APPLIED DEVELOPMENTAL SYSTEMS SCIENCE



Skinner, Kindermann, & Roeser
Portland State University

LibreTexts™

Portland State University

Applied Developmental Systems Science

Skinner, Kindermann, & Roeser

This text is disseminated via the Open Education Resource (OER) LibreTexts Project (https://LibreTexts.org) and like the thousands of other texts available within this powerful platform, it is freely available for reading, printing, and "consuming."

The LibreTexts mission is to bring together students, faculty, and scholars in a collaborative effort to provide an accessible, and comprehensive platform that empowers our community to develop, curate, adapt, and adopt openly licensed resources and technologies; through these efforts we can reduce the financial burden born from traditional educational resource costs, ensuring education is more accessible for students and communities worldwide.

Most, but not all, pages in the library have licenses that may allow individuals to make changes, save, and print this book. Carefully consult the applicable license(s) before pursuing such effects. Instructors can adopt existing LibreTexts texts or Remix them to quickly build course-specific resources to meet the needs of their students. Unlike traditional textbooks, LibreTexts' web based origins allow powerful integration of advanced features and new technologies to support learning.



LibreTexts is the adaptable, user-friendly non-profit open education resource platform that educators trust for creating, customizing, and sharing accessible, interactive textbooks, adaptive homework, and ancillary materials. We collaborate with individuals and organizations to champion open education initiatives, support institutional publishing programs, drive curriculum development projects, and more.

The LibreTexts libraries are Powered by NICE CXone Expert and was supported by the Department of Education Open Textbook Pilot Project, the California Education Learning Lab, the UC Davis Office of the Provost, the UC Davis Library, the California State University Affordable Learning Solutions Program, and Merlot. This material is based upon work supported by the National Science Foundation under Grant No. 1246120, 1525057, and 1413739.

Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation nor the US Department of Education.

Have questions or comments? For information about adoptions or adaptions contact info@LibreTexts.org or visit our main website at https://LibreTexts.org.

This text was compiled on 04/14/2026

TABLE OF CONTENTS

Licensing

1: Introduction

- 1.1: Introduction
- 1.2: What is the purpose of the textbook and the course?
- 1.3: How are the course and the guidebook organized?
- 1.4: How should the book be used?
- 1.5: What should students be getting out of the course and book?
- 1.6: What should instructors be getting out of the course and book?
- 1.7: Why are all the sections headed by questions?
- 1.8: References

2: Developmental Equivalence- Sampling and Selection

- 2.1: What is the general idea of “developmental equivalence”?
- 2.2: What does it mean to describe human development?
- 2.3: What does it mean to describe qualitative changes in development?
- 2.4: How can the description of stability be part of the goals of developmental science?
- 2.5: How is the explanation of development different from its description?
- 2.6: Why do developmentalists need to explain stability?
- 2.7: What is meant by explanations of differential patterns of stability and change?
- 2.8: How does optimization of human development differ from explanation?
- 2.9: Conclusion

3: Developmental Equivalence- Measurement and “Developmentally-friendly” Conceptualizations

- 3.1: What is developmental measurement equivalence?
- 3.2: Before we get into the details, could we think about another developmental example?
- 3.3: Why isn't there a bigger bruhaha about this problem in the developmental literature?
- 3.4: What would a relational organismic-contextualist systems-thinking type researcher do to deal with the problem of developmental measurement equivalence ?
- 3.5: How did attachment researchers blow up that developmental balloon so successfully?
- 3.6: All these strategies seem to imply that with development, some things are changing and some are staying the same. Is that right?
- 3.7: It doesn’t seem like you are solving the problem of developmental measurement equivalence. Are we missing something?

4: Experimental Designs- Lab and Field

- 4.1: Study of Development- Explanation- Experimental Designs- Lab and Field
- 4.2: What makes causality such a difficult issue?
- 4.3: Experimental Designs and Research Settings

5: Naturalistic Designs and Causal Inferences

- 5.1: Naturalistic Designs and Causal Inferences
- 5.2: Okay, can you break down the reasons that correlations do not prove causation?
- 5.3: What is the specific problem that researchers working within relational meta-theories have created?
- 5.4: Adding Time to the Design of Naturalistic Studies
- 5.5: Use of Time Series Designs for Casual Inference
- 5.6: Getting Rid of Developmental Differences and Changes

6: Proximal Processes and Sequential Observations

- 6.1: Proximal Processes and Sequential Observations
- 6.2: What are the important conceptual points about proximal processes?
- 6.3: How are naturalistic observations connected to our meta-theories?
- 6.4: What are the most common types of observational methods?
- 6.5: Sequential Observations
- 6.6: Design Decisions with Sequential Observations

7: Individual Time Series- Trajectories and Episodes

- 7.1: Individual Time Series- Trajectories and Episodes
- 7.2: What are some strategies for collecting and analyzing our bread-and-butter, that is, dense time-ordered data?
- 7.3: What are intra-individual time series studies?
- 7.4: What are “inter-individual questions"?
- 7.5: In what way do relational meta-theories converge on that assumption?
- 7.6: Do correlations also differ depending on whether they are inter-individual and intraindividual?
- 7.7: Strategies for Charting Individual Trajectories Over Developmental Transitions
- 7.8: Strategies for Charting Individual Proximal Processes
- 7.9: Is there a take-home message from time series designs?

