. Are a sense of humor, artistic skills, dramatic skills, and so forth also separate intelligences?[9]

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[8] Lifespan Development: A Psychological Perspective by Martha Lally and Suzanne Valentine-French is licensed under CC BY-NC-SA 3.0; Table adapted from Gardner, H. (1999). *Intelligence reframed: Multiple intelligences for the 21st century*. New York, NY: Basic Books.

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13.3: Measuring Intelligence

The goal of most intelligence tests is to measure "G", the general intelligence factor. Good intelligence tests are **reliable,** meaning that they are consistent over time, and also demonstrate **validity,** meaning that they actually measure intelligence rather than something *else*. Because intelligence is such an important part of individual differences, psychologists have invested substantial effort in creating and improving measures of intelligence, and these tests are now considered the most accurate of all psychological tests.

Intelligence changes with age. A 3-year-old who could accurately multiply 183 by 39 would certainly be intelligent, but a 25-year-old who could not do so would be seen as unintelligent. Thus understanding intelligence requires that we know the norms or standards in a given population of people at a given age. The **standardization** of a test involves giving it to a large number of people at different ages and computing the average score on the test at each age level.

Once the standardization has been accomplished, we have a picture of the average abilities of people at different ages and can calculate a person's **mental age**, which is the age at which a person is performing intellectually. If we compare the mental age of a person to the person's chronological age, the result is the **Intelligence Quotient (IQ),** a measure of intelligence that is adjusted for age. A simple way to calculate IQ is by using the following formula:

$$IQ = mental\ age \div chronological\ age \times 100 \tag{13.3.1}$$

Thus a 10-year-old child who does as well as the average 10-year-old child has an IQ of 100 (10 ÷ 10 × 100), whereas an 8-year-old child who does as well as the average 10-year-old child would have an IQ of 125 (10 ÷ 8 × 100). Most modern intelligence tests are based on the relative position of a person's score among people of the same age, rather than on the basis of this formula, but the idea of intelligence "ratio" or "quotient" provides a good description of the score's meaning.

The Flynn Effect

It is important that intelligence tests be standardized on a regular basis, because the overall level of intelligence (as measured by tests like the Wechsler scales) in a population may change over time. The Flynn effect refers to the observation that scores on intelligence tests worldwide have increased substantially over the past decades (Flynn, 1999). Although the increase varies somewhat from country to country, the average increase is about 3 IQ points every 10 years. There are many explanations for the Flynn effect, including better nutrition, increased access to information, and more familiarity with multiple-choice tests (Neisser, 1998). But whether people are actually getting smarter is debatable (Neisser,1997). [1]

The Value of IQ Testing

The value of IQ testing is most evident in educational or clinical settings. Children who seem to be experiencing learning difficulties or severe behavioral problems can be tested to ascertain whether the child's difficulties can be partly attributed to an IQ score that is significantly different from the mean for her age group. Without IQ testing—or another measure of intelligence—children and adults needing extra support might not be identified effectively. People also use IQ testing results to seek disability benefits from the Social Security Administration. Some believe in the value of this test as important to help those in need.[2]

However a perusal of the history of IQ theory and testing shows that there have been many vile uses of these tests. At the extreme, IQ tests have sometimes been used as arguments in support of insidious purposes, such as the **eugenics movement,** which was the science of improving a human population by controlled breeding to increase desirable heritable characteristics. At a seemingly less horrendous, but nonetheless pervasive and macro level, the use of intelligence tests and IQ in particular is highly culturally biased (for example, Shuttleworth-Edwards et al, 2010; Naglieri, 2008; Hessels & Hamers, 1992; Ford, 2008) and has become a tool in systemically marginalizing non-White, non-Eurocentric, and non-individualistic perspectives.

Today, as noted above, IQ tests are used quite regularly and often in educational settings. They are also widely used in neuropsychological assessments, as clinical diagnostic tools (Jewsbury et al, 2016).

Alfred Binet & Théodore Simon - Stanford- Binet Intelligence Test

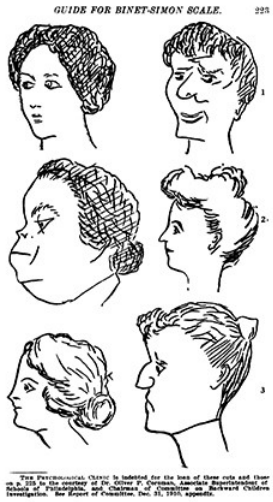
From 1904- 1905 the French psychologist Alfred Binet (1857–1914) and his colleague Théodore Simon (1872–1961) began working on behalf of the French government to develop a measure that would identify children who would not be successful with

the regular school curriculum. The goal was to help teachers better educate these students (Aiken, 1994). It is important to note that Binet was concerned about how his test might be used to discriminate against people.

Binet and Simon developed what most psychologists today regard as the first intelligence test, which consisted of a wide variety of questions that included the ability to name objects, define words, draw pictures, complete sentences, compare items, and construct sentences. Binet and Simon (Binet, Simon, & Town, 1915; Siegler, 1992) believed that the questions they asked the children all assessed the basic abilities to understand, reason, and make judgments.



(a)



(b)

Figure **13.3.1**: (a) Alfred Binet (b) This page is from a 1908 version of the Binet-Simon, Intelligence Scale. Children being tested were asked which face, of each pair, was prettier.[3]

Soon after Binet and Simon introduced their test, the American psychologist Lewis Terman at Stanford University (1877–1956) developed an American version of Binet's test that became known as the ***Stanford- Binet Intelligence Test.*** The Stanford-Binet is a measure of general intelligence made up of a wide variety of tasks including vocabulary, memory for pictures, naming of familiar objects, repeating sentences, and following commands.[4]

David Wechsler- Wechsler-Bellevue Intelligence Scale

In 1939, David Wechsler, a psychologist who spent part of his career working with World War I veterans, developed a new IQ test in the United States. Wechsler combined several subtests from other intelligence tests used between 1880 and World War I. These subtests tapped into a variety of verbal and nonverbal skills, because Wechsler believed that intelligence encompassed "the global capacity of a person to act purposefully, to think rationally, and to deal effectively with his environment" (Wechsler, 1958, p. 7). He named the test the **Wechsler-Bellevue Intelligence Scale** (Wechsler, 1981). This combination of subtests became one of the most extensively used intelligence tests in the history of psychology.



Figure **13.3.2**: David Wechsler[5]

Today, there are three intelligence tests credited to Wechsler, the Wechsler Adult Intelligence Scale-fourth edition (WAIS-IV), the Wechsler Intelligence Scale for Children (WISC-V), and the Wechsler Preschool and Primary Scale of Intelligence—Revised (WPPSI-III) (Wechsler, 2002). These tests are used widely in schools and communities throughout the United States, and they are periodically normed and standardized as a means of recalibration.

Bias of IQ Testing

Intelligence tests and psychological definitions of intelligence have been heavily criticized since the 1970s for being biased in favor of Anglo-American, middle-class respondents and for being inadequate tools for measuring non-academic types of intelligence or talent. Intelligence changes with experience, and intelligence quotients or scores do not reflect that ability to change. What is considered smart varies culturally as well, and most intelligence tests do not take this variation into account. For example, in the West, being smart is associated with being quick. A person who answers a question the fastest is seen as the smartest, but in some cultures being smart is associated with considering an idea thoroughly before giving an answer. A well- thought out, contemplative answer is the best answer.[6]

Sternberg's (2021) more recent ideas about adaptive intelligence as an alternative to G provide some interesting alternative about how intelligence needs to be considered within a context rather than as mental energy.

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13.4: More about culture and intelligence

It is quite clear that the Western conceptions and tests of intelligence are not exportable to other cultures where creativity, character and practical intelligence might be more emphasized, or actually the only things that matter. Greenfield also suggests that whether the intelligence test that is administered is visual or verbal will also affect the outcome (and surprisingly the verbal test is more likely to be fair, because exposure to visual stimuli like matrices is very much dependent on culture). Further many researchers like Grigorenko and Serpell have studied intelligence in multiple African societies and come up with different findings.

Naglieri designed the Cognitive Assessment System (CAS) and the Kaufmans designed the Assessment Battery for Children (K-ABC). Both are based on the work of Russian neuropsychologist Luria. The CAS can be used with neurodivergent children and children from different cultural backgrounds in educational settings. These psychologists believe that intelligence testing is valid and useful in the hands of competent school psychologists who can interpret the numbers to best serve students' needs in closing the intelligence-achievement gap and tailoring school for each child's strengths and weaknesses. This is in contrast to obtaining an IQ score that most practitioners today would object to as being culturally unfair. Halpern says we all have different abilities and potentials that are not static but rather grow in a context that is diverse and varied.

The work of psychologists Serpell, Nisbett and Peng suggests that in many Eastern and African cultures (that are what is known as collectivistic cultures) intelligence is defined within a social context – the ability to interact with others responsibly, interact to reconcile and avoid conflict, and even to know when it is appropriate to display one's cognitive abilities and when not to (Cole & Packer, 2019). Of course, it is important to realize that these differences are experiential, and that not all individuals of one culture are better at these things. In Western models cognitive speed is often a component of intelligence. On the other hand, Serpell (2011) points out for example that in cultures like rural Zambia where culture differentiates between cognitive speed and responsibility (and both are considered components of intelligence), the lines between the two are often intentionally blurred, and cleverness is seen as a combination of both.

It would appear that the verbal subtests of the commonly used intelligence tests (WISC or Stanford Binet) would be most susceptible to cultural differences and negatively affect the scores of non-native English speakers since these tests were written in English for English speaking individuals. And clearly this makes sense, given that verbal and written aspects of culture and language can be considerably different in different cultures. However, even the non-verbal, seemingly culture-free or culture fair aspects of these tests are heavily influenced by cultural differences (Shuttleworth-Edwards, 2016).

In tests like Raven's matrices that are nonverbal, non-Western participants appear to consistently score lower. There are some questions about the methodological issues that account for these findings. However, on average there do appear to be differences. Generally, it is assumed that the type of processing required in these tests – visuo-spatial cognition tasks – should be fairly universal, and therefore that these tests are "culture fair." And then some researchers have assumed therefore that the cultural differences found in the results of testing are racial and genetic. These are precisely the type of conclusions that have been grounded in the work of historically racist practitioners in psychology like Galton and Jensen (and the type of implementation and outcomes that the APA issued an apology for in 2021).

Gonthier (2022)[1] showed that the assumption that these visuo-spatial tasks in intelligence tests are universal is a myth. Since these types of tests involve only color and shapes and very little verbal content, many researchers have suggested that these tests are not influenced by the culture of participants. In fact, the opposite is true. At least five studies with participants in Ecuador, Columbia, Uganda, the Phillippines and Indonesia found that while these individuals did comparably well on verbal tasks as Western participants, they were completely unable to perform on items such as the Wechsler Block design – they stacked blocks on top of each other, made the designs more symmetrical than the prompts, ignored color entirely and in general responded in ways that when taken out of context would suggest that their "intelligence was much lower" than their Western counterparts'. "The authors of these five studies all concluded that the inability of the subjects to perform adequately stemmed not from an innate difficulty in visuo-spatial reasoning, but from a lack of cultural expertise in perception, conceptualization or manipulation of this type of materials." Gonthier goes on to point out specific issues that influence differences in test findings ranging from the use of and unfamiliarity with paper, that pictures represent something is not universal, not having names for shapes, positions, and colors, importance to numerosity, movement/time, symmetry, and cognitive load and processing of orientation. In some cases orientation of figures on a test are not considered important by participants who vastly outperform Western participants in cardinal orientation and directions of items that are extremely far away and of themselves even when in a windowless room. The matrix format with

rows and columns (particularly going from left to right) is culture bound and most definitely affected by language orientations. Literacy and literacy in a particular language will affect outcomes on tests that are matrix based. Three dimensional representation causes even more problems. And particular colors and shapes may have different meanings in different cultures. Finally response production is affected by familiarity with the materials like blocks (and this is particularly an issue with timed tests, but also cognitive load).

So while intelligence testing has been the topic of much psychological research, it is important to carefully consider the history, motivation, and complexity of such testing. This is particularly true given the impact of the results of this research and implementation in perpetuating systemic biases.

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13.5: Spectrum of intelligence

The results of studies assessing the measurement of intelligence show that IQ, like many other traits (think height or weight) is distributed in the population in the form of a **Normal Distribution (or bell curve),** which is the pattern of scores usually observed in a variable that clusters around its average. In a normal distribution, the bulk of the scores fall toward the middle, with many fewer scores falling at the extremes. The normal distribution of intelligence shows that on IQ tests the majority of people cluster around the average (in this case, where IQ = 100), and fewer are either very smart or very dull (see below).

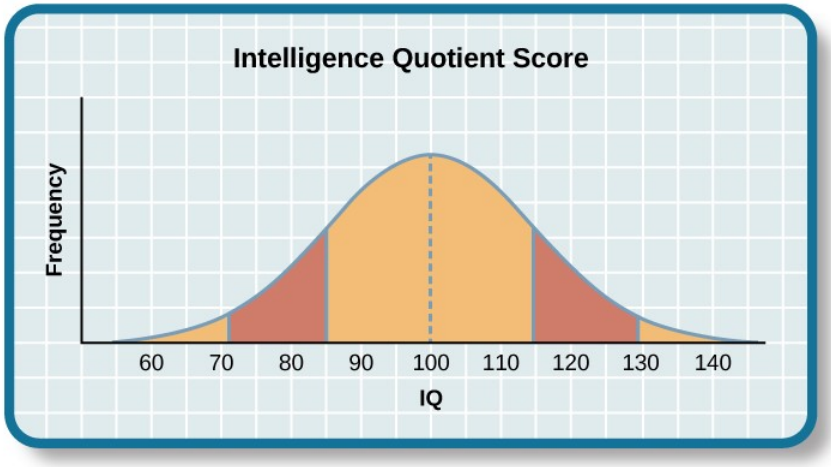


Figure **13.5.1**: The majority of people have an IQ score between 85 and 115.[1]

This means that about 2% of people score above an IQ of 130, often considered the threshold for giftedness, and about the same percentage score below an IQ of 70, often being considered the threshold for an intellectual disability.

Intellectual Disabilities

One end of the distribution of intelligence scores is defined by people with very low IQ. **Intellectual disability** (or **intellectual developmental disorder**) is assessed based on cognitive capacity (IQ) and adaptive functioning. The severity of the disability is based on adaptive functioning, or how well the person handles everyday life tasks. About 1% of the United States population, most of them males, fulfill the criteria for intellectual developmental disorder, but some children who are given this diagnosis lose the classification as they get older and better learn to function in society. A particular vulnerability of people with low IQ is that they may be taken advantage of by others, and this is an important aspect of the definition of intellectual developmental disorder (Greenspan, Loughlin, & Black, 2001).

One example of an intellectual developmental disorder is **Down syndrome**, a chromosomal disorder caused by the presence of all or part of an extra 21st chromosome. The incidence of Down syndrome is estimated at approximately 1 per 700 births, and the prevalence increases as the mother's age increases (CDC, 2014a). People with Down syndrome typically exhibit a distinctive pattern of physical features, including a flat nose, upwardly slanted eye, a protruding tongue, and a short neck.



Figure **13.5.2**: Down Syndrome is caused by the presence of all or part of an extra 21st chromosome.[2]

Fortunately, societal attitudes toward individuals with intellectual disabilities have changed over the past decades. We no longer use derogatory terms to describe people with intellectual differences, although these were the official psychological terms used to describe degrees of what was referred to as “mental retardation” in the past. Laws such as the Americans with Disabilities Act (ADA) have made it illegal to discriminate on the basis of mental and physical disability.

The normal distribution of IQ scores in the general population shows that most people have about average intelligence, while very few have extremely high or extremely low intelligence.[3]

Giftedness

Being **gifted** refers to children who have an IQ of 130 or higher (Lally & Valentine-French, 2015). Having an extremely high IQ is clearly less of a problem than having an extremely low IQ but there may also be challenges to being particularly smart. It is often assumed that school children who are labeled as “gifted” may have adjustment problems that make it more difficult for them to create and maintain social relationships.



Figure **13.5.3**: Children who get a score on an intelligence test showing an IQ of 130 or higher are labeled as gifted.[4]

As you might expect based on our discussion of intelligence, there are also different types and areas of intelligence and giftedness. Some children are particularly good at math or science, some at automobile repair or carpentry, some at music or art, some at sports

or leadership, and so on. There is a lively debate among scholars about whether it is appropriate or beneficial to label some children as “gifted and talented” in school and to provide them with accelerated special classes and other programs that are not available to everyone. Although doing so may help the gifted kids (Colangelo & Assouline, 2009), it also may isolate them from their peers and make such provisions unavailable to those who are not classified as “gifted.”

Testing for high IQ or for disabilities needs to be critically looked at so that the good that these tests were created for are not used for undesirable purposes.[5] Clearly, as mentioned at the start of the discussion on intelligence, much of the research has been tainted in many ways. The APA issued a public apology in Oct 2021 for much of the harms that were initiated and perpetrated by much of the theories, practices and social ills generated and ignored under its auspices. This is an unprecedented move and was clearly long in coming. But the history generated is very telling in how intelligence research and theorists have been particularly egregious contributors to this harm.

There is research that does connect intelligence to academic performance. However there are other factors that have been found to predict academic performance as well - such as motivation (Lavrijsen et al, 2022) and self control (Duckworth & Seligman, 2005). In a separate section we look at different types of testing in schools.

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13.6: Testing in schools

Children's academic performance is often measured with the use of standardized tests. Those tests include, but are not limited to Achievement and Aptitude tests.



Figure **13.6.1**: Standardized tests are used to measure academic performance.[1]

Achievement tests are used to measure what a child has already learned. Achievement tests are often used as measures of teaching effectiveness within a school setting and as a method to make schools that receive tax dollars (such as public schools, charter schools, and private schools that receive vouchers) accountable to the government for their performance.

California uses the California Assessment of Student Performance and Progress (CAASPP) System since 2014 to measure student academic achievement in public schools. Maybe you have taken some of these (or equivalent of these) tests when you were in grade school. There are tests administered in English Language Arts, Math and Science.

Similarly other states use achievement tests in each of these areas to measure student performance at specific grade level intervals and check on teaching and learning in K-12 public schools.

The term aptitude seems fairly simple conceptually, but is clearly difficult to test. How can you test whether someone has the potential for something if they have not yet developed it? What exactly would you be testing? And might those test scores be reflecting something other than pure potential? Could those test scores be influenced by familiarity with the test and learning strategies for how to take those tests? Conversely, might we be disadvantaging those students who do not have access to those strategies particularly because their parents do not have the means to send them to expensive classes to learn them? These are the kinds of questions that formed the basis of recent decisions by many US universities to no longer require SAT or ACT scores for admissions applications. Did you know that even before this year (and in fact for many years before this), many people did not know that the A in SAT stood for “aptitude.” The College Board had long since eliminated advertising this fact, precisely because of these questions raised here!

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13.7: Preschool and Head Start

Providing universal preschool has become an important lobbying point for federal, state, and local leaders throughout our country. In his 2013 State of the Union address, President Obama called upon Congress to provide high-quality preschool for all children. He continued to support universal preschool in his legislative agenda, and in December 2014 the President convened state and local policymakers for the White House Summit on Early Education (White House Press Secretary, 2014). Democrat hopeful Elizabeth Warren made universal preschool one of the rallying cries of her campaign to be on the Presidential ticket in 2020. However, universal preschool covering all four-year-olds in the country would require significant funding. Further, how effective preschools are in preparing children for elementary school, and what constitutes high-quality preschool have been debated. To set criteria for designation as a high quality preschool, the National Association for the Education of Young Children (NAEYC) identifies 10 standards (NAEYC, 2016). These include:

- Positive relationships among all children and adults are
- A curriculum that supports learning and development in social, emotional, physical, language, and cognitive areas.
- Teaching approaches that are developmentally, culturally, and linguistically
- Assessment of children's progress to provide information on learning and
- The health and nutrition of children are promoted, while they are protected from illness and injury.
- Teachers possess the educational qualifications, knowledge, and commitment to promote children's learning.
- Collaborative relationships with families are established and
- Relationships with agencies and institutions in the children's communities are established to support the program's goals.
- Indoor and outdoor physical environments are safe and well-
- Leadership and management personnel are well qualified, effective, and maintain licensure status with the applicable state agency.



Figure **13.7.1**: Children making crafts at preschool.[1]

Primary caregivers should review preschool programs using the NAEYC criteria as a guide and template for asking questions that will assist them in choosing the best program for their child. Selecting the right preschool is also difficult because there are so many types of preschools available. Zachry (2013) identified Montessori, Waldorf, Reggio Emilia, High Scope, Parent Co-Ops, and Bank Street as types of preschool programs that focus on children learning through discovery. Teachers act as guides and create activities based on the child's developmental level (Zachry, 2013).

Head Start

For children who live in poverty, Head Start has been providing preschool education since 1965 when it was begun by President Lyndon Johnson as part of his war on poverty. In 2013, research revealed that Head Start served nearly one million children and annually costs approximately 7.5 billion dollars (US Department of Health and Human Services, 2015)

However, concerns about the effectiveness of Head Start have been ongoing since the program began. Some research claims that the program which today spends about ten thousand dollars per child per year (and there are about 900 thousand enrollees) needs to be worthwhile. (It infuriates me when you put this in context that our US spent at least 801 billion dollars on the military!)

Anecdotally to start, consider the following excerpt from a blog by Amanda Bryans - the research and education to practice supervisor at Head Start -

"Over the last 57 years, there have been countless efforts to describe us and ongoing debates about whether the program works, how it works, and if it works well enough to justify its cost. The Head Start program works! Why? Because it is rooted in the strength of families and has the unique capacity to do different things for different children and families.

How would you respond to the question?

The Head Start program works because parents and guardians are recognized as the experts about their own children. They have a seat at every table, and they help govern the programs their children attend. It works because the staff knows children need adults who keep them safe, ensure they have good nutrition, health, and dental care, and support their social and emotional development and well-being. Children's interests, curiosity, and joy are recognized as they experience individualized teaching and learning. The program offers parents opportunities to set goals and supports to meet them. Parents have access to assistance acquiring a GED diploma or a college degree, finding a job, or locating secure housing.

Once after I spoke at a conference in Region IV, a woman approached and introduced herself as a Head Start director. She said she started with the program as a parent. She had gotten a position first as a teacher assistant and then worked her way up to director, obtaining a master's degree along the way. I asked about her Head Start child, and she said, "Oh my daughter who went to the Head Start program is doing great. She is getting a master's in educational administration and wants to be a principal. My older daughter though, did not get a Head Start experience and she is struggling." She thought for a moment and then said, "The difference was my younger daughter was so loved at the Head Start program. She knew she was somebody." This story stuck with me. So when I have a chance to talk about the program, this is what I say —

The Head Start program means:

- Children and families come first.
- All people are included and respected.
- Children's basic needs are met, and their ideas and interests are important.
- School readiness includes academic skills and social and emotional competence for children, advocacy skills for parents, and kindergarten partnerships.
- Families can get help with their goals and with basic needs and are valued partners."

Zhang and Dobbes-Oates (2019) research has found a positive relationship between length of Head Start participation and children's performance in receptive language and math in elementary school. Johnson and Jackson (2019) did an economic analysis to show that the investment in this federal program is more than justified (especially when combined with improvements in K-12 spending) because participating low-income children are more likely to graduate from high school, earn higher incomes and are less likely to be incarcerated. There are other positive health and parenting outcomes of head start that are listed by Jancart et al. (2021) and Douglass et al. (2021).

Nonexperimental designs are a significant problem in determining the effectiveness of Head Start programs because a control group is needed to show group differences that would demonstrate educational benefits. Because of ethical reasons, low-income children are usually provided with some type of preschool programming in an alternative setting. Additionally, Head Start programs are different depending on their location, and these differences include the length of the day or qualification of the teachers. Lastly, testing young children is difficult and strongly dependent on their language skills and comfort level with an evaluator (Barshay, 2015).



Figure **13.7.2**: A photograph from when Head Start began – a program meant to equalize educational opportunity and thereby IQ.[2]



Figure **13.7.3**: Head start students learning in class

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13.8: Early education continued

Table **13.8.1**: - Types of Early Childhood Education Programs[1]

Program	Founder	Characteristics
Montessori	Dr. Maria Montessori	• Refers to children's activity as work (not play); children are given long periods of time to work • Focus on individual learning • Features child-sized furniture and defined work areas • Materials are carefully chosen and introduced to children by teacher • Features mixed-aged grouping • Teachers should be certified
Waldorf	Rudolf Steiner	• Focus on whole child • Features connections to nature, sensory learning, and imagination • Provides large blocks of time for play • Delay formal academic instruction • Environment protects children from negative influences • Relationships are important so groupings last for several years (**looping**) • Teachers should be certified
Reggio Emilia	Loris Malaguzzi	• Teachers and children co-construct the curriculum • Teachers are researchers • Environment is the third teacher and features beauty and order • Children's learning is documented through the multiple methods (100 languages of children) • Have atelier (art studio) with an atelierista (artist) to instruct children • Believe children are competent and capable • Children stay together for 3 years • Parents partner with teachers • Community is extension of school
High Scope	David Weikart	• Features defined learning areas • Has 8 content areas with 58 key developmental indicators • Consistency of daily routine is important • Uses plan-do-review sequence in which they make a plan, act on it, and then reflect on the results • Teachers are partners and use the Child Observation Record (COR) to help assess children and plan curriculum • Utilizes 6 step process to teach children conflict resolution
Bank Street	Lucy Sprague Mitchell	• Also referred to as the Developmental-Interactionist Approach • Environment is arranged into learning centers • Focus on hands-on experience with long periods of time given • Teacher uses questions to further children's exploration • Blocks are primary material in the classroom • Field trips are frequently used
Creative Curriculum	Diane Trister Dodge	• Focus on children's play and self-selected activities • Environment is arranged into learning areas • Large blocks of time are given for self-selected play • Uses projects as basis for curriculum • Is researched based and includes assessment system

Maria Montessori: The Montessori Method



Figure **13.8.1**: This child in a Montessori classroom is experimenting with crafts. (Photo Source: Eric Blocher, CC BY SA 3.0)

Maria Montessori scientifically observed and measured the behaviors of young children which resulted in her development of The Montessori Method–an educational teaching method and philosophy. According to Montessori, a child's mind is quickly developing within the first six years of life ("the absorbent mind") whereby a child takes in as much as possible from one's environment.[2]

Key hallmarks of The Montessori Method include self-directed, hands-on experiential learning, collaborative play, and freedom of movement and activity within a safe, multi-sensory environment. Trained teachers maximize these hallmarks by offering developmentally-appropriate activities that promote individualized learning to optimize children's physical, cognitive, social, and emotional development.

Children work at their own pace and engage in free choice activities within clear, firm, reasonable, and developmentally-appropriate boundaries established by trained teachers. Montessori's research deduced that these practices stimulate deeper learning experiences, independent thinking, problem- solving, creativity, confidence, and lifelong enthusiasm for learning.

A recent longitudinal study by Lillard et al (2017) found that Montessori preschools (and up to 8th grade) had strong positive effects on children's academic and social learning. These researchers reported "preschool programs tend to either be teacher-led and didactic, or else to lack academic content. One preschool model that involves both child-directed, freely chosen activity and academic content is Montessori. Here we report a longitudinal study that took advantage of randomized lottery-based admission to two public Montessori magnet schools in a high-poverty American city. The final sample included 141 children, 70 in Montessori and 71 in other schools, most of whom were tested 4 times over 3 years, from the first semester to the end of preschool (ages 3–6), on a variety of cognitive and socio-emotional measures. Montessori preschool elevated children's outcomes in several ways. Although not different at the first test point, over time the Montessori children fared better on measures of academic achievement, social understanding, and mastery orientation, and they also reported relatively more liking of scholastic tasks. They also scored higher on executive function when they were 4. In addition to elevating overall performance on these measures, Montessori preschool also equalized outcomes among subgroups that typically have unequal outcomes. First, the difference in academic achievement between lower income Montessori and higher income conventionally schooled children was smaller at each time point, and was not (statistically speaking) significantly different at the end of the study. Second, defying the typical finding that executive function predicts academic achievement, in Montessori classrooms children with lower executive function scored as well on academic achievement as those with higher executive function. This suggests that Montessori preschool has potential to elevate and equalize important outcomes, and a larger study of public Montessori preschools is warranted."

Applications of Early Education

Understanding how children think and learn has proven useful for improving education. Activities like playing games that involve working with numbers and spatial relationships can give young children a developmental advantage over peers who have less exposure to the same concepts.

Mathematics

Even before they enter kindergarten, the mathematical knowledge of children from low-income backgrounds lags far behind that of children from more affluent backgrounds. Ramani and Siegler (2008) hypothesized that this difference is due to the children in middle- and upper-income families engaging more frequently in numerical activities, for example playing numerical board games such as Chutes and Ladders. Chutes and Ladders is a game with a number in each square; children start at the number one and spin a spinner or throw a dice to determine how far to move their token. Playing this game seemed likely to teach children about numbers, because in it, larger numbers are associated with greater values on a variety of dimensions. In particular, the higher the number that a child's token reaches, the greater the distance the token will have traveled from the starting point, the greater the number of physical movements the child will have made in moving the token from one square to another, the greater the number of number-words the child will have said and heard, and the more time will have passed since the beginning of the game. These spatial, kinesthetic, verbal, and time-based cues provide a broad-based, multisensory foundation for knowledge of numerical magnitudes (the sizes of numbers), a type of knowledge that is closely related to mathematics achievement test scores (Booth & Siegler, 2006).

Playing this numerical board game for roughly 1 hour, distributed over a 2-week period, improved low-income children's knowledge of numerical magnitudes, ability to read printed numbers, and skill at learning novel arithmetic problems. The gains lasted for months after the game-playing experience (Ramani & Siegler, 2008; Siegler & Ramani, 2009). An advantage of this type of educational intervention is that it has minimal if any cost—a parent could just draw a game on a piece of paper.

Reading

Cognitive developmental research has shown that phonemic awareness—that is, awareness of the component sounds within words—is a crucial skill in learning to read. To measure awareness of the component sounds within words, researchers ask children to decide whether two words rhyme, to decide whether the words start with the same sound, to identify the component sounds within words, and to indicate what would be left if a given sound were removed from a word. Kindergartners' performance on these tasks is the strongest predictor of reading achievement in third and fourth grade, even stronger than IQ or social class background (Nation, 2008). Moreover, teaching these skills to randomly chosen 4- and 5-year-olds results in their being better readers years later (National Reading Panel, 2000).

Continuing Brain Maturation

Understanding of cognitive development is advancing on many different fronts. One exciting area is linking changes in brain activity to changes in children's thinking (Nelson et al., 2006). Although many people believe that brain maturation is something that occurs before birth, the brain actually continues to change in large ways for many years thereafter. For example, a part of the brain called the prefrontal cortex, which is located at the front of the brain and is particularly involved with planning and flexible problem solving, continues to develop throughout adolescence (Blakemore & Choudhury, 2006). Such new research domains, as well as enduring issues such as nature and nurture, continuity and discontinuity, and how to apply cognitive development research to education, insure that cognitive development will continue to be an exciting area of research in the coming years.[3]

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13.9: Grade school and middle childhood

Remember the ecological systems model that we explored? This model helps us understand an individual by examining the contexts in which the person lives and the direct and indirect influences on that person's life. School becomes a very important component of children's lives during middle and late childhood, and parents and the culture contribute to children's experiences in school as indicated by the ecological systems model through their interaction with the school.

Clearly there are entire graduate courses devoted to the intersection of child developmental psychology and grade school education. Of course, here we only talk about a snippet of that.

Stanley Hall and Pedagogy



Figure **13.9.1**: Children in a classroom environment that could be in one of many locations around the world

Hall was one of the first scientific psychologists who gained notoriety as an educational expert; his work was often geared toward parents and educators in addition to psychologists.[1]

Hall presented public lectures to educators on the psychology underlying childhood and how to "best" teach children (otherwise known as "pedagogy").

This work made significant contributions to the study of, and improvements within, parenting and educational practices.

Hall believed that a child's nature should guide educational practices so children could become healthy, productive members of society. Overall, Hall's in-person presentations started the movement for the U.S. to integrate psychological and scientific studies within educational endeavors.[2]

Parental Involvement in School

Parents and caregivers vary in their level of involvement with their children's schools. Teachers often complain that they have difficulty getting parents/caregivers to participate in their child's education and devise a variety of techniques to keep parents in touch with daily and overall progress. For example, parents may be required to sign a behavior chart each evening to be returned to school or may be given information about the school's events through websites and newsletters. There are other factors that need to be considered when looking at parental involvement. To explore these, first ask yourself if all parents who enter the school with concerns about their child be received in the same way?

Horvat (2004) found that teachers seek a particular type of involvement from particular types of parents.[18] While teachers thought they were open and neutral in their responses to parental involvement, in reality teachers were most receptive to support, praise and agreement coming from parents who were most similar in race and social class with the teachers. Parents who criticized the school or its policies were less likely to be given voice. Parents who have higher levels of income, occupational status, and other qualities

favored in society have **family capital.** This is a form of power that can be used to improve a child's education. Caregivers who do not have these qualities may find it more difficult to be effectively involved.

Lareau and Horvat (2004) offer three cases of African-American parents who were each concerned about discrimination in the schools. Despite evidence that such discrimination existed, their children's white, middle-class teachers were reluctant to address the situation directly. Note the variation in approaches and outcomes for these three families:

- The Irvings were a middle class, African-American couple was concerned that the school was discriminating against black students. They fought against it without using direct confrontation by staying actively involved in their daughter's schooling and making frequent visits to the school to make sure that discrimination would not occur. They also talked with other African-American teachers and parents about their concerns.
- The Masons were a working class, African-American couple, a minister and a beautician, who voiced direct complaints about discrimination in the schools. Their claims were thought to undermine the authority of the school and as a result, their daughter was kept in a lower reading class. However, her grade was boosted to "avoid a scene" and the parents were not told of this grade change.
- Ms. Caldron, a poor, single parent was concerned about discrimination in the school. She was a recovering drug addict receiving welfare. She did not discuss her concerns with other parents because she did not know the other parents and did not monitor her child's progress or get involved with the school. She felt that her concerns would not receive attention. She requested spelling lists from the teacher on several occasions but did not receive them. The teacher complained that Ms. Caldron did not sign forms that were sent home for her signature.