8: Person-centered Analysis- Configurations, Lifespaces, and Life-paths

- 8.1: Person-centered Analysis- Configurations, Lifespaces, and Life-paths
- 8.2: Okay—so what are “variable-centered” analyses?
- 8.3: Can you give an example of a variable-centered approach?
- 8.4: Are person-centered methodologists operating from a set of larger principles?
- 8.5: Person- and Pattern-Centered Methods- Cluster Analyses
- 8.6: Pattern- and Person-Centered Approaches To Development
- 8.7: Lifeplace Analysis
- 8.8: Lifespan Analysis

9: Development of Contexts

- 9.1: Optimization of Development
- 9.2: Don't we already have the idea of “changing contexts” incorporated into our meta-models?
- 9.3: Models of Contexts That Are Indifferent to Change
- 9.4: Models of Context Development

10: Developing Brains - Experience and Neuroplasticity

- 10.1: Introduction
- 10.2: Okay, but haven’t we already incorporated the brain as the “bio” in our “bio-psycho-sociocultural” people?
- 10.3: What does “plasticity” mean when applied to the brain?

- 10.4: Neural Architecture
- 10.5: Experience Expectant Development
- 10.6: Experience Dependent Development
- 10.7: Development, Neuroplasticity, and Interventions

11: Developing Individuals- Transformation and Branching Cascades

- 11.1: Introduction
- 11.2: Agency and Individual Transformation
- 11.3: Developmental Cascades

12: Goals of Developmental Science

- 12.1: What are the goals of developmental science?
- 12.2: Description of Human Development- What does it mean to describe human development?
- 12.3: What does it mean to describe qualitative changes in development?
- 12.4: How can the description of stability be part of the goals of developmental science?
- 12.5: Explanation of Human Development- How is the explanation of development different from its description?
- 12.6: Why do developmentalists need to explain stability?
- 12.7: What is meant by explanations of differential patterns of stability and change?
- 12.8: Optimization of Human Development- How does optimization of human development differ from explanation?
- 12.9: Conclusion- How do these three goals of developmental science fit together?
- 12.10: References

13: Converging Operations and Multiple Lines of Sight

- 13.1: Converging Operations

14: Understanding a Theory

- 14.1: What are the steps to “understanding a theory”?
- 14.2: Why does understanding start with articulating the “theoretical question”?
- 14.3: What is meant by “theoretical context”?
- 14.4: What are the key constructs of the theory and their definitions?
- 14.5: What is the target phenomenon and what is its developmental trajectory?
- 14.6: What are the parts of “explanation”?
- 14.7: What are the parts of a theory that focus on optimization?
- 14.8: What happens next-- “beyond understanding”?
- 14.9: Is it really necessary to draw theories?

15: Contrasting Theories- Attachment

- 15.1: What is Ainsworth’s conceptual question and theoretical context?
- 15.2: What are Ainsworth’s key constructs and target phenomenon?
- 15.3: What are the antecedents, consequences, and mechanisms in Ainsworth’s theory?
- 15.4: What are the optimization implications of Ainsworth’s theory of attachment?
- 15.5: What are the meta-theoretical assumptions of Ainsworth’s theory of attachment?
- 15.6: Why do we need to learn about Gerwitz’s theory of attachment?
- 15.7: How do we draw Gewirtz’s theory of attachment?
- 15.8: Why are the theories of Bowlby, Gewirtz, and Ainsworth so very different?

16: Contrasting Theories- Motivation and Learning

- 16.1: Motivation
- 16.2: Learning
- 16.3: Section 3-
- 16.4: Section 4-
- 16.5: Section 5-
- 16.6: Section 6-

17: Assumptions About Humans and their Development

- 17.1: Metaphors and Meta-theories in Human Development
- 17.2: What did Reese and Overton think was going on?
- 17.3: What is a meta-theory?
- 17.4: What kinds of assumptions guide the study of human development?
- 17.5: Assumptions About Description
- 17.6: Assumptions About Explanation

18: Meta-theories of Human Development

- 18.1: Metaphors and Meta-theories in Human Development
- 18.2: What are Mechanistic meta-theories of human development?
- 18.3: What are Organismic meta-theories?
- 18.4: What are Contextual meta-theories?
- 18.5: What are Maturational meta-theories of human development?
- 18.6: Which researchers have meta-theories?
- 18.7: Does the field of psychology have meta-theories?
- 18.8: What is the dominant meta-theory in the field today?
- 18.9: Who else has meta-theories?
- 18.10: Where can meta-theories be seen most clearly?
- 18.11: What is the meta-theory that guides our class and our book?
- 18.12: Do I have a meta-theory about development?
- 18.13: How do I get rid of my meta-theory?
- 18.14: What is the correct meta-theory?

19: Contrasting Meta-theories

- 19.1: Comparing and Contrasting Meta-theories
- 19.2: What are some key issues upon which these meta-theories differ?
- 19.3: How do the two meta-theories that focus on the organism differ from each other?
- 19.4: Are there other ways to compare and contrast the four meta-theories?
- 19.5: What do Maturational and Mechanistic meta-theories have in common?
- 19.6: What do Organismic and Contextualist meta-theories have in common?
- 19.7: What is the point of these two “meta-models”?
- 19.8: Where do developmental systems meta-theories fit on this meta-map?
- 19.9: Developmentally Systematizing a Phenomenon

20: Lifespan Perspectives

- 20.1: Lifespan Developmental Perspectives
- 20.2: What was the “traditional” view of development?
- 20.3: Why was the traditional view so appealing?

- 20.4: What did the lifespan perspective offer as an alternative view of development?
- 20.5: What are the key features of the proposition that “development is a life-long process”?
- 20.6: What is the point of “multi-directionality”?
- 20.7: What are the implications of the proposition that development includes both “gains and losses”?
- 20.8: What is meant by the notion of “plasticity”?
- 20.9: What are the implications of the proposition of “historical embeddedness”?
- 20.10: What are the implications of “Contextualism as paradigm”?
- 20.11: Why is the study of development a “multidisciplinary” affair?
- 20.12: Did the lifespan perspective demonstrate that old age is a period of plasticity filled with gains?
- 20.13: What are the most important take-home messages of lifespan developmental perspectives?
- 20.14: What are the most important critiques of lifespan developmental perspectives?