In summary, working within the system without direct confrontation seemed to yield better results for the Irvings, although the issue of discrimination in the school was not completely addressed. Ms. Caldron was the least involved and felt powerless in the school setting. Her lack of family wealth and lack of knowledge and confidence kept her from addressing her concerns with the teachers. What do you think would happen if she directly addressed the teachers and complained about discrimination? Chances are, she would be dismissed as undermining the authority of the school, just as the Masons, and might be thought to lack credibility because of her poverty and drug addiction.

The authors of this study suggest that teachers closely examine their biases against parents. Schools may also need to examine their ability to dialogue with parents about school policies in more open ways. What happens when parents have concerns over school policy or view student problems as arising from flaws in the educational system? How are parents who are critical of the school treated? And are their children treated fairly even when the school is being criticized? Certainly, any efforts to improve effective parental involvement should address these concerns.

What Happened to No Child Left Behind?

In 2001, President Bush signed into effect Public Law 107-110, better known as the **No Child Left Behind Act** mandating that schools administer achievement tests to students and publish those results so that parents have an idea of their children's performance. Additionally, the government would have information on the gaps in educational achievement between children from various social class, racial, and ethnic groups.

Schools that showed significant gaps in these levels of performance were mandated to work toward narrowing these gaps. Educators criticized the policy for focusing too much on testing as the only indication of student performance. Target goals were considered unrealistic and set by the federal government rather than individual states. Because these requirements became increasingly unworkable for schools, changes to the law were requested.



Figure **13.9.2**: The No Child Left Behind Act was signed into effect in 2001 by George W. Bush.[3]



Figure **13.9.1**: The Every Student Succeeds Act was signed into effect in 2015 by Barack Obama.[4]

On December 12, 2015 President Obama signed into law the **Every Student Succeeds Act** (ESSA). This law is state driven and focuses on expanding educational opportunities and improving student outcomes, including in the areas of high school graduation, drop-out rates, and college attendance.[5]

Culture and Formal Schooling

Stevenson and Stigler conducted a cross national study (published in 1992) investigating the differences in the cultural contexts and math academic achievement of students in Japan, Taiwan, China and the US. These studies looked at math classrooms in the four settings and found that the average US seventh grader performed at the same level as the average Japanese second grader. Twenty years later in an NPR episode, Stigler described his observations in a Japanese classroom that demonstrate some of the dynamics that are diametrically opposed to what one might see in a US classroom. He described how in the Japanese classroom the teacher invited a child who was having trouble drawing a three-dimensional figure of a cube up to the board to demonstrate what he was doing. The child struggled with his work on the board while other students were invited to give him periodic feedback. At the end of the lesson when he managed to do it right, they all applauded. Stigler, (and Stevenson and later other psychologists like Li) argue that this indicates a fundamental cultural difference between Eastern and Western educational culture. Effort is seen as positive and inherent to education. In service of that Japanese parents and teachers emphasize effort over intelligence as a fixed trait that each of us possesses a certain amount of. Similar to Carol Dweck's idea of growth versus fixed mindset, Japanese (and Chinese) adults see education as a process that requires effort on the part of everyone. Japanese teachers are given more paid preparation time, and treat each lesson as a polished jewel. Novice teachers are paired with more experienced mentors. The goal is to create lessons where

children are challenged to work at a level slightly above their current ability, so that they need to struggle and try. When they do, teachers take the time to consciously point out and praise their efforts.

Of course these aren't binary differences - not all Eastern cultures, and certainly not only Eastern cultures all have this view. Also, it's not as if all the Eastern practices yield positive results. Individualism does lend itself to greater creativity. There are lessons that we can all learn from each other to benefit outcomes for school children everywhere.

Diversity inside urban schools

Certainly learning is complicated by the diversity of situations students come from. First of all, language presents an interesting challenge. In LAUSD for example, children speak different languages at home, and their fluency in English varies dramatically. Clearly language can affect other cognitive abilities that we expect children to learn in the academic setting. Also for immigrant children, the traumatic experience of relocation, the difference of cultures and conflict of families with new reality, all this has an impact on the way the child feels in the new classroom. Among migrant adolescents one can note a more intensive experience of internal conflicts, they face a wrenching sense of loneliness, don't feel understood and accepted. (Khaperskaia, Yu and Sensin, C).

Support for schools - cross national differences

In the US schools differ greatly in the amount of funding they receive from state and federal governments. In other Western nations there is more financial and logistical support for education. The purpose of this is to produce citizens who are academically supported and ready to enter the workforce, but also that their health and wellbeing is supported along the way. Gabola et al (2021) had intended to find out whether school burnout (exhaustion, cynicism and inadequacy) differed in between Switzerland and Italy where the cultures are relatively similar, but support varies. They did conclude that Italian adolescents reported greater exhaustion and cynicism than their Swiss counterparts. According to Gabola et al. (2021) "...every cantonal educational department offers a health team supporting each school in Switzerland. The main goal is to promote students' health and wellbeing. Furthermore, they work to maintain positive relationships among student groups and between teachers and their classrooms. Some health professionals are, for example, the school nurse, school mediator, school doctor, and school psychologist. Overall, the health team may guarantee a quick and easy answer to students' maladaptive behaviors by contributing to developing a wellbeing culture and offering a helping service devoted to each student.

By contrast, there are no stable health professionals inside the Italian school system. Apart from some specific school districts, the Italian school system does not offer psychosocial and medical support to their students. As is well known in Italy, there is a very long tradition of inclusion of students with special needs taught by specialized teachers who work with the regular teacher and the whole classroom. Nevertheless, students with intimate and personal needs due to their private and school life can only rely on sensitive and responsive teachers."

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13.10: Formal schooling and adolescence

Cognitive growth and a new found sense of freedom and independence makes it both easier and more difficult for teens when making choices and coping with upcoming transitions and life decisions.

As adolescents grow older, they encounter age-related transition points that require them to progress into a new role, such as go to college, take a year off or Gap Year, or start to work towards a career. Educational expectations vary not only from culture to culture, but also from class to class. While middle- or upper-class families may expect their daughter or son to attend a four-year university after graduating from high school, other families may expect their child to immediately begin working full-time, as many within their families have done before.[1]

Academic Achievement

Adolescents spend more waking time in school than in any other context (Eccles & Roeser, 2011). Academic achievement during adolescence is predicted by interpersonal (e.g., parental engagement in adolescents' education), intrapersonal (e.g., intrinsic motivation), and institutional (e.g., school quality) factors. Academic achievement is important in its own right as a marker of positive adjustment during adolescence but also because academic achievement sets the stage for future educational and occupational opportunities. The most serious consequence of school failure, particularly dropping out of school, is the high risk of unemployment or underemployment in adulthood that follows. High achievement can set the stage for college or future vocational training and opportunities.[2]

Tracking in education

Tracking refers to placing students in classrooms or schools that are particular to their academic ability. So high achieving students are placed in honors, AP or accelerated paths, while "average" students take traditional or vocational classes. In the US, there is some amount of tracking, but it is relatively easy for students to move between tracks. However there are inherent inequities in how students are placed into tracks (immigrant and English language learners for example, are more likely to be placed in lower level classes), how they continue to be funneled into those same tracks (higher SES parents are more likely to be involved in schools and channel their kids into college preparatory classes), and the long term outcomes (students taking AP classes have an advantage getting into competitive colleges, getting jobs after they graduate and earning higher incomes). On the other hand, there are advantages to tracking in that teachers can focus on the particular ability level they are teaching in a homogenous classroom, and so they don't spend their time either teaching way above or way below some children's ability/understanding.

In general, the US education system has less obvious tracking than say the German education system. In Germany, students are tracked by the end of primary school. At that point they attend different schools and take different classes depending on what type of career they might want to end up in. It is more difficult to move from a vocational track to a college-oriented one.

High School Dropouts

The **status dropout rate** refers to the percentage of 16 to 24 year-olds who are not enrolled in school and do not have high school credentials (either a diploma or an equivalency credential such as a General Educational Development [GED] certificate). The dropout rate is based on sample surveys of the civilian, non- institutionalized population, which excludes persons in prisons, persons in the military, and other persons not living in households. [3] The overall status dropout rate decreased from 8.3 percent in 2010 to 5.2 percent in 2021. [4]

Gap Year: How different Societies Socialize Young Adults

Age transition points require socialization into new roles that can vary widely between societies. For example, in the United Kingdom, when teens finish their secondary schooling (aka high school in the United States), they often take a year "off" before entering college. Frequently, they might take a job, travel, or find other ways to experience another culture. Prince William, the Duke of Cambridge, spent his gap year practicing survival skills in Belize, teaching English in Chile, and working on a dairy farm in the United Kingdom (Prince of Wales 2012a). His brother, Prince Harry, advocated for AIDS orphans in Africa and worked as a jackeroo (a novice ranch hand) in Australia (Prince of Wales 2012b).



Figure **13.10.1**: Prince William.[5]



Figure **13.10.1**: Prince Harry.[6]

In the United States, this life transition point is socialized quite differently, and taking a year off is generally frowned upon. Instead, U.S. youth are encouraged to pick career paths by their mid-teens, to select a college and a major by their late teens, and to have completed all collegiate schooling or technical training for their career by their early twenties.

In other nations, this phase of the life course is tied into **conscription**, a term that describes compulsory military service. Egypt, Switzerland, Turkey, and Singapore all have this system in place. Youth in these nations (often only the males) are expected to undergo a number of months or years of military training and service.[7]

Adolescents' independence: In the Workforce

Many adolescents work either summer jobs, or during the school year, or may work in lieu of college. Holding a job may offer teenagers extra funds, provide the opportunity to learn new skills, foster ideas about future careers, and perhaps shed light on the true value of money. However, there are numerous concerns about teenagers working, especially during the school year. Several studies have found that working more than 20 hours per week can lead to declines in grades, a general disengagement from school (Staff, Schulenberg, & Bachman, 2010; Lee & Staff, 2007; Marsh & Kleitman, 2005), an increase in substance abuse (Longest & Shanahan, 2007), engaging in earlier sexual behavior, and pregnancy (Staff et al., 2011). Like many employee groups, teens have seen a drop in the number of jobs. The summer jobs of previous generations have been on a steady decline, according to the United States Department of Labor, Bureau of Labor Statistics (2016).



Figure **13.10.3**: How many hours and the reasons why this teen works, will influence the effects of her job.[8]

The Working Poor

A major concern in the United States is the rising number of young people who choose to work rather than continue their education and are growing up or continuing to grow up in poverty. Growing up poor or entering the workforce too soon, can cut off access to the education and services people need to move out of poverty and into stable employment. Research states that education was often a key to stability, and those raised in poverty are the ones least able to find well-paying work, perpetuating a cycle. Those who work only part time, may it be teens or whomever, are more likely to be classified as working poor than are those with full-time employment; higher levels of education lead to less likelihood of being among the working poor. [9] In 2017, the working poor included 6.9 million Americans, down from 7.6 million in 2011 (U.S. Bureau of Labor Statistics, 2019).[10]

Referring back to the section on tracking in education, might it be better that students go to vocational school earlier and learn a trade as they do in countries like Germany and Switzerland, rather than be "required" to go to a full service high school where they get a "well rounded" education? This is certainly food for thought...

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13.11: Neurodivergence and Special Education

This is the term used to describe the wide range of differences we might see in the ways children develop. The Diagnostic and Statistical Manual of Mental Disorders (2013) lists a section of neurodevelopmental disorders that includes intellectual disabilities, autism spectrum disorder, learning disabilities, communication disorders, and AD/HD.

Autism spectrum disorder

Sometimes children's brains work differently. One form of this neurodiversity is **Autism spectrum disorder.**

Autism: Defining Spectrum Disorder

Autism spectrum disorder (ASD) describes a range of conditions classified as neuro-developmental disorders in the fifth revision of the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (DSM-5). The DSM-5, published in 2013, redefined the autism spectrum to encompass the previous (DSM-IV-TR) diagnoses of autism, Asperger syndrome, pervasive developmental disorder not otherwise specified (PDD-NOS), and childhood disintegrative disorder. These disorders are characterized by social deficits and communication difficulties, repetitive behaviors and interests, sensory issues, and in some cases, cognitive delays.

Asperger syndrome was distinguished from autism in the earlier DSM-IV by the lack of delay or deviance in early language development. Additionally, individuals diagnosed with Asperger syndrome did not have significant cognitive delays. PDD-NOS was considered "subthreshold autism" and "atypical autism" because it was often characterized by milder symptoms of autism or symptoms in only one domain (such as social difficulties). In the DSM-5, both of these diagnoses have been subsumed into autism spectrum disorder.

Autism spectrum disorders are considered to be on a spectrum because each individual with ASD expresses the disorder uniquely and has varying degrees of functionality. Many have above-average intellectual abilities and excel in visual skills, music, math, and the arts, while others have significant disabilities and are unable to live independently. About 25 percent of individuals with ASD are nonverbal; however, they may learn to communicate using other means.

Social Communication Symptoms

Social impairments in children with autism can be characterized by a distinctive lack of intuition about others. Unusual social development becomes apparent early in childhood. Infants with ASD show less attention to social stimuli, smile and look at others less often, and respond less to their own name. Toddlers with ASD differ more strikingly from social norms; for example, they may show less eye contact and turn-taking and may not have the ability to use simple movements to express themselves. Individuals with severe forms of ASD do not develop enough natural speech to meet their daily communication needs.

Restricted and Repetitive Behaviors

Children with ASD may exhibit repetitive or restricted behavior, including:

- Stereotypy—repetitive movement, such as hand flapping, head rolling, or body rocking.
- Compulsive behavior—exhibiting intention to follow rules, such as arranging objects in stacks or lines.
- Sameness—resistance to change; for example, insisting that the furniture not be moved or sticking to an unvarying pattern of daily activities.
- Restricted behavior—limits in focus, interest, or activity, such as preoccupation with a single television program, toy, or game.
- Self-injury—movements that injure or can injure the person, such as eye poking, skin picking, hand biting, and head banging.



Figure **13.11.1**: Repetitive behavior can be one of the symptoms of autism spectrum disorder.[1]

Etiology

While specific causes of ASD have yet to be found, many risk factors have been identified in the research literature that may contribute to its development. These risk factors include genetics, prenatal and perinatal factors, neuroanatomical abnormalities, and environmental factors. It is possible to identify general risk factors, but much more difficult to pinpoint specific factors.

Genetics

ASD affects information processing in the brain by altering how nerve cells and their synapses connect and organize; thus, it is categorized as a neuro-developmental disorder. The results of family and twin studies suggest that genetic factors play a role in the etiology of ASD and other pervasive developmental disorders. Studies have consistently found that the prevalence of ASD in siblings of children with ASD is approximately 15 to 30 times greater than the rate in the general population. In addition, research suggests that there is a much higher concordance rate among monozygotic (identical) twins compared to dizygotic (fraternal) twins. It appears that there is no single gene that can account for ASD; instead, there seem to be multiple genes involved, each of which is a risk factor for part of the autism syndrome through various groups. It is unclear whether ASD is explained more by rare mutations or by combinations of common genetic variants.

Prenatal and Perinatal Factors

A number of prenatal and perinatal complications have been reported as possible risk factors for ASD. These risk factors include maternal gestational diabetes, maternal and paternal age over 30, bleeding after first trimester, use of prescription medication (such as valproate) during pregnancy, and meconium (the earliest stool of an infant) in the amniotic fluid. While research is not conclusive on the relation of these factors to ASD, each of these factors has been identified more frequently in children with ASD than in developing youth without ASD.

Environmental Factors

Evidence for environmental causes is anecdotal and has not been confirmed by reliable studies. In the last few decades, controversy surrounded the idea that vaccinations may be the cause for many cases of autism; however, these theories lack scientific evidence and are biologically implausible. Even still, parental concern about a potential vaccine link with autism has led to lower rates of childhood immunizations, outbreaks of previously controlled childhood diseases in some countries, and the preventable deaths of several children.

Treatment

There is no known cure for ASD, and treatment tends to focus on management of symptoms. The main goals when treating children with ASD are to lessen associated deficits and family distress and to increase quality of life and functional independence. [2] Treatment for ASD should begin as soon as possible after diagnosis. Early treatment for ASD is important as proper care can reduce individuals' difficulties while helping them learn new skills and make the most of their strengths.



Figure **13.11.2**: Applied Behavior Analysis takes place at the client's home or school where a trained individual works one on one with the child using specific techniques.[5]

There has been increasing attention to the development of evidenced-based interventions for young children with ASD. Although evidence-based interventions for children with ASD vary in their methods, many adopt a psychoeducational approach to enhancing cognitive, communication, and social skills while minimizing behaviors that are thought to be problematic.[6]

COVID 19 pandemic, mask wearing has affected the social cognition of children with ASD further (Tamon et al, 2022).

The Diversity of the Autism Spectrum

The rainbow-colored infinity symbol represents the diversity of the autism spectrum as well as the greater neurodiversity movement. The neurodiversity movement suggests that diverse neurological conditions appear as a result of normal variations in the human genome. It challenges the idea that such neurological differences are inherently pathological, instead asserting that differences should be recognized and respected as a social category on a par with gender, ethnicity, sexual orientation, or disability status.



Figure **13.11.3**: A symbol of the autism spectrum – worldwide there has been growing awareness of the disorder.[7]

Learning Disorders

When children don't seem to be developing or learning in the typical pattern one might be assessed for a disorder or disability. What is a learning disorder or disability? In the next section we'll learn about the spectrum of disorders and how they may impact many areas of the child's life.

- A **learning disorde**r is a classification of disorders in which a person has difficulty learning in a typical manner within one of several domains. Types of learning disorders include difficulties in reading (dyslexia), mathematics (dyscalculia), and writing (dysgraphia). These disorders are diagnosed with certain criteria.
- A **learning disability** has problems in a specific area or with a specific task or type of activity related to education.

Children with learning challenges are usually identified in school because this is when their academic abilities are being tested, compared, and measured. In the Diagnostic and Statistical Manual of Mental Disorders -DSM-5, a qualified person will make a diagnosis, identified causes, and will make a treatment plan for disorders and disabilities. The diagnosis of specific learning disorder was added to the DSM-5 in 2013.

The DSM does not require that a single domain of difficulty (such as reading, mathematics, or written expression) be identified—instead, it is a single diagnosis that describes a collection of potential difficulties with general academic skills, simply including detailed specifies for the areas of reading, mathematics, and writing. Academic performance must be below average in at least one of these fields, and the symptoms may also interfere with daily life or work. In addition, the learning difficulties cannot be attributed to other sensory, motor, developmental, or neurological disorders.[8]

The following is an example of the DSM-5 - learning disorders.

- Dyslexia - Reading
- Dyscalculia – Mathematics
- Dyspraxia - Motor Coordination
- Dysgraphia - Writing
- Auditory Processing Disorder - Hearing
- Visual Processing Disorder - Visual

Dyslexia

Dyslexia, sometimes called "reading disorder," is the most common learning disability; of all students with specific learning disabilities, 70%–80% have deficits in reading. The term "developmental dyslexia" is often used as a catchall term, but researchers assert that dyslexia is just one of several types of reading disabilities. A reading disability can affect any part of the reading process, including word recognition, word decoding, reading speed, prosody (oral reading with expression), and reading comprehension.

Dyscalculia

Dyscalculia is a form of math-related disability that involves difficulties with learning math-related concepts (such as quantity, place value, and time), memorizing math-related facts, organizing numbers, and understanding how problems are organized on the page. Dyscalculics are often referred to as having poor "number sense."

Dyspraxia

Children who have motor skills substantially below what is expected for their age are diagnosed with **dyspraxia** – or developmental coordination disorder (DCD) as it is more formally known. They are not lazy, clumsy or unintelligent – in fact, their intellectual ability is in line with the general population – but they do struggle with everyday tasks that require coordination.



Figure 13.11.4: Children with learning challenges are usually identified in school because this is when their academic abilities are being tested, compared, and measured.[9]

Dysgraphia

The term **dysgraphia** is often used as an overarching term for all disorders of written expression. Individuals with dysgraphia typically show multiple writing-related deficiencies, such as grammatical and punctuation errors within sentences, poor paragraph organization, multiple spelling errors, and excessively poor penmanship.[10]

Auditory Processing Disorder

A processing deficit in the auditory modality that spans multiple processes is **auditory processing disorder** (APD). To date, APD diagnosis is mostly based on the utilization of speech material. Unfortunately, acceptable non-speech tests that allow differentiation between an actual central hearing disorder and related disorders such as specific language impairments are still not adequately available.

Visual Processing Disorder

Difficulty processing or interpreting visual information is referred to as **visual processing disorder** (VPD). Kids with visual processing issues may have difficulty telling the difference between two shapes or finding a specific piece of information on a page.[11]

Table 13.11.1: - Summary of Learning Disabilities[12]

Disability	Difficulties	Effects
Dyslexia	Difficulty with reading	Problems reading, writing, spelling
Dyscalculia	Difficulty with math	Problems doing math problems, understanding time, using money
Dyspraxia (Sensory Integration Disorder)	Difficulty with fine motor skills	Problems with hand-eye coordination, balance manual dexterity
Dysgraphia	Difficulty with writing	Problems with handwriting, spelling, organizing ideas
Auditory Processing Disorder	Difficulty hearing difference between sounds	Problems with reading, comprehension, language
Visual Processing Disorder	Difficulty interpreting visual information	Problems with reading, math, maps, charts, symbols, pictures

Legislation for Children with Disabilities

Since the 1970s political and social attitudes have moved increasingly toward including people with disabilities into a wide variety of "regular" activities. In the United States, the shift is illustrated clearly in the Federal legislation that was enacted during this time. Three major laws were passed that guaranteed the rights of persons with disabilities, and of children and students with disabilities in particular. The third law has had the biggest impact on education.

The Rehabilitation Act of 1973, Section 504

This law, the first of its kind, required that individuals with disabilities be accommodated in any program or activity that receives Federal funding (PL93-112, 1973). Although this law was not intended specifically for education, in practice it has protected students' rights in some extra-curricular activities (for older students) and in some childcare or after-school care programs (for younger students). If those programs receive Federal funding of any kind, the programs are not allowed to exclude children or youths with disabilities, and they have to find reasonable ways to accommodate the individuals' disabilities.

Americans with Disabilities Act of 1990 (or ADA)

This legislation also prohibited discrimination on the basis of disability, just as Section 504 of the Rehabilitation Act had done (PL 101-336, 1990). Although the ADA also applies to all people (not just to students), its provisions are more specific and "stronger" than those of Section 504. In particular, ADA extends to all employment and jobs, not just those receiving Federal funding. It also specifically requires accommodations to be made in public facilities such as with buses, restrooms, and telephones. ADA legislation is therefore responsible for some of the "minor" renovations in schools that you may have noticed in recent years, like wheelchair-accessible doors, ramps, and restrooms, and public telephones with volume controls.



Figure **13.11.5**: President George H. W. Bush Signs the Americans with Disabilities Act, 07/26/1990.[13]

Individuals with Disabilities Education Act (or IDEA)

As its name implied this legislation was more focused on education than either Section 504 or ADA. It was first passed in 1975 and has been amended several times since, including most recently in 2004 (PL 108-446, 2004). In its current form, the law guarantees the following rights related to education for anyone with a disability from birth to age 21.

The first two rights influence schooling in general, but the last three affect the work of classroom teachers rather directly:

- **Free, appropriate education**: An individual or an individual's family should not have to pay for education simply because the individual has a disability, and the educational program should be truly educational; i.e., not merely caretaking or babysitting.
- **Due process**: In case of disagreements between an individual with a disability and the schools or other professionals, there must be procedures for resolving the disagreements that are fair and accessible to all parties, including the person himself or herself or the person's representative.

- **Fair evaluation of performance in spite of disability:** Tests or other evaluations should not assume test taking skills that a person with a disability cannot reasonably be expected to have, such as holding a pencil, hearing or seeing questions, working quickly, or understanding and speaking orally. Evaluation procedures should be modified to allow for these differences. This provision of the law applies both to evaluations made by teachers and to school-wide or "high-stakes" testing programs.
- **Education in the "least restrictive environment":** Education for someone with a disability should provide as many educational opportunities and options for the person as possible, both in the short term and in the long term. In practice, this requirement has meant including students in regular classrooms and school activities as much as possible.
- **An Individualized Educational Plan (IEP):** Given that every disability is unique, instructional planning for a person with a disability should be unique or individualized as well. In practice, this provision has led to classroom teachers planning individualized programs jointly with other professionals (like reading specialists, psychologists, or medical personnel) as part of a team.[14]

Special Education Process



Figure **13.11.6**:The special education process includes evaluation, eligibility, IEP, placement, instruction, annual review and evaluation again.[15]

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CHAPTER OVERVIEW

14: Emotions and Attachment

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14.1: Social cognition

People can talk about their and others' feelings etc. But even young infants without language show by their behavior that they have some knowledge of others' mental states. Right from the start infants have an interest in and preference for social interaction – human faces and voices are most interesting to them. By 2-3 months infants engage with others' emotions, expressions etc. By 6-12 months they engage in play and activities with toys along with others. By the second year they develop a sense of self and understanding that others might see and feel differently from themselves. There is the start of empathy and prosocial behavior. Why abilities develop when they do is less understood. Yet parents and teachers can capitalize on infants' need for regular and reliable social interaction for increasing social competence.[1]

The idea of social cognition (particularly in early childhood) started with Piaget's "egocentrism" – that children are not able to separate their own ideas from those of others. Piaget might have underestimated children's abilities. Then there is also the idea of perspective taking which might be considered part of metacognition – what children understand about memory, attention and problem solving. These develop mostly in grade school and continue into adulthood.

Theory of mind is a more overarching concept. It includes the full understanding of mental states, their causes and results. Theory of mind research is interested in what abilities children have at different ages, why, and how those affect their interactions.

The most famous experiments are false belief tasks but then there are other studies looking at how emotions are affected by desire satisfaction and also age changes in things like recursive thinking. Like in Piaget's studies, 4 year olds have difficulty with false beliefs, differentiating between appearance and reality, and tracking the connection between experience and beliefs. But by end of 4 or 5 years (unlike Piagetian findings), children seem to show a lot of progress, and there is also definite connection between social cognition abilities and interaction skills quality. Social behavior and social acceptance can therefore be influenced by changing parenting in order to increase theory of mind and social cognitive skills as well as self perception.[2]

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14.2: Forming attachments

Attachment is the close bond with a caregiver from which the infant derives a sense of security. The formation of attachments in infancy has been the subject of considerable research as attachments have been viewed as foundations for future relationships. Additionally, attachments form the basis for confidence and curiosity as toddlers, and as important influences on self- concept.



Figure **14.2.1**: Attachment relationships form as caregivers cuddle newborns, hold them close, talk to them and make eye contact with them, while taking care of their needs.[1]

Freud's Psychoanalytic Theory

According to Freud (1938) infants are oral creatures who obtain pleasure from sucking and mouthing objects. Freud believed the infant will become attached to a person or object that provides this pleasure. Consequently, infants were believed to become attached to their mother because she was the one who satisfied their oral needs and provided pleasure. Freud further believed that the infants will become attached to their mothers "if the mother is relaxed and generous in her feeding practices, thereby allowing the child a lot of oral pleasure," (Shaffer, 1985, p. 435).

Harlow's Research

In one classic study, Wisconsin University psychologists Harry and Margaret Harlow investigated the responses of young rhesus monkeys to explore if breastfeeding was the most important factor to attachment.



Figure 14.2.2: Rhesus monkeys show behaviors similar to human infant as they snuggle cloth and suck their thumbs.[2]

The infant monkeys were separated from their biological mothers, and two surrogate mothers were introduced to their cages. The first mother (the wire mother) consisted of a round wooden head, a mesh of cold metal wires, and a bottle of milk from which the baby monkey could drink. The second mother was a foam-rubber form wrapped in a heated terry-cloth blanket. The infant monkeys went to the wire mother for food, but they overwhelmingly preferred and spent significantly more time with the warm terry-cloth mother. The warm terry-cloth mother provided no food but did provide comfort (Harlow, 1958). The infant's need for physical closeness and touching is referred to as **contact comfort**. Contact comfort is believed to be the foundation for attachment. The Harlows' studies confirmed that babies have social as well as physical needs. Both monkeys and human babies need a secure base that allows them to feel safe. From this base, they can gain the confidence they need to venture out and explore their worlds.

Bowlby's Theory

Building on the work of Harlow and others, John Bowlby developed the concept of attachment theory. He defined attachment as the affectional bond or tie that an infant forms with the mother (Bowlby, 1969). An infant must form this bond with a primary caregiver in order to have normal social and emotional development. In addition, Bowlby proposed that this attachment bond is very powerful and continues throughout life. He used the concept of secure base to define a healthy attachment between parent and child (Bowlby, 1982). A **secure base** is a parental presence that gives the child a sense of safety as the child explores the surroundings.



Figure 14.2.3: A mother offering a secure base as her infant plays on a slide.[3]

Bowlby said that two things are needed for a healthy attachment: The caregiver must be responsive to the child's physical, social, and emotional needs; and the caregiver and child must engage in mutually enjoyable interactions (Bowlby, 1969). Additionally, Bowlby observed that infants would go to extraordinary lengths to prevent separation from their parents, such as crying, refusing to be comforted, and waiting for the caregiver to return.



Figure 14.2.4: This child is seeking comfort from an attachment figure.[4]

Bowlby also observed that these same expressions were common to many other mammals, and consequently argued that these negative responses to separation serve an evolutionary function. Because mammalian infants cannot feed or protect themselves, they are dependent upon the care and protection of adults for survival. Thus, those infants who were able to maintain proximity to an attachment figure were more likely to survive and reproduce.

Erikson: Trust vs. Mistrust

As previously discussed in chapter 1, Erikson formulated an eight-stage theory of psychosocial development. Erikson was in agreement on the importance of a secure base, arguing that the most important goal of infancy was the development of a basic sense of trust in one's caregivers. Consequently, the first stage, trust vs. mistrust, highlights the importance of attachment. Erikson maintained that the first year to year and a half of life involves the establishment of a sense of trust (Erikson, 1982). Infants are dependent and must rely on others to meet their basic physical needs as well as their needs for stimulation and comfort. A caregiver who consistently meets these needs instills a sense of trust or the belief that the world is a trustworthy place. The caregiver should not worry about overly indulging a child's need for comfort, contact or stimulation.



Figure **14.2.5**: This baby-wearing father is creating trust with his infant child.[5]

Problems Establishing Trust

Erikson (1982) believed that mistrust could contaminate all aspects of one's life and deprive the individual of love and fellowship with others. Consider the implications for establishing trust if a caregiver is unavailable or is upset and ill-prepared to care for a child. Or if a child is born prematurely, is unwanted, or has physical problems that make him or her more challenging to parent. Under these circumstances, we cannot assume that the parent is going to provide the child with a feeling of trust.

Mary Ainsworth and the Strange Situation

Developmental psychologist Mary Ainsworth, a student of John Bowlby, continued studying the development of attachment in infants. Ainsworth and her colleagues created a laboratory test that measured an infant's attachment to his or her parent. The test is called **The Strange Situation** because it is conducted in a context that is unfamiliar to the child and therefore likely to heighten the child's need for his or her parent (Ainsworth, 1979).



Figure **14.2.6**: In the Strange Situation test, a child comes into the laboratory where there are many toys they can potentially play with.[6]

During the procedure, which lasts about 20 minutes, the parent and the infant are first left alone, while the infant explores the room full of toys. Then a strange adult enters the room and talks for a minute to the parent, after which the parent leaves the room. The stranger stays with the infant for a few minutes, and then the parent again enters and the stranger leaves the room. During the entire session, a video camera records the child's behaviors, which are later coded by the research team. The investigators were especially interested in how the child responded to the caregiver leaving and returning to the room, referred to as the "reunion." On the basis of their behaviors, the children are categorized into one of four groups where each group reflects a different kind of attachment relationship with the caregiver. One style is secure and the other three styles are referred to as insecure.

- A child with a **secure attachment style** usually explores freely while the caregiver is present and may engage with the stranger. The child will typically play with the toys and bring one to the caregiver to show and describe from time to time. The child may be upset when the caregiver departs, but is also happy to see the caregiver return.
- A child with an **ambivalent** (sometimes called **resistant**) **attachment style** is wary about the situation in general, particularly the stranger, and stays close or even clings to the caregiver rather than exploring the toys. When the caregiver leaves, the child is extremely distressed and is ambivalent when the caregiver returns. The child may rush to the caregiver, but then fails to be comforted when picked up. The child may still be angry and even resist attempts to be soothed.
- A child with an **avoidant attachment style** will avoid or ignore the mother, showing little emotion when the mother departs or returns. The child may run away from the mother when she approaches. The child will not explore very much, regardless of who is there, and the stranger will not be treated much differently from the mother.
- A child with a **disorganized/disoriented attachment style** seems to have an inconsistent way of coping with the stress of the strange situation. The child may cry during the separation, but avoid the mother when she returns, or the child may approach the mother but then freeze or fall to the floor.

How common are the attachment styles among children in the United States? It is estimated that about 65 percent of children in the United States are securely attached. Twenty percent exhibit avoidant styles and 10 to 15 percent are ambivalent. Another 5 to 10 percent may be characterized as disorganized.

Some cultural differences in attachment styles have been found (Rothbaum, Weisz, Pott, Miyake, & Morelli, 2010). For example, German parents value independence and Japanese mothers are typically by their children's sides. As a result, the rate of insecure-avoidant attachments is higher in Germany and insecure-resistant attachments are higher in Japan. These differences reflect cultural variation rather than true insecurity, however (van Ijzendoorn and Sagi, 1999).

Keep in mind that methods for measuring attachment styles have been based on a model that reflects middle-class, U. S. values and interpretation. Newer methods for assessment attachment styles involve using a **Q-sort technique** in which a large number of behaviors are recorded on cards and the observer sorts the cards in a way that reflects the type of behavior that occurs within the situation (Waters, 1987). There are 90 items in the third version of the Q-sort technique, and examples of the behaviors assessed include:

- When child returns to mother after playing, the child is sometimes fussy for no clear reason.
- When the child is upset or injured, the child will accept comforting from adults other than mother.
- Child often hugs or cuddles against mother, without her asking or inviting the child to do so.
- When the child is upset by mother's leaving, the child continues to cry or even gets angry after she is gone.

At least two researchers observe the child and parent in the home for 1.5-2 hours per visit. Usually two visits are sufficient to gather adequate information. The parent is asked if the behaviors observed are typical for the child. This information is used to test the validity of the Strange Situation classifications across age, cultures, and with clinical populations.

Caregiver Interactions and the Formation of Attachment

Most developmental psychologists argue that a child becomes **securely attached** when there is consistent contact from one or more caregivers who meet the physical and emotional needs of the child in a responsive and appropriate manner. However, even in cultures where mothers do not talk, cuddle, and play with their infants, secure attachments can develop (LeVine et al, 1994).

The **insecure ambivalent style** occurs when the parent is insensitive and responds inconsistently to the child's needs. Consequently, the infant is never sure that the world is a trustworthy place or that he or she can rely on others without some anxiety. A caregiver who is unavailable, perhaps because of marital tension, substance abuse, or preoccupation with work, may

send a message to the infant he or she cannot rely on having needs met. An infant who receives only sporadic attention when experiencing discomfort may not learn how to calm down. The child may cry if separated from the caregiver and also cry upon their return. They seek constant reassurance that never seems to satisfy their doubt. Keep in mind that clingy behavior can also just be part of a child's natural disposition or temperament and does not necessarily reflect some kind of parental neglect. Additionally, a caregiver that attends to a child's frustration can help teach them to be calm and to relax.

The **insecure avoidant style** is marked by insecurity, but this style is also characterized by a tendency to avoid contact with the caregiver and with others. This child may have learned that needs typically go unmet and learns that the caregiver does not provide care and cannot be relied upon for comfort, even sporadically. An insecure avoidant child learns to be more independent and disengaged.

The **insecure disorganized/disoriented style** represents the most insecure style of attachment and occurs when the child is given mixed, confused, and inappropriate responses from the caregiver. For example, a mother who suffers from schizophrenia may laugh when a child is hurting or cry when a child exhibits joy. The child does not learn how to interpret emotions or to connect with the unpredictable caregiver. This type of attachment is also often seen in children who have been abused. Research has shown that abuse disrupts a child's ability to regulate their emotions (Main and Solomon, 1990).

Consistent caregiving may be jeopardized if the infant is institutionalized and given little more than basic physical care or if cared for in a daycare setting with a high turn-over of staff. Infants who, perhaps because of being in orphanages with inadequate care, have not had the opportunity to attach in infancy may still form initial secure attachments several years later. However, they may have more emotional problems of depression, anger, or be overly friendly as they interact with others (O'Connor et al, 2003).

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14.3: Factors affecting attachment

Several factors affect attachment.

Caregiver Consistency

Having a consistent caregiver may be jeopardized if the infant is cared for in a child care setting with a high turnover of staff or if institutionalized and given little more than basic physical care. Infants who, perhaps because of being in orphanages with inadequate care, have not had the opportunity to attach in infancy may still form initial secure attachments several years later. However, they may have more emotional problems of depression, anger, or be overly friendly as they interact with others (O'Connor et. al., 2003).

Social Deprivation

Severe deprivation of parental attachment can lead to serious problems. According to studies of children who have not been given warm, nurturing care, they may show developmental delays, failure to thrive, and attachment disorders (Bowlby, 1982). **Non-organic failure to thrive** is the diagnosis for an infant who does not grow, develop, or gain weight on schedule. In addition, postpartum depression can cause even a well-intentioned mother to neglect her infant.

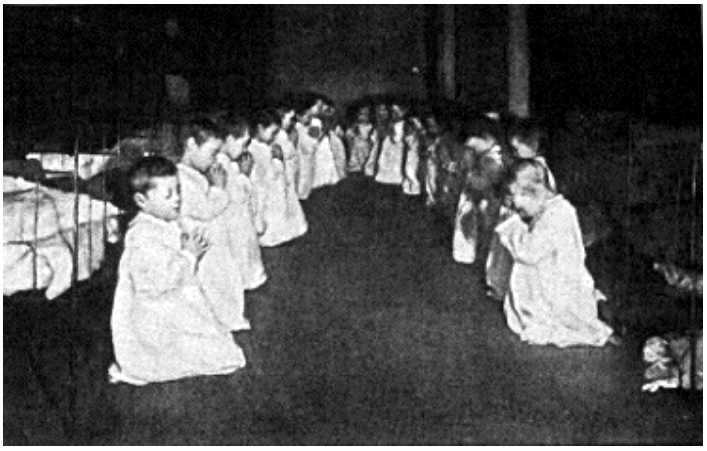


Figure **14.3.1**: This is a residential nursery in 1888 – This type of residential facility for children has come under much fire from psychological literature that shows that human children need hugging, cuddling and physical contact in order to thrive emotionally and physically.[1]

Resiliency

Being able to overcome challenges and successfully adapt is **resiliency.** Even young children can exhibit strong resilience to harsh circumstances. Resiliency can be attributed to certain personality factors, such as an easy-going temperament. Some children are warm, friendly, and responsive, whereas others tend to be more irritable, less manageable, and difficult to console, and these differences play a role in attachment (Gillath, Shaver, Baek, & Chun, 2008; Seifer, Schiller, Sameroff, Resnick, & Riordan, 1996). It seems safe to say that attachment, like most other developmental processes, is affected by an inter play of genetic and socialization influences.



Figure **14.3.2**: This infant massage class for new mothers could provide training and support for mothers of newborns. Massage can be an important physical stimulation and bonding experience.[3]

Reactive Attachment Disorder

Children who experience social neglect or deprivation, repeatedly change primary caregivers that limit opportunities to form stable attachments, or are reared in unusual settings (such as institutions) that limit opportunities to form stable attachments can certainly have difficulty forming attachments. According to the Diagnostic and Manual of Mental Disorders, 5th edition (American Psychiatric Association, 2013), those children experiencing neglectful situations and also displaying markedly disturbed and developmentally inappropriate attachment behavior, such as being inhibited and withdrawn, minimal social and emotional responsiveness to others, and limited positive affect, may be diagnosed with **Reactive Attachment Disorder.** This disorder often occurs with developmental delays, especially in cognitive and language areas. Fortunately, the majority of severely neglected children do not develop Reactive Attachment Disorder, which occurs in less than 10% of such children. The quality of the caregiving environment after serious neglect affects the development of this disorder.

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14.4: Child care

Child care involves supervising a child or children, usually from infancy to age thirteen, and typically refers to work done by somebody outside the child's immediate family. Child care is a broad topic covering a wide spectrum of contexts, activities, social and cultural conventions, and institutions. The majority of child care institutions that are available require that child care providers have extensive training in first aid and are CPR certified. In addition, background checks, drug testing, and reference verification are normally required.

It is traditional in Western society for children to be cared for by their parents or their legal guardians. In families where children live with one or both of their parents, the child care role may also be taken on by the child's extended family. If a parent or extended family is unable to care for the children, orphanages and foster homes are a way of providing for children's care, housing, and schooling.

Child Care in the United States

According to the U.S. Census Bureau in 2011, over sixty percent of families with children under five relied on regular child care arrangements. Around a quarter of those families used organized child care facilities as their primary arrangement.[1]

Of course these numbers have been highly volatile during and since the COVID 19 pandemic. In 2019 before the pandemic started, 66.4% of women with children under 6 were part of the US workforce. This dropped to 65.6% in 2021 (aauw.org) Lack of childcare was the main reason why almost half the mothers with children under 6 left the workforce (Gitlin et al, 2022).

Formal child care options include **center-based care** and **family child care homes**. Each state has different regulations for licensing child care centers, including teacher requirements. In some states, teaching in a child care center requires an associate's degree in child development. States with quality standards built into their licensing programs may have higher requirements for support staff, such as teacher assistants. **Head Start** (a federally funded child care program for income qualified families) lead teachers must have a bachelor's degree in Early Childhood Education. States vary in other standards set for daycare providers, such as teacher to child ratios.



Figure **14.4.1**: Daycares and preschools support children's development in many ways providing stimulation with colors, textures, toys, books, reading and multiple opportunities.[2]

State legislation may regulate the number and ages of children allowed before the home is considered an official family child care program and subject to licensing regulations. Often the nationally recognized Child Development Associate credential is the minimum standard for the individual leading this home care program.



Figure **14.4.2**: Caregivers can provide care in a family daycare situation where they watch multiple children of different ages in their own home that has been licensed as a family care center.[3]

In addition to these licensed options, parents may also choose to find their own caregiver or arrange childcare exchanges/swaps with another family. This care is typically provided by nannies, au pairs, or friends and family. The child is watched inside their own home or the caregiver's home, reducing exposure to outside children and illnesses. Depending on the number of children in the home, the children utilizing in-home care can enjoy the greatest amount of interaction with their caregiver and form a close bond.

There are no required licensing or background checks for this type of in-home care, making parental vigilance essential in choosing an appropriate caregiver. The cost of in-home care is the highest of childcare options per child, though a household with many children may find this the most convenient and affordable option.[4]

Child Care Concerns in early childhood

About 77.3 percent of mothers of school-aged and 64.2 percent of mothers of preschool-aged children in the United States work outside the home (Cohen and Bianchi, 1999; Bureau of Labor Statistics, 2010). Seventy-five percent of children under age 5 are in scheduled childcare programs. Others are cared for by family members or friends. Older children are often in after school programs, before school programs, or stay at home alone after school once they are older.

Quality childcare programs can enhance a child’s social skills and can provide rich learning experiences. But long hours in poor quality care can have negative consequences, especially for young children.

Quality of Care

What determines the quality of child care? One consideration is the **teacher/child ratio**. States specify the maximum number of children that can be supervised by one teacher. In general, the younger the children, the more teachers required for a given number of children. The lower the teacher to child ratio, the more time the teacher has for involvement with the children and the less stressed the teacher may be so that the interactions can be more relaxed, stimulating and positive. Larger group sizes present challenges to quality as well. The program may be more rigid in rules and structure to accommodate the large number of children in the facility.

The **physical environment** should be engaging, clean, and safe. The **philosophy** of the organization and the **curriculum** available should be child-centered, positive, and stimulating. Providers should be trained in early childhood education. A majority of states do not require training for their childcare providers. And while formal education is not required for a person to provide a warm,

loving relationship to a child, knowledge of a child's development is useful for addressing their social, emotional, and cognitive needs in an effective way.



Figure **14.4.3**: Children can learn a lot before entering kindergarten, when they attend a day care center like this one where they are given the opportunity to play with multiple different kinds of toys.[5]

By working toward improving the quality of childcare and increasing family-friendly workplace policies such as more flexible scheduling and perhaps childcare facilities at places of employment, we can accommodate families with smaller children and relieve parents of the stress sometimes associated with managing work and family life.[6]

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14.5: Culture and attachment, particularly in middle childhood

In the last few years, attachment theory has been met with growing criticism. With attachment research attributing global universality to behavioral concepts developed based on Western ideals of childhood and on empirical data limited to Western samples, this criticism mostly refers to the neglect of contextual adaptiveness and the resulting Eurocentric perspective on childhood (LeVine, 2014; Weisner, 2014; Keller, 2016). Especially the concept of monotropy has been criticized for describing the limited reality of Western nuclear families compared to the globally more common broad social networks (Nsamenang, 1992; Arnett, 1995, 2008; Keller, 2016). Thus, cultural psychology has developed an alternative approach, guided by the assumption that attachment patterns, too, can take a multitude of pathways, shaped by ecocultural features of the distinct settings of development (Weisner, 2005; Keller, 2014).

One way to study the different ecological contexts is to compare two prototypical settings.

One of these approaches highlighting the range of developmental settings describes two prototypical sociodemographic communities, each representing extremes in their ideas on the relationship between the individual and the group, conceptualized with the two dimensions of autonomy and relatedness (Kâğıtçıbaşı, 1996; Keller et al., 2006; Keller, 2007). Resulting from the ecocultural environment, each setting has a distinct psychology that shapes the context-specific developmental paths of socialization, conveying context-specific competences and strategies of survival (Kâğıtçıbaşı, 1996; Greenfield et al., 2003; Keller, 2007, 2014).

The first prototype describes the developmental setting of traditional villages. These relational contexts are often illustrated using the Cameroonian Nso as an example (Keller, 2007). This environment is marked by low maternal education, a high number of children per mother, and an early onset of reproduction (Keller et al., 2006). The cultural model focuses on interdependence, considering the individual as heteronomous and interconnected with others, and values obedience, harmony in the hierarchically organized group and social responsibility (Nsamenang and Lamb, 1993; Kâğıtçıbaşı, 1996; Keller et al., 2006; Keller, 2007). Families in these small-scale communities live in large households and are integrated into extended social networks. The interconnectedness translates into a care system based on shared care (Keller, 2014), oftentimes also involving peers as caregivers (Weisner and Gallimore, 1977; Bryant, 1989). Children have an economic value, contributing to the mostly subsistence based economy from early on (Kâğıtçıbaşı, 1996; Keller, 2007 Keller, 2007). Early care focuses primarily on the infant's health () and survival due to critical living conditions, with care peaking in the first months and years before being transferred to the next child (LeVine, 1974, 1988). The infant is constantly monitored and never left alone (Keller, 2007).

The second prototype describes middle-class families in autonomous Western contexts, often illustrated using samples from Berlin or Los Angeles (Keller, 2007). This setting is marked by high maternal education, few children per mother and a comparably late onset of reproduction (Keller et al., 2006; Keller, 2007). The cultural model of this context focuses on independence, perceiving the individual as self-contained (Kâğıtçıbaşı, 1996; Keller et al., 2006; Keller, 2007). Individuals in these large-scale postindustrial communities that are based on cash economy live in nuclear families (Kâğıtçıbaşı, 1996; Keller, 2007). Child care is primarily a dyadic and parental task, with mothers taking over the majority of practical responsibilities and only a few non-parental caregivers present, especially during the first years. Care strategies in this context convey values of self-maximization, assertiveness and initiative (Weisner, 1984, 2005; Keller, 2007, 2014). Early care focuses on communication and cognitive development (Keller, 2007), preparing the child for the challenges of school and the job market (LeVine, 1974, 1988). Children only hold psychological value due to the high affluence and public pension systems (Kâğıtçıbaşı, 1996; Keller, 2007). They learn to spend time alone from early on, reinforcing autonomy (Keller, 2007; Yovsi et al., 2009).

For the first years of development, the adaptiveness of socialization and attachment patterns has thoroughly been investigated, highlighting differences in children's developmental pathways. It has been demonstrated that caregivers in autonomous settings support emotional expressiveness, socializing children toward self-expression and self-definition (Keller and Otto, 2009), with children explicitly expressing their distress in attachment situations (Ainsworth et al., 1978). In contrast, caregivers in relational contexts prefer calm and inexpressive children as investigated among the Cameroonian Nso. This inexpressiveness extends to children's attachment behavior. When confronted with a stranger, a situation expected to be stressful according to attachment theory, they remain calm and relaxed, even on a physiological level. Children's emotional regulation is promoted in this context since it allows for the introduction of several caregivers, lifting the mother's burden and ensuring a constant supervision while integrating the child into an interconnected society (Otto, 2008, 2014; Keller and Otto, 2009).

Not only is this continued view that even in middle childhood only one attachment figure (mainly the mother) is important problematic from the cross cultural point of view, but it also fails to acknowledge the importance of networks of other attachment to non-parental adults and peers that become important as the child's network grows even in Westernized nuclear households.

In rural traditional areas, children take on more responsibilities in social settings (for example more complex caregiving of younger children) and religious settings (e.g. secret societies, Ndze, 2008). In Western contexts, children of this age are expected to self regulate and be more independent and become more self reliant particularly in formal schooling. The latter also requires new relationship formation and maintenance with new adults and peers. Parents provide less support and supervision in both types of contexts.

When Cameroonian Nseh children were compared to Western middle class children in Germany, the selection of contextual dimensions were based on physical environmental structures, population parameters and socioeconomic structures, taking into consideration the environment, history and maintenance of settings that influence children's learning. In the German contexts, when children are asked for the functionality of their attachment ties, children reference the ability of attachment figures to cope with socially difficult situations. Consistency and harmonization are also described as second and third most important factors. Education figures and those providing instrumental assistance in distress are next most important in the German contexts. In the Cameroonian context, four categories of perceived functionality of attachment were nutritional care (mostly from older peers and adults), kinship described in great or exact detail, everyday instrumental assistance (not referencing distress), and affection.

Cameroonian children described larger settings of attachments, whereas German children primarily report depending on adults. However, children across both samples also identify a considerable number of same-aged peers as their attachment figures, i.e., individuals contributing to their continuous feeling of security. For the context of the Nseh, these peers constitute an important developmental and interactional space, resulting from the normative parental withdrawal during this period, as demonstrated for many comparable Sub-Saharan settings (Weisner and Gallimore, 1977; Weisner, 1984; Gottlieb, 2004; Lancy, 2015).

German children experience more diverse social settings as they grow, unlike their Cameroonian counterparts. There is also wider geographical experience for German children.

In general similar developmental challenges are experienced, and attachment security fulfills similar needs in both contexts for middle childhood aged kids. Superordinate figures like parents remain important, but in general peers become more and more important.

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14.6: Emotions - development in infancy and early childhood

Emotions are composed of 1. Neurological factors, 2. Physiological changes 3. Subjective feeling 4. Emotional expression 5. Action tendency. Functionalists suggest that emotion serve a purpose for adaptation. Emotions organize and regulate how we react – attention, cognition, social function, health effects.

Infant Emotional Development

Initially infants do not demonstrate different emotions – just general distress and contentment. At birth, infants exhibit two emotional responses: attraction and withdrawal. They show attraction to pleasant situations that bring comfort, stimulation, and pleasure, and they withdraw from unpleasant stimulation such as bitter flavors or physical discomfort. At around two months, infants exhibit social engagement in the form of social smiling as they respond with smiles to those who engage their positive attention (Lavelli & Fogel, 2005). Smiling and laughing becomes more differentiated and permanent by end of year.

Social smiling becomes more stable and organized as infants learn to use their smiles to engage their parents in interactions. Pleasure is expressed as laughter at 3 to 5 months of age, and displeasure becomes more specific as fear, sadness, or anger between ages 6 and 8 months.

Anger is often the reaction to being prevented from obtaining a goal, such as a toy being removed (Braungart-Rieker, Hill-Soderlund, & Karrass, 2010). Anger is more common at end of first year because their movements and control are developing and up until 3 they are also less easily distracted. From 3 to 6 years, there is decrease of anger because of self regulation and better language skills. Anger often results in crying and of course evolutionarily caregivers want to reduce that crying and therefore have that anger resolved.

In contrast, sadness is typically the response when infants are deprived of a caregiver (Papousek, 2007).

Fear increases in end of first year with stranger anxiety. Fear keeps exploration in check, and by second year they learn to distinguish between threatening and non-threatening individuals. Fear is often associated with the presence of a stranger, known as **stranger wariness**, or the departure of significant others known as **separation anxiety.** Both appear sometime between 6 and 15 months after object permanence has been acquired. Further, there is some indication that infants may experience jealousy as young as 6 months of age (Hart & Carrington, 2002).



Figure **14.6.1**: Very small infants show facial expressions of anger.[1]

Early emotions are often divided into two general categories: **Basic emotions** (primary emotions), such as interest, happiness, anger, fear, surprise, sadness and disgust, which appear first, and **self-conscious emotions** (secondary emotions), such as envy, pride, shame, guilt, doubt, and embarrassment. Unlike primary emotions, secondary emotions appear as children start to develop a self-concept, and require social instruction on when to feel such emotions. The situations in which children learn self-conscious emotions varies from culture to culture. Individualistic cultures teach us to feel pride in personal accomplishments, while in more collective cultures children are taught to not call attention to themselves, unless you wish to feel embarrassed for doing so (Akimoto & Sanbinmatsu, 1999).

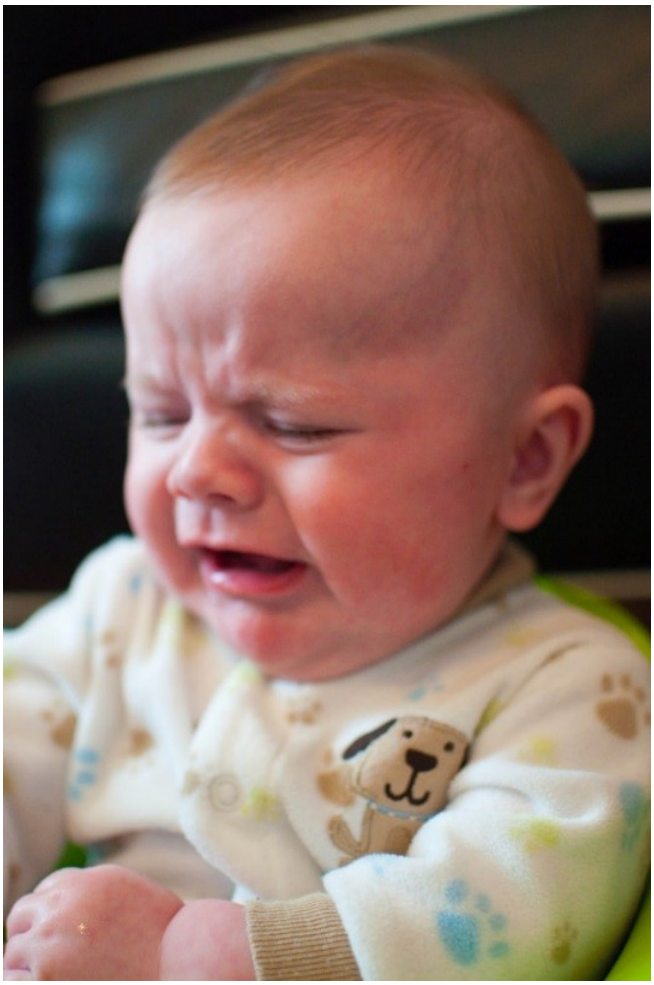


Figure **14.6.2**: Infants certainly cry under a number of different conditions. [2].

Facial expressions of emotion are important regulators of social interaction. In the developmental literature, this concept has been investigated under the concept of **social referencing**; that is, the process whereby infants seek out information from others to clarify a situation and then use that information to act (Klinnert, Campos, & Sorce, 1983). To date, the strongest demonstration of social referencing comes from work on the visual cliff. In the first study to investigate this concept, Campos and colleagues (Sorce, Emde, Campos, & Klinnert, 1985) placed mothers on the far end of the "cliff" from the infant. Mothers first smiled to the infants and placed a toy on top of the safety glass to attract them; infants invariably began crawling to their mothers. When the infants were in the center of the table, however, the mother then posed an expression of fear, sadness, anger, interest, or joy. The results were clearly different for the different faces; no infant crossed the table when the mother showed fear; only 6% did when the mother posed anger, 33% crossed when the mother posed sadness, and approximately 75% of the infants crossed when the mother posed joy or interest.

Other studies provide similar support for facial expressions as regulators of social interaction. Researchers posed facial expressions of neutral, anger, or disgust toward babies as they moved toward an object and measured the amount of inhibition the babies showed in touching the object (Bradshaw, 1986). The results for 10- and 15-month olds were the same: Anger produced the greatest inhibition, followed by disgust, with neutral the least. This study was later replicated using joy and disgust expressions, altering the method so that the infants were not allowed to touch the toy (compared with a distractor object) until one hour after exposure to the expression (Hertenstein & Campos, 2004). At 14 months of age, significantly more infants touched the toy when they saw joyful expressions, but fewer touched the toy when the infants saw disgust.

A final emotional change in infancy is in self-regulation. **Emotional self-regulation** refers to strategies we use to control (modulate and regulate) our emotional states so that we can attain goals (Thompson & Goodvin, 2007). This requires effortful control of emotions and initially requires assistance from caregivers (Rothbart, Posner, & Kieras, 2006). Young infants have very limited

capacity to adjust their emotional states and depend on their caregivers to help soothe themselves. Caregivers can offer distractions to redirect the infant's attention and comfort to reduce the emotional distress. Parents help in the start by coregulating emotions. As areas of the infant's prefrontal cortex continue to develop, infants can tolerate more stimulation. By 4 to 6 months, babies can begin to shift their attention away from upsetting stimuli (Rothbart et al, 2006). By five months infants comfort themselves by sucking their thumb or self distraction by looking away. These are paralleled by neurological developments in inhibition and attention regulation. Older infants and toddlers can more effectively communicate their need for help. By the age of two they can discuss and regulate emotions better especially with growth of language skills that can help with planning and problem solving. And by this time they can crawl or walk toward or away from various situations (Cole, Armstrong, & Pemberton, 2010). This helps them in their ability to self-regulate. Throughout the process, parents also teach and model emotional regulation. Problems with emotional regulation are also problematic for later development.



Figure \(\PageIndex{3}\): Some children are more cautious and thoughtful by nature/temperament. They might be more considering and hesitant than others who jump into situations more impulsively.[4]

Development of sense of self: During the second year of life, children begin to recognize themselves as they gain a sense of self as separate from their primary caregiver. In a classic experiment by Lewis and Brooks (1978) children 9 to 24 months of age were placed in front of a mirror after a spot of rouge/red powder was placed on their nose as their mothers pretended to wipe something off the child's face. If the child reacted by touching his or her own nose rather than that of the "baby" in the mirror, it was taken to suggest that the child recognized the reflection as him or herself. Lewis and Brooks found that somewhere between 15 and 24 months most infants developed a sense of self-awareness. **Self-awareness** is the realization that you are separate from others (Kopp, 2011). Once a child has achieved self-awareness, the child is moving toward understanding social emotions such as guilt, shame or embarrassment, as well as, sympathy or empathy.[5]

Toddlers develop guilt, shame, envy, embarrassment and pride at about 18-24 months as a result of a sense of self and what societal expectations are. Since these self conscious emotions are influenced by societal expectations, they are experienced and result differently in different cultures. Personal achievement, for example, in individualistic cultures results in pride, but in collectivistic cultures in self effacement and embarrassment.

Children are also able to interpret facial expressions of others – 3 month olds can distinguish happiness, anger and surprise and 7 month olds can distinguish fear, sadness and interest. And they begin to understand what those emotional expressions convey, and so by 8-10 months they can start social referencing in uncertain situations. Social cognition depends on understanding others' emotions – 1. Giving insight in cause and effect 2. Understanding that thinking and feeling are connected (even thinking about sad past can lead to sadness and 3. Combining multiple cues to understand complexity.

Social Emotional Milestones of infancy

As infants and toddlers interact with other people, their social and emotional skills develop. Here is a table of social and emotional milestones that they typically experience during the first two years.

Table **14.6.1**: Social and Emotional Milestones of development in infancy[6]

Typical Age	What Most Children Do By This Age
2 months	• Begins to smile at people • Can briefly calm self (may bring hands to mouth and suck on hand) • Tries to look at parent
4 months	• Smiles spontaneously, especially at people • Likes to play with people and might cry when playing stops • Copies some movements and facial expressions, like smiling or frowning
6 months	• Knows familiar faces and begins to know if someone is a stranger • Likes to play with others, especially parents • Responds to other people's emotions and often seems happy • Likes to look at self in a mirror
9 months	• May be afraid of strangers • May be clingy with familiar adults • Has favorite toys
1 year	• Is shy or nervous with strangers • Cries when mom or dad leaves • Has favorite things and people • Shows fear in some situations • Hands you a book when wants to hear a story • Repeats sounds or actions to get attention • Puts out arm or leg to help with dressing • Plays games such as "peek-a-boo" and "pat-a-cake"
18 months	• Likes to hand things to others as play • May have temper tantrums • May be afraid of strangers • Shows affection to familiar people • Plays simple pretend, such as feeding a doll • May cling to caregivers in new situations • Points to show others something interesting • Explores alone but with parent close by
2 years	• Copies others, especially adults and older children • Gets excited when with other children • Shows more and more independence • Shows defiant behavior (doing what he has been told not to) • Plays mainly beside other children, but is beginning to include other children, such as in chase games

Emotional Development in Early Childhood

In early childhood, children's understanding of themselves and their role in the world expands greatly.

Social and Emotional Milestones

That expanding understanding of themselves and others develops with age. Here is a table of social and emotional milestones that children typically experience during early childhood.

Table **14.6.2**: Social and Emotional Milestones of development in early childhood[7]

Typical Age	What Most Children Do by This Age
3 years	• Copies adults and friends • Shows affection for friends without prompting • Takes turns in games • Shows concern for a crying friend • Dresses and undresses self • Understands the idea of “mine” and “his” or “hers” • Shows a wide range of emotions • Separates easily from mom and dad • May get upset with major changes in routine
4 years	• Enjoys doing new things • Is more and more creative with make-believe play • Would rather play with other children than by self • Cooperates with other children • Plays “mom” or “dad” • Often can’t tell what’s real and what’s make-believe • Talks about what she likes and what she is interested in
5 years	• Wants to please friends • Wants to be like friends • More likely to agree with rules • Likes to sing, dance, and act • Is aware of gender • Can tell what’s real and what’s make-believe • Shows more independence • Is sometimes demanding and sometimes very cooperative

Many things influence how children develop those milestones as how they view themselves and how they interact with those around them changes.

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14.7: Erikson's Psychosocial Stages of Development

Erikson proposed that each period of life has a unique challenge or crisis that a person must face. This is referred to as a **psychosocial development.** According to Erikson, successful development involves dealing with and resolving the goals and demands of each of these crises in a positive way. These crises are usually called stages, although that is not the term Erikson used. If a person does not resolve a crisis successfully, it may hinder their ability to deal with later crises. For example, an individual who does not develop a clear sense of purpose and identity (Erikson's fifth crisis - Identity vs. Role Confusion) may become self-absorbed and stagnate rather than working toward the betterment of others (Erikson's seventh crisis - Generativity vs. Stagnation). However, most individuals are able to successfully complete the eight crises of his theory.[1]

Erik Erikson proposed that we are motivated by a need to achieve competence in certain areas of our lives. As mentioned in the chapter on theory, Erikson's psychosocial theory has eight stages of development over the lifespan, from infancy through late adulthood. At each stage there is a conflict, or task, that we need to resolve. Successful completion of each developmental task results in a sense of competence and a healthy personality. Failure to master these tasks leads to feelings of inadequacy.

Trust v. mistrust

According to Erikson, a child needs to develop trust in the first year of life. This refers to trusting that the world is a predictable place, that they have some agency in the world, and that when they cry, their caregiver will attend to them. If this trust is not established, this stage will be concluded with mistrust.



Figure **14.7.1**: Surely this infant in Dhaka will learn that their father is around to protect and meet their needs. (Steve Evans from India and USA, CC BY 2.0 <https://creativecommons.org/licenses/by/2.0>, via Wikimedia Commons)

This stage is also discussed as Erikson's contribution to the topic of attachment.

Autonomy v. shame/doubt

According to Erikson, toddlers are often wanting to do things for themselves. Caregivers can encourage them to be autonomous by picking their own clothes and feeding themselves. Instead, if caregivers swoop in to "correct" a possible spillage, or simply take over doing things, the toddler will end up feeling ashamed and doubtful.



Figure **14.7.2**: This child allowed to feed themself is likely to end this stage with autonomy, rather than feeling ashamed or doubtful. (Image by Mostafameraji, CC BY-SA 4.0, via Wikimedia Commons)

Initiative vs. Guilt

Psychologist Erik Erikson argues that children in early childhood go through a stage of “initiative vs. guilt”. If the child is placed in an environment where he/she can explore, make decisions, and initiate activities, they have achieved initiative. On the other hand, if the child is put in an environment where initiation is repressed through criticism and control, he/she will develop a sense of guilt.



Figure **14.7.3**: In Erikson’s view preschoolers resolve their psychosocial conflict with initiative (rather than guilt) when they are allowed to explore and try out new things.[2]

Figure –

The trust and autonomy of previous stages develop into a desire to take initiative or to think of ideas and initiative action. Children may want to build a fort with the cushions from the living room couch or open a lemonade stand in the driveway or make a zoo with their stuffed animals and issue tickets to those who want to come. Or they may just want to get themselves ready for bed without any assistance. To reinforce taking initiative, caregivers should offer praise for the child’s efforts and avoid being critical of messes or mistakes. Soggy washrags and toothpaste left in the sink pales in comparison to the smiling face of a five-year-old that emerges from the bathroom with clean teeth and pajamas![3] To reinforce taking initiative, caregivers should offer praise for the

child's efforts and avoid being critical of messes or mistakes. Placing pictures of drawings on the refrigerator, purchasing mud pies for dinner, and admiring towers of legos will facilitate the child's sense of initiative.

Erik Erikson- Industry vs. Inferiority

During the elementary school stage (ages 6-12), children face the task of *Industry versus Inferiority*. Children begin to compare themselves to their peers to see how they measure up.



Figure **14.7.4**: The academic award this boy is receiving may contribute to his sense of industry.[4]

They either develop a sense of pride and accomplishment in their schoolwork, sports, social activities, and family life, or they feel inferior and inadequate when they don't measure up.[5]

According to Erikson, children in middle childhood are very busy or industrious. They are constantly doing, planning, playing, getting together with friends, achieving. This is a very active time and a time when they are gaining a sense of how they measure up when compared with friends. Erikson believed that if these industrious children can be successful in their endeavors, they will get a sense of confidence for future challenges. If not, a sense of inferiority can be particularly haunting during middle childhood. [6]

Identity vs. Role Confusion

Identity vs. Role Confusion is a major stage of development where the child has to learn the roles he will occupy as an adult. In adolescence, children (ages 12–18) face the task of *identity vs. role confusion.* Success in this stage will lead to the virtue of **fidelity**. **Fidelity** involves being able to commit one's self to others on the basis of accepting others, even when there may be ideological differences. According to Erikson, an adolescent's main task is developing a sense of self. Adolescents struggle with questions such as "Who am I?" and "What do I want to do with my life?" Along the way, most adolescents try on many different selves to see which ones fit; they explore various roles and ideas, set goals, and attempt to discover their "adult" selves. Adolescents who are successful at this stage have a strong sense of identity and are able to remain true to their beliefs and values in the face of problems and other people's perspectives. When adolescents are apathetic, do not make a conscious search for identity, or are pressured to conform to their parents' ideas for the future, they may develop a weak sense of self and experience role confusion. They will be unsure of their identity and confused about the future. Teenagers who struggle to adopt a positive role will likely struggle to "find" themselves as adults.[7]

Erikson saw this as a period of confusion and experimentation regarding identity and how one navigates along life's path. During adolescence, we experience **psychological moratorium**, where teens put their current identity on hold while they explore their options for identity. The culmination of this exploration is a more coherent view of oneself. Those who are unsuccessful at resolving this stage may either withdraw further into social isolation or become lost in the crowd. However, more recent research

suggests, that few leave this age period with identity achievement, and that most identity formation occurs during young adulthood (Côtè, 2006).[8]

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14.8: Social and conscience development

Social, biological, and representational changes' influences result in important developmental outcomes that matter to children, parents, and society. A young adult develops a capacity to engage in socially constructive actions (helping, caring, sharing with others), to curb hostile or aggressive impulses, to live according to meaningful moral values, to develop a healthy identity and sense of self, and to develop talents and achieve success in using them. These are some of the developmental outcomes that denote social and emotional competence.