21: Ecological Model

- 21.1: Ecological Model- Nested Contexts
- 21.2: What is an ecological perspective?
- 21.3: What is a “microsystem”?
- 21.4: What is a “mesosystem”?
- 21.5: What is an “exosystem”?
- 21.6: What is a “macrosystem”?
- 21.7: Did the ecological perspective reject experimental designs and lab-based studies?
- 21.8: So what? Did an ecological perspective change anything for developmentalists?
- 21.9: What use were these environmental maps?
- 21.10: What are the most important take-home messages of the ecological perspective?
- 21.11: What are the most important critiques of the ecological perspective?

22: Bioecological Models

- 22.1: Bioecological Model- Proximal Processes
- 22.2: What is the reformulated ecological model?
- 22.3: How can some clarity be brought to this complexity?
- 22.4: What are “proximal processes”?
- 22.5: What are some examples of proximal processes?
- 22.6: Is everything we do a “proximal process”?
- 22.7: Are all proximal processes good news for development?
- 22.8: Why are proximal processes so central to this reformulation?
- 22.9: How do proximal processes fit in with the other components of the model?
- 22.10: What are the person characteristics that shape proximal processes and their effects on development?
- 22.11: What are the characteristics of the context that shape proximal processes and their effects on development?
- 22.12: How do I select the PPCTs that are important to study?
- 22.13: Where is the target developing person located in this map?
- 22.14: What use are PPCT maps?
- 22.15: What are the most important take-home messages of the bioecological model?
- 22.16: What are the most important critiques of the bioecological model?

23: Dialectical and Transactional Perspectives

- 23.1: Dialectic and Transactional Perspectives
- 23.2: What are we talking about now? Have we left the realm of psychology and landed in philosophy?
- 23.3: What is a “transaction”?
- 23.4: What are the components of the transactional perspective?

- 23.5: What is the Contextual model?
- 23.6: What is the Regulation model?
- 23.7: What is the Representational model?
- 23.8: How do these four components fit together into a unified theory of development?
- 23.9: What is the process formulation of the unified theory?
- 23.10: Where is the representational model in the unified theory?
- 23.11: Any clues about what prompts development in the unified theory?
- 23.12: What are the important take-home messages from dialectical-transactional meta-theories?

24: Relational Systems Meta-theories

- 24.1: Relational-Developmental Systems Meta-theories
- 24.2: What are the key differences between “split” and “relational” worldviews?
- 24.3: Why is the difference between Split and Relational metatheories important?
- 24.4: How can everything be 100% biological, 100% psychological, 100% social, and 100% cultural?
- 24.5: Does this mean we are always studying “biopsychosociocultural” globs?
- 24.6: Where does Relationism fit on our meta-theory map?
- 24.7: What are the principles that allow organism and contextualism to be unified?
- 24.8: What does the relational meta-theory offer in terms of causal explanation?
- 24.9: Where do all these new terms come from?
- 24.10: Where did the relational meta-theory come from?
- 24.11: What are the take-home messages from relational meta-theories?

25: Nonlinear Dynamic Systems Meta-theories

- 25.1: Nonlinear Dynamic Systems Meta-theories
- 25.2: Okay, if there is no design, then what is there?
- 25.3: How does this happen?
- 25.4: What are some examples of “emergence” in psychology?
- 25.5: And do all NLDS approaches agree on how self-organization happens?
- 25.6: Why is “circular causality” so important?
- 25.7: If downward causality doesn't push or pull anything, how does it influence development?
- 25.8: Okay, then how do these four kinds of causes work together?
- 25.9: Why do books and papers on NLDS seem like they are written in an alien language?
- 25.10: What are our “take-home” messages about nonlinear dynamic systems perspectives?

26: Three Big Ideas of Developmental Systems- The Big Ideas of Levels and Proximal Processes

- 26.1: The Big Ideas of Levels and Proximal Processes
- 26.2: What is holding up the revolution?
- 26.3: What are the essential elements of “systems” approaches?
- 26.4: What are the key tools for keeping our balance?
- 26.5: Big Idea #1- Levels- What is the “big idea” of levels?
- 26.6: Big Idea # 2- Proximal Processes- What is the “big idea” of proximal processes?

27: Three Big Ideas of Developmental Systems- The Big Idea of Dynamics

- 27.1: Big Idea # 3- Dynamics- What is the “big idea” of developmental dynamics?

- 27.2: Speaking of “circular causality” -- I can see the bottom-up effects of proximal processes and the “pop” of new actions, but where is the top-down stuff?
- 27.3: Is there such of a thing as higher-order organization of the context as well?
- 27.4: Okay, so formal cause is a property of individuals and environments-- but what about “final cause”-- “teleology”?
- 27.5: What is the difference between locally and developmentally adaptive?
- 27.6: Is there any developmental directionality implied by the idea of culture?
- 27.7: These final causes or teleological forces—How do they work? Didn't we decided that they do not actually pull the organism down a predetermined path?
- 27.8: Is that dialectical interaction what is causing the movement?
- 27.9: Are we close to understanding the “big enchilada” or qualitative shifts?
- 27.10: Activity 3. The Observation Project

28: From Meta-Theories to Methods

- 28.1: From Meta-Theories to Methods
- 28.2: What are the meta-theoretical and theoretical issues that now seem clear to students?
- 28.3: I thought that meta-theories shape theories and methods. Now you are saying that methods shape theories and meta-theories?
- 28.4: So is this part of the book full of new tools and (gulp) equations?
- 28.5: How does time enter into our methodological decisions and strategies?
- 28.6: Activity 4- Study Sketches for a Program of Research- Makin’ a List, Checkin’ it Twice

29: Developmental Designs- Cross-section, Longitudinal, and Cross-sequential

- 29.1: What are developmental designs?
- 29.2: Why is it challenging to figure how people change with age?
- 29.3: What is the cross-sectional design?
- 29.4: What is a longitudinal design?
- 29.5: Okay, I’m starting to warm up more and more to cross-sectional designs. What are their advantages?
- 29.6: What is a cross-sequential design?
- 29.7: What can we do about the big problem in longitudinal and cross-sequential designs-- that people drop out and that we are changing people by testing them repeatedly?
- 29.8: Which are the best study designs?