These achievements of social and personality development derive from the interaction of many social, biological, and representational influences throughout childhood. Consider, for example, the development of conscience, which is an early foundation for moral development.

Conscience consists of the cognitive, emotional, and social influences that cause young children to act consistently with internal standards of conduct (Kochanska, 2002). Conscience emerges from young children's experiences with parents, particularly in the development of a mutually responsive relationship that motivates young children to respond constructively to the parents' requests and expectations. Biologically based temperament is involved, as some children are temperamentally more capable of motivated self-regulation (a quality called effortful control) than are others, while some children are more prone to the fear and anxiety that parental disapproval can evoke. The development of conscience is influenced by having good fit between the child's temperamental qualities and how parents communicate and reinforce behavioral expectations.

Conscience development also expands as young children begin to represent moral values and think of themselves as moral beings. By the end of the preschool years, for example, young children develop a "moral self" by which they think of themselves as people who want to do the right thing, who feel badly after misbehaving, and who feel uncomfortable when others misbehave. In the development of conscience, young children become more socially and emotionally competent in a manner that provides a foundation for later moral conduct (Thompson, 2012).



Figure **14.8.1**: Children of preschool age can experience a guilty conscience upon recognizing that they did something wrong.[1]

Sigmund Freud - Psychoanalytic Theory

According to Freud, there are three components to personality - id, superego and ego. The id is only interested in personal gratification, but the process of socialization leads to the formation of the superego which is one's conscience or ego ideal. Much

development of the superego happens during the anal stage (2-3 years old). Freud believed that it was during this stage that there is an eternal struggle between parents, representing society's rules and teaching the child when and where to go potty, and the child representing their own id and wanting to go potty whenever and wherever they want to. Children finally end up internalizing those social rules and that is the development of the superego.

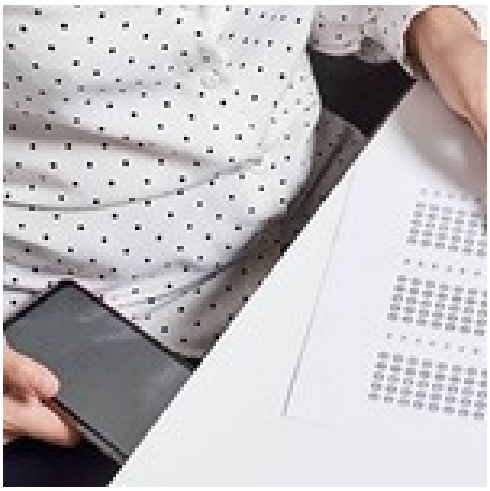


Figure **14.8.2**: Cheating on exams, particularly high stakes ones, represent a classic conflict between the id and superego[3]

Lawrence Kohlberg's Stages of Moral Development

Kohlberg (1963) built on the work of Piaget and was interested in finding out how our moral reasoning changes as we get older. He wanted to find out how people decide what is right and what is wrong. Just as Piaget believed that children's cognitive development follows specific patterns, Kohlberg (1984) argued that we learn our moral values through active thinking and reasoning, and that moral development follows a series of stages. Kohlberg's six stages are generally organized into three levels of moral reasons. To study moral development, Kohlberg looked at how children (and adults) respond to moral dilemmas. One of Kohlberg's best known moral dilemmas is the Heinz dilemma:

In Europe, a woman was near death from a special kind of cancer. There was one drug that the doctors thought might save her. It was a form of radium that a druggist in the same town had recently discovered. The drug was expensive to make but the druggist was charging ten times what the drug cost him to make. He paid $200 for the radium and charged $2,000 for a small dose of the drug. The sick woman's husband, Heinz, went to everyone he knew to borrow the money but he could only get together about $1,000, about half of what the drug cost. He told the druggist that his wife was dying and asked him to sell it cheaper or let him pay later. But the druggist said: "No, I discovered the drug and I'm going to make money from it." Heinz got desperate and broke into the man's store to steal the drug for his wife. Should the husband have done that? (Kohlberg, 1969, p. 379)[4]

Level One - Preconventional Morality

In stage one, moral reasoning is based on concepts of punishment. The child believes that if the consequence for an action is punishment, then the action was wrong. In the second stage, the child bases his or her thinking on self-interest and reward ("You scratch my back, I'll scratch yours"). The youngest subjects seemed to answer based on what would happen to the man as a result of the act. For example, they might say the man should not break into the pharmacy because the pharmacist might find him and beat him. Or they might say that the man should break in and steal the drug and his wife will give him a big kiss. Right or wrong, both decisions were based on what would physically happen to the man as a result of the act. This is a self-centered approach to moral decision-making. He called this most superficial understanding of right and wrong **preconventional morality.** Preconventional morality focuses on self-interest. Punishment is avoided and rewards are sought. Adults can also fall into these stages, particularly when they are under pressure.

Level Two - Conventional Morality

Those tested who based their answers on what other people would think of the man as a result of his act, were placed in Level Two. For instance, they might say he should break into the store, then everyone would think he was a good husband, or he should not because it is against the law. In either case, right and wrong is determined by what other people think. In stage three, the person

wants to please others. At stage four, the person acknowledges the importance of social norms or laws and wants to be a good member of the group or society. A good decision is one that gains the approval of others or one that complies with the law. This he called **conventional morality**, *people care about the effect of their actions on others*. Some older children, adolescents, and adults use this reasoning.

Level Three, post conventional morality, is not included because it focuses mainly on adulthood, and in fact Kohlberg held that only a few people ever get to that level. However, it is in the table below if you'd like an overview of Level Three - Stages 5 and 6.

Tables - Lawrence Kohlberg's Levels of Moral Reasoning

Table 14.8.1: Preconventional Morality (young children)

Preconventional Level

Stage	Description
Stage 1	Focus is on self-interest and punishment is avoided. The man shouldn't steal the drug, as he may get caught and go to jail.
Stage 2	Rewards are sought. A person at this level will argue that the man should steal the drug because he does not want to lose his wife who takes care of him.

Table 14.8.2: Conventional Morality (older children, adolescents, most adults)

Conventional Level

Stage	Description
Stage 3	Focus is on how situational outcomes impact others and wanting to please and be accepted. The man should steal the drug because that is what good husbands do.
Stage 4	People make decisions based on laws or formalized rules. The man should obey the law because stealing is a crime.

Table 14.8.3: Post Conventional Morality (rare in adolescents, a few adults)

Postconventional Level

Stage	Description
Stage 5	Individuals employ abstract reasoning to justify behaviors. The man should steal the drug because laws can be unjust and you have to consider the whole situation.
Stage 6	Moral behavior is based on self-chosen ethical principles. The man should steal the drug because life is more important than property.

Although research has supported Kohlberg's idea that moral reasoning changes from an early emphasis on punishment and social rules and regulations to an emphasis on more general ethical principles, as with Piaget's approach, Kohlberg's stage model is probably too simple. For one, people may use higher levels of reasoning for some types of problems but revert to lower levels in situations where doing so is more consistent with their goals or beliefs (Rest, 1979). Second, it has been argued that the stage model is particularly appropriate for Western, rather than non-Western, samples in which allegiance to social norms, such as respect for authority, may be particularly important (Haidt, 2001). In addition, there is frequently little correlation between how we score on the moral stages and how we behave in real life. Perhaps the most important critique of Kohlberg's theory is that it may describe the moral development of males better than it describes that of females (Jaffee & Hyde, 2000).[5]

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14.9: Culture and emotional development

Earlier we discussed that Emotions are composed of 1. Neurological factors, 2. Physiological changes 3. Subjective feeling 4. Emotional expression 5. Action tendency. Functionalists suggest that emotion serve a purpose for adaptation. Emotions organize and regulate how we react – attention, cognition, social function, health effects.

If facial expression is seen as a component of emotion, and a valid representation of the internal state, are those facial expressions universal? If they are, does culture affect how closely those two are connected, or whether they are masked in certain cultures? Also, are there clearly delineated bodily conditions or brain activity that signify emotional states? Not everyone agrees. The "universal view" is the idea that regardless of time and location emotional states are universal. But the "relative view" is that emotional states vary from culture to culture and differ depending on the circumstances that cause them. Universalists take a biological view that, for example, when your progress toward a goal is blocked everyone feels frustration and anger. But it might be that these events – the experience of frustration and certainly the resulting anger - might be culturally defined. Attachment theorists, like universalists, would say that there are some events like loss of mom or primary caregiver that are universally experienced. Also, whether emotional experience is seen as internal is more culturally influenced. So, since the self-conscious emotions are not necessarily tied to specific environmental events, they are more influenced by culture and family. "Simply stated, we do not have a good theoretical basis to connect cultural values, goals, or standards to specific socialization practices. Because of this, we do not know where to look nor do we have a good sense of when these socialization practices are likely to have these effects. When we add to this dilemma the problem of understanding what features of emotion we should focus on, we realize the enormity of the undertaking" (Lewis, 2006).

Views of self in relation to emotion

Independent and interdependent cultures view "self" differently. A culture's views of self influence the appraisal, experience, expression, regulation and developmental pathways of emotion. In independent cultures, authentic expressions of emotion are valued, whereas in interdependent cultures emotions are seen as ways to maintain social harmony.

Pride is undoubtedly a positive and disengaged emotion indicating congruence between self and goal in individualistic cultures. In collectivistic ones, pride is undesirable unless it is in relation to increasing others' or collective goals, and success is attributed to the group.

Shame on the other hand is seen as positive in interdependent contexts because it indicates social engagement, relatedness, striving for social conformity and motivation to future better performance and self-critical continuous effort.

Similarly, in the US anger is seen as self assertion, whereas in Asian cultures it is seen as disrupting harmony. In Nepal, Brahman children refrain from communicating anger and Tamang children appraise situations in such a way so that they don't even feel anger.

In the cultural frame of reference, rather than talking about positive and negative emotions, it might be useful to talk about "engaging" (other-focused) and "disengaging" (self-focused) emotions. Similarly, parenting practices use praise in line with values of independence or interdependence also.

Another US assumption is that open expression of emotions and early family emotional discourse fosters children's emotional competence. But in interdependent cultures open expression is inhibited in favor of concern for others. Emotions are inner states versus interpersonal experience in different cultures. In US families, children are taught to regulate emotions using an autonomous sense of self. In Chinese families, regulation of emotion is based on relatedness and acceptance of social norms. In Japanese attachments, moms anticipate negativity with proactive sensitivity, whereas German moms show more reactive sensitivity. "The development of emotion regulation in these cultures is a process of (internalized) interpersonal co-regulation based on empathy and anticipation as part of the interdependent self-construal." (Trommsdorff, 2006).

Classifying culture

It is also difficult to measure what culture means. For example, there are many studies that separate individuals into groups like "Latinx," and they are certainly ignoring class, regional (and possibly even language) differences within this large heterogenous group that are all intertwined, and likely influence parenting and emotional socialization in different ways. Some studies compare immigrants to their natal and host cultures, but those classifications again might be too broad.

Similarly, another dimension that is often used to define/measure culture is collectivism v. individualism. These contrasting poles are epitomized in the different parenting expectations and practices of individualistic versus collectivistic cultures. For example, we do see that Asian children are often socialized to reduce emotional displays as compared to Western European kids. However, emotional restraint is achieved by Chinese mothers in the interest of Confucian interdependence through stern shaming; whereas Japanese mothers achieve it by coddling to promote "amae." Even what is considered the prototype of sensitive mothering in Germany when mothers have face to face positive reciprocal exchanges, would be considered inadequate and far too cold by Cameroonian Nso moms who believe children should be held in close physical contact to show them love and affection.

What parts of culture are important and how they influence emotional socialization are varied, entangled and multidirectional. Even when studying two subgroups - the Tamang and the Brahmin – in a small country like Nepal, it is clear that the differences between the two groups might be the result of religious, historical, political, geographical and social factors. From the lens of the Western outsider the practices and values of the two might look exactly the same. However there are differences that need to be situated and different outcomes between the subgroups can be best explained by looking at both subgroups' practices/routines, as well as values and norms. (Cole & Tan, 2006)

Knowledge of emotions

In Asian cultures in contrast to the US, children are not encouraged to talk about and develop emotion knowledge. Rather they are taught to emphasize psychological discipline and behavioral standards. In keeping with Confucian teachings of moderation, children are to restrain their emotions from an early age to show good manners and promote social harmony. When talking to 3-year olds about their past positive and negative emotions, both Chinese and US moms focused on a social theme for positive emotions, but many more Chinese (86% social) than US moms (75% personal) focused on social versus a personal theme that elicited a negative emotion. US moms took a more cognitive approach and explored the causes of the child's emotions and were more accepting of these. Chinese moms focused on the outcomes, the behaviors and "teaching the child lessons" about social harmony. Disagreements about emotions are extended and tolerated in US child-parent dyad conversations. In longitudinal and other studies, US preschoolers are shown to have higher emotional knowledge as judged by story emotion responses and picking pictures of emotions. Emotion knowledge has been found to mediate the relation between culture and autobiographical memory also, because those adults and children who have higher emotion knowledge remember more details of those memories. For US moms, emotions are an important part of the child's self, whereas for Chinese mothers, emotions are social acts and are instrumental for helping the child control negative feelings and impulses and staying connected to others (Wang, 2006).

Original studies showed that there are temperamental differences between Asian and US children and in fact in empirical research it has been found that both crying and Duchenne smiles are seen most in US children, second in Japanese children and least in Chinese kids, in both intensity and frequency. Empirical studies with Chinese children adopted into US families as compared with non adopted US and Chinese children showed that cultural environment led to these individual differences in reactivity and expressivity, not genetic ethnic differences.

Emotional Expression

Before making these sorts of generalizations, it is also important to note that using Western measures may not pick up the emotional expressivity of Chinese children so maybe Chinese mothers need to code the videos and also specify what cues they are using to do so. Similarly, the scales that are used to measure the environmental influences (like maternal warmth) are designed by and for Western samples so they may not mean the same thing (may not translate or may not sufficiently capture what is intended) in Chinese families. Use of Likert scales might also be culturally influenced, and then there are a ton of other bias issues that should be considered. Also instead of lab studies, it would be good to see if those same results are obtained in naturalistic settings (with no obvious stranger present) (Camras & Fatani, 2006).

More emotional knowledge can vary by culture – for example, cultures differ on many dimensions:

- the ability to identify others' emotions through facial expression, gestures and vocal tone,
- the ability to identify one's own emotional states, knowledge of what situations are associated with what emotions,
- how to resolve discrepancy between emotional expression and situational cues,
- understanding how personality, experience and other factors influence individual emotions in same context,
- knowledge about suppression, neutralization and faking emotional expression,
- cultural beliefs regarding uses of emotions, whether trying to understand others' emotion is considered useful or acceptable,
- knowledge of ways to regulate emotions, and which is most useful in what context and whether regulation is good at all.

Children need to acquire this knowledge and also develop the skills to act on that. So those kids who have the most valued skills will be the most socially accepted and psychologically adjusted in that culture.

In Indonesia any extreme emotional expression – positive or negative – is believed to disrupt human relations and cause health problems. So, mothers' positive emotional expression was not related to better child psychological adjustment. Because emotion related regulation is necessary to act in accordance with social norms in all cultures, so it might predict positive development in all cultures (Eisenberg, 2006).

Should we have a new field of psychology based on the interests here? Trommsdorff suggested that whether emotions are positive/negative is defined by culture. Wang suggests that cultural differences in adult/child conversations result in differences in emotion knowledge. Camras and Fatani found clear evidence for cultural factors in emotional expression using adopted children as participants. Cole and Tan point out that culture can mean so many different things. "Cultural differences [affect] the experience of, expression of, knowledge of, memory of, bodily manifestations of, and regulation of – emotion. So while the cultural framing of issues is certainly important, the question that remains is - Is emotion even a separate entity from its causes, consequences, manifestations and other processes?

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14.10: Social and emotional development in adolescence



Figure **14.10.1**: The relationships between this teen and his mom will have positive outcomes for him. [2]

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14.11: Temperament and personality

While temperament is determined by genetics and emotions develop through maturation, the early interactions we have with the adults that care for us as infants and toddlers are very important for healthy emotional development.

Perhaps you have spent time with a number of infants. How were they alike? How did they differ? How do you compare with your siblings or other children you have known well? You may have noticed that some seemed to be in a better mood than others and that some were more sensitive to noise or more easily distracted than others. These differences may be attributed to temperament. **Temperament** is the innate characteristics of the infant, including mood, activity level, and emotional reactivity, noticeable soon after birth. Temperament in children is similar to what might be considered personality in adults, except with a larger biological component to temperament.

In a 1956 landmark study, Chess and Thomas (1996) evaluated 141 children's temperament based on parental interviews. Referred to as the New York Longitudinal Study, infants were assessed on 10 dimensions of temperament including:

- activity level
- rhythmicity (regularity of biological functions)
- approach/withdrawal (how children deal with new things)
- adaptability to situations
- intensity of reactions
- sensitivity or threshold of responsiveness (how intense a stimulus has to be for the child to react)
- quality of mood
- distractibility
- attention span or persistence

Based on the infants' behavioral profiles, they were categorized into three general types of temperament:

Table - Types of Temperament

Categories of temperament

Type	Percentage	Description
Easy	40%	• Able to quickly adapt to routine and new situations • Remains calm • Easy to soothe • Usually in positive mood
Difficult	10%	• Reacts negatively to new situations • Has trouble adapting to routine • Usually negative in mood • Cries frequently
Slow-to-warm-up	15%	• Low activity level • Adjusts slowly to new situations • Often negative in mood

As can be seen the percentages do not equal 100% as some children were not able to be placed neatly into one of the categories. Think about how each type of child should be approached to improve interactions with them. An easy child requires less intervention, but still has needs that must not be overlooked. A slow-to-warm-up child may need to be given advance warning if new people or situations are going to be introduced. A child with a difficult temperament may need to be given extra time to burn off their energy.

Jerome Kagan's research focused on the reactivity dimension of temperament. Based on research with 4-month old infants, Kagan found that some children were relaxed, curious and interested when presented with a new toy or loud sounds. He called these children uninhibited and predicted that these characteristics would enable them to become outgoing toddlers. On the other hand, about 15% of the infants in his study reacted with negativity to novel sounds and objects. They showed greater muscle tenseness

(even when “relaxed”) and were easily upset by newness. Kagan called these children inhibited and predicted that they would become shy as toddlers.

A caregiver's ability to work well and accurately read the child will influence a **goodness- of-fit**, meaning their styles match and communication and interaction can flow. Parents who recognize each child’s temperament and accept it, will nurture more effective interactions with the child and encourage more adaptive functioning.[1]

For example, an adventurous child whose parents regularly take her outside on hikes would provide a good “fit” to her temperament. Remember that parenting and child-rearing is bidirectional; both caregivers and children influence each other’s behaviors.



Figure **14.11.1**: This adventurous child’s parents provide a good “fit” to her temperament.[2]

Parenting Is Bidirectional

Not only do parents affect their children, children influence their parents. A child’s characteristics, such as temperament, affect parenting behaviors and roles. For example, an infant with an easy temperament may enable parents to feel more effective, as they are easily able to soothe the child and elicit smiling and cooing. On the other hand, a cranky or fussy infant elicits fewer positive reactions from his or her parents and may result in parents feeling less effective in the parenting role (Eisenberg et al., 2008). Over time, parents of more difficult children may become more punitive and less patient with their children (Clark, Kochanska, & Ready, 2000; Eisenberg et al., 1999; Kiff, Lengua, & Zalewski, 2011). Parents who have a fussy, difficult child are less satisfied with their marriages and have greater challenges in balancing work and family roles (Hyde, Else-Quest, & Goldsmith, 2004). Thus, child temperament is one of the child characteristics that influences how parents behave with their children.

Personality

Temperament does not change dramatically as we grow up, but we may learn how to work around and manage our temperamental qualities. Temperament may be one of the things about us that stays the same throughout development. In contrast, **personality**, defined as an individual’s consistent pattern of feeling, thinking, and behaving, is the result of the continuous interplay between biological disposition and experience.

Personality also develops from temperament in other ways (Thompson, Winer, & Goodvin, 2010). As children mature biologically, temperamental characteristics emerge and change over time. A newborn is not capable of much self-control, but as brain-based capacities for self- control advance, temperamental changes in self-regulation become more apparent. For example, a newborn who cries frequently doesn’t necessarily have a grumpy personality; over time, with sufficient parental support and increased sense of security, the child might be less likely to cry.

In addition, personality is made up of many other features besides temperament. Children’s developing self-concept, their motivations to achieve or to socialize, their values and goals, their coping styles, their sense of responsibility and conscientiousness, as well as many other qualities are encompassed into personality. These qualities are influenced by biological dispositions, but even more by the child’s experiences with others, particularly in close relationships, that guide the growth of individual characteristics. Indeed, personality development begins with the biological foundations of temperament but becomes

increasingly elaborated, extended, and refined over time. The newborn that parents gazed upon thus becomes an adult with a personality of depth and nuance.[3]

Culture and Personality/Temperament

The term **culture** refers to all of the beliefs, customs, ideas, behaviors, and traditions of a particular society that are passed through generations. Culture is transmitted to people through language as well as through the modeling of behavior, and it defines which traits and behaviors are considered important, desirable, or undesirable.

Within a culture there are norms and behavioral expectations. These cultural norms can dictate which personality traits are considered important. The researcher Gordon Allport considered culture to be an important influence on traits and defined common traits as those that are recognized within a culture. These traits may vary from culture to culture based on differing values, needs, and beliefs. Positive and negative traits can be determined by cultural expectations: what is considered a positive trait in one culture may be considered negative in another, thus resulting in different expressions of personality across cultures. In fact you could also argue that the entire conceptualization of personality and temperament are culturally driven.



Figure **14.11.2**: A family from a non-Western culture -while nuclear families are common in Western cultures, in other cultures "families" include aunts, uncles, older cousins and others often living close by or together.[4]

Considering cultural influences on personality is important because Western ideas and theories are not necessarily applicable to other cultures (Benet-Martinez & Oishi, 2008). There is a great deal of evidence that the strength of personality traits varies across cultures, and this is especially true when comparing individualist cultures (such as European, North American, and Australian cultures) and collectivist cultures (such as Asian, African, and South American cultures). People who live in **individualist cultures** tend to believe that independence, competition, and personal achievement are important. In contrast, people who live in **collectivist cultures** tend to value social harmony, respectfulness, and group needs over individual needs. These values influence personality in different but substantial ways; for example, Yang (2006) found that people in individualist cultures displayed more personally-oriented personality traits, whereas people in collectivist cultures displayed more socially-oriented personality traits.[5]

Cross cultural studies (Desmairais, et al, 2019; Gartstein et al, 2006; Krassner et al, 2017) find that there are indeed differences in temperament between children in different countries. There are differences along the lines one would expect - greater differences between individualistic and collectivistic cultures, but also differences between individualistic Western cultures.

Gender and Personality

In much the same manner that cultural norms can influence personality and behavior, gender norms (the behaviors that males and females are expected to conform to in a given society) can also influence personality by emphasizing different traits between different genders.



Figure **14.11.3**: A female infant wearing stereotypically feminine clothing and accessories – we start the gender typing process often very early.[6]



Figure **14.11.4**: A male infant wearing stereotypically masculine clothing.[7]

Ideas of appropriate behavior for each gender (masculine and feminine) vary among cultures and tend to change over time. For example, aggression and assertiveness have historically been emphasized as positive masculine personality traits in the United States. Meanwhile, submissiveness and caretaking have historically been held as ideal feminine traits. While many **gender roles** remain the same, others change over time. In 1938, for example, only 1 out of 5 Americans agreed that a married woman should earn money in industry and business. By 1996, however, 4 out of 5 Americans approved of women working in these fields. Today I have several female friends who are the sole earners in their marriages, while their husbands are stay-at-home. This type of attitude change has been accompanied by behavioral shifts that coincide with changes in trait expectations and shifts in personal identity for men and women.[8]

Many Gen-Z'ers in fact would say that these constitute ideas of heteronormativity. The individuals of this generation (which is the first to never know a world without the internet) value uniqueness and yet are highly collaborative. In their experience and views, Gen Zers are more comfortable than any previous generation with using gender neutral pronouns and requiring official forms to have an alternative other than male or female.

Personality in early childhood

Parents often scrutinize their child's preferences, characteristics, and responses for clues of a developing personality. They are quite right to do so, because temperament is a foundation for personality growth. But temperament (defined as early-emerging differences in reactivity and self-regulation) is not the whole story. Although temperament is biologically based, it interacts with the influence of experience from the moment of birth (if not before) to shape personality (Rothbart, 2011). Temperamental dispositions are affected, for example, by the support level of parental care. More generally, personality is shaped by the goodness of fit between the child's temperamental qualities and characteristics of the environment (Chess & Thomas, 1999). For example, an adventurous child whose parents regularly take her on weekend hiking and fishing trips would be a good "fit" to her lifestyle, supporting personality growth. Personality is the result, therefore, of the continuous interplay between biological disposition and experience, as is true for many other aspects of social and personality development.



Figure \(\PageIndex{5}\): A girl enjoying nature – this girl might be engaged in this delicate activity reinforcing a gender stereotype and it might also be that her personality is more gentle and quiet than her sisters who love to climb trees.[9]

Indeed, personality development begins with the biological foundations of temperament but becomes increasingly elaborated, extended, and refined over time. The newborn that parents observed in wonder upon becomes an adult with a personality of depth and nuance.

Interaction of genes and environment in personality development

There are individual differences in emotional expression, reactivity and attention and how these are regulated. Temperament is a very good predictor of cognition and social function. Consider attentional strategies that are used for regulating emotions and also predict cognitive development and learning. For example, shy and inhibited children show anxiety in social situations which discourage interactions. Children showing anger and inattention often show problem behaviors in general.

How temperament ends up affecting personality and development over time and with age is influenced by a number of different factors. Genes play a role in dopamine production which is involved in emotional regulation. Gene activity influences neural activity which involves cognitive function which is involved in emotional regulation which affects development of temperament. Further prenatal exposure to drugs can lead to difficulties with regulating attention, as also harsh parenting leads to poorer temperamental outcomes in emotional regulation. Conversely difficult children elicit more punitive parenting in general, while more sociable children elicits more warmth so the directionality of factors is important.

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CHAPTER OVERVIEW

15: Self and Identity

15.1: Theories and concepts about self

15.2: Self efficacy and motivation

15.3: Self concept and self esteem in adolescence

15.4: Identity development

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15.1: Theories and concepts about self

Early childhood is a time of forming an initial sense of self. A **self-concept** or idea of who we are, what we are capable of doing, and how we think and feel is a social process that involves taking into consideration how others view us. So, in order to develop a sense of self, you must have interaction with others. Interactionist theorists, Cooley and Mead offer two interesting explanations of how a sense of self develops.

Cooley

The "looking-glass self" is a social psychological concept created by Cooley in 1902. It states that a person's self grows out of society's interpersonal interactions and the perceptions of others. The term refers to people shaping their identity based on the perception of others. (Sociology (Boundless)).



Figure **15.1.1**:The looking-glass self involves trying to figure out how others perceive us.[2]

Mead

Herbert Mead (1967) offers an explanation of how we develop a social sense of self by being able to see ourselves through the eyes of others. There are two parts of the self: the "I" which is the part of the self that is spontaneous, creative, innate, and is not concerned with how others view us and the "me" or the social definition of who we are.

When we are born, we are all "I" and act without concern about how others view us. But the socialized self begins when we are able to consider how one important person views us. This initial stage is called "taking the role of the significant other". For example, a child may pull a cat's tail and be told by his mother, "No! Don't do that, that's bad" while receiving a slight slap on the hand. Later, the child may mimic the same behavior toward the self and say aloud, "No, that's bad" while patting his own hand. What has happened? The child is able to see himself through the eyes of the mother. As the child grows and is exposed to many situations and rules of culture, he begins to view the self in the eyes of many others through these cultural norms or rules. This is referred to as "taking the role of the generalized other" and results in a sense of self with many dimensions. The child comes to have a sense of self as student, as friend, as son, and so on.

Exaggerated Sense of Self

One of the ways to gain a clearer sense of self is to exaggerate those qualities that are to be incorporated into the self. Preschoolers often like to exaggerate their own qualities or to seek validation as the biggest, smartest, or child who can jump the highest. This exaggeration tends to be replaced by a more realistic sense of self in middle childhood.

Self concept

Self-concept refers to beliefs about general personal identity (Seiffert, 2011). These beliefs include personal attributes, such as one's age, physical characteristics, behaviors, and competencies. Children in middle and late childhood have a more realistic sense

of self than do those in early childhood, and they better understand their strengths and weaknesses. This can be attributed to greater experience in comparing their own performance with that of others, and to greater cognitive flexibility. Children in middle and late childhood are also able to include other peoples' appraisals of them into their self-concept, including parents, teachers, peers, culture, and media.

Self-Esteem

Early childhood is a time of forming an initial sense of self. **Self-concept** is our self-description according to various categories, such as our external and internal qualities. In contrast, **self- esteem** is an evaluative judgment about who we are. The emergence of cognitive skills in this age group results in improved perceptions of the self, but they tend to focus on external qualities, which are referred to as the **categorical self**. When researchers ask young children to describe themselves, their descriptions tend to include physical descriptors, preferred activities, and favorite possessions. Thus, the **self-description** of a 3-year-old might be a 3-year-old girl with red hair, who likes to play with blocks. However, even children as young as three know there is more to themselves than these external characteristics.

Harter and Pike (1984) challenged the method of measuring personality with an open-ended question as they felt that language limitations were hindering the ability of young children to express their self-knowledge. They suggested a change to the method of measuring self-concept in young children, whereby researchers provide statements that ask whether something is true of the child (e.g., "I like to boss people around", "I am grumpy most of the time"). They discovered that in early childhood, children answer these statements in an internally consistent manner, especially after the age of four (Goodvin, Meyer, Thompson & Hayes, 2008) and often give similar responses to what others (parents and teachers) say about the child (Brown, Mangelsdorf, Agathen, & Ho, 2008; Colwell & Lindsey, 2003).



Figure 15.1.2: Older children don't always feel good about themselves.[3]

Young children tend to have a generally positive self-image. This optimism is often the result of a lack of social comparison when making self-evaluations (Ruble, Boggiano, Feldman, & Loeble, 1980), and with comparison between what the child once could do to what they can do now (Kemple, 1995). However, this does not mean that preschool children are exempt from negative self-evaluations. Preschool children with insecure attachments to their caregivers tend to have lower self-esteem at age four (Goodwin et al., 2008). Maternal negative affect (emotional state) was also found by Goodwin and her colleagues to produce more negative self-evaluations in preschool children.

Self-Control

Self-control is not a single phenomenon, but is multi-facetted. It includes **response initiation,** the ability to not initiate a behavior before you have evaluated all of the information, **response inhibition,** the ability to stop a behavior that has already begun, and **delayed gratification**, the ability to hold out for a larger reward by forgoing a smaller immediate reward (Dougherty, Marsh, Mathias, & Swann, 2005). It is in early childhood that we see the start of self-control, a process that takes many years to fully develop. In the now classic "Marshmallow Test" (Mischel, Ebbesen, & Zeiss, 1972) children are confronted with the choice of a

small immediate reward (a marshmallow) and a larger delayed reward (more marshmallows). Walter Mischel and his colleagues over the years have found that the ability to delay gratification at the age of four predicted better academic performance and health later in life (Mischel, et al., 2011). Self- control is related to executive function, discussed earlier in the chapter. As executive function improves, children become less impulsive (Traverso, Viterbori, & Usai, 2015).[4]

Self control and Play

Thanks to the new Centre for Research on Play in Education, Development and Learning (PEDaL), Whitebread, Baker, Gibson and a team of researchers hope to provide evidence on the role of play in how a child develops.

“A strong possibility is that play supports the early development of children’s self-control,” explains Baker. “These are our abilities to develop awareness of our own thinking processes – they influence how effectively we go about undertaking challenging activities.”

In a study carried out by Baker with toddlers and young preschoolers, she found that children with greater self-control solved problems quicker when exploring an unfamiliar set-up requiring scientific reasoning, regardless of their IQ. “This sort of evidence makes us think that giving children the chance to play will make them more successful and creative problem-solvers in the long run.”

If playful experiences do facilitate this aspect of development, say the researchers, it could be extremely significant for educational practices because the ability to self-regulate has been shown to be a key predictor of academic performance.

Gibson adds: “Playful behavior is also an important indicator of healthy social and emotional development. In my previous research, I investigated how observing children at play can give us important clues about their well being and can even be useful in the diagnosis of neurodevelopmental disorders like autism.”[5]

Self-Understanding

Children in middle childhood have a more realistic sense of self than do those in early childhood. That exaggerated sense of self as “biggest” or “smartest” or “tallest” gives way to an understanding of one’s strengths and weaknesses. This can be attributed to greater experience in comparing one’s own performance with that of others and to greater cognitive flexibility. A child’s self-concept can be influenced by peers and family and the messages they send about a child’s worth. Contemporary children also receive messages from the media about how they should look and act. Movies, music videos, the internet, and advertisers can all create cultural images of what is desirable or undesirable and this too can influence a child’s self-concept.



Figure **15.1.3**: Interactions with the media influence children’s perception of themselves.[6]

Remarkably, young children begin developing social understanding very early in life and are also able to include other peoples’ appraisals of them into their self-concept, including parents, teachers, peers, culture, and media. Internalizing others’ appraisals and

creating social comparison affect children's **self-esteem,** which is defined as an evaluation of one's identity. Children can have individual assessments of how well they perform a variety of activities and also develop an overall, global self-assessment. If there is a discrepancy between how children view themselves and what they consider to be their ideal selves, their self-esteem can be negatively affected.[7]

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15.2: Self efficacy and motivation

Another important development in self-understanding is **self-efficacy**, which is the belief that you are capable of carrying out a specific task or of reaching a specific goal (Bandura, 1977, 1986, 1997). Large discrepancies between self-efficacy and ability can create motivational problems for the individual (Seifert, 2011). If a student believes that they can solve mathematical problems, then the student is more likely to attempt the mathematics homework that the teacher assigns.

Unfortunately, the converse is also true. If a student believes that they are incapable of math, then the student is less likely to attempt the math homework regardless of the student's actual ability in math. Since self-efficacy is self-constructed, it is possible for students to miscalculate or misperceive their true skill, and these misperceptions can have complex effects on students' motivations. It is possible to have either too much or too little self-efficacy, and according to Bandura (1997) the optimal level seems to be either at, or slightly above, true ability.[1]



Figure 15.2.1: Families can support children's social and emotional skills, and support the development of self efficacy in different situations..[2]

As we have seen, children's experience of relationships at home and the peer group contributes to an expanding repertoire of social and emotional skills and also to broadened social understanding. In these relationships, children develop expectations for specific people (leading, for example, to secure or insecure attachments to parents), understanding of how to interact with adults and peers, and self-concept based on how others respond to them. These relationships are also significant forums for emotional development. [3]

Motivation and Self-Efficacy

In addition to being influenced by their goals, interests, and attributions, students' motives are affected by specific beliefs about the student's personal capacities. In **self-efficacy theory** the beliefs become a primary, explicit explanation for motivation (Bandura, 1977, 1986, 1997). **Self-efficacy** is the belief that you are capable of carrying out a specific task or of reaching a specific goal. As mentioned previously, the optimal level seems to be either at or slightly above true capacity (Bandura, 1997). As we indicate below, large discrepancies between self-efficacy and ability can create motivational problems for the individual.[4]

Motivation

Motivation refers to a desire, need, or drive that contributes to and explains behavioral changes. In general, motivators provide some sort of incentive for completing a task. One definition of a motivator explains it as a force "acting either on or within a person to initiate behavior." In addition to biological motives, motivations can be either intrinsic (arising from internal factors) or extrinsic (arising from external factors).

Extrinsic vs. Intrinsic Motivation

Intrinsically motivated behaviors are performed because of the sense of personal satisfaction that they bring. According to Deci (1971), these behaviors are defined as ones for which the reward is the satisfaction of performing the activity itself. Intrinsic motivation thus represents engagement in an activity for its own sake. For example, if comforting a friend makes a child feel good, they are intrinsically motivated to respond to their friend's distress.

Extrinsically motivated behaviors, on the other hand, are performed in order to receive something from others or avoid certain negative outcomes. The extrinsic motivator is outside of, and acts on, the individual. Rewards—such as a sticker, or candy—are good examples of extrinsic motivators. Social and emotional incentives like praise and attention are also extrinsic motivators since they are bestowed on the individual by another person.



Figure **15.2.2**: A lollipop can be an extrinsic motivator.[5]

Learned Helplessness and Self-Efficacy

If a person's sense of self-efficacy is very low, he or she can develop **learned helplessness**, a perception of complete *lack* of control in mastering a task. The attitude is similar to depression, a pervasive feeling of apathy and a belief that effort makes no difference and does not lead to success. Learned helplessness was originally studied from the behaviorist perspective of classical and operant conditioning by the psychologist Martin Seligman (1995). In people, learned helplessness leads to characteristic ways of dealing with problems. They tend to attribute the source of a problem to themselves, to generalize the problem to many aspects of life, and to see the problem as lasting or permanent. More optimistic individuals, in contrast, are more likely to attribute a problem to outside sources, to see it as specific to a particular situation or activity, and to see it as temporary or time-limited. Consider, for example, two students who each fail a test. The one with a lot of learned helplessness is more likely to explain the failure by saying something like: "I'm stupid; I never perform well on any schoolwork, and I never will perform well at it." The other, more optimistic student is more likely to say something like: "The teacher made the test too hard this time, so the test doesn't prove anything about how I will do next time or in other subjects."



Figure **15.2.3**: If this girl thinks that studying won't help her do well on the test, her low self-efficacy may develop into learned helplessness.[6]

What is noteworthy about these differences in perception is how much the more optimistic of these perspectives resembles high self-efficacy and how much learned helplessness seems to contradict or differ from it. As already noted, high self-efficacy is a strong belief in one's capacity to carry out a *specific* task successfully. By definition, therefore, self-efficacy focuses attention on a temporary or time-limited activity (the task), even though the cause of successful completion (oneself) is "internal."[7]

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15.3: Self concept and self esteem in adolescence

In adolescence, teens continue to develop their self-concept. Their ability to think of the possibilities and to reason more abstractly may explain the further differentiation of the self during adolescence. However, the teen's understanding of self is often full of contradictions. Young teens may see themselves as outgoing but also withdrawn, happy yet often moody, and both smart and completely clueless (Harter, 2012). These contradictions, along with the teen's growing recognition that their personality and behavior seem to change depending on who they are with or where they are, can lead the young teen to feel like a fraud. With their parents they may seem angrier and sullen, with their friends they are more outgoing and goofy, and at work they are quiet and cautious. "Which one is really me?" may be the refrain of the young teenager. Harter (2012) found that adolescents emphasize traits such as being friendly and considerate more than do children, highlighting their increasing concern about how others may see them. Harter also found that older teens add values and moral standards to their self-descriptions.



Figure **15.3.1**: An adolescent's understanding of their self is often full of contradictions.[1]



Figure **15.3.1**:Adolescents are more likely to emphasize values in their self-descriptions.[2]

As self-concept develops, so does self-esteem. In addition to the academic, social, appearance, and physical/athletic dimensions of self-esteem in middle and late childhood, teens also add perceptions of their competency in romantic relationships, on the job, and in close friendships (Harter, 2006). Self-esteem often decreases when children transition from one school setting to another, such as shifting from elementary to middle school, or junior high to high school (Ryan, Shim, & Makara, 2013). These decreases are usually temporary, unless there are additional stressors such as parental conflict, or other family disruptions (De Wit, Karioja, Rye, & Shain, 2011). Self-esteem rises from mid to late adolescence for most teenagers, especially if they feel confident in their peer relationships, their appearance, and athletic abilities (Birkeland, Melkivik, Holsen, & Wold, 2012).

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15.4: Identity development

James Marcia – Theory of Identity Development

One approach to assessing identity development was proposed by James Marcia. In his approach, adolescents ask questions regarding their exploration of and commitment to issues related to occupation, politics, religion, and sexual behavior. Studies assessing how teens pass through Marcia's stages show that although most teens eventually succeed in developing a stable identity, the path to it is not always easy and there are many routes that can be taken. Some teens may simply adopt the beliefs of their parents or the first role that is offered to them, perhaps at the expense of searching for other more promising possibilities (foreclosure status). Other teens may spend years trying on different possible identities (moratorium status) before finally choosing one.[1]

Marcia identified four identity statuses that represent the four possible combinations of the dimension of commitment and exploration.[2]

Table 15.4.1:- Identity Status

Identity Statuses

Identity Status	Description[3]
Identity-Diffusion status is a status that characterizes those who have neither explored the options, nor made a commitment to an identity.	The individual does not have firm commitments regarding the issues in question and is not making progress toward them. Those who persist in this identity may drift aimlessly with little connection to those around them or have little sense of purpose in life.
Identity-Foreclosure status is the status for those who have made a commitment to an identity without having explored the options.	The individual has not engaged in any identity experimentation and has established an identity based on the choices or values of others. Some parents may make these decisions for their children and do not grant the teen the opportunity to make choices. In other instances, teens may strongly identify with parents and others in their life and wish to follow in their footsteps.
Identity-Moratorium status is a status that describes those who are exploring in an attempt to establish an identity but have yet to have made any commitment.	The individual is exploring various choices but has not yet made a clear commitment to any of them. This can be an anxious and emotionally tense time period as the adolescent experiments with different roles and explores various beliefs. Nothing is certain and there are many questions, but few answers.
Identity-Achievement status refers to the status for those who, after exploration, have made a commitment.	The individual has attained a coherent and committed identity based on personal decisions. This is a long process and is not often achieved by the end of adolescence

The least mature status, and one common in many children, is identity diffusion. During high school and the college years, teens and young adults move from identity diffusion and foreclosure toward moratorium and achievement. The biggest gains in the development of identity are in college, as college students are exposed to a greater variety of career choices, lifestyles, and beliefs. This is likely to spur on questions regarding identity. A great deal of the identity work we do in adolescence and young adulthood is about values and goals, as we strive to articulate a personal vision or dream for what we hope to accomplish in the future (McAdams, 2013).[4]

To help them work through the process of developing an identity, teenagers may try out different identities in different social situations. They may maintain one identity at home and a different type of persona when they are with their peers. Eventually, most teenagers do integrate the different possibilities into a single self-concept and a comfortable sense of identity (identity-achievement status). For teenagers, the peer group provides valuable information about the self-concept. For instance, in response to the question "What were you like as a teenager? (e.g., cool, nerdy, awkward?)," posed on the website Answerbag, one teenager replied in this way:

"I'm still a teenager now, but from 8th-9th grade I didn't really know what I wanted at all. I was smart, so I hung out with the nerdy kids. I still do; my friends mean the world to me. But in the middle of 8th grade I started hanging out with which you may call the

"cool" kids…and I also hung out with some stoners, just for variety. I pierced various parts of my body and kept my grades up. Now, I'm just trying to find who I am. I'm even doing my sophomore year in China so I can get a better view of what I want. (Answerbag, 2007). What were you like as a teenager? (e.g., cool, nerdy, awkward?)." (Quoted from dojokills on http://www.answerbag.com/q_view/171753)







Figure 15.4.3: Again this skateboarders sense of self is likely affected by the other skateboarders they hang out with. [8]



Figure **15.4.4**: These teens appear to be studying and they likely associate themselves as such, while their religious practices might also affect how they are viewed and how they view themselves in the social context. [9]

Adolescents search for stable attachments through the development of social identities.

Development of Identity and Self Concept: Who am I?

Developmental psychologists have researched several different areas of identity development for adolescence and some of the main areas include:

Religious Identity

The religious views of teens are often similar to that of their families (Kim- Spoon, Longo, & McCullough, 2012). Most teens may question specific customs, practices, or ideas in the faith of their parents, but few completely reject the religion of their families.



Figure **15.4.5**:A Muslim teen[10]



Figure **15.4.6**: A Jewish teen[11]

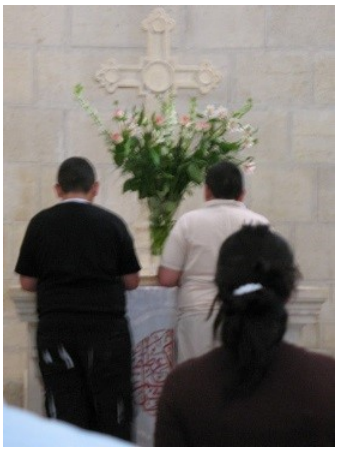


Figure **15.4.7**: A Catholic teen[12]



Figure **15.4.8**: A Buddhist teen[13]

Religious identity is an important aspect of identity development in adolescence

Political Identity

The political ideology of teens is also influenced by their parents' political beliefs. A new trend in the 21st century is a decrease in party affiliation among adults. Many adults do not align themselves with either the democratic or republican party, but view themselves as more of an "independent". Their teenage children are often following suit or becoming more apolitical (Côtè, 2006).

Vocational Identity

While adolescents in earlier generations envisioned themselves as working in a particular job, and often worked as an apprentice or part-time, this is rarely the case today. Vocational identity takes longer to develop, as most of today's occupations require specific skills and knowledge that will require additional education or are acquired on the job itself. In addition, many of the jobs held by teens are not in professions that most teens will seek as adults.

Gender Identity

This is also becoming an increasingly prolonged task as attitudes and norms regarding gender keep changing. The roles appropriate for males and females are evolving. Some teens may foreclose on a gender identity as a way of dealing with this uncertainty, and they may adopt more stereotypic male or female roles (Sinclair & Carlsson, 2013). [14]

Ethnic Identity (this is repeated in the culture section/module)

Ethnic identity refers to how people come to terms with who they are based on their ethnic or racial ancestry. "The task of ethnic identity formation involves sorting out and resolving positive and negative feelings and attitudes about one's own ethnic group and about other groups and identifying one's place in relation to both" (Phinney, 2006, p. 119). When groups differ in status in a culture, those from the non- dominant group have to be cognizant of the customs and values of those from the dominant culture.

The reverse is rarely the case. This makes ethnic identity far less salient for members of the dominant culture. In the United States, those of European ancestry engage in less exploration of ethnic identity, than do those of non-European ancestry (Phinney, 1989). However, according to the U.S. Census (2012) more than 40% of Americans under the age of 18 are from ethnic For many ethnic minority teens, discovering one's ethnic identity is an important part of identity formation.

Phinney's model of ethnic identity formation is based on Erikson's and Marcia's model of identity formation (Phinney, 1990; Syed & Juang, 2014) Through the process of exploration and commitment, individuals come to understand and create an ethnic identity. Phinney suggests three stages or statuses with regard to ethnic identity:

1. **Unexamined Ethnic Identity:** Adolescents and adults who have not been exposed to ethnicidentity issues may be in the first stage, unexamined ethnic identity. This is often characterized by a preference for the dominant culture, or where the individual has given little thought to the question of their ethnic heritage. This is similar to diffusion in Marcia's model of identity (Marcia 2010). Included in this group are also those who have adopted the ethnicity of their parents and other family members with little thought about the issues themselves, similar to Marcia's foreclosure status (Phinney, 1990).
2. **Ethnic Identity Search**: Adolescents and adults who are exploring the customs, culture, and history of their ethnic group are in the ethnic identity search stage, similar to Marcia's moratorium status (Phinney, 1990). Often some event "awakens" a teen or adult to their ethnic group; either personal experience with prejudice, a highly profiled case in the media, or even a more positive event that recognizes the contribution of someone from the individual's ethnic group. Teens and adults in this stage will immerse themselves in their ethnic culture. For some, "it may lead to a rejection of the values of the dominant culture" (Phinney, 1990, p. 503).
3. **Achieved Ethnic Identity:** Those who have actively explored their culture are likely to have a deeper appreciation and understanding of their ethnic heritage, leading to progress toward an achieved ethnic identity (Phinney, 1990). An achieved ethnic identity does not necessarily imply that the individual is highly involved in the customs and values of their ethnic culture. One can be confident in their ethnic identity without wanting to maintain the language or other customs.

The development of ethnic identity takes time, with about 25% of tenth graders from ethnic minority backgrounds having explored and resolved the issues (Phinney, 1990). The more ethnically homogeneous the high school, the less identity exploration and achievement (Umana-Taylor, 2003). Moreover, even in more ethnically diverse high schools, teens tend to spend more time with their own group, reducing exposure to other ethnicities. This may explain why, for many, college becomes the time of ethnic identity exploration. "[The] transition to college may serve as a consciousness-raising experience that triggers exploration." (Syed & Azemitia, 2009).

It is also important to note that those who do achieve ethnic identity may periodically reexamine the issues of ethnicity. This cycling between exploration and achievement is common not only for ethnic identity formation but in other aspects of identity development (Grotevant, 1987).

Bicultural/Multiracial Identity

Some who identify as ethnic minorities may wrestle with the question of how, and to what extent, they will identify with the culture of the surrounding society and with the culture of their family. Phinney (2006) suggests that people may handle it in different ways.[51] Some may keep the identities separate, others may combine them in some way, while others may reject some of them. **Bicultural identity** means the individual sees oneself as part of both the ethnic minority group and the larger society. Those who are **multiracial**, that is whose parents come from two or more ethnic or racial groups, may have a more challenging task. In some cases their appearance may be ambiguous. This can lead to others constantly asking them to categorize themselves. Phinney (2006) notes that the process of identity formation may start earlier and take longer to accomplish in those who are not mono-racial.

Individual Identity Development within the Family Context

An individual's identity forms in part from being a member of a family. In other words, an individual's personal identity emerges within the context of the family. It is not a neutral environment and family can greatly affect an individual's identity development (Scabini & Manzi, 2011). Recall the definition of family from the key concepts at the beginning of this book, that family can include various people who have relationship with an individual beyond just legal or biological ties. Many families are also a well-organized group with a high degree of unity that interacts with its social and cultural context. It is different from other social groups

because it typically does not have a limited lifetime similar to most social groups, but rather most families have a past, present, and future (Scabini & Manzi, 2011).

Based on the family systems theory (visit the family systems chapter for more information) the family is considered a system (or unit) which is also made up of subsystems that inform one's individual identity. These subsystems may include couple relationships, sibling relationships, parent- child relationships, and so on (Scabini & Manzi, 2011). Individuals within these systems have separate individual identities as well as the shared identity of a subsystem or family system. This means that individuals' role identities, such as being a sibling, spouse, parent, and/or child are interdependent with one another. One's identity in multiple domains such as the identity of being both a parent and child are linked, meaning that parents are also children of the preceding generation (Cigoli & Scabini, 2006). Thus, one's identity formed in part by one identity role, such as being a child of a parent can influence later identity roles such as becoming a parent. Parenting style can also influence identity development. For example, those who experience significant abuse within their family may not achieve as clear of an identity compared to those who do not experience any abuse within their family (Hasanah et al, 2019).

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CHAPTER OVERVIEW

16: Sex, Gender and Sexuality

16.1: Sexual orientation

16.2: Gender identity

16.3: Theories of Gender Development

16.4: Biology in sex and gender

16.5: Gender dysphoria

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16.1: Sexual orientation

A person's **sexual orientation** is their emotional and sexual attraction to a particular sex or gender. A continuing pattern of romantic or sexual attraction (or a combination of these) to persons of a given sex or gender. According to the American Psychological Association (APA) (2016), sexual orientation also refers to a person's sense of identity based on those attractions, related behaviors, and membership in a community of others who share those attractions. Some specific orientation is defined in many ways, including **heterosexuality** (attraction to the opposite sex/gender), **same-sex attraction** (previously referred to as **homosexuality**, which is an outdated term that many people find offensive because it was previously classified as a mental illness), **bisexuality**, **polysexuality**, or **pansexuality** (attraction to two, multiple, or all sexes/genders respectively), and **asexuality** (no sexual attraction to any sex/gender).

Sexual Orientation on a Continuum

Sexuality researcher Alfred Kinsey was among the first to conceptualize sexuality as a continuum rather than a strict dichotomy of gay or straight. To classify this continuum of heterosexuality and homosexuality, Kinsey et al. (1948) created a seven-point rating scale that ranged from exclusively heterosexual to exclusively homosexual. Research done over several decades has supported this idea that sexual orientation ranges along a continuum, from exclusive attraction to the opposite sex/gender to exclusive attraction to the same sex/gender (Carroll, 2016).

A more contemporary look at sexual orientation as infinite variations of attraction. A closer examination of The Genderbread Person v2.0 illustrates this:

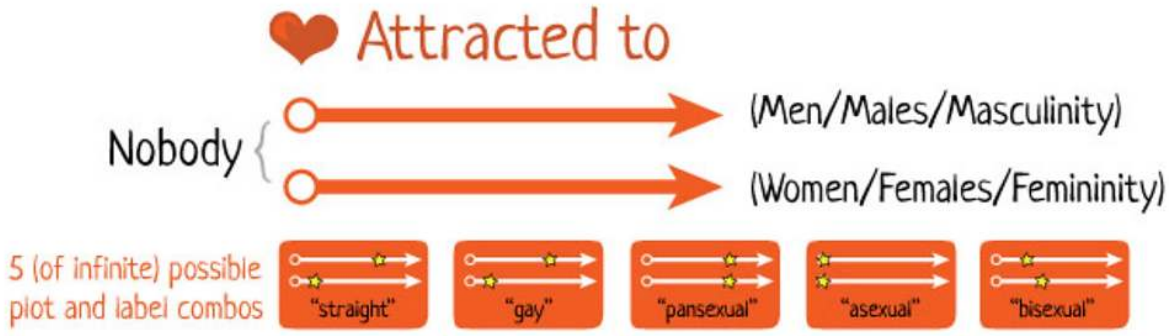


Figure **16.1.1**: A spectrum of sexual orientation - As the figure illustrates, who we are attracted to can range in intensity and in whether we are attracted to males/masculinity and/or females/femininity. We can see this in the five little boxes below that show 5 (of infinite) possible plot and label combos - the first one showing very little attraction to females and a lot to males so for a cis-female that indicates being "straight." The second showing the same combination for a cis-male would indicate being "gay." Being attracted to both at the same high level might be labeled "pansexual," while being attracted to nobody would be considered "asexual." Being slightly and variedly attracted to both might be called "bisexual."[1]

Development of Sexual Orientation

According to current scientific understanding, individuals are usually aware of their sexual orientation between middle childhood and early adolescence. However, this is not always the case, and some do not become aware of their sexual orientation until much later in life. It is not necessary to participate in sexual activity to be aware of these emotional, romantic, and physical attractions; people can be celibate and still recognize their sexual orientation. Some researchers argue that sexual orientation is not static and inborn, but is instead fluid and changeable throughout the lifespan.



Figure **16.1.2**: This teen couple is at a LGBTQIA pride event, events that are increasingly common as people recognize the many dimensions of love.[2]

There is no scientific consensus regarding the exact reasons why an individual holds a particular sexual orientation. Research has examined possible biological, developmental, social, and cultural influences on sexual orientation, but there has been no evidence that links sexual orientation to one factor (APA, 2016). Biological explanations, that include genetics, hormones, and birth order, will be explored further. Excess or deficient exposure to hormones during prenatal development has also been theorized as an explanation for sexual orientation. One-third of females exposed to abnormal amounts of prenatal androgens, a condition called congenital adrenal hyperplasia (CAH), identify as bisexual or lesbian (Cohen-Bendahan, van de Beek, & Berenbaum, 2005). In contrast, too little exposure to prenatal androgens may affect male sexual orientation (Carlson, 2011).

Understanding the Acronyms: LGBT, LGBTQ, LGBTQ+

The letters LGBT refer to a group of individuals that identify as Lesbian, Gay, Bisexual, and Transgender. This community includes a diverse group of people from all backgrounds, races, ethnicities, ages, and socioeconomic statuses.

A Little History

LGB was used to replace the term, “Gay,” in the mid-1980s, but the acronym LGBT became common in the 1990s. However, recently the term has evolved with the preferred acronym to LGBTQ. The added “Q” means Questioning or Queer. The addition of “Q” as a term of questioning includes people that are in the process of exploring their gender or sexual orientation.

Additionally, the term, “Queer,” can be used as an umbrella term, as the community has accepted this word to represent anything outside of the dominant narrative. Queer is not specific to sexual orientation or gender identity and can be used to refer to the community as a whole. While Queer was used as a derogatory term for decades, it was reclaimed by the LGBTQ community in the 1990s with the rise of an organization called Queer Nation. As an activist group out of New York, Queer Nation opposed discrimination of the LGBTQ community and rejected the heteronormative ideals of society.

What does the + sign mean?

Recently LGBTQ is also used as **LGBTQ+.** The plus sign, “+” accounts for many additional identifications in the community, including transsexual, two-spirit, intersex, asexual, pansexual, and gender queer. Gender Queer is an umbrella term that can be used for all gender identities not exclusive to masculine or feminine, including gender fluid, agender, bigender, pan gender, gender free, genderless, gender variant, and gender non-conforming. The plus also includes allies or people in support of the LGBTQ community.

While LGBTQ+ or Queer are currently the most common terms, additionally the term, Rainbow Community, may be used. The important takeaway is that the community will **continue to evolve, and the terminology will evolve with it.**[3]

Sexual Orientation Discrimination

The United States is **heteronormative**, meaning that society supports heterosexuality as the norm. Consider, for example, that homosexuals are often asked, "When did you know you were gay?" but heterosexuals are rarely asked, "When did you know you were straight?" (Ryle, 2011). Living in a culture that privileges heterosexuality has a significant impact on the ways in which non-heterosexual people are able to develop and express their sexuality.

Open identification of one's sexual orientation may be hindered by **homophobia,** which encompasses a range of negative attitudes and feelings toward homosexuality or people who are identified or perceived as being lesbian, gay, bisexual, or transgender (LGBT). It can be expressed as antipathy, contempt, prejudice, aversion, or hatred; it may be based on irrational fear and is sometimes related to religious beliefs (Carroll, 2016). Homophobia is observable in critical and hostile behavior, such as discrimination and violence on the basis of sexual orientations that are non- heterosexual. Recognized types of homophobia include **institutionalized homophobia**, such as religious and state-sponsored homophobia, and **internalized homophobia** in which people with same-sex attractions internalize, or believe, society's negative views and/or hatred of themselves.



Figure **16.1.3**: This is an example of discrimination that is portrayed in a high school play. These students from Mercer Island High School are playing Westboro Baptist Church protestors in the play *The Laramie Project* that tells the story of the murder of a gay college student, Matthew Shephard.[5]

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16.2: Gender identity

A person's subjective experience of their own gender and how it develops, or **gender identity,** is a topic of much debate. It is the extent to which one identifies with a particular gender; it is a person's individual sense and subjective experience of being a man, a woman, or other gender. It is often shaped early in life and consists primarily of the acceptance (or non-acceptance) of one's membership into a gender category. In most societies, there is a basic division between gender attributes assigned to males and females. In all societies, however, some individuals do not identify with some (or all) of the aspects of gender that are assigned to their biological sex.

Those that identify with the gender that corresponds to the sex assigned to them at birth (for example, they are assigned female at birth and continue to identify as a girl, and later a woman) are called **cisgender**. In many Western cultures, individuals who identify with a gender that is different from their biological sex (for example, they are assigned female at birth but feel inwardly that they are a boy or a gender other than a girl) are called **transgender**. Some transgender individuals, if they have access to resources and medical care, choose to alter their bodies through medical interventions such as surgery and hormonal therapy so that their physical being is better aligned with their gender identity.



Figure 16.2.1: More young people today in Western cultures identify as genderqueer.[1]

Recent terms such as "genderqueer," "genderfluid," "gender variant," "androgynous," "agender," and "gender nonconforming" are used by individuals who do not identify within the gender binary as either a man or a woman. Instead they identify as existing somewhere along a spectrum or continuum of genders, or outside of the spectrum altogether, often in a way that is continuously evolving.

The Gender Continuum

Viewing gender as a continuum allows us to perceive the rich diversity of genders, from trans- and cisgender to gender queer and agender. Most Western societies operate on the idea that gender is a **binary**, that there are essentially only two genders (men and women) based on two sexes (male and female), and that everyone must fit one or the other. This social dichotomy enforces conformance to the ideals of masculinity and femininity in all aspects of gender and sex—gender identity, gender expression, and biological sex.

According to supporters of **queer theory**, gender identity is not a rigid or static identity but can continue to evolve and change over time. Queer theory developed in response to the perceived limitations of the way in which identities are thought to become

consolidated or stabilized (for instance, male or female), and theorists constructed *queerness* in an attempt to resist this. In this way, the theory attempts to maintain a critique rather than define a specific identity. While “queer” defies a simple definition, the term is often used to convey an identity that is not rigidly developed but is instead fluid and changing.[2]

The Genderbread Person

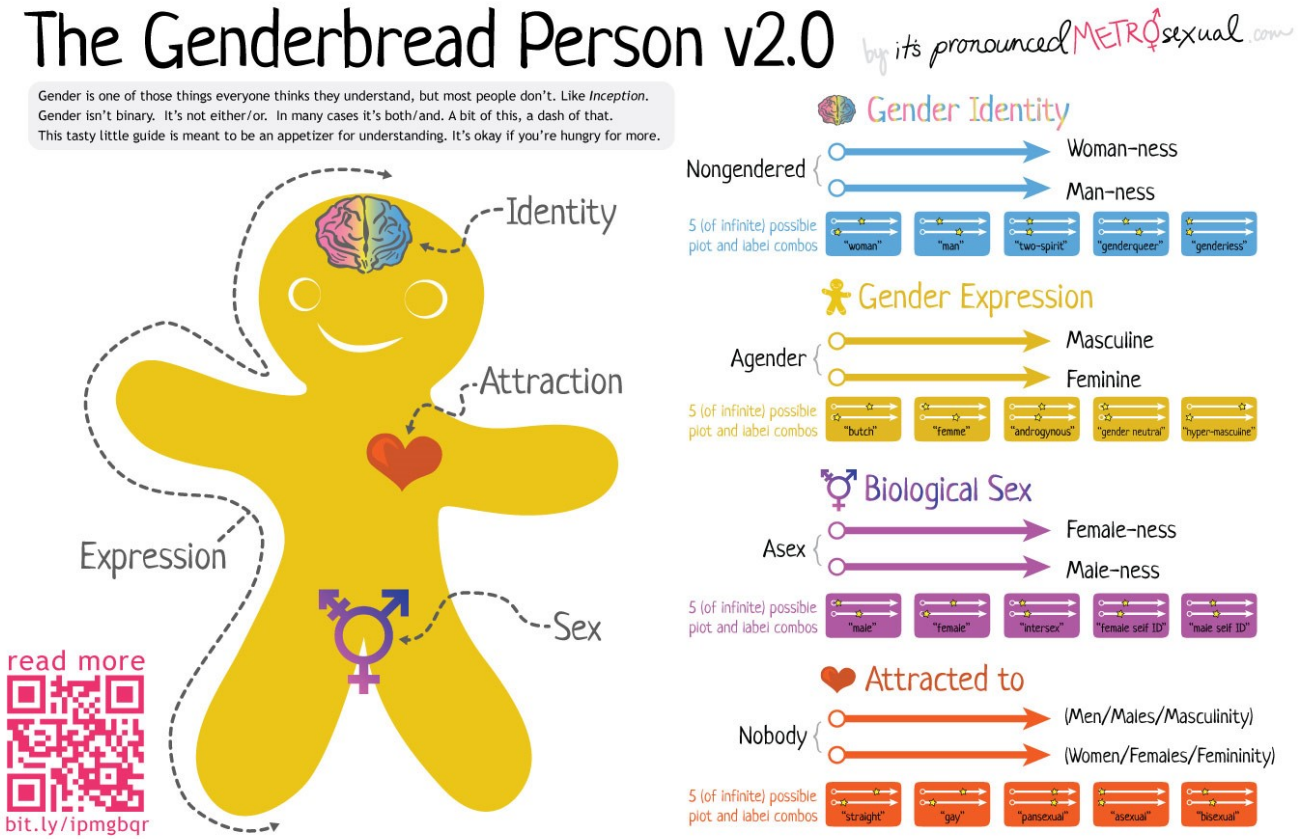


Figure **16.2.2**: The Genderbread Person explains gender identity (how one thinks about themselves ranging from nongendered to man-ness or woman-ness or both), gender expression (how one presents oneself from agender to masculine or feminine or both), biological sex (one’s genitalia as asex, to male-ness, female-ness or both), and sexual orientation (who one is attracted to from nobody to men/masculinity, women/femininity, or both) .[5]

Gender Pronouns

Pronouns are a part of language used to refer to someone or something without using proper nouns. In standard English, some singular third-person pronouns are "he" and "she," which are usually seen as gender-specific pronouns, referring to a man and a woman, respectively. A gender-neutral pronoun or gender-inclusive pronoun is one that gives no implications about gender, and could be used for someone of any gender.

Some languages only have gender-neutral pronouns, whereas other languages have difficulty establishing any that aren't gender-specific. People with non-binary gender identities often choose new third-person pronouns for themselves as part of their transition. They often choose gender-neutral pronouns so that others won't see them as female or male.[6]

Here is a table based on the Rainbow Coalition of Yellowknife’s *Handy Guide to Pronouns*:

Table **16.2.1**:- Guide to Pronouns[7]

Pronouns	Example
He/His/Him (masculine pronouns)	He is going to the store to buy himself a hat. I saw him lose his old hat yesterday.
She/Her/Her (feminine pronouns)	She is going to the store to buy herself a hat. I saw her lose her old hat yesterday.
They/Them/Their (gender neutral pronouns)	They are going to the store to buy themselves a hat. I saw them lose their old hat yesterday.

Factors that Influence Gender Identity

Although the formation of gender identity is not completely understood, many factors have been suggested as influencing its development. Biological factors that may influence gender identity include pre- and post-natal hormone levels and genetic makeup. Social factors include ideas regarding gender roles conveyed by family, authority figures, mass media, and other influential people in a child's life. According to social-learning theory, children develop their gender identity through observing and imitating the gender-linked behaviors of others; they are then "rewarded" for imitating the behaviors of people of the same gender and "punished" for imitating the behaviors of another gender. For example, male children will often be rewarded for imitating their father's love of baseball but punished or redirected in some way if they imitate their older sister's love of dolls. Children are shaped and molded by the people surrounding them, who they try to imitate and follow.

Gender Roles

The term "gender role" refers to society's concept of how men and women are expected to act. As we grow, we learn how to behave from those around us. In this socialization process, children are introduced to certain roles that are typically linked to their biological sex. The term "gender role" refers to society's concept of how men and women are expected to act and behave. Gender roles are based on norms, or standards, created by society. In American culture, masculine roles have traditionally been associated with strength, aggression, and dominance, while feminine roles have traditionally been associated with passivity, nurturing, and subordination.

Gender Socialization

The socialization process in which children learn these gender roles begins at birth. Today, our society is quick to outfit male infants in blue and girls in pink, even applying these color-coded gender labels while a baby is in the womb. It is interesting to note that these color associations with gender have not always been what they are today. Up until the beginning of the 20th century, pink was actually more associated with boys, while blue was more associated with girls—illustrating how socially constructed these associations really are.

Gender socialization occurs through four major agents: family, education, peer groups, and mass media. Each agent reinforces gender roles by creating and maintaining normative expectations for gender-specific behavior. Exposure also occurs through secondary agents, such as religion and the workplace. Repeated exposure to these agents over time leads people into a false sense that they are acting naturally based on their gender rather than following a socially constructed role.

Gender Stereotypes, Sexism, and Gender-Role Enforcement

The attitudes and expectations surrounding gender roles are not typically based on any inherent or natural gender differences, but on **gender stereotypes**, or oversimplified notions about the attitudes, traits, and behavior patterns of males and females. We engage in gender stereotyping when we do things like making the assumption that a teenage babysitter is female.

While it is somewhat acceptable for women to take on a narrow range of masculine characteristics without repercussions (such as dressing in traditionally male clothing), men are rarely able to take on more feminine characteristics (such as wearing skirts) without the risk of harassment or violence. This threat of punishment for stepping outside of gender norms is especially true for those who do not identify as male or female.