30: More Developmental Designs- Time-lag and Time- and Cohort-Sequential Studies

- 30.1: What is the time-lag design?
- 30.2: What is a time-sequential design?
- 30.3: What do you get when you put the time-lag and longitudinal design together?
- 30.4: Which of the designs described in this chapter are most useful for developmentalists?
- 30.5: Section 5-
- 30.6: Section 6-

Index

Glossary

Glossary

Detailed Licensing

Licensing

*A detailed breakdown of this resource's licensing can be found in **Back Matter/Detailed Licensing**.*

CHAPTER OVERVIEW

1: Introduction

1.1: Introduction
1.2: What is the purpose of the textbook and the course?
1.3: How are the course and the guidebook organized?
1.4: How should the book be used?
1.5: What should students be getting out of the course and book?
1.6: What should instructors be getting out of the course and book?
1.7: Why are all the sections headed by questions?
1.8: References

This page titled 1: Introduction is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

1.2: What is the purpose of the textbook and the course?

This text is designed to act as a guidebook for advanced undergraduates and graduate students in awakening them to the dominance of conventional assumptions in shaping our approaches and solutions to applied developmental problems, and in enabling and encouraging them to try out the lens of developmental systems with its power to transform their approaches to research and practice. This book contains multiple versions of the course we have created and taught jointly with our colleagues and students over the last 20 years, a course that is a requirement in our doctoral program on Applied Psychology and serves students specializing in social, community, and industrial-organizational psychology, as well as in developmental science and education. These students go on to be academics and researchers, but they also join public and private organizations, like businesses, school districts, hospitals, and non-profits, where their perspectives on the people they are trying to serve and the problems they are trying to solve, change lives.public and private organizations, like businesses, school districts, hospitals, and non-profits, where their perspectives on the people they are trying to serve and the problems they are trying to solve, change lives.

This page titled 1.2: What is the purpose of the textbook and the course? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

1.3: How are the course and the guidebook organized?

This class is not an easy one to take or to teach. It is at once abstract and philosophical, while also reaching down into the foundations of our identities and our science. We have not found "exposure models," in which we assign readings or lecture students on the benefits of developmental systems approaches, to be very effective in creating the internal paradigm shift that is the ultimate goal of the course. Instead, as described in subsequent chapters in more detail, we begin the course by inviting students to select the phenomena and applied problems of their choice, one that is authentically meaningful to them and in which they are already invested and informed, and bring it to the class as their work project. It is our conviction that any applied problem actually is, and so can be revealed to be, embedded in a complex multi-level developmental system, and this revelation can generate rich theories, interesting studies, important intervention efforts, and innovative practices. It is our commitment to students (and our challenge to ourselves as teachers) that, over the course, we (and the rest of the class) will be working with them to complete this transformation. In working with students who come from all over the map in terms of applied problems and (sub)disciplines, we have discovered that there are many pathways to developmental systems perspectives, but since no one can be an expert in all areas of applied psychology, following any of them requires hard work for students and teachers alike.

From these joint efforts, however, came the process that we now follow in the course and that is carefully described in this book, taking student (and instructor) through a series of exercises, readings, discussions, and activities. We think that it is students' work on their projects, through a sequence of short papers, class presentations, real-world observations, and open-ended interviews, that ultimately allow students not only to view their applied problem through a developmental systems perspective, but also to understand how they accomplished this-- and so find themselves prepared to use these tools on any applied problem they tackle in the future. Each step on these projects also makes students' thinking and questions visible to instructors and, because they are worked on by the whole class, creates as many examples of how to "developmental system-ize" an applied problem as there are students in the class. This allows the class to reflect on the characteristics of a phenomenon (and its sub-specialty within social science) that make it easier or more difficult for researchers and practitioners to bring a developmental systems lens to bear.

There are four parts to the teaching and learning process and they correspond to the four sections in this textbook. First, students learn to "understand theories," using a set of tools for unpacking and analyzing theories that allows us to look at the components of theories and distinguish their micro-developmental processes from their macro-developmental processes. Such an analysis is the basis for locating places where a theory can be "developmentalized" and allows students to unpack their target phenomenon, focus on their applied problem, and start identifying and generating their developmental possibilities.

Students first practice understanding theories on conceptualizations that represent dueling assumptions about the nature of development, and this exercise introduces them to the second set of tools, which we refer to as "meta-views on meta-theories." These activities allow them to chew on the key assumptions (e.g., nature versus nurture) that underlie our developmental science and see how they are packaged into higher-order families. The class visits a series of developmental systems meta-theories, including the life-span perspective, the bioecological model, the transactional model, relational meta-theories, probabilistic epigenesis, and dynamic systems. These visits allow students to experience first hand the three "big ideas" that underlie all developmental systems perspectives: (1) "levels," or the notion that integrated multi-level organized people are embedded in integrated organized multi-level contexts; (2) "proximal processes," or the notion that all development is caused by the reciprocal social interaction between these biopsychosocial people and their local contexts, and that the effects of lower- and higher-order personal and social attributes are all channeled through their influences on the social interactions that take place in these microsystem "envelopes;" and (3) "dynamics," or the notion that these multiple reciprocal proximal processes, operating at their multiple levels, can be seen, when we "take our hands off" to create movement or change within the system, selforganizing and giving rise to emergent properties and qualitative shifts that then entrain subsequent lower-order processes.