Figure 16.2.3: Would girls likely pose this way for an image? What does this say about gender stereotypes?[8]

Gender stereotypes form the basis of sexism, or the prejudiced beliefs that value males over females. Common forms of sexism in modern society include gender-role expectations, such as expecting women to be the caretakers of the household. Sexism also includes people's expectations of how members of a gender group should behave. For example, girls and women are expected to be friendly, passive, and nurturing; when she behaves in an unfriendly or assertive manner, she may be disliked or perceived as aggressive because she has violated a gender role (Rudman, 1998). In contrast, a boy or man behaving in a similarly unfriendly or assertive way might be perceived as strong or even gain respect in some circumstances.[9]

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[7] Rainbow Coalition of Yellowknife. (n.d). Handy Guide to Pronouns [PDF files]. Retrieved from http://www.rainbowcoalitionyk.org/resources/.

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16.3: Theories of Gender Development

In the section on biological sex, we learn about how the biological aspects of reproductive organs, hormones etc develop. The World Health Organization says "Gender refers to the characteristics of women, men, girls and boys that are socially constructed. This includes norms, behaviours and roles associated with being a woman, man, girl or boy, as well as relationships with each other. As a social construct, gender varies from society to society and can change over time" (WHO, Gender and Health, 2023). In this section we will talk about some psychological theories of how gender develops.

Identity Constancy and roles in early childhood

Society as we know it today focuses on an important dimension of the self as male or female. Preschool-aged children become increasingly interested in finding out the differences between boys and girls both physically and in terms of what activities are acceptable for each. While 2 year olds can identify some differences and learn whether they are boys or girls, preschoolers become more interested in what it means to be male or female. This self-identification or **gender identity** is followed sometime later with **gender constanc**y or the knowledge that gender does not change. **Gender roles** or the rights and expectations that are associated with being male or female are learned throughout childhood and into adulthood.

Freud and the Phallic Stage

Freud believed that masculinity and femininity were learned during the phallic stage of psychosexual development. According to Freud, during the phallic stage, the child develops an attraction to the opposite-sex parent but after recognizing that that they cannot actually be romantically involved with that parent, the child learns to model their own behavior after the same-sex parent. The child develops his or her own sense of masculinity or femininity from this resolution. And, according to Freud, a person who does not exhibit gender appropriate behavior, such as a woman who competes with men for jobs or a man who lacks self-assurance and dominance, has not successfully completed this stage of development. Consequently, such a person continues to struggle with his or her own gender identity.

Chodorow and Mothering

Chodorow, a Neo-Freudian, believed that mothering promotes gender stereotypic behavior. Mothers push their sons away too soon and direct their attention toward problem-solving and independence. As a result, sons grow up confident in their own abilities but uncomfortable with intimacy. Girls are kept dependent too long and are given unnecessary and even unwelcome assistance from their mothers. Girls learn to underestimate their abilities and lack assertiveness, but feel comfortable with intimacy.



Figure 16.3.1: A boy showing independence and confidence.[1]



Figure 16.3.2: A girl showing dependence and comfort within a relationship.[2]

Both of these models assume that early childhood experiences result in lifelong gender self-concepts. However, gender socialization is a process that continues throughout life. Children, teens, and adults refine and can modify their sense of self based on gender.

Learning through Reinforcement and Modeling

Learning theorists suggest that gender role socialization is a result of the ways in which parents, teachers, friends, schools, religious institutions, media and others send messages about what is acceptable or desirable behavior as males or females. This socialization begins early-in fact, it may even begin the moment a parent learns that a child is on the way. Knowing the sex of the child can

conjure up images of the child's behavior, appearance, and potential on the part of a parent. And this stereotyping continues to guide perception through life. Consider parents of newborns, shown a 7 pound, 20 inch baby, wrapped in blue (a color designating males) describe the child as tough, strong, and angry when crying. Shown the same infant in pink (a color used in the United States for baby girls), these parents are likely to describe the baby as pretty, delicate, and frustrated when crying. (Maccoby & Jacklin, 1987). Female infants are held more, talked to more frequently and given direct eye contact, while male infants play is often mediated through a toy or activity.

Sons are given tasks that take them outside the house and that have to be performed only on occasion while girls are more likely to be given chores inside the home such as cleaning or cooking that is performed daily. Sons are encouraged to think for themselves when they encounter problems and daughters are more likely to be given assistance even when they are working on an answer. This impatience is reflected in teachers waiting less time when asking a female student for an answer than when asking for a reply from a male student (Sadker and Sadker, 1994). Girls are given the message from teachers that they must try harder and endure in order to succeed while boys' successes are attributed to their intelligence. Of course, the stereotypes of advisors can also influence which kinds of courses or vocational choices girls and boys are encouraged to make.

Friends discuss what is acceptable for boys and girls and popularity may be based on modeling what is considered ideal behavior or looks for the sexes. Girls tend to tell one another secrets to validate others as best friends while boys compete for position by emphasizing their knowledge, strength or accomplishments. This focus on accomplishments can even give rise to exaggerating accomplishments in boys, but girls are discouraged from showing off and may learn to minimize their accomplishments as a result.

Cognitive and schema theories

Gender messages abound in our environment. But does this mean that each of us receives and interprets these messages in the same way? Probably not. In addition to being recipients of these cultural expectations, we are individuals who also modify these roles (Kimmel, 2008). Based on what young children learn about gender from parents, peers, and those who they observe in society, children develop their own conceptions of the attributes associated with maleness or femaleness which is referred to as **gender schemas**.

How much does gender matter? In the United States, gender differences are found in school experiences (even into college and professional school, girls are less vocal in the classrooms and much more at risk for sexual harassment from teachers, coaches, classmates, and professors), in social interactions and in media messages. The **stereotypes** that boys should be strong, forceful, active, dominant, and rational and that girls should be pretty, subordinate, unintelligent, emotional, and gabby are portrayed in children's toys, books, commercials, video games, movies, television shows and music.



Figure **16.3.3**: Stores subscribe to gender stereotyping by color coding and categorizing toys.[3]



Figure 16.3.4: Commercial enterprises encourage the gender stereotypes with colors and categorizing toys by gender norms.[4]

In adulthood, these differences are reflected in income gaps between men and women where women working full-time earn about 74 percent the income of men, in higher rates of women suffering rape and domestic violence, higher rates of eating disorders for females, and in higher rates of violent death for men in young adulthood. Each of these differences will be explored further in subsequent chapters.[5]

Gender Identity in middle childhood

The development of gender and gender identity is likewise an interaction among social, biological, and representational influences (Ruble, Martin, & Berenbaum, 2006). Young children learn about gender from parents, peers, and others in society, and develop their own conceptions of the attributes associated with maleness or femaleness (called **gender schemas**). They also negotiate biological transitions (such as puberty) that cause their sense of themselves and their sexual identity to mature.

Each of these examples of the growth of social and emotional competence illustrates not only the interaction of social, biological, and representational influences, but also how their development unfolds over an extended period. Early influences are important, but not determinative, because the capabilities required for mature moral conduct, gender identity, and other outcomes continue to develop throughout childhood, adolescence, and even the adult years.



Figure 16.3.5: Social influences such as cultural norms impact children's interests, dress, style of speech and even life aspirations. [7]

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16.4: Biology in sex and gender

From birth, children are assigned a gender and are socialized to conform to certain gender roles based on their biological sex. "**Sex,**" refers to physical or physiological differences between males, females, and intersex persons, including both their primary and secondary sex characteristics. "**Gender**," on the other hand, refers to social or cultural distinctions associated with a given sex.

When babies are born, they are assigned a gender based on an assessment of their biological sex—male babies are assigned as boys, female babies are assigned as girls, and i**ntersex** babies are born with sex characteristics that do not fit the typical definitions for male or female bodies, and are usually relegated into one gender category or another. Scholars generally regard gender as a **social construct**, meaning that it doesn't exist naturally but is instead a concept that is created by cultural and societal norms. From birth, children are socialized to conform to certain gender roles based on their biological sex and the gender to which they are assigned.[1]

Psychologists have long admitted that sex refers to biology – genes, hormones and genitalia, and that gender refers to the psychological experience of femininity or masculinity and the range in-between. The above discussion was about how much of this debate has played out as well as what queer theorists assert.

Biological psychologists have focused on the role that biology plays in this process. It is commonly known and understood that human prenatal development starts with one cell typically having 2 sex chromosomes – XX or XY, and therefore the presence of the Y chromosome will "determine" male development. I put determine in quotes because this is in fact far from the actual truth. It is hardly as if the Y chromosome has a penis on it! It is important to understand the full process of genital development in utero first in order to understand the tenuous nature of such binaries. Of course, we all start off at conception with a single cell – mostly with an XX or an XY situation. The Y chromosome contains an SRY gene which triggers a cascade of events that lead to male genitalia, and its absence leads to female genitalia. So female development is the default system so to speak. At the start of embryonic development, the embryo has undifferentiated gonads. It is the presence of the SRY gene that at about 6 weeks of pregnancy causes the production of testes determining factor, a chemical that leads to the undifferentiated gonads becoming testes. Testes produce testosterone which further the development of the testes, and also produce Mullerian inhibiting substance – a hormone that causes the female reproductive duct possibilities to be removed, and the Wolffian or male reproductive duct system to flourish and develop further. It is not until about 3 months in utero that the fetus develops external genitalia ie a penis (the testes don't descend into the scrotal sac until later).

So as you may note there are several steps from a Y chromosome to a "normal" male. And there are several things that have to happen in that cascade for one or other extreme to develop. Could there be situations where one is born with possibly both sets of reproductive organs, none, or ambiguous genitalia? Certainly! Similarly, during any developmental stage there are many situations where a person's hormones may not fall strictly into well-defined "male" or "female" ranges, and notably a person need not be only "male" or "female" across their genes, hormones or genitals.

Intersex

At least 1 in every 1,000 conceptions results in a variation of chromosomal sex beyond the typical XX or XY sets. Some of these variations include XXX (Figure 13.3.2), XYY, XXY, or even a single X (Dreger, 1998).



Figure 16.4.1: 9 year old girl with Triple X Syndrome.

Some individuals with atypical sex chromosomes may have unusual physical characteristics, such as being taller than average, having a thick neck, or being sterile (unable to reproduce); but in many cases, these individuals have no cognitive, physical, or sexual issues (Wisniewski et al., 2000). These sex-linked chromosomal disorders are briefly described in the Table below.

Table 16.4.1: Sex-linked Chromosomal Disorders

Disorder	Sex Appearance & Fertility	Characteristics
Klinefelter Syndrome (XXY)	Male, may have some breast development (often infertile)	The Y chromosome stimulates the growth of male genitalia, but the additional X chromosome inhibits this development (may have low levels of testosterone).
Supermale Syndrome (XYY)	Male (usually normal fertility)	Few symptoms, which may include being taller than average, acne, and an increased risk of learning problems. Generally otherwise normal.
Triple X Syndrome (XXX)	Female (usually normal fertility)	May result in being taller than average, having learning difficulties, decreased muscle tone, seizures, and kidney problems.
Turner Syndrome (XO)	Female, but immature (infertile)	Affects cognitive functioning and sexual maturation; short stature may be noted.

The more common of these sex chromosome disorders are Turner Syndrome and Klinefelter Syndrome. **Turner Syndrome** occurs when one of the X chromosomes is missing or damaged and the resulting zygote has XO sex chromosomes. This occurs in 1 of every 2,500 live female births (Carroll, 2007) and affects the individual's cognitive functioning and sexual maturation. The external genitalia appear normal, but breasts and ovaries do not develop fully and the woman does not menstruate. Turner's syndrome also results in short stature and other physical characteristics, such as a webbed neck, shield-shaped thorax, and cardiac defects.

Klinefelter Syndrome (XXY) *results when an extra X chromosome is present in the cells of a male* and occurs in 1 out of 700 live male births. The Y chromosome stimulates the growth of male genitalia, but the additional X chromosome inhibits this development. An individual with Klinefelter Syndrome often has some breast development, wide hips, infertility (this is the most common cause of infertility in males), small testicular size, and low levels of testosterone (National Institutes of Health, 2019). Figure illustrates the symptoms of Klinefelter's syndrome on the left and a 29 year old male with Klinefelter`s syndrome who is

undergoing testosterone treatment on the right. Regular testosterone injections can promote strength and facial hair growth, build a more muscular body type, increase sexual desire, and enlarge the testes.

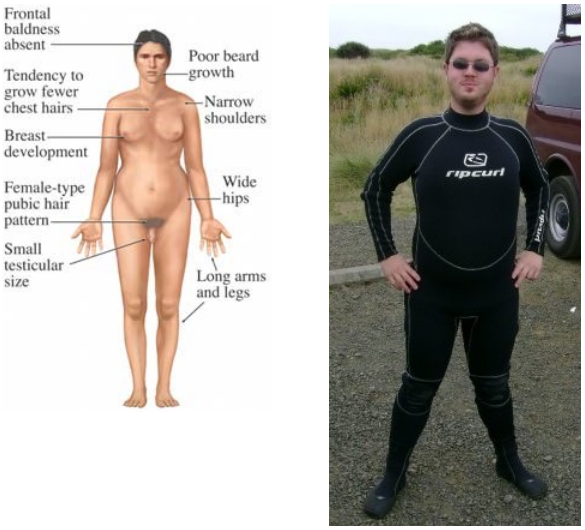


Figure 16.4.1: Symptoms of Klinefelter's syndrome [left] and 29 year old male undergoing testosterone treatment [right].

Intersex is the term used to describe situations where a person's anatomy does not fit neatly into the male or female categories. There are several situations where hormones are not produced or bodies do not respond to the hormones that are produced resulting in intersex conditions. The most common of these are CAH and androgen insensitivity syndrome.

It is beyond the scope of this chapter, and indeed this book, to address all of the details involved here (for some short really interesting talks I would suggest watching Emily Quinn's TedTalk and actually anything else she has uploaded or written) but it is my hope that this small introduction has made you realize that even the largest argument for binaries – that humans are biologically "intended to be" either male or female – is very far from fact.

Although male and female are the most typical biologically ordained poles of sexual identity, a vast number of gradations can be produced by normally occurring variations in the underlying hormonal control mechanisms that guide gender differentiation" (Panksepp, 2004, page 234). In humans, intersex individuals make up about two percent—more than 150 million people—of the world's population (Blackless et al., 2000). There are dozens of conditions that can lead to intersex anatomical variations, such as Androgen Insensitivity Syndrome and Turner's Syndrome (Lee et al., 2006). The term "syndrome" can be misleading; although intersex individuals may have physical limitations (e.g., about a third of Turner's individuals have heart defects; Matura et al., 2007), they otherwise lead relatively normal intellectual, personal, and social lives. In any case, intersex individuals demonstrate the diverse variations of biological sex.

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16.5: Gender dysphoria

A growing body of research is now focused on Gender Dysphoria, or the distress accompanying a mismatch between one's gender identity and biological sex (American Psychiatric Association, 2013). Although prevalence rates are low, at approximately 0.3 percent of the United States population (Russo, 2016), children who later identified as transgender, often stated that they were the opposite gender as soon as they began talking. Comments such as stating they prefer the toys, clothing and anatomy of the opposite sex, while rejecting the toys, clothing, and anatomy of their assigned sex are criteria for a diagnosis of Gender Dysphoria in children. Certainly, many young children do not conform to the gender roles modeled by the culture and even push back against assigned roles. However, they do not experience discomfort regarding their gender identity and would not be identified with Gender Dysphoria. [1]

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CHAPTER OVERVIEW

17: Family

17.1: Definitions
17.2: Family structures
17.3: Influences on parenting
17.4: Developmental issues in parenting
17.5: Parenting styles
17.6: Sibling relationships
17.7: The child and the family
17.8: Stress, violence and abuse

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17.1: Definitions

Family: The words, “family” and “families” will be used to signify the diverse social and cultural constructions that may be derived from (a) values, beliefs, or relationship bonds (e.g., cohabitation), (b) blood, marriage, or legal ties (e.g., adoption), (c) social bonds (e.g., fostering, nurturing, or economic ties), and (d) decision-making related to day-to-day functioning[1] Therefore, “family” may include, but is not limited to, extended family members, guardians, fictive kin, foster families, close friends, those joined by legal or biological ties, etc.

Despite contextual factors and varied goals associated with parenting, roles and responsibilities of parenthood are derived from national and international laws, policies, research, and practice. Below are well-agreed upon fundamental tasks of parenthood[2] that extend across many cultures:

- **Safety and sustenance:** ensuring adequate food, housing, clothing, medical care, and protection from harm in a multitude of contexts (e.g., neighborhood, household structure)
- **Socioemotional support**: providing warm and positive responsivity, affection, communication, expectations, affirmations, encouragement, emotional regulation, guidance, discipline, and modeling of appropriate behaviors
- **Stimulation/instruction**: encouraging achievement and learning through exposure to developmentally-appropriate and culturally- enriching experiences
- **Supervision:** monitoring whereabouts, communications, activities; collecting information from various sources; maintaining ongoing, reciprocal communications with children
- **Structure:** facilitating organized environments and activities via routines, rituals, scaffolding, and time management
- **Socialization:** supporting connections with communities, relatives, friends, peers, and institutions [3]



Figure **17.1.1**:: A parent feeding their child exhibits the “providing sustenance” task of parenting. (Photo Credit: Andrea Piacquadio, Pexels License)

Many “family functions” are similar to parenting tasks, goals, and responsibilities. However, it is important to understand how “family functions” and parenting tasks impact each other. The following is a list of somewhat universal family functions (e.g., almost all families in all countries worldwide have some of these in common):

- **Economic support**: providing basic needs, such as food, shelter, clothing, etc.
- **Emotional suppor**t: providing love, comfort, intimacy, companionship, nurturing, belongingness, etc.
- **Socialization of children**: rearing children, parenting, helping children function to the best of their abilities within their cultural and societal roles.
- **Control of sexuality**: defining and managing when and with whom (e.g., marriage) sexuality occurs.

- **Procreation**: contributing to the continuation of society and
- **Ascribed status**: providing a social identity (e.g., social class, race, ethnicity, kinship, religion, etc.) [4]



Figure 17.1.1: This infant getting immunization shots is being provided for in ways that not all families can afford. (Photo Credit: Maria Immaculata Hospital, CC BY-SA 4.0)

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17.2: Family structures



Figure **17.2.1**: Traditional nuclear families include heterosexual adult partners with sundry number of kids (Photo Credit: Emma Bauso, Pexels License)

“Family structures” delineate household members who are related by blood or legal ties; this concept typically assumes there is at least one child younger than 18 years of age residing in the household.

US Census Bureau data shows that in 2016 50.7 million children lived with two parents (many of whom had a sibling or other family members also present), 3 million lived with father only, 17.2 million lived with mother only and 2.8 had no parent present in their household (55% of this last category lived with a grandparent in the household).

Specific structures include two-parent, one-parent, and “living with neither parent” (e.g., grandparents or other relatives rearing a child, families providing foster care, and children living in institutionalized settings), blended families, single-parent plus partner families (cohabiting couples, for example), multigenerational families, binuclear families, and adoptive families.

The U.S. Census Bureau utilizes these definitions of family structures:

- **Nuclear family:** a child lives with two married biologically-related parents and with only full siblings, if siblings are present.
- **Cohabiting families:** a child’s parent lives with at least one opposite-sex, non-related adult. This additional adult may or may not be the biological parent of the child.
- **Same-sex cohabiting/married families:** a child’s parent lives with at least one same-sex, non-related adult. The additional adult may or may not be the biological parent of the child.
- **Stepfamilies and blended families (terms used interchangeably):** children who live in a household formed through remarriage resulting in children living with one or no biologically- related parents. The presence of a stepparent, stepsibling, or half-sibling designates a family as [1]

The sociology of the family examines the family as an institution and a unit of socialization. Sociological studies of the family look at demographic characteristics of the family members: family size, age, ethnicity and gender of its members, social class of the family, the economic level and mobility of the family, professions of its members, and the education levels of the family members.

Currently, one of the biggest issues that sociologists study are the changing roles of family members. Often, each member is restricted by the gender roles of the traditional family. These roles, such as the father as the breadwinner and the mother as the homemaker, are declining. Now, the mother is often the supplementary provider while retaining the responsibilities of child rearing. In this scenario, females' role in the labor force is "compatible with the demands of the traditional family.” Sociology studies have examined the adaptation of males' role to caregiver as well as provider. The gender roles are becoming increasingly interwoven and various other family forms are becoming more common.

What families look like is illustrated in the following pictures:



Figure 17.2.2: A childless family [2]



Figure 17.2.3: A single parent (father) family[3]



Figure 17.2.4: An extended family[4]



Figure 17.2.5: A same-sex family[5]



Figure 17.2.6: Asingle parent (mother) family[6]



Figure 17.2.7: A two-parent (nuclear) family[7]

In the preceding images, you can see a variety of types of families. A few of these family types are included below:

Families with One Parent

A **single parent family** usually refers to a parent who has most of the day-to-day responsibilities in the raising of the child or children, who is not living with a spouse or partner, or who is not married. The dominant caregiver is the parent with whom the children reside the majority of the time. If the parents are separated or divorced, children live with their custodial parent and have visitation with their noncustodial parent. In western society in general, following separation a child will end up with the primary caregiver, usually the mother, and a secondary caregiver, usually the father. There is a growing community of **single parent by choice** families in which a family is built by a single adult (through foster care, adoption, donor gametes and embryos, and surrogacy).



Figure 17.2.8: A single-parent family is more common today than in past years.[8]

Single parent by choice families refer to a family that a single person builds by choice. These families can be built with the use of assisted reproductive technology and donor gametes (sperm and/or egg) or embryos, surrogacy, foster or kinship care, and adoption.

Two Parent Families

The nuclear family is often referred to as the traditional family structure. It includes two married parents and children. While common in industrialized cultures (such as the U.S.), it is not actually the most common type of family worldwide.[9]

Cohabitation

Cohabitation is an arrangement where two people who are not married live together in an intimate relationship, particularly an emotionally and/or sexually intimate one, on a long-term or permanent basis. Today, cohabitation is a common pattern among people in the Western world. More than two-thirds of married couples in the U.S. say that they lived together before getting married.

Gay parenting



Figure 17.2.9: A family with parents of the same sex are growing in number in the US.[12]

Gay and lesbian couples with children have same-sex families. While now recognized legally in the United States, discrimination against same-sex families is not uncommon. According to the American Academy of Pediatrics, there is “ample evidence to show that children raised by same-gender parents fare as well as those raised by heterosexual parents. More than 25 years of research have documented that there is no relationship between parents' sexual orientation and any measure of a child's emotional, psychosocial, and behavioral adjustment. Conscientious and nurturing adults, whether they are men or women, heterosexual or homosexual, can be excellent parents. The rights, benefits, and protections of civil marriage can further strengthen these families.”[13]

Blended families

Blended families describe families with mixed parents: one or both parents remarried, bringing children of the former family into the new family[14]. Blended families are complex in a number of ways that can pose unique challenges to those who seek to form successful stepfamily relationships (Visher & Visher, 1985). These families are also referred to as stepfamilies.

Families That Include Additional Adults

Extended families include three generations, grandparents, parents, and children. This is the most common type of family worldwide.[15]

Data from the US Census bureau (2022) shows that compared to 2008, in 2018 regardless of ethnic group all children were more likely to live in multigenerational households. Data (2019) also shows that 1.3 million US grandparents are working in the labor force and responsible for their grandchildren's basic care.

Families by choice are relatively newly recognized. Popularized by the LGBTQ community to describe a family not recognized by the legal system. It may include adopted children, live-in partners, kin of each member of the household, and close friends. Increasingly family by choice is being practiced by those who see benefit to including people beyond blood relatives in their families.[16]

While most families in the U.S. are **monogamous**, some families have more than two married parents. These families are **polygamous**.[17] Polygamy is illegal in all 50 states, but it is legal in other parts of the world.[18]

Additional Forms of Families

Kinship families are those in which the full-time care, nurturing, and protection of a child is provided by relatives, members of their Tribe or clan, godparents, stepparents, or other adults who have a family relationship to a child. When children cannot be cared for by their parents, research finds benefits to kinship care.[19]

When a person assumes the parenting of another, usually a child, from that person's biological or legal parent or parents this creates **adoptive families.** Legal adoption permanently transfers all rights and responsibilities and is intended to affect a permanent change in status and as such requires societal recognition, either through legal or religious sanction. Adoption can be done privately, through an agency, or through foster care and in the U.S. or from abroad. Adoptions can be closed (no contact with birth/biological families or open, with different degrees of contact with birth/biological families). Couples, both opposite and same-sex, and single parents can adopt (although not all agencies and foreign countries will work with unmarried, single, or same-sex intended parents). [20]

When parents are not of the same ethnicity, they build **interracial families.** Until the decision in Loving v Virginia in 1969, this was not legal in the U.S. There are other parts of the world where marrying someone outside of your race (or social class) has legal and social ramifications.[21] These families may experience issues unique to each individual family’s culture.

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17.3: Influences on parenting

Parenting is a complex process in which parents and children both impact one another. There are many reasons that parents behave the way they do. The multiple influences on parenting are still being explored. Proposed influences on parental behavior include:

1. parent characteristics,
2. child characteristics, and
3. contextual and sociocultural characteristics.1 2[1]

Parent Characteristics

Parents' personalities also affect parenting behaviors. Parents who are more agreeable, conscientious, and outgoing are warmer and provide more structure to their children. Parents who are more agreeable, less anxious, and less negative also support their children's autonomy more than parents who are anxious and less agreeable. Parents who have these personality traits appear to be better able to respond to their children positively and provide a more consistent, structured environment for their children.[2]

Parents' developmental histories, or their experiences as children, can also affect their parenting strategies. Parents may learn parenting practices from their own parents. Fathers whose own parents provided monitoring, consistent and age-appropriate discipline, and warmth are more likely to provide this constructive parenting to their own children.[3] Patterns of negative parenting and ineffective discipline also appear from one generation to the next. However, parents who are dissatisfied with their primary caregivers' approach may be more likely to change their parenting methods when they have children.



Figure **17.3.1**: A child with a difficult temperament can have a significant impact on a parent. (Photo Credit: Harald Groven, CC BY-SA 2.0)

Child Characteristics

Parenting is bidirectional. Not only do parents and caregivers affect their children, but children influence their parents/primary caregivers as well.[4] Child characteristics, such as gender identity, birth order, temperament, and health status, can affect child-rearing behaviors and roles. For example, an infant with an easy temperament may enable caregivers to feel more effective, as they are easily able to soothe the child and elicit smiling and cooing. On the other hand, a cranky or fussy infant can elicit fewer positive reactions from caregivers and may result in parents feeling less effective in the role.[5] Over time, parents of more difficult children may become more punitive and less patient with their children.[6] Many parents who have a fussy, difficult child have been found to be less satisfied with their relationships and have greater challenges in balancing work and family roles.[7] Thus, child temperament is one of the child characteristics that influences how caregivers behave with their children.

Another child characteristic is the child's gender identity. Some parents assign different household chores to their children based on their childs gender identity. For example, older research has shown girls are more often responsible for caring for younger siblings and household chores, whereas boys are more likely to be asked to perform chores outside the home, such as mowing the lawn.[8] Research has also demonstrated that some parents talk differently with their children based on their child's gender identity, such as providing more scientific explanations to their sons and using more emotion words with their daughters.[9]

Contextual Factors and Sociocultural Characteristics

The parent-child relationship does not occur in isolation. Sociocultural characteristics, including economic hardship, religion, politics, neighborhoods, schools, and social support, can also influence parenting. Parents who experience economic hardship tend to be more easily frustrated, depressed, and sad, and these emotional characteristics can affect their parenting skills.[10] Culture can also impact parenting behaviors in fundamental ways. Although promoting the development of skills necessary to function effectively in one's community, to the best of one's abilities, is a universal goal of parenting, the specific skills necessary vary widely from culture to culture. Thus, parents have different goals for their children that partially depend on their culture.[11] For example, parents vary in how much they emphasize goals for independence and individual achievements and goals involving maintaining harmonious relationships and being embedded in a strong network of social relationships.

These differences in parental goals can also be influenced by culture and immigration status. Other important contextual characteristics, such as the neighborhood, school, and social networks, can affect parenting, even though these settings do not always include both the child and the parent.[12] For example, Latina mothers who perceived their neighborhood as more dangerous showed less warmth with their children, perhaps because of the greater stress associated with living in a threatening environment.[13]

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17.4: Developmental issues in parenting

Relationships between parents and children are important throughout childhood. Some people might say that there are either "tough" or "easy-going" parenting styles. Keep in mind that most parents do not follow any model completely. Real people tend to fall somewhere in between these styles. And sometimes parenting styles change from one child to the next or in times when the parent has more or less time and energy for parenting. Parenting styles can also be affected by concerns the parent has in other areas of his or her life. For example, parenting styles tend to become more authoritarian when parents are tired and perhaps more authoritative when they are more energetic (the terms "authoritarian" and "authoritative" are discussed in the section on parenting styles). Sometimes parents seem to change their parenting approach when others are around, maybe because they become more self-conscious as parents or are concerned with giving others the impression that they are a “tough” parent or an “easy-going” parent. And of course, parenting styles may reflect the type of parenting someone saw modeled while growing up.



Figure **17.4.1**: One of the main functions of a family is to allow children multiple opportunities to interact with each other, adults, in play situations indoors and outdoors. The relationships with parents act as a major influence on children’s development.[1]

Socialization Agents During Adolescence

Adolescence is a crucial period in social development, research shows there are four main types of relationships that influence an adolescent: parents, peers, community, and society.

Parents and Teens: Autonomy and Attachment

While most adolescents get along with their parents, they do spend less time with them (Smetana, 2011). This decrease in the time spent with families may be a reflection of a teenager’s greater desire for independence or **autonomy.** It can be difficult for many parents to deal with this desire for autonomy. However, it is normal for teenagers to increasingly distance themselves and establish relationships outside of their families in preparation for adulthood.

Children in middle and late childhood are increasingly given greater freedom regarding basic decision making. This continues in adolescence, as teens demand more and more control over the decisions that affect their daily lives. Teens believe they should manage the areas that parents previously had considerable control over, which can increase tension between parents and their teenagers. Their arguments often center on issues of a power struggle or conflict in areas such as chores, homework, curfew, dating, personal appearance, and the right to privacy.



Figure **17.4.2**: Teenagers report more conflicts with their mothers.[2]

As teens grow older, more compromise is reached between parents and teenagers (Smetana, 2011). Teens report more conflict with their mothers, as many mothers believe they should still have some control over many of these areas, yet often report their mothers to be more encouraging and supportive (Costigan, Cauce, & Etchison, 2007). Parents are more controlling of daughters, especially early maturing girls, than they are sons (Caspi, Lynam, Moffitt, & Silva, 1993). In addition, culture and ethnicity also play a role in how restrictive parents are with the daily lives of their children (Chen, Vansteenkiste, Beyers, Soensens, & Van Petegem, 2013).[3]

Having supportive, less conflict ridden relationships with parents also benefits teenagers. Research on attachment in adolescence finds that teens who are still securely attached to their parents have less emotional problems (Rawatlal, Kliewer & Pillay, 2015), are less likely to engage in drug abuse and other criminal behaviors (Meeus, Branje & Overbeek, 2004), and have more positive peer relationships (Shomaker & Furman, 2009). This means that both parents and teenagers need to strike a balance between autonomy, while still maintaining close and caring familial relationships.[4]

The Parent-Child Relationship

The relationship with parents may be a mitigating factor of the negative influence by peers. Communicating family rules and parental style have been inversely associated to substance, alcohol, and tobacco consumption during adolescence. This influence is essential for adolescents' development up to adulthood. Communication between parents and adolescents emerges as a protective factor for alcohol, tobacco, and substance use (Newman, Harrison & Dashiff, 2008).

Sen (2010) observed that family meals could lead to creating a closer relation between parents and adolescents, by strengthening a positive relationship and avoiding certain risk behaviors, such as substance use amongst girls and alcohol consumption, physical violence, and robberies, amongst boys. These differences between genders may be due to a greater importance that girls attribute to family activities but they do not reveal that boys are indifferent to them, only that the relation between genders may differ. Huebner and Howell (2003) verified that parental monitoring and communication with parents protected adolescents of both genders from being involved in risk behaviors.



Figure **17.4.3**: If this father monitors and communicates with his son, he can reduce the teen's risky behaviors.[5]

Parental monitoring can be defined as parents' knowledge about their children's activities, who they hang out with and what they do. It has been associated to protection of various risk behaviors throughout adolescence, such as substance use or sexual behaviors. The greater the parental monitoring, the lower the adolescents' involvement in risk behavior. It may vary according to age, gender or ethnicity and it generally decreases with age (Westling, Andrews, Hampson & Peterson, 2008).[6]

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17.5: Parenting styles

Baumrind

Baumrind (1971) offers a model of parenting that includes four styles. Baumrind's original research suggested that there are two critical components or dimensions of parenting along which parents differ. Those dimensions are warmth or affection, and control or discipline. Since parents can be high or low on each of these dimensions, there are four resulting parenting styles:

The first, **authoritarian**, is the traditional model of parenting (high control, low warmth) in which parents make the rules and children are expected to be obedient. Baumrind suggests that authoritarian parents tend to place maturity demands on their children that are unreasonably high and tend to be aloof and distant. Consequently, children reared in this way may fear rather than respect their parents and, because their parents do not allow discussion, may take out their frustrations on safer targets-perhaps as bullies toward peers.

Permissive parenting (low control, high warmth) involves holding expectations of children that are below what could be reasonably expected from them. Children are allowed to make their own rules and determine their own activities. Parents are warm and communicative, but provide little structure for their children. Children fail to learn self-discipline and may feel somewhat insecure because they do not know the limits.

Authoritative parenting (high control, high warmth) involves being appropriately strict, reasonable, and affectionate. Parents allow negotiation where appropriate and discipline matches the severity of the offense. A popular parenting program that is offered in many school districts is called “Love and Logic” and reflects the authoritative or democratic style of parenting just described.

Uninvolved parents (low control, low warmth), also referred to as rejecting/neglecting are disengaged from their children. They do not make demands on their children and are non-responsive. These children can suffer in school and in their relationships with their peers (Gecas & Self, 1991).

This view of parenting styles has been studied repeatedly by developmental psychologists and for decades it was agreed that authoritative parenting has the best adjustment outcomes for children - in school, in their social relationships and in their self esteem.

Other conceptualizations of parenting suggest the following as well:

Overindulgent parenting (also similar to Baumrind's permissive parent) is providing children with too much of what “looks good, too soon, too long.”[2] Oftentimes, it appears that parents implement these strategies to fulfill their own unmet needs or feelings of neglect from their own childhood. They might give children an overabundance of things, experiences, family resources, freedom with minimal boundaries and limits that are inappropriate for the child.[3]

Helicopter parenting is characterized by caregivers who are *extremely overinvolved in their child’s life* due to the belief that they can protect their child’s physical and/or emotional well-being. Caregivers using this approach appear overbearing and overprotective due to the close attention they pay to all of their child’s problems and successes. Parents “hover overhead” by constantly overseeing or being excessively interested in every aspect of their child’s life. Some contend that cell phones are “the world’s longest umbilical cord” which is contributing to this phenomenon.[4]

The traditional parenting style is more commonly used in families with non-Western cultural values. Parents using this approach expect their children to respect and obey authority (e.g., parents, elders, etc.) and comply with their cultural beliefs and values without questions. Parents using this approach are high in demandingness, warmth, and responsiveness, similar to the authoritative approach, however, they do not engage in democratic discussions.[5] This style was created because many parenting styles in non-Western cultures do not meet the criteria for authoritarian (due to expressing warmth) or authoritative (due to lack of communication).

For example, many families who self-identify as Asian Americans and Latino Americans engage in high demandingness and expect respect and obedience of their children. However, these caregivers also value closeness and love which is different from the authoritarian parenting style. Adolescents who grow up in families using traditional parenting style characteristics tend to show higher academic achievements and lower behavioral and psychological problems when compared to their peers who are reared by

caregivers using the authoritarian approach. These positive outcomes may be related to the closeness and love shown to children, which is different from the “cold” or “distant” characteristics consistent with the authoritarian style. [6]

There is much less research on the following types of parenting, but LeMasters and Defrain's 1983 book on parenting has been cited numerous times.

LeMasters and Defrain

Lemasters and Defrain (1989) offer another model of parenting. This model is interesting because it looks more closely at the motivations of the parent and suggests that parenting styles are often designed to meet the psychological needs of the parent rather than the developmental needs of the child.

The **martyr** is a parent who will do anything for the child; even tasks that the child should do for himself or herself. All of the good deeds performed for the child, in the name of being a “good parent”, may be used later should the parent want to gain compliance from the child. If a child goes against the parent’s wishes, the parent can remind the child of all of the times the parent helped the child and evoke a feeling of guilt so that the child will do what the parent wants. The child learns to be dependent and manipulative as a result.

The **pal** is like the permissive parent described previously in Baumrind’s model. The pal wants to be the child’s friend. Perhaps the parent is lonely or perhaps the parent is trying to win a popularity contest against an ex-spouse. Pals let children do what they want and focus mostly on being entertaining and fun and set few limitations. Consequently, the child may have little self-discipline and may try to test limits with others.

The **police officer/drill sergeant** style of parenting is similar to the authoritarian parent described by Baumrind. The parent focuses primarily on making sure that the child is obedient and that the parent has full control of the child. Sometimes this can be taken to extreme by giving the child tasks that are really designed to check on their level of obedience. For example, the parent may require that the child fold the clothes and place items back in the drawer in a particular way. If not, the child might be scolded or punished for not doing things “right”. This type of parent has a very difficult time allowing the child to grow and learn to make decisions independently. And the child may have a lot of resentment toward the parent that is displaced on others.

The **teacher-counselor** parent is one who pays a lot of attention to expert advice on parenting and who believes that as long as all of the steps are followed, the parent can rear a perfect child. “What’s wrong with that?” you might ask. There are two major problems with this approach. First, the parent is taking all of the responsibility for the child’s behavior-at least indirectly. If the child has difficulty, the parent feels responsible and thinks that the solution lies in reading more advice and trying more diligently to follow that advice. Another problem with this approach is that the child may get an unrealistic sense of the world and what can be expected from others.



Figure **17.5.1**: A father interacting with his son who is drawing a picture. He could be portraying the style of teacher-counselor or athletic coach[1]

So what is left? Lemasters and Defrain (1989) suggest that the **athletic coach** style of parenting is best. Before you draw conclusions here, set aside any negative experiences you may have had with coaches in the past. The principles of coaching are what are important to Lemasters and Defrain. A coach helps players form strategies, supports their efforts, gives feedback on what went right and what went wrong, and stands at the sideline while the players perform. Coaches and referees make sure that the rules of the game are followed and that all players adhere to those rules. Their role is to provide guidance while the child learns firsthand how to handle these situations. And the rules for behavior are consistent and objective and presented in that way. So, a child who is late for dinner might hear the parent respond in this way, "Dinner was at six o'clock." Rather than, "You know good and well that we always eat at six. If you expect me to get up and make something for you now, you have got another thing coming! Just who do you think you are showing up late and looking for food? You're grounded until further notice!"

Suggestions for good parenting

There are several techniques and suggestions for good parenting including active listening, I statements, CALM method, four pluses and a wish, anticipatory structure, grounding, constructive choices, induction (children reared in an environment with this approach tend to have higher moral reasoning, internalized standards for behaviors, prosocial skills, and resistance to external influences when compared to their peers who have not been exposed to this technique.[8]), natural, and immediate and consistent logical consequences, no-lose method, problem ownership, positive language, redirecting, reward oriented parenting and positive reinforcement, structure with flexibility – routines, rules and directions, warmth and consistency, time-ins and time-outs,

Cultural Influences on Parenting Styles

The impact of class and culture cannot be ignored when examining parenting styles. The two models of parenting described above assume that authoritative and athletic coaching styles are best because they are designed to help the parent raise a child who is independent, self-reliant and responsible. These are qualities favored in "individualistic" cultures such as the United States, particularly by the white middle class. African-American, Hispanic and Asian parents tend to be more authoritarian than non-Hispanic whites.



Figure 17.5.2: A family from a collectivistic culture.[9]

In “collectivistic” cultures such as China or Korea, being obedient and compliant are favored behaviors. Authoritarian parenting has been used historically and reflects cultural need for children to do as they are told. In societies where family members’ cooperation is necessary for survival, as in the case of raising crops, rearing children who are independent and who strive to be on their own makes no sense. But in an economy based on being mobile in order to find jobs and where one’s earnings are based on education, raising a child to be independent is very important.

Working class parents are more likely than middle class parents to focus on obedience and honesty when raising their children. In a classic study on social class and parenting styles called Class and Conformity, Kohn (1977) explains that parents tend to emphasize qualities that are needed for their own survival when parenting their children. Working class parents are rewarded for being obedient, reliable, and honest in their jobs. They are not paid to be independent or to question the management; rather, they move up and are considered good employees if they show up on time, do their work as they are told, and can be counted on by their employers. Consequently, these parents reward honesty and obedience in their children.

Middle class parents who work as professionals are rewarded for taking initiative, being self-directed, and assertive in their jobs. They are required to get the job done without being told exactly what to do. They are asked to be innovative and to work independently. These parents encourage their children to have those qualities as well by rewarding independence and self-reliance. Parenting styles can reflect many elements of culture.[10]

Spanking

Many adults can remember being spanked as a child. This method of discipline continues to be endorsed by the majority of parents (Smith, 2012). Just how effective is spanking, however, and are there any negative consequences? After reviewing the research, Smith (2012) states “many studies have shown that physical punishment, including spanking, hitting and other means of causing pain, can lead to increased aggression, antisocial behavior, physical injury and mental health problems for children” (p. 60).



Figure **17.5.3**: Spanking invariably is distressing for the child.[11]

Gershoff, (2008) reviewed decades of research and recommended that parents and caregivers make every effort to avoid physical punishment and called for the banning of physical discipline in all U.S. schools. Gershoff and Grogan-Kaylor (2016) completed another metanalysis that looked at research over 160,927 children . They found increased risk for negative outcomes for children who are spanked and that effects of spanking were similar to that of physical abuse.

In a longitudinal study that followed more than 1500 families from 20 U.S. cities, parents' reports of spanking were assessed at ages three and five (MacKenzie, Nicklas, Waldfogel, & Brooks-Gunn, 2013). Measures of externalizing behavior (aggression and rule-breaking) and receptive vocabulary were assessed at age nine.

Overall, 57% of mothers and 40% of fathers engaged in spanking when children were age 3, and 52% of mothers and 33% of fathers engaged in spanking at age 5. Maternal spanking at age 5, even at low levels, was associated with higher levels of aggression at age 9, even after an array of risks and earlier child behavior were controlled for. Father's high-frequency spanking at age 5 was associated with lower child receptive vocabulary scores at age 9. This study revealed the negative cognitive effects of spanking in addition to the increase in aggressive behavior.

Internationally, physical discipline is increasingly being viewed as a violation of children's human rights. Thirty countries have banned the use of physical punishment, and the United Nations Committee on the Rights of the Child (2014) called physical punishment "legalized violence against children" and advocated that physical punishment be eliminated in all settings.

Alternatives to spanking are advocated by child development specialists and include:

- Praising and modeling appropriate behavior
- Providing time-outs for inappropriate behavior
- Giving choices
- Helping the child identify emotions and learning to calm down
- Ignoring small annoyances
- Withdrawing privileges

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17.6: Sibling relationships

Siblings spend a considerable amount of time with each other and offer a unique relationship that is not found with same-age peers or with adults. Siblings play an important role in the development of social skills. Cooperative and pretend play interactions between younger and older siblings can teach empathy, sharing, and cooperation (Pike, Coldwell, & Dunn, 2005) as well as negotiation and conflict resolution (Abuhatoum & Howe, 2013). However, the quality of sibling relationships is often mediated by the quality of the parent-child relationship and the psychological adjustment of the child (Pike et al., 2005). For instance, more negative interactions between siblings have been reported in families where parents had poor patterns of communication with their children (Brody, Stoneman, & McCoy, 1994). Children who have emotional and behavioral problems are also more likely to have negative interactions with their siblings. However, the psychological adjustment of the child can sometimes be a reflection of the parent-child relationship. Thus, when examining the quality of sibling interactions, it is often difficult to tease out the separate effect of adjustment from the effect of the parent-child relationship.

While parents want positive interactions between their children, conflicts are going to arise, and some confrontations can be the impetus for growth in children's social and cognitive skills. The sources of conflict between siblings often depend on their respective ages. Dunn and Munn (1987) revealed that over half of all sibling conflicts in early childhood were disputes about property rights. By middle childhood this starts shifting toward control over social situations, such as what games to play, disagreements about facts or opinions, or rude behavior (Howe, Rinaldi, Jennings, & Petrakos, 2002). Researchers have also found that the strategies children use to deal with conflict change with age, but that this is also tempered by the nature of the conflict.

Abuhatoum and Howe (2013) found that coercive strategies (e.g., threats) were preferred when the dispute centered on property rights, while reasoning was more likely to be used by older siblings and in disputes regarding control over the social situation. However, younger siblings also use reasoning, frequently bringing up the concern of legitimacy (e.g., "You're not the boss") when in conflict with an older sibling. This is a very common strategy used by younger siblings and is possibly an adaptive strategy in order for younger siblings to assert their autonomy (Abuhatoum & Howe, 2013). A number of researchers have found that children who can use non-coercive strategies are more likely to have a successful resolution, whereby a compromise is reached and neither child feels slighted (Ram & Ross, 2008; Abuhatoum & Howe, 2013).



Figure **17.6.1**: Sibling relationships are unique in their closeness and shared history.[2]

A cultural lens

Like many other relationships and behaviors, sibling relationships are clearly affected a great deal by culture. In Hindu mythology, for example, cross gender sibling relationships, even half-sibling relationships are highly valued. One of the Hindu epics, the Ramayana, is based on the devotion of half siblings for each other, with one following another into a fourteen year exile and

another placing his exiled brothers slippers on the throne instead of taking over the kingdom wrongly. Hindus also celebrate a holiday called Raksha Bandhan (loosely translated as "Bond for security") where the sister ties a thread around the brother's wrist, and the brother reciprocates with a present.

In many poor, ethnically diverse families in urban centers of the US like Harlem, New York, middle school aged children are responsible for some of the basic needs of their younger siblings like getting them ready for school and getting them to and from school.

It is clear that culture and ethnicity play a large role in sibling relations. On the one hand from the Western perspective it is not ideal that young children should have to grow up so fast and become responsible for their younger family members. On the other hand, in many non-industrialized settings in the world older siblings learn many skills, and take an important role in their community by watching and modeling for younger children. So perhaps we can learn many things from other cultures, but also acknowledge that within the setting of our own culture we can do better to provide basic necessities for all families so that all children may enjoy their own growth at their own pace.

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17.7: The child and the family



Figure **17.7.1**: When children grow up to love reading, may have been influenced by the positive experiences of being read to in their families. .[2]

Family Atmosphere

One of the ways to assess the quality of family life is to consider the tasks of families. Berger (2005) lists five family functions:

1. Providing food, clothing and shelter
2. Encouraging learning
3. Developing self-esteem
4. Nurturing friendships with peers
5. Providing harmony and stability



Figure **17.7.2**: This mother is helping her son navigate using a tablet.[4]

Family systems theory

The **Family Systems Theory** assumes that a family is understood best by examining the family as one whole system. This one system is a complex, deeply-connected changing collection of parts, subsystems and family members, where each member has a known purpose or function.[5]

Other key concepts within the Family Systems Theory include:

- **boundaries** (e.g., who is a member of the system),
- **equilibrium** (e.g., during stressors or crises, the system attempts to return to its original state wherein members are functional and comfortable), and
- **bidirectional** (e.g., a change with one member will impact at least one other member, and hence impact the whole system).

Based on this theory, individuals experiencing a crisis or problem are best-served by assessments that include other members of the system as opposed to examining only one family member.[6]

This theory also assumes that families can examine their own processes and set deliberate goals. Change can occur when a family system acknowledges that a particular family pattern is dysfunctional and identifies new processes that support the family's goals. Resettlement is one example of a large change that a family system may choose or be forced to make.

In order to assess patterns of adjustment in families that have resettled into a new country, we must examine the **structure** of the family unit and the **processes** that occur within that family system.



Figure **17.7.3**: Doctors ask patients medical questions during a visit to a family practice clinic in Vietnam. (Photo Source: U.S. Air Force photo/Capt. Timothy Lundberg)

The **Systemic Family Development Theory** asserts that families are (a) **complex**, (b) **extremely diverse** related to the types, numbers, and timing of transitions and stressors, and (c) **multigenerational systems**. It also assumes that families share common processes through their development, but the processes must take into account intergenerational influences and variations within and between all families. No two families are alike.[9]

Many studies have shown that patterns of family interactions are similar within families across generations.[10][11] Intergenerational transmissions of conflict, trauma, communication styles, parenting practices, etc., continue to be examined.



Figure 17.7.4: Extended family members of multiple generations all provide experiences and relationships that shape children's development in different and meaningful ways. (Photo Source: Lee Hnetinka, Pexels License)

The following genogram (a pictorial display of family relationships and medical history) shows relationship patterns across generations within a family.

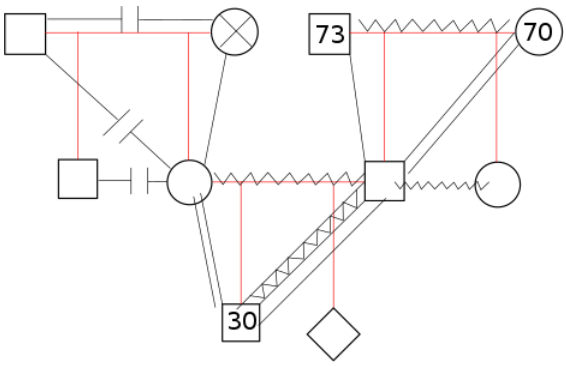


Figure 17.7.5: A genogram, a family tree that displays connections and relationships with more detail (Image Source: Wikimedia Commons, CC BY SA)

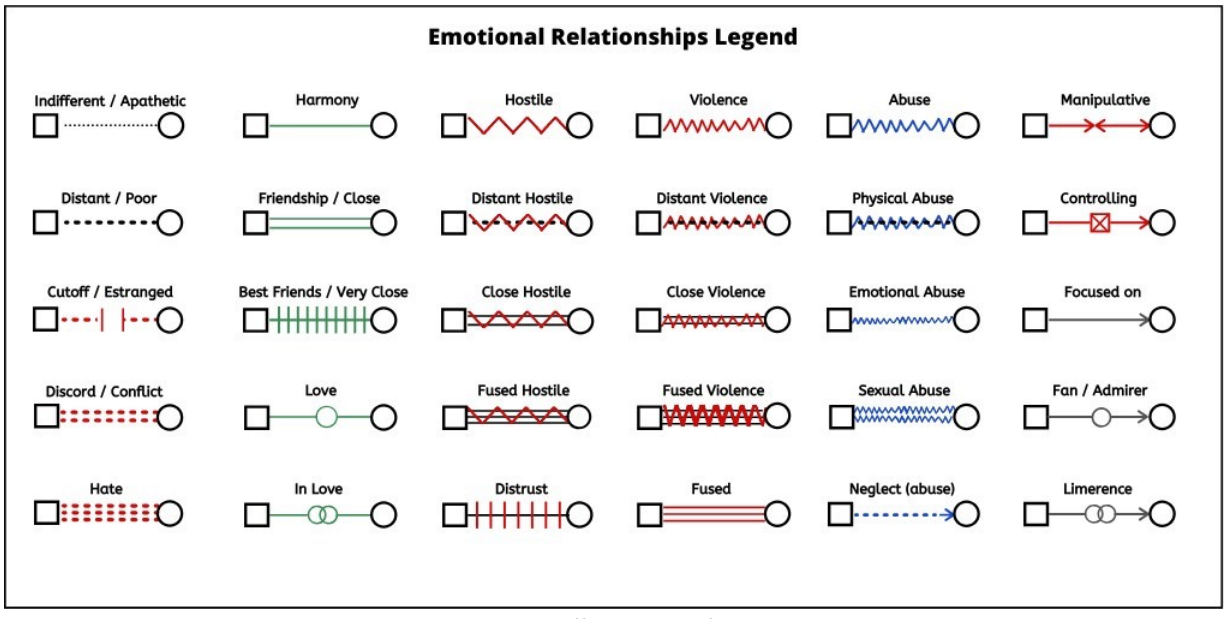


Figure 17.7.6: This legend explains what different kinds of connectors in a genogram represent.

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17.8: Stress, violence and abuse

The Family Stress Model

Family relationships are significantly affected by conditions outside the home. For instance, the **Family Stress Model** describes how financial difficulties are associated with parents' depressed moods, which in turn lead to marital problems and poor parenting that contributes to poorer child adjustment (Conger, Conger, & Martin, 2010). Within the home, parental marital difficulty or divorce affects more than half the children growing up today in the United States. Divorce is typically associated with economic stresses for children and parents, the renegotiation of parent-child relationships (with one parent typically as primary custodian and the other assuming a visiting relationship), and many other significant adjustments for children. Divorce is often regarded by children as a sad turning point in their lives, although for most it is not associated with long-term problems of adjustment (Emery, 1999)

Violence and Abuse

Violence and abuse are among the most disconcerting of the challenges that today's families face. Abuse can occur between spouses, between parent and child, as well as between other family members. The frequency of violence among families is difficult to determine because many cases of spousal abuse and child abuse go unreported. In any case, studies have shown that abuse (reported or not) has a major impact on families and society as a whole.

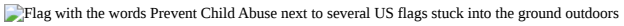


Figure **17.8.1**: Children and teens are among the most helpless victims of abuse.[2]

Does Corporal Punishment Constitute Child Abuse?

Physical abuse in children may come in the form of beating, kicking, throwing, choking, hitting with objects, burning, or other methods. Injury inflicted by such behavior is considered abuse even if the parent or caregiver did not intend to harm the child. Other types of physical contact that are characterized as discipline (spanking, for example) are not considered abuse as long as no injury results (Child Welfare Information Gateway 2008).

This issue is rather controversial among modern-day people in the United States. While some parents feel that physical discipline, or corporal punishment, is an effective way to respond to bad behavior, others feel that it is a form of abuse. According to a poll conducted by ABC News, 65 percent of respondents approve of spanking and 50 percent said that they sometimes spank their child. But in the U.S., the majority of mental health professionals, as well as other professionals such as physicians and child welfare personnel, do not support the use of physical punishment.

Tendency toward physical punishment may be affected by culture and education. Those who live in the South are more likely than those who live in other regions to spank their child. Those who do not have a college education are also more likely to spank their child (Crandall 2011). Currently, 23 states officially allow spanking in the school system; however, many parents may object and school officials must follow a set of clear guidelines when administering this type of punishment (Crandall 2011).

Decades of research have yielded more than 500 studies examining the impact of physical punishment on children (Gershoff & Grogan-Kaylor, 2016). Within the past 15 years, several meta-analyses have attempted to synthesize this body of research. In a highly publicized meta-analysis, Gershoff (2002) concluded that physical punishment is not only ineffective, but also harmful. It may lead to aggression by the victim, particularly in those who are spanked at a young age (Berlin 2009).

Debates about parental use of physical punishment have been ongoing in the USA for decades. Calls to "move beyond" the research, or to "end the debate," have become commonplace (e.g., Durrant & Ensom, 2017; MacMillan & Mikton, 2017). Three questions, it seems, sit at the center of these debates. Is physical punishment of children a Human Rights Issue? Is physical punishment effective? Is physical punishment harmful?[3]

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CHAPTER OVERVIEW

18: Culture and Media

18.1: Culture

18.2: Teen driving

18.3: Media

18.4: Media use in adolescence

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18.1: Culture

Community, Society, and Culture

Culture is learned and socially shared, and it affects all aspects of an individual's life. Social responsibilities, sexual expression, and belief-system development, for instance, are all likely to vary based on culture. Furthermore, many distinguishing characteristics of an individual (such as dress, employment, recreation, and language) are all products of culture.



Figure **18.1.1**: Culture is learned and socially shared.[1]

Many factors that shape child and adolescent development vary by culture.This is the reason why most of the topics discussed throughout the course have sections relating those to culture.

In psychological studies, cross cultural aspects of research take generally two slightly different approaches. Many cross cultural studies talk about comparisons across different countries and international approaches. However, some studies are more ethnographic - meaning that they describe one culture in depth.

For instance, the degree to which adolescents are perceived as autonomous, or independent beings varies widely in different cultures, as do the behaviors that represent this emerging autonomy. The lifestyle of an adolescent in a given culture is also profoundly shaped by the roles and responsibilities he or she is expected to assume. The extent to which an adolescent is expected to share family responsibilities, for example, is one large determining factor in normative adolescent behavior. Adolescents in certain cultures are expected to contribute significantly to household chores and responsibilities, while others are given more freedom or come from families with more privilege where responsibilities are fewer. Differences between families in the distribution of financial responsibilities or provision of allowance may reflect various socioeconomic backgrounds, which are further influenced by cultural norms and values.

Adolescents begin to develop unique belief systems through their interaction with social, familial, and cultural environments. These belief systems encompass everything from religion and spirituality to gender, sexuality, work ethics, and politics. The range of attitudes that a culture embraces on a particular topic affects the beliefs, lifestyles, and perceptions of its adolescents, and can have both positive and negative impacts on their development.

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18.2: Teen driving

In the U.S. getting a driver's license is a milestone in an adolescent's life. Driving gives teens a sense of freedom and independence from their parents. It can also free up time for parents as they are not shuttling teens to and from school, activities, or work. The National Highway Traffic Safety Administration (NHTSA) reports that in 2014 young drivers (15 to 20 year-olds) accounted for 5.5% (11.7 million) of the total number of drivers (214 million) in the US (National Center for Statistics and Analysis (NCSA), 2016). However, almost 9% of all drivers involved in fatal crashes that year were young drivers (NCSA, 2016), and according to the National Center for Health Statistics (2014), motor vehicle accidents are the leading cause of death for 15 to 20 year-olds. “In all motorized jurisdictions around the world, young, inexperienced drivers have much higher crash rates than older, more experienced drivers” (NCSA, 2016, p. 1).

The rate of fatal crashes is higher for young males than for young females, although for both genders the rate was highest for the 15-20 year-old age group. For young males, the rate for fatal crashes was approximately 46 per 100,000 drivers, compared to 20 per 100,000 drivers for young females. The NHTSA (NCSA, 2016) reported that of the young drivers who were killed and who had alcohol in their system, 81% had a blood alcohol count past what was considered the legal limit. Fatal crashes involving alcohol use were higher among young men than young women. The NHTSA also found that teens were less likely to use seat belt restraints if they were driving under the influence of alcohol, and that restraint use decreased as the level of alcohol intoxication increased.

AAA completed a study in 2014 that showed that the following are risk factors for accidents for teen drivers:

- Following cars too closely
- Driving too fast for weather and road conditions
- Distraction from fellow passengers
- Distraction from cell phones

According to the NHTSA, 10% of drivers aged 15 to 19 years involved in fatal crashes were reported to be distracted at the time of the crash; the highest figure for any age group (NCSA, 2016). Distraction coupled with inexperience has been found to greatly increase the risk of an accident (Klauer et al., 2014).



Figure **18.2.1**: Teens need to have solid driver training and awareness of driving challenges.[2]

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18.3: Media

Media is another agent of socialization that influences our political views; our tastes in popular culture; our views of women, people of color, and the LGBTQ+ community; and many other beliefs and practices. In an ongoing controversy, the media is often blamed for youth violence and many other of society's ills. The average child sees thousands of acts of violence on television and in the movies before reaching young adulthood. Rap lyrics often seemingly extol ugly violence, including violence against women. Commercials can greatly influence our choice of soda, shoes, and countless other products. The mass media may also reinforce racial and gender stereotypes, including the belief that women are sex objects and suitable targets of male violence. In the General Social Survey (GSS), about 28% of respondents said that they watch four or more hours of television every day, while another 46% watch 2-3 hours daily (see "Average Number of Hours of Television Watched Daily"). The media certainly are an important source of socialization that was unimaginable a half-century ago.

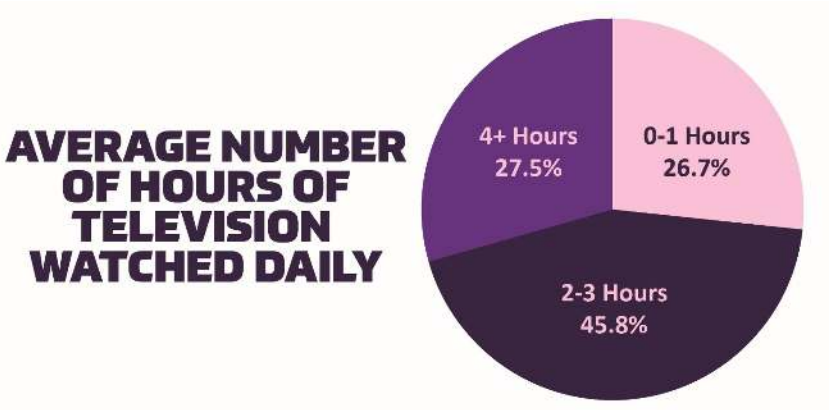


Figure 18.3.1: Daily television viewing time - in 2008 almost half of the participants watched 2-3 hours of TV daily while more than a quarter watched over four hours, and just over a quarter watched between 0 and 1 hour each day.[1]

As the media socializes children, adolescents, and even adults, a key question is the extent to which media violence causes violence in our society. Studies consistently uncover a strong correlation between watching violent television shows and movies and committing violence. However, this does not necessarily mean that watching the violence actually causes violent behavior: perhaps people watch violence because they are already interested in it and perhaps even committing it. Scholars continue to debate the effect of media violence on youth violence. In a free society, this question is especially important, as the belief in this effect has prompted calls for monitoring the media and the banning of certain acts of violence. Civil libertarians argue that such calls smack of censorship that violates the First Amendment to the Constitution, while others argue that they fall within the First Amendment and would make for a safer society. Certainly, the concern and debate over mass media violence will continue for years to come.[2]

Of course when we talk about technology, digital media and social media, we might be referring to slightly different things. Before 2007 phones were used for calls and texts. Today social media can broadly be divided into social networking sites, microblogs and photo/videosharing. But as the commonsense media research shows, children engage in all kinds of passive and active activities online (including for their school work).

Social Media Use

Social media has become ubiquitous in our contemporary world. Common Sense Media reported that there was a 17% increase in entertainment screen use of both tweens and teens from 2019 to 2021. Teen screen use increased from 7:22 hours to 8:39 hours, and tweens from 4:44 to 5:33 hours. In both age groups boys used screens for entertainment more than girls, Latinx children used it most, followed by Black children and White children used it least number of hours. Middle and lower income teens spent most number of hours on screens for entertainment. Viewing online videos was reported to be the favorite activity (as opposed to playing video games, social media, and other activities like browsing websites, content creation or video chatting) of both teens and tweens. Tween percent who used social media sites increased a lot between 2019 and 2021. They also found that in lower income households only 67% reported having a computer (laptop or desktop) in the home, while 89% of middle income and 94% of higher income 8-18 year olds had computers in the home.

It used to be that we would talk about media as the "idiot box" or TV in the family living room. But now media is available in every pocket - even every pocket on a playground slide! To show how many children this data might apply to, Kamenetz (Oct 2019) reports that 53% of those under 11, and 84% of teenagers own a smart phone.

Effects of digital media

What is the effect of this ubiquity? I know that in my lifetime I have seen huge changes. Since I was born in 1969 in India (in a big city middle class household), I knew a time before TV in my family home, and remember walking to extended family about 15 minutes away to watch biweekly programming for entertainment! There was no 24 hour programming and certainly no choices of channels to pick from. As I came to the US and witnessed (and was an unwitting participant in) the computer revolution, my cohort and I have wondered (and researched) the effects of this pervasiveness on my own children, my students and society at large. I wanted to point out this divide because much of at least the initial research comes from the studies that people of my generation (if not necessarily my SES or national background) have conducted. I have heard us referred to as "digital immigrants" as we certainly are! As a parent I struggled to monitor my children's exposure to first television, then video games, computers, and finally phones, social media and smart devices.

Jean Twenge at SDSU represents a group of my generation who claimed that there are several dangers of child media use and that children (particularly teens) have disappeared into their online lives, not engaging with their families, becoming more narcissistic, depressed and having greater suicidal ideation. Twenge's book "iGen" epitomizes and fuels this concern about how social media is bad for children. However, in Kamenetz's (Aug 2019) article, it is pointed out that not all psychologists agree. When radio first came out, psychologists were worried about radio addiction! The same went for TV and now for computerized media. Kamenetz discussed with Amy Orben at Cambridge University that the datasets used by Twenge showed only about 1% of the variance in teen depression is attributable to social media. In discussion with Keyes at Columbia University, Kamenetz was told that much of Twenge's data might be methodologically misinterpreted. Similarly Steele, Hall and Christofferson (2019) reviewed the literature about the effects of social media. Their scholarly article reported that adolescents themselves report ambivalence over their own and their peers' use of social media and digital technology.

In line with Twenge's work, Steele et al do suggest that adolescent psychosocial outcomes are affected by digital use. However, the latter conclude that there are several personal factors like age and gender, social factors like parental monitoring, preexisting social conditions like social isolation, preexisting mental health conditions like loneliness and depression, and situational variables like type of platforms used - that all moderate and mediate those effects. Simply speaking, some parts of this debate are similar to the age old question about TV viewing and aggression. I was certainly concerned about whether my children (and their cohort) were being exposed to too much violence on TV and that that was leading to more acts of violence in real life. But the argument many suggested then was that it was the children with aggressive tendencies who watch more violent TV and therefore it ends up looking like violence on TV leads to greater aggression. Similarly, it has been found that many children who are lonely and predisposed to depression engage in greater digital media pursuits, making it look like digital media leads to depression. Wang et al's review (2023) of 36 studies found that overall preschoolers spend more screen time than is recommended by the American Academy of Pediatrics (in 2001 they recommended no screen time before 18 months, and no more than an hour a day till age 5), and the WHO (in 2019 they recommended no screen time before 24 months and no more than an hour a day till age 5). In Wang et al's review they also found that a majority of studies found that there were negative effects on children's health, cognition and psychosocial functioning as a result of screen time and problematic digital use. But there were at least a few insignificant findings as well as many mediating individual (child sex, temperament, possible predispositions) and parent factors (parental digital time, addiction, parenting and education) that these studies uncovered as playing a role.

Steele et al also point out that the quality, frequency and type of media use affects these outcomes. For example, passive users of platforms like Facebook show more negative outcomes than more active users. They also suggest that there are many components of digital stress including availability stress (perceiving the need to be available to friends 24/7), approval anxiety (over belongingness and how the self is perceived - this is also greatly influenced by the use of platforms that are more permanent, public and picture based), fear of missing out, and connection overload.

All these issues are further confounded by the fact that children and adolescents' brains are not fully developed. With a prefrontal cortex that is still getting wired, and where peer relationships are replacing family ones in importance, adolescents' executive

functioning in the form of attention control, delayed gratification and perspective taking comes under huge stress. This is particularly true when the media in question are synchronous, available and quantifiable.

Recommendations for digital media use

So digital stress is not simply a monolithic issue. There are, and can be, no universal instructions for parents or clinicians. Technology has undoubtedly increased the quality of life for us all. The potential for learning, creativity, productivity and even social contact has increased manifold. It is unproductive in so many ways for parents to simply decry the use of technology by children. Keyes (in conversation with Kamenetz) points out that when parents' daily confrontations with their children are about reducing or removing their digital media, it leaves no room for communication about relationships, media and even ironically the stress that that media might be causing. In fact Jordan Shapiro at Temple University says it is better we lean into technology while parenting and spend more screen time with our kids.

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18.4: Media use in adolescence

Increasing evidence shows that electronic media use (EMU) is associated with adolescents' development and mental health (1). Adolescence is a critical transitional stage in physical, behavioral, and psychosocial development. Brain regions involved in extensive developmental transformation during adolescence are particularly impacted by EMU (2). Meta-analyses reported the association of excessive EMU with depressive symptoms and psychological distress in adolescents (3, 4). Excessive EMU (such as computer use, talking on the phone, and television viewing) may affect the holistic personal development of adolescents as it would replace other physical, social, and family activities. International public health guidelines have recommended that children should have no more than 2 h of EMU daily. When investigating the EMU behavior in adolescents, it is found that only one-third of adolescents worldwide have been able to adhere to the 2 h guideline suggestion (5, 6). Ostensibly, adolescents with excessive EMU are vulnerable to social, emotional, and behavioral difficulties (SEBD).

In this article authors further examine the relation of the timing of EMU to outcomes. Disruption of the circadian cycle as a result of the exposure to white light, the arousal resultant from late night gaming, and the togetherness engendered by family watching TV at night differentially affect SEBD outcomes in adolescence.