In reflecting on the sources of our meta-theoretical assumptions, it becomes clear that the standard methods we use in our science (e.g., strategies of sampling, measurement, design, and analysis) contain assumptions about the nature of development. For example, if some areas within psychology are dominated by designs that include only one time point, it becomes clear that they assume that no change is occurring or, if it is, it is not important. If researchers use the same measures for participants of different ages, they are also assuming developmental continuity in the target phenomenon. If researchers rely primarily on self-reports and use no direct assessments of contexts or social interactions, then they are assuming the primacy of the person and their perspective. Hence, in the third part of the course and textbook, we consider methodological issues, including developmental sampling and

measurement equivalence, causal inference, observational strategies, person-centered approaches, and the use of time in designs, including longitudinal, sequential, and time series designs.

The fourth and last section of the course and textbook zooms in on mechanisms or processes of development, trying to take seriously what is changing or developing in individuals and in their contexts. We consider different perspectives on what is "on the arrows" in most developmental theories and how these different views might lead to different strategies for designing, improving, and evaluating practices and interventions that aim to optimize development. We take as our target developmental phenomena in this section the features of the person and context that are most often assumed to be stable (e.g., neurophysiological structures or higher-order contexts) and examine evidence that they are plastic and review the multiple developmental pathways they can visit.

This page titled 1.3: How are the course and the guidebook organized? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

1.4: How should the book be used?

In general, this textbook is designed for three primary audiences, and for each target group, it would be combined with different sets of materials (see Table 1.1 for an overview). First, more senior researchers, interventionists, and methodologists might use the text as a primary guide to their own reflection which, in combination with their day-to-day readings in developmental science and their own specialties, could be used as an opportunity to reconsider and improve their ongoing work, guiding their own professional development to be more fully informed by systems approaches. A complementary text for such an expedition might be Slife and Williams (1995) small book, What's behind the research? Discovering hidden assumptions in the behavioral sciences, which deals with many of the same issues for psychology and social sciences more generally.

Second, the textbook can be used in courses designed to prepare graduate students for several different kinds of careers. For graduate students considering careers as researchers in the applied social sciences, the text could provide the primary guide, in combination with original conceptual and empirical readings that illustrate the key principles of a developmental systems approach. To select readings, instructors can use the menu of those listed in the textbook or find alternative readings that cover the range of topics appropriate for the respective doctoral program. For graduate students in developmental science, this text could be combined with an advanced textbook covering the contents of lifespan human development (e.g., Bornstein & Lamb, 2010) or focused on a specific aspect of development (e.g., cognitive development,) or age period (e.g., child and adolescent development, Damon, Lerner, & Kuhn, 2008), as a way to frame and ground an understanding of the many programs of research that contribute to descriptions, explanations, and optimization of development. To prepare graduate students as researchers or methodologists in dynamic systems, this text could be used as an introductory bridge from current conventional perspectives to dynamic systems approaches, in order to prepare and motivate students for an advanced text on theories and methods in dynamic systems (such as Molenaar, Lerner, & Newell, 2014). This text could also be used as a supplement for graduate courses in the applied practice disciplines, such as education, social work, health care, or business, where it could help frame major debates and decisions in policy and practice.

Third, the text can be used in courses for advanced undergraduates, as a supplement to more standard textbooks, whether the upper division class focuses on human development (or specific areas of development or age groups), or on preparing undergraduates for further research training in the applied social sciences or for further study in practice careers. Although this textbook deals with complex ideas, it intentionally presents them in a clear and straightforward manner, according to a developmentally sequenced set of activities, that together allow undergraduates to grapple with, master, and apply its principles to their own thinking and applied practice. For example, when we used the chapter on meta-theories in an advanced undergraduate lifespan human development class, we found that over the course of 10 weeks, with repeated guided practice and discussion, students were able to thoughtfully and accurately analyze the meta-theoretical assumptions underlying major theories, research questions, and intervention applications of developmental science.

We have modeled this textbook after a small paperback book by Paul Baltes, Hayne Reese, and John Nesselroade, entitled Life-span developmental psychology: Introduction to research methods, which was first published in 1977. This small text was part of the paradigm shift from child psychology to lifespan developmental science and was instrumental as a tool in graduate training in lifespan development. We do not aspire to instigate a paradigm shift in the field, as these great theoreticians and researchers did, but we do hope to help researchers and their students create conditions and interactions that can facilitate their own internal paradigm shifts.

Table 1.1. Who should use the textbook?

TARGET AUDIENCE	GOALS	PRIMARY TEXT	SUPPLEMENTARY
Researchers, Interventionists, and Methodologists			
Applied social science researchers	• Generate rich and innovative theories and designs for research	This textbook	
Applied social science interventionists	• Generate rich and innovative theories and designs for interventions	This textbook	
Applied social science methodologists	• Generate rich and innovative theories and designs for methods	This textbook	
Graduate Students			
Graduate student in applied social science	• Improve applied descriptive and explanatory research • Create and test better interventions • Critique and improve current theories and research	This textbook	As suggested in Textbook: Original theoretical and empirical articles
Graduate student in developmental social science	• Deeper understanding and • More insightful critique of developmental theories, research, and interventions	Advanced textbook on content of human development	This textbook
Graduate student in dynamic systems theories and methods	• More insightful critique of current methodologies • Greater innovation and flexibility in improving current developmental methodologies	Advanced textbook on dynamic systems theories and methods	Preparatory text: This textbook
Graduate student in practice disciplines, such as education, social work, health care and business	• Deeper understanding and better integration of evidence base • Improved practice	Standard disciplinary textbook or readings	This textbook
Advanced Undergraduate Student			
Advanced undergraduates in research track	• Improved understanding of theories and methods in applied descriptive. explanatory, and intervention research	Standard social science methods textbook	This textbook

	• Commitment to applied work		
Advanced undergraduates in human development	• Deeper understanding and improved integration of evident base • Become more positive force in own and others' development	Standard developmental textbook	This textbook
Advanced undergraduates preparing for practice careers	• Deeper understanding and improved integration of evidence base • Improved practice	Standard practice textbook	This textbook

This page titled 1.4: How should the book be used? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

1.5: What should students be getting out of the course and book?

Table 1.1 also summarizes what researchers, interventionists, methodologists, and students should come away with at the end of the book and/or course. At the highest level, they should have their own “meta-view” on meta-theories, capable of articulating, inferring, critiquing, and building on their own and others assumptions about the nature of applied developmental systems, their study, and their use in guiding policies, practices, and interventions. This should allow researchers to become better able to generate rich and innovative theories and designs for research and interventions, and to critique and improve theories and methods for studying and optimizing developmental systems.

Graduate students should show a more nuanced understanding and insightful selection and critique of developmental theories, research, interventions, and methodologies; an improved capacity to generate interesting applied descriptive and explanatory research questions and to design studies to examine them, and to create and test more effective interventions. Undergraduates should show a deeper comprehension and improved integration of the developmental evidence base, and as a result, evince a greater commitment to applied work and improved practice.

This page titled 1.5: What should students be getting out of the course and book? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

1.6: What should instructors be getting out of the course and book?

As co-instructors of this course, we learned a great deal—about our students, ourselves, and our science—and we have tried to organize this text so that other instructors can use this course as a learning experience for themselves as well. About our graduate students, we learned that our training largely teaches them to think in methodological terms, about variables and associations, and to organize their understanding of their phenomena in terms of research questions and analyses. For that reason, this text and course has as one of its primary goals to help students "de-fuse" their thinking so they can move up several levels to become more flexible in their conceptualizations and representations of their phenomena. We also learned that students are largely unaware of the meta-theoretical assumptions that "reside quietly and unrecognized in the background of our day-to day empirical science" (Overton, 2007, p. 154).

Perhaps most importantly, we learned about sequence and patience, both of which are represented in the structure of this text and course. It is tempting to start a class at the end—by telling students what you want them to end up learning. We did, in fact, teach this course that way—once. We started with a pile of fascinating papers on dynamic systems; we assigned students to read them and tried to discuss them in class (Skinner & Lendaris, 2007). This way of teaching the course crashed and burned. Students looked at us as if we had transported them to a distant planet and asked them to speak a foreign language—one that had no relevance to them and which they would never use again. So we learned to start where students currently reside— even if, to some instructors, the starting places seem too easy. If you watch students working with these beginning ideas, you will see that they are not easy or simple. They are foundational. And we learned to be patient while students struggle with the activities and exercises in this book. They need time and space to re-construct their working models of their phenomena, and at the same time, to re-construct their working models of applied developmental science. If we can make ourselves slow down and really try to figure out what our students are thinking and doing, we can learn and discover along with them.

We suggest that, the first time through, instructors try the sequence recommended in this text. And then, after they have experienced its effects on student engagement and learning directly, they can freely refine, reorder, and optimize the class for their specific students and their own particular style of teaching. We always co-teach this course and we highly recommend this practice. It allows instructors to embody the key notion of multiple perspectives and competing claims. It prevents the meta-theory of a single instructor from taking on the unexamined status as "correct," and demonstrates how good scientists remain skeptical about their beliefs, no matter how deeply rooted. We would wish for future instructors all the frustrating, confusing, and precious moments we have experienced in teaching the course-- all the good arguments, the floundering attempts to articulate clearly our own positions and warrants and to comprehend the differing views articulated by respected others, the laughter at uncovering our own hidden assumptions, and the rare and delicious moments of insight and of opening and changing our minds.

This page titled 1.6: What should instructors be getting out of the course and book? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

1.7: Why are all the sections headed by questions?

We view this class as a series of conversations and discussions with our students, and so we have written the textbook using the same format. We have used students' frequently asked questions to organize the ways that we provide information. We hope that it is not too distracting, and might even be helpful in providing clues to instructors about how students typically think about these issues. We have also included as figures, the graphic information we have found useful in communicating and illustrating these ideas to students. They can also be found in the series of Powerpoint slides on the website that accompanies this book. We invite instructors and students to submit additional materials to the website, and we look forward to the opportunity to learn from them, as together we continue the process of figuring out how to interact with our science and our phenomena in new ways, using key concepts and principles, and slowly incorporating the lessons of a developmental systems perspective on applied social science.

This page titled 1.7: Why are all the sections headed by questions? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

1.8: References

Baltes, P. B., Reese, H. W., & Nesselroade, J. R. (1977). Life-span developmental psychology: Introduction to research methods. Oxford, England: Brooks/Cole.

Bornstein, M. H., & Lamb, M. E. (Eds.). (2010). Developmental science: An advanced textbook. New York: Psychology Press.

Damon, W., Lerner, R., & Kuhn, D. (Eds.) (2008). Child and adolescent development: An advanced course. Hoboken, NJ: Wiley.

Lerner, R. M., & Damon, W. E. (2006). Handbook of child psychology: Vol 1, Theoretical models of human development. John Wiley & Sons Inc.

Lerner, R., Jacobs, F., & Wertleib, D. (Eds.) (2005). Applied developmental science: An advanced textbook. Thousand Oaks, CA: Sage.

Molenaar, P., Lerner, R., & Newell, K. (2014). Handbook of developmental systems theories and methods. New York: Guilford Press.

Overton, W. F. (2007). A coherent meta-theory for dynamic systems: Relational organicismcontextualism. Human Development, 50, 154-159.