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CHAPTER OVERVIEW

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19.1: Peers and play

Relationships within the family (parent-child and siblings) are not the only significant relationships in a child's life. Peer relationships are also important. Social interaction with another child who is similar in age, skills, and knowledge provokes the development of many social skills that are valuable for the rest of life (Bukowski, Buhrmester, & Underwood, 2011). In peer relationships, children learn how to initiate and maintain social interactions with other children. They learn skills for managing conflict, such as turn-taking, compromise, and bargaining. Play also involves the mutual, sometimes complex, coordination of goals, actions, and understanding. For example, as preschoolers engage in pretend play they create narratives together, choose roles, and collaborate to act out their stories. Through these experiences, children develop friendships that provide additional sources of security and support to those provided by their parents.



Figure **19.1.1**: Navigating dramatic play provides great opportunities to continue to develop social skills with same-age peers .[1]

However, peer relationships can be challenging as well as supportive (Rubin, Coplan, Chen, Bowker, & McDonald, 2011). Being accepted by other children is an important source of affirmation and self-esteem, but peer rejection can foreshadow later behavior problems (especially when children are rejected due to aggressive behavior).

Peer relationships require developing very different social and emotional skills than those that emerge in parent-child relationships. They also illustrate the many ways that peer relationships influence the growth of personality and self-concept.[2]

Freud saw play as a means for children to release pent-up emotions and to deal with emotionally distressing situations in a more secure environment. Vygotsky and Piaget saw play as a way of children developing their intellectual abilities (Dyer & Moneta, 2006).

Piaget created stages of play that correspond with his stages of cognitive development. The stages are:

Table 19.1.1: Piaget's Stages of Play[3]

Stage	Description
Functional Play	Exploring, inspecting, and learning through repetitive physical activity.
Symbolic Play	The ability to use objects, actions, or ideas to represent other objects, actions, or ideas and may include taking on roles.[4]
Constructive Play	Involves experimenting with objects to build things[5]; learning things that were previously unknown with hands on manipulations of materials.
Games with Rules	Imposes rules that must be followed by everyone that is playing; the logic and order involved forms that the foundations for developing game playing strategy[6]

While Freud, Piaget, and Vygostsky looked at play slightly differently, all three theorists saw play as providing positive outcomes for children.

Parten

Mildred Parten (1932) observed two to five year-old children and noted six types of play. Three types she labeled as non-social (unoccupied, solitary, and onlooker) and three types were categorized as social play (parallel, associative, and cooperative). The table below describes each type of play. Younger children engage in non-social play more than those who are older; by age five associative and cooperative play are the most common forms of play (Dyer & Moneta, 2006). [7]

Table 19.1.2: Parten's Classification of Types of Play[8]

Category	Description
Unoccupied Play	Children's behavior seems more random and without a specific goal. This is the least common form of play.
Solitary Play	Children play by themselves, do not interact with others, nor are they engaging in similar activities as the children around them.
Onlooker Play	Children are observing other children playing. They may comment on the activities and even make suggestions, but will not directly join the play.
Parallel Play	Children play alongside each other, using similar toys, but do not directly act with each other
Associative Play	Children will interact with each other and share toys, but are not working toward a common goal.
Cooperative Play	Children are interacting to achieve a common goal. Children may take on different tasks to reach that goal.

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19.2: Functions of play

Bodrova et al (2023) describe play in the following manner: "Play is a freely chosen and intrinsically motivated activity controlled by the players. While humans engage in various forms of play way beyond early childhood (Van Vleet and Feeney, 2015), it is the early years when the impact of play on development is the greatest. The acknowledgment of the critical importance of play for young children is based on evidence from diverse fields, from evolutionary psychology (Greve and Thomsen, 2016) to child development (Vygotsky, 1967; Hewes, 2014) to pediatrics (Ginsburg, Committee on Communications, and Committee on Psychological Aspects of Child and Family Health, 2007; Yogman et al., 2018) and is reflected in the UN Convention on the Rights of the Child (Hodgkin and Newell, 2007)."

Play and learning

We intuitively "know" what separates play from other activities children engage in. There isn't necessarily consensus about the value of play in education - academic and socioemotional learning.

"While the educational field has not come to a single definition of play, there seems to exist some agreement about the features of an activity that qualifies as play: it must be pleasurable, process-oriented, intrinsically motivated, meaningful, iterative, and controlled by a child (Canning, 2012; Zosh et al., 2017, 2022). The activity possessing these qualities is frequently described as *spontaneous*[2] or *free* play (Hewes, 2014) to distinguish it from other activities that retain some degree of playfulness but are not entirely intrinsically motivated or child controlled."

Many people define play as children's work. They believe that the role playing can foster social learning, and that play also has an integral role in academic learning. In fact the science of learning suggests that children learn best when the learning environment is

- active
- engaging
- meaningful
- socially interactive
- iterative
- joyful

These are characteristics that are certainly characteristics of play situations, particularly in early childhood settings. In play environments children learn content, but they also learn collaboration, communication, critical thinking, creative innovation and confidence. When listed in this manner, it becomes pretty clear that play and formal "schoolified" education share multiple characteristics and outcomes particularly in early childhood years. Alternative schools like the Montessori method actively and explicitly employ these principles.

Pesch et al (2022) describe playful learning as a continuum ranging from free play which is child led, child initiated and generally has no intentional learning objective, to direct instruction. Guided play (where joy is an important component, and there is direction from the child, but gentle direction from the adult) falls in the middle of that continuum. Empirical research has shown that guided play increased math skills, vocabulary and greater learning and joyful exchanges with caregivers, especially in children from lower income and underresourced communities.

Other uses of play

Play is often used by occupational therapists in order to assess children's motor, cognitive, language and social skills (Salomatova, 2022). Therapists also assess such things as humor, interaction and so on.

On the other hand, play is also used as therapy by clinical social workers and psychoanalysts, particularly with young children who may not have great insight or be able to communicate fully their feelings and/or traumas.

Imaginative mindsets required in play can also foster creativity in humans of all ages.

Play can therefore be used as a diagnostic tool of emotional health, social and cognitive abilities and as a tool for learning and encouraging progress in these areas.

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19.3: Social understanding

Children's experience of relationships at home and the peer group contributes to an expanding repertoire of social and emotional skills and also to broadened social understanding. In these relationships, children develop expectations for specific people (leading, for example, to secure or insecure attachments to parents), understanding of how to interact with adults and peers, and developing self-concept based on how others respond to them. These relationships are also significant forums for emotional development.

Remarkably, young children begin developing social understanding very early in life. Before the end of the first year, infants are aware that other people have perceptions, feelings, and other mental states that affect their behavior, and which are different from the child's own mental states. Carefully designed experimental studies show that by late in the preschool years, young children understand that another's beliefs can be mistaken rather than correct, that memories can affect how you feel, and that one's emotions can be hidden from others (Wellman, 2011). Social understanding grows significantly as children's theory of mind develops.

How do these achievements in social understanding occur? One answer is that young children are remarkably sensitive observers of other people, making connections between their emotional expressions, words, and behavior to derive simple inferences about mental states (e.g., concluding, for example, that what Mommy is looking at is in her mind) (Gopnik, Meltzoff, & Kuhl, 2001). This is especially likely to occur in relationships with people whom the child knows well, consistent with the ideas of attachment theory discussed in the section on attachment and emotions.



Figure **19.3.1**: While children learn a lot from playing with each other, communicating with adults is a crucial part of development. [1]

Growing language skills give young children words with which to represent these mental states (e.g., "mad," "wants") and talk about them with others. Thus, in conversation with their parents about everyday experiences, children learn much about people's mental states from how adults talk about them ("Your sister was sad because she thought Daddy was coming home.") (Thompson, 2006b).

Developing social understanding is based on children's everyday interactions with others and their careful interpretations of what they see and hear. There are also some scientists who believe that infants are biologically prepared to perceive people in a special way, as organisms with an internal mental life, and this facilitates their interpretation of people's behavior with reference to those mental states (Leslie, 1994).

Hou et al (2020) showed that the presence of siblings affect the development of Theory of Mind. Infant are not born with a theory of mind, but by age 12 months, they understand that others have intentions and goals. By toddlerhood, they understand others' desires, ignorance and beliefs. Most children are able to understand the concept of false beliefs by 4-5 years and second order false beliefs a year or two later. Hou et al's review revealed that just the presence of siblings is not always positive for children's social understanding. But rather, studies have shown that the number, gender, birth order and age differences all play a role, and are

mediated by the types of relationships and behaviors siblings share - including reciprocity, social pretend play and sibling conflict and rivalry.



Figure **19.3.2**:

Parents of course play an important independent role in children's social understanding, but they also mediate and moderate sibling relationships and outcomes on social understanding. This mediation is a result of parenting style and mind-mindedness i.e. parents' attitude toward sibling relationships and whether they deal with conflict in a child centered (negotiations) manner or a punitive (scolding) manner.

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19.4: Peer groups



Figure 19.4.1: Peers influence a child's self-esteem.[2]

Children's conceptualization of what makes someone a "friend" changes from a more egocentric understanding to one based on mutual trust and commitment. Both Bigelow (1977) and Selman (1980) believe that these changes are linked to advances in cognitive development. Bigelow and La Gaipa (1975) outline three stages to children's conceptualization of friendship[3].

Table 19.4.1:- Three Stages to Children's Conceptualization of Friendship[4]

Stage	Descriptions
Stage One	**In stage one**, **reward-cost**, friendship focuses on mutual activities. Children in early, middle, and late childhood all emphasize similar interests as the main characteristics of a good friend.
Stage Two	**In stage two**, **normative expectation**, focuses on conventional morality; that is, the emphasis is on a friend as someone who is kind and shares with you. Clark and Bittle (1992) found that fifth graders emphasized this in a friend more than third or eighth graders.
Stage Three	**In stage three, empathy and understanding**, friends are people who are loyal, committed to the relationship, and share intimate information. Clark and Bittle (1992) reported eighth graders emphasized this more in a friend. They also found that as early as fifth grade, girls were starting to include the sharing of secrets and not betraying confidences as crucial to someone who is a friend.

Friendships are very important for children. The social interaction with another child who is similar in age, skills, and knowledge provokes the development of many social skills that are valuable for the rest of life (Bukowski, Buhrmester, & Underwood, 2011). In these relationships, children learn how to initiate and maintain social interactions with other children. They learn skills for managing conflict, such as turn-taking, compromise, and bargaining. Play also involves the mutual, sometimes complex, coordination of goals, actions, and understanding. Through these experiences, children develop friendships that provide additional sources of security and support to those provided by their parents.[5]

Five Stages of Friendship from Early Childhood through Adulthood

Selman (1980) outlines five stages of friendship from early childhood through to adulthood.

- In stage 0, **momentary physical interaction**, *a friend is someone who you are playing with at this point in time.* Selman notes that this is typical of children between the ages of three and six. These early friendships are based more on circumstances (e.g., a neighbor) than on genuine similarities.

- In stage 1, **one-way assistance**, *a friend is someone who does nice things for you*, such as saving you a seat on the school bus or sharing a toy. However, children in this stage, do not always think about what they are contributing to the relationships. Nonetheless, having a friend is important and children will sometimes put up with a not so nice friend, just to have a friend. Children as young as five and as old as nine may be in this stage.
- In stage 2, **fair-weather cooperation**, children are very concerned with fairness and reciprocity, and thus, *a friend is someone who returns a favor*. In this stage, if a child does something nice for a friend there is an expectation that the friend will do something nice for them at the first available opportunity. When this fails to happen, a child may break off the friendship. Selman found that some children as young as seven and as old as twelve are in this stage.
- In stage 3, **intimate and mutual sharing**, typically between the ages of eight and fifteen, *a friend is someone who you can tell them things you would tell no one else.* Children and teens in this stage no longer "keep score," and do things for a friend because they genuinely care for the person. If a friendship dissolves in this stage it is usually due to a violation of trust. However, children in this stage do expect their friend to share similar interests and viewpoints and may take it as a betrayal if a friend likes someone that they do not.
- In stage 4, **autonomous interdependence**, *a friend is someone who accepts you and that you accept as they are*. In this stage children, teens, and adults accept and even appreciate differences between themselves and their friends. They are also not as possessive, so they are less likely to feel threatened if their friends have other relationships or interests. Children are typically twelve or older in this stage.

Peer Groups

However, peer relationships can be challenging as well as supportive (Rubin, Coplan, Chen, Bowker, & McDonald, 2011). Being accepted by other children is an important source of affirmation and self-esteem, but peer rejection can foreshadow later behavior problems (especially when children are rejected due to aggressive behavior). With increasing age, children confront the challenges of bullying, peer victimization, and managing conformity pressures. Social comparison with peers is an important means by which children evaluate their skills, knowledge, and personal qualities, but it may cause them to feel that they do not measure up well against others. For example, a boy who is not athletic may feel unworthy of his football-playing peers and revert to shy behavior, isolating himself and avoiding conversation. Conversely, an athlete who doesn't "get" Shakespeare may feel embarrassed and avoid reading altogether.



Figure **19.4.2**: Social comparison with peers is an important means by which children evaluate their value.[7]

Also, with the approach of adolescence, peer relationships become focused on psychological intimacy, involving personal disclosure, vulnerability, and loyalty (or its betrayal)—which significantly affect a child's outlook on the world. Each of these aspects of peer relationships require developing very different social and emotional skills than those that emerge in parent-child relationships. They also illustrate the many ways that peer relationships influence the growth of personality and self-concept.[8]

Peer Relationships

Most children want to be liked and accepted by their friends. Some popular children are nice and have good social skills. These popular-prosocial children tend to do well in school and are cooperative and friendly. Popular-antisocial children may gain popularity by acting tough or spreading rumors about others (Cillessen & Mayeux, 2004). Rejected children are sometimes excluded because they are shy and withdrawn. The withdrawn-rejected children are easy targets for bullies because they are unlikely to retaliate when belittled (Boulton, 1999). Other rejected children are ostracized because they are aggressive, loud, and confrontational. The aggressive-rejected children may be acting out of a feeling of insecurity.



Figure **19.4.3**: Peer relationships are particularly important for children. They can be supportive but also challenging. Peer rejection may lead to behavioral problems later in life.[9]

Peer Relationships are studied using **sociometric assessment** (which measures attraction between members of a group). Children are asked to mention the three children they like to play with the most, and those they do not like to play with. The number of times a child is nominated for each of the two categories (like and do not like) is tabulated. Based on those tabulations, children are categorized into the following:

Table 19.4.2:- Categories in Peer Relationships[10]

Category	Description
Popular Children	Receive many votes in the “like” category, and very few in the “do not like” category.
Rejected children	Receive more unfavorable votes, and few favorable ones.
Controversial children	Mentioned frequently in each category, with several children liking them and several children placing them in the do not like category.
Neglected children	Rarely mentioned in either category.
Average children	Have a few positive votes with very few negative ones.
Popular-prosocial children	Are nice and have good social skills; tend to do well in school and are cooperative and friendly.
Popular-antisocial children	May gain popularity by acting tough or spreading rumors about others.
Rejected-withdrawn children	Are shy and withdrawn and are easy targets for bullies because they are unlikely to retaliate when belittled.
Rejected-aggressive children	Are ostracized because they are aggressive, loud, and confrontational. They may be acting out of a feeling of insecurity.

Unfortunately for rejected children, their fear of rejection only leads to behavior that brings further rejection from other children. Children who are not accepted are more likely to experience conflict, lack confidence, and have trouble adjusting. (Klima & Repetti, 2008; Schwartz, Lansford, Dodge, Pettit, & Bates, 2014).[11]

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19.5: Adolescent peer relationships

As children become adolescents, they usually begin spending more time with their peers and less time with their families, and peer interactions are increasingly unsupervised by adults. The level of influence that peers can have over an adolescent makes these relationships particularly important in their personal development. Adolescents with positive peer relationships are happier and better adjusted than those who are socially isolated or have conflictual peer relationships.

Adolescents' notions of friendship increasingly focus on intimate exchanges of thoughts and feelings, which are important to forming friendships; these high quality friendships may enhance a child's development regardless of the particular characteristics of those friends. In addition, peers also serve as an important source of social support and companionship during adolescence.

The peer group may serve as a model and influence behaviors and attitudes and also provide easy access, encouragement and an appropriate social setting for consumption (Glaser, Shelton & Bree, 2010). Social Learning Theory suggests that it is not necessary for adolescents to observe a given behavior and adopt it; it is sufficient to perceive that the peer group accepts it, in order to be able to opt for similar behaviors (Petraitis, Flay & Miller, 1995).[1]

Peers can serve both positive and negative functions during adolescence. Relationships with peers are valuable opportunities for adolescents to practice their social and conflict resolution skills. But negative peer pressure can lead adolescents to make riskier decisions or engage in more problematic behavior than they would alone or in the presence of their family. One of the most widely studied aspects of adolescent peer influence is known as **deviant peer contagion** (Dishion & Tipsord, 2011), which is the process by which peers reinforce problem behavior by laughing or showing other signs of approval that then increase the likelihood of future problem behavior.[2]

Peers may strongly determine preference in the way of dressing, speaking, using illicit substances, sexual behavior, adopting and accepting violence, adopting criminal and anti-social behaviors, and in many other areas of the adolescent's life (Padilla, Walker & Bean, 2009; Tomé, Matos & Diniz, 2008). An example of this is that the main motives for alcohol consumption given by adolescents are related to social events, which usually take place in the company of friends, namely: drinking makes holidays more fun, it facilitates approaching others, it helps relaxing or facilitates sharing experiences and feelings (Kuntsche, Knibbe, Gmel & Engels, 2005). Also, mimicking risk behaviors may be greater when consumption begins in the context of a social event (Larsen, Engels, Souren, Granic & Overbeek, 2010).



Figure 19.5.1: Adolescents might engage in underage drinking when they are with their peers.[3]

Having friends allows one to share experiences and feelings and to learn how to solve conflicts. Not having friends, on the other hand, leads to social isolation and limited social contacts, as there are fewer opportunities to develop new relations and social interactional skills.

Friendship is also positively associated with psychological well-being (Ueno, 2004), Stronger friendships may provide adolescents with an appropriate environment to development in a healthy way and to achieve good academic results. Adolescents with reciprocal friendships mention high levels of feelings of belonging in school; at the same time, reciprocity and feelings of belonging have positive effects in academic results (Vaquera & Kao, 2008).

School is a setting where interpersonal relations are promoted, which are important for youngsters' personal and social development (Ruini et al., 2009); it is responsible for the transmission of behavioral norms and standards and it represents an essential role in the adolescent's socialization process. The school is able to gather different peer communities and to promote self-esteem and a harmonious development between adolescents, which makes it a privileged space for meetings and interactions (Baptista, Tomé, Matos, Gaspar & Cruz, 2008). Adolescents spend a great part of their time at school, which also makes it a privileged context for involvement in or protection from risk behaviors (Piko & Kovács, 2010). Camacho, Tomé, Matos, Gamito and Diniz (2010) confirmed that adolescents who like school were those that more often were part of a peer group without involvement in risk behaviors; while those that mentioned they did not have any friends reported that they liked school less and those in conflict with their peers had more negative health outcomes.



Figure 19.5.2: Teens' self worth often hinges heavily on their personal appearance and comparisons with others.[4]

Despite the positive influence of the peer group during adolescence, the higher the adolescent's autonomy from the peer group, the higher their resilience against its influence. This resilience seems to increase with age, which may mean that it is associated with youngsters' maturity; and girls emerge in several studies as more resilient than boys (Sumter, Bokhorst, Steinberg & Westenberg, 2009).

Another factor that may be found in the influence of the peer group is the type of friendship, which adolescents maintain with their peer group: if friends are close they have a greater influence on the other's behaviors (Glaser, Shelton & Bree, 2010). When the friendship is perceived as reciprocal and of quality, it exerts greater influence (Mercken, Snijders, Steglich, Vartiainen & Vries, 2010). Another factor, which has been identified as a possible way of decreasing peer influence, is assertive refusal. Adolescents that are able to maintain an assertive refusal are less susceptible to the group's influence (Glaser, Shelton & Bree, 2010). These are only some variables identified as possible factors decreasing peer influence.[5]

Peers in Groups

During adolescence, it is common to have friends of the opposite sex much more than in childhood, peer groups evolve from primarily single-sex to mixed-sex. Teens within a peer group tend to be similar to one another in behavior and attitudes, which has been explained as a function of **homophily**, that is, adolescents who are similar to one another choose to spend time together in a "birds of a feather flock together" way. Adolescents who spend time together also shape each other's behavior.



Figure 19.5.3: **Clique**[7] - cliques are groups of teens who are friends with each other and do things together like this group dressed up to go to a dance.

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Figure 19.5.4: **Crowd**[8] - crowds are groups of teens that share the same sorts of interests/backgrounds but aren't necessarily all friends with each other.

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19.6: Dating and romantic relationships

Adolescence is the developmental period during which romantic relationships typically first emerge. By the end of adolescence, most American teens have dated others and have had at least one romantic relationship (Dolgin, 2011). However, culture does play a role as Asian Americans and Latinas are less likely to date than other ethnic groups (Connolly, Craig, Goldberg, & Pepler, 2004). Dating serves many purposes for teens, including having fun, companionship, status, socialization, intimacy, sexual experimentation, and partner selection for those in late adolescence (Dolgin, 2011). There are several stages in the dating process, beginning with engaging in mixed-sex group activities in early adolescence (Dolgin, 2011).

Table Romantic Relationships in Adolescence

Age	Relationship
Early Adolescence	Romantic relationships often form in the context of these mixed-sex peer groups (Connolly, Furman, & Konarski, 2000). Interacting in mixed-sex groups is easier for teens as they are among a supportive group of friends, can observe others interacting, and are kept safe from becoming intimate too soon.
Middle Adolescence	By middle adolescence, teens are engaging in brief, casual dating, or in group dating with other couples (Dolgin, 2011).
Late Adolescence	In late adolescence, dating involves exclusive, intense relationships that are short-lived or are long-term committed partnerships, either way their importance should not be minimized. Adolescents spend a great deal of time focused on romantic relationships or lack thereof. Their positive and negative emotions are tied to this intense interest more than they are to friendships, family relationships, or school (Furman & Shaffer, 2003).



Figure **19.6.1**: Romantic relationships emerge in adolescence.[2]

Violence by Someone You Know

Violence can be committed against someone that the victim knows well, referred to as an intimate, in many ways: an intimate can hit with their fists, slap with an open hand, throw an object, push or shove, or use or threaten to use a weapon. While we can never be certain of the exact number of intimates that are attacked, the U.S. Department of Justice estimates from its National Crime Victimization Survey that almost 600,000 acts of violence (2008 data) are committed annually by one intimate against another intimate. [3]

According to a fact sheet from the National Coalition Against Domestic Violence that compiled the results of several studies:

- In 2013, 35% of 10th graders reported that they had been physically or verbally abused and 31% reported having perpetrated such abuse
- In 2014, 10% of teenage students in dating relationships reported being coerced into sexual intercourse in the previous year
- In 2015, 20.9% of female and 13.4% of male high school students reported being physically or sexually assaulted by a dating partner
- But only 33% of teenage dating abuse victims reported having ever told anyone about it (according to a 2005 study) [4]

A 2010 report by the CDC shows the larger pictures of intimate partner violence

- 1 in 3 women and 1 in 4 men have been victims of some form of physical violence by an intimate partner in their lifetime
- 1 in 7 women and 1 in 18 men have been stalked by an intimate partner to the point that they were fearful for their safety[5]



Figure **19.6.2**: Almost a quarter of U.S. women have been physically assaulted by a spouse or partner.[6]

This topic is an important one because "domestic violence is prevalent in every community, and affects all people regardless of age, socio-economic status, sexual orientation, gender, race, religion, or nationality. Physical violence is often accompanied by emotionally abusive and controlling behavior as part of a much larger, systematic pattern of dominance and control. Domestic violence can result in physical injury, psychological trauma, and even death. The devastating consequences of domestic violence can cross generations and last a lifetime."[7]

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19.7: Sexuality

Human sexuality refers to people's sexual interest in and attraction to others, as well as their capacity to have erotic experiences and responses. Sexuality may be experienced and expressed in a variety of ways, including thoughts, fantasies, desires, beliefs, attitudes, values, behaviors, practices, roles, and relationships. These may manifest themselves in biological, physical, emotional, social, or spiritual aspects. The biological and physical aspects of sexuality largely concern the human reproductive functions, including the human sexual-response cycle and the basic biological drive that exists in all species. Emotional aspects of sexuality include bonds between individuals that are expressed through profound feelings or physical manifestations of love, trust, and care. Social aspects deal with the effects of human society on one's sexuality, while spirituality concerns an individual's spiritual connection with others through sexuality. Sexuality also impacts, and is impacted by cultural, political, legal, philosophical, moral, ethical, and religious aspects of life.

The Human Sexual Response Cycle:

Sexual motivation, often referred to as **libido**, is a person's overall sexual drive or desire for sexual activity. This motivation is determined by biological, psychological, and social factors. In most mammalian species, sex hormones control the ability to engage in sexual behaviors. However, sex hormones do not directly regulate the ability *to have sexual intercourse* or to **copulate** in primates (including humans); rather, they are only one influence on the motivation to engage in sexual behaviors. Social factors, such as work and family also have an impact, as do internal psychological factors like personality and stress. Sex drive may also be affected by hormones, medical conditions, medications, lifestyle stress, pregnancy, and relationship issues.

The **human sexual response cycle** is a model that describes the physiological responses that take place during sexual activity. According to Kinsey, Pomeroy, and Martin (1948), the cycle consists of four phases: excitement, plateau, orgasm, and resolution.

Table **19.7.1**: Human Sexual Response Cycle

Phase	Description
Excitement Phase	the phase in which the intrinsic (inner) motivation to pursue sex arises
Plateau Phase	the period of sexual excitement with increased heart rate and circulation that sets the stage for orgasm
Orgasm Phase	the climax
Resolution Phase	the un-arousal state before the cycle begins again

Societal Views on Sexuality

Society's views on sexuality are influenced by everything from religion to philosophy, and they have changed throughout history and are continuously evolving. Historically, religion has been the greatest influence on sexual behavior in the United States; however, in more recent years, peers and the media have emerged as two of the strongest influences, particularly among American teens (Potard, Courtois, & Rusch, 2008).

Media Influences on Sexuality

Media in the form of television, magazines, movies, music, online, etc., continues to shape what is deemed appropriate or normal sexuality, targeting everything from body image to products meant to enhance sex appeal. Media serves to perpetuate a number of social scripts about sexual relationships and the sexual roles of men and women, many of which have been shown to have both empowering and problematic effects on people's (especially women's) developing sexual identities and sexual attitudes.

Cultural Differences with Sexuality

In the West, premarital sex is normative by the late teens, more than a decade before most people enter marriage. In the United States and Canada, and in northern and Eastern Europe, cohabitation is also normative; most people have at least one cohabiting partnership before marriage. In southern Europe, cohabiting is still taboo, but premarital sex is tolerated in emerging adulthood. In contrast, both premarital sex and cohabitation remain rare and forbidden throughout Asia. Even dating is discouraged until the late twenties, when it would be a prelude to a serious relationship leading to marriage. In cross-cultural comparisons, about three

fourths of emerging adults in the United States and Europe report having had premarital sexual relations by age 20, versus less than one fifth in Japan and South Korea (Hatfield & Rapson, 2006).[1]

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19.8: Antisocial behavior

Aggression may be physical or verbal/emotional. Aggression is activated in large part by the amygdala and regulated by the prefrontal cortex.



Figure **19.8.1**: This boy is threatening physical aggression.[1]

Testosterone is associated with increased aggression in both males and females. Aggression is also caused by negative experiences and emotions, including frustration, pain, and heat. As predicted by principles of observational learning, research evidence makes it very clear that, on average, people who watch violent behavior become more aggressive. Early, antisocial behavior leads to befriending others who also engage in antisocial behavior, which only perpetuates the downward cycle of aggression and wrongful acts.[2]

Bullying

According to Stopbullying.gov (2016), a federal government website managed by the U.S. Department of Health & Human Services, **bullying** is defined as unwanted, aggressive behavior among school aged children that involves a real or perceived power imbalance. Further, the aggressive behavior happens more than once or has the potential to be repeated. There are different types of bullying, including verbal bullying, which is saying or writing mean things, teasing, name-calling, taunting, threatening, or making inappropriate sexual comments. Social bullying, also referred to as relational bullying, involves spreading rumors, purposefully excluding someone from a group, or embarrassing someone on purpose. Physical bullying involves hurting a person's body or possessions.

Dynamics of Youth program at Utrecht University Dr. Bram Orobio de Castro studies bullying and why children engage in these behaviors. Suggests it is better to look at these kinds of behaviors on a continuum, rather than dichotomies of normal and abnormal. So they looking for causes in temperament, family (culture, SES), school contexts and other places. Also believes in being patient to collaborate with such far flung ideas as game theorists in understanding bullying.

The different types of bullying are detailed in the table below.

Table **19.8.1**: Types of Bullying

Type of Bullying	Description
Verbal Bullying	Includes saying or writing mean things, teasing, name calling, taunting, threatening, or making inappropriate sexual comments.
Social bullying (also referred to as relational bullying)	Includes spreading rumors, purposefully excluding someone from a group, or embarrassing someone on purpose.
Physical Bullying	Includes hurting a person's body or possessions.
Cyberbullying	Involves electronic technology. Examples of cyberbullying include sending mean text messages or emails, creating fake profiles, and posting embarrassing pictures, videos or rumors on social networking sites.



Figure **19.8.2**: Cyberbullying, like this email message calling this teen names and suggesting that they have no friends or worth, is a form of bullying that has some similar and some different facets from schoolyard bullying.[3]

Cyberbullying



Figure **19.8.3**: Cyberbullying can be devastating for children.[5]

Children who experience cyberbullying have a harder time getting away from the behavior because it can occur at any time of day and without being in the presence of others. Additional concerns of cyberbullying include that messages and images can be posted anonymously, distributed quickly, and be difficult to trace or delete. Children who are cyberbullied are more likely to experience in-person bullying, be unwilling to attend school, receive poor grades, use alcohol and drugs, skip school, have lower self-esteem, and have more health problems (stopbullying.gov).

Those at Risk for Bullying

Bullying can happen to anyone but some students are at an increased risk for being bullied, including lesbian, gay, bisexual, transgendered (LGBT) youth, those with disabilities, and those who are socially isolated. Additionally, those who are perceived as

different, weak, less popular, overweight, or having low self-esteem, have a higher likelihood of being bullied.

Those Who are More Likely to Bully

Bullies are often thought of as having low self-esteem, and then bully others to feel better about themselves. Although this can occur, many bullies in fact have high levels of self-esteem. They possess considerable popularity and social power and have well-connected peer relationships. They do not lack self-esteem, and instead lack empathy for others. They like to dominate or be in charge of others.

The Bystander Effect

The discussion of bullying highlights the problem of witnesses not intervening to help a victim. Researchers Latané and Darley (1968) described a phenomenon called the bystander effect. The bystander effect is a phenomenon in which a witness or bystander does not volunteer to help a victim or person in distress. Instead, they just watch what is happening. Social psychologists hold that we make these decisions based on the social situation, not our own personality variables. Why do you think bystanders don't get help? What are the benefits to helping? What are the risks? It is very likely you listed more costs than benefits to helping. In many situations, bystanders likely feared for their own lives—if they went to help, the attacker might harm them. However, how difficult would it be to make a phone call to the police? Social psychologists claim that diffusion of responsibility is the likely explanation. Diffusion of responsibility is the tendency for no one in a group to help because the responsibility to help is spread throughout the group (Bandura, 1999). Have you ever passed an accident on the freeway and assumed that a victim or certainly another motorist has already reported the accident? In general, the greater the number of bystanders, the less likely any one person will help.[6]

Bullied Children

Unfortunately, most children do not let adults know that they are being bullied. Some fear retaliation from the bully, while others are too embarrassed to ask for help. Those who are socially isolated may not know who to ask for help or believe that no one would care or assist them if they did ask for assistance. Consequently, it is important for parents and teachers to know the warning signs that may indicate a child is being bullied. These include: unexplainable injuries, lost or destroyed possessions, changes in eating or sleeping patterns, declining school grades, not wanting to go to school, loss of friends, decreased self-esteem and/or self-destructive behaviors.

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19.9: Clinical diagnoses of antisocial behavior

According to the American Academy of Psychiatry (2018),

- Most kids will act up or become disruptive or defiant sometimes. Disruptive and conduct disorders, however, involve much more severe and longer-lasting behaviors than typical, short-lived episodes. Disruptive, impulse-control and conduct disorders refer to a group of disorders that include oppositional defiant disorder, conduct disorder, intermittent explosive disorder, kleptomania and pyromania. These disorders can cause people to behave angrily or aggressively toward people or property. They may have difficulty controlling their emotions and behavior and may break rules or laws. An estimated 6 percent of children are affected by oppositional defiant disorder or conduct disorder.[1]

Oppositional Defiant Disorder (ODD): There is a recurrent pattern of negative, defiant, disobedient, and hostile behavior toward authority figures. It is important to remember that this is toward authority figures and not their peers. This occurs outside of normal developmental levels and leads to impairment in functioning (Lack, 2010).[2]

Conduct Disorder (CD): Children with Conduct Disorder (CD) show acts of aggression towards others and animals. Children with conduct disorder (CD) usually show little to no compassion or concern for others or their feelings. Also, concern for the well-being of others is at a minimum. Children also perceive the actions and intentions of others as more harmful and threatening than they actually are and respond with what they feel is reasonable and justified aggression. They may lack feelings of guilt or remorse. Since these individuals learn that expressing guilt or remorse may help in avoiding or lessening punishment, it may be difficult to evaluate when their guilt or remorse is genuine. Individuals will also try and place blame on others for the wrongdoings that they had committed.



Figure 19.9.1: Children with conduct disorders show acts of aggression towards others and animals.[3]

Children with conduct disorders (CD) tend to have lower levels of self-esteem. Children diagnosed with conduct disorders (CD) are typically characterized as being easily irritable and often reckless, as well as having many temper tantrums despite their projected “tough” image portrayed to society. Conduct Disorder (CD) often accompanies early onset of sexual behavior, drinking, smoking, use of illegal drugs, and reckless acts. Illegal drug use may increase the risk of the disorder persisting. The disorder may lead to school suspension or expulsion, problems at work, legal difficulties, STD’s, unplanned pregnancy, and injury from fights or accidents. Suicidal ideation and attempts occur at a higher rate than expected.[4]

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