Skinner, E. A., & Lendaris, G. G. (2007). Complexifying and Clarifying Theories and Research in Psychology: Three Steps towards a Paradigm Shift to Systems Meta-theories. Unpublished Manuscript, Portland State University.

Slife, B. D. & Williams, R. N. (1995). What's behind the research? Discovering hidden assumptions in the behavioral sciences. Thousand Oaks, CA: Sage. The SAGE Program on Applied Developmental Science

This page titled 1.8: References is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

CHAPTER OVERVIEW

2: Developmental Equivalence- Sampling and Selection

2.1: What is the general idea of “developmental equivalence”?

2.2: What does it mean to describe human development?

2.3: What does it mean to describe qualitative changes in development?

2.4: How can the description of stability be part of the goals of developmental science?

2.5: How is the explanation of development different from its description?

2.6: Why do developmentalists need to explain stability?

2.7: What is meant by explanations of differential patterns of stability and change?

2.8: How does optimization of human development differ from explanation?

2.9: Conclusion

This page titled 2: Developmental Equivalence- Sampling and Selection is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

2.1: What is the general idea of “developmental equivalence”?

Developmental science has three goals: to describe, explain, and optimize human development (Baltes et al., 1977; see Table 2.1). There two target of human development: (1) patterns of normative change and stability and (2) patterns of differential change and stability. Patterns of normative change refer to regular age-graded constellations of intra-individual change, including quantitative changes, often referred to as “trajectories,” and qualitative changes, such as reorganizations or the emergence of new forms. Patterns of normative stability refer to regular age-graded periods of constancy, including quantitative consistency, or flat trajectories, as well as continuity in qualitative organization or functioning. We illustrate what it means to describe, explain, and optimize these kinds of development using examples from the area of children’s motivation for school (Wigfield, Eccles, Schiefele, Roeser, & Davis-Kean, 2006).

Table 2.1. Goals of Developmental Science

1. Description of patterns of intra-individual change and stability

- Depiction of patterns of normative change and stability

o Delineation of typical quantitative trajectories

o Delineation of typical qualitative shifts

- Depiction of differences between people in their developmental pathways
  - o Delineation of range of quantitative trajectories
  - o Delineation of different kinds of qualitative shifts

2. Explanation of patterns of intra-individual change and stability

- Account of the set of causes that produce normative change and stability

o Specification of influences that generate typical quantitative changes

o Specification of influences that give rise to typical qualitative shifts

- Account of the sets of causes that produce different pathways
  - o Specification of influences that generate different quantitative trajectories
  - o Specification of influences that give rise to different kinds of qualitative shifts

3. Optimization of intra-individual development

- Identification of conditions that promote optimal normative and differential development

o Specification of influences that generate optimal trajectories and qualitative shifts

o Specification of influences that give rise to resilience

- Discovery of strategies and levers to create such optimal developmental conditions

o Discovery of ways to remediate or compensate for non-optimal conditions

o Discovery of ways to promote occurrence of optimal developmental conditions

This page titled 2.1: What is the general idea of “developmental equivalence”? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

2.2: What does it mean to describe human development?

The task of *description* for developmental scientists involves depicting, portraying, or representing patterns of development in the target phenomena. As shown in Figure 2.1, this includes description of *normative* development, or typical quantitative and qualitative age-graded changes and continuities, as well as identifying the variety of *different* quantitative and qualitative pathways the phenomena can take. In the area of academic motivation, many decades of descriptive research reveals that, normatively, children's enthusiasm, interest, valuing, and engagement in academic activities show quantitative declines, starting the day they enter academic classes and ending when they graduate from high school or drop out. These declines can be depicted as relatively steady linear decreases, punctuated by steeper declines at school transitions, typically around the transition to academic curriculum (during Kindergarten or first grade), around grade 3 (considered the transition from "learning to read" to "reading to learn"), over the transition to middle school (about grade 6), and the transition to high school (grade 9).

In terms of differential pathways, these quantitative declines are less pronounced for girls, for high achieving children and youth, for white middle class students, and for students who attend schools that include kindergarten through eighth grade in the same building. In contrast, declines are more pronounced, and more likely to lead to dropping out prior to high school completion (which can be seen as a qualitative shift), for boys, for children and youth who struggle with the dominant language or academic material, for students who are low in socioeconomic status, or from some ethnic minority and immigrant groups, and for students who attend schools in districts that separate elementary from middle schools.

This page titled 2.2: What does it mean to describe human development? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

2.3: What does it mean to describe qualitative changes in development?

In general, describing qualitative change involves depicting the age-graded organizations and re-organizations in the constituents of a phenomena, sometimes referred to as phases, stages, structures, or developmental tasks. The clearest descriptions of qualitative shifts can be found in Piagetian and neo-Piagetian accounts of development, which depict sequences of qualitatively different structural reorganizations of cognitive and affective processes (e.g., Case, 1985). In terms of academic motivation (and many phenomenon not as directly tied to cognitive developments), relatively less consensus exists about how to characterize the pattern of normative qualitative changes. Some examples can be found in work on the normative development of self-perceptions that seem to underlie children's motivation and engagement, for example, self-perceptions of ability, which during early childhood are initially high and unrealistic, and subsequently come to be tied more directly to actual levels of performance (e.g., Stipek, Recchia, & McClintic, 1992), and children's conceptions of effort and ability, which initially are fused, but, with the onset of formal operations, come to be differentiated and take on an inverse compensatory relationship, in which low performance under conditions of high effort implies low ability (e.g., Nicholls, 1978).

This page titled 2.3: What does it mean to describe qualitative changes in development? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

2.4: How can the description of stability be part of the goals of developmental science?

Sometimes it may seem surprising that developmentalists would be interested in identifying time windows during which phenomena are stable or unchanging. Doesn't it seem like stable phenomena would be left to non-developmental scientists to study? Such questions makes sense if one subscribes to certain assumptions, namely, the assumption that stability is the default state of all phenomena; if so, then of interest are states that differ from this default, namely, states of change. However, it is also possible to assume that the natural state of affairs is movement, flux, or change; from this perspective, it is important to describe not only the qualities and directions of these changes, but also to document states that manage to differ from this default, namely, periods of stability, continuity, or constancy.

This page titled 2.4: How can the description of stability be part of the goals of developmental science? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

2.5: How is the explanation of development different from its description?

Although, when studying any phenomenon, it is an important step to describe age-graded patterns of change and stability, age by itself (that is, time since birth) cannot explain why these patterns occur. Age (and other measures of time) can provide a metric along which change and stability can be plotted, but they are only considered to be markers for the temporally-graded causal factors that give rise to development patterns in the target phenomenon. Hence, explanation differs from description in that it refers to an account of the causes that together are necessary and sufficient to produce the patterns of changes and stability that have been described or observed. If descriptions answer questions like “what?” (i.e., the nature of the target phenomena), “how?” (i.e., the ways in which phenomena can change or remain the same), and “when?” (i.e., the ways in which these patterns appear as a function of age or time), then explanations focus on the “why?” questions: What sets of factors cause, influence, or produce these different patterns of change or stability over time? Explanations of normative development focus on the causes that underlie typical patterns of change and stability. In the example of motivation, explanatory theories and research would focus on the causes of the steady declines in students’ academic engagement and motivation, and why sharper declines are typically evident during school transitions. They would also focus on the causes that maintain engagement or compensate for losses in motivation, and so produce patterns of normative stability. Causal processes can remain the same over development, resulting in what can be called “explanatory continuity,” or different causal processes may be involved in explaining similar phenomena at different ages, resulting in “explanatory discontinuity.”

Explanations are completely different from descriptions. Researchers can compile the most elaborate description of the development of a phenomena, and not have discovered anything about the causes that underlie it. In the motivational area, general consensus exists about normative and differential changes in academic engagement over the school careers of children and youth, but a great deal of lively debate persists about the causes of these developments—neurophysiological, psychological, social, and contextual factors have all been nominated. Of course, description and explanation are linked—the search for explanations are guided by signposts originating in the patterns of development that have been described-- but even when normative descriptions have been ascertained for decades (e.g., the sequence of locomotion from creeping to crawling to walking described by Gesell in the 1930s; Gesell & Ames, 1940), it often takes many more decades for causal accounts to be well-established and accepted (Thelen & Adolph, 1992; Thelen, Ulrich, & Wolff, 1991).

This page titled 2.5: How is the explanation of development different from its description? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

2.6: Why do developmentalists need to explain stability?

Just as with descriptions of stability, it may seem that the search for explanations for stability would be a waste of developmentalists' time. And indeed, if researchers assume that the natural state of all phenomena is constancy or continuity, that is, if they assume that all phenomena are inherently at rest, then no explanations for this state are needed. However, if, on the other hand, change is assumed, then the natural state of all phenomena is considered to be movement or flux, and explanations are needed for how constancy could be accomplished. In general, such states of stability or constancy are often described as "steady states," and they are considered to be achieved through active means, such as are visible in all those activities needed to maintain the steady state of "balance" when walking on a narrow ledge or, over longer periods of time, all those activities needed to maintain a constant weight. These active processes are captured in concepts such as maintenance, conservation, preservation, compensation, equilibrium, homeostasis, or homeorhesis.

This page titled 2.6: Why do developmentalists need to explain stability? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

2.7: What is meant by explanations of differential patterns of stability and change?

In addition to explaining normative patterns of development, researchers are also interested in providing a causal account for why a target phenomena should take any of the variety of different pathways it has been observed to follow. Sometimes this task is relatively straightforward—especially when pathways differ only in mean level or age of onset. Then it can be the case that the same factors that explain normative change and stability also can account for different pathways. Pathways are traversed at earlier ages or at higher mean levels because some individuals have more of the factors that promote the phenomena and less of the factors that undermine it, whereas pathways are traversed at later ages or at lower mean levels because some individuals have less of the factors that promote the phenomena and more of the factors that undermine it. In the case of motivation, this kind of "explanatory continuity" has been found for some of the differences between girls and boys in motivational development. In general, many of the same factors that predict and explain engagement in girls (who start and remain higher in motivation) also predict and explain engagement in boys; they just operate on a lower plane for boys.

The task of differential explanation is made more challenging when the causal factors that produce normative development are not the same ones as those that generate the different pathways. Such "explanatory discontinuity" seems to be the case for differences in motivation, engagement, and achievement for students from different socio-economic classes and ethnic groups. Explanatory models for white middle class students simply did not include factors like affordable medical care (e.g., to treat ear infections which otherwise produce high rates of school absence), dangerous neighborhoods (e.g., which can interfere with getting to school and completion of homework), and discrimination from teachers and peers.

2.7: What is meant by explanations of differential patterns of stability and change? is shared under a not declared license and was authored, remixed, and/or curated by LibreTexts.

2.8: How does optimization of human development differ from explanation?

The goal of optimization of human development refers to research and intervention activities designed to figure out how to promote healthy development (also referred to as flourishing or thriving) and the development of resilience. This task goes beyond description and explanation in two ways. First, in order to optimize development, trajectories and pathways must be identified as targets—targets that represent “optimal” development. These kinds of trajectories are often better than normative development, and so represent rare or even imaginary pathways, especially for groups with many risk factors. The search for optimal pathways reflects the assumption that individuals hold much more potential and plasticity in their development than is typically expressed or observed.

The second way that optimization goes beyond description and explanation is that even when explanatory theories and research have identified the necessary and sufficient conditions likely to promote optimal development, researchers and interventionists still need to discover the strategies and levers that can consistently bring about these developmental conditions. For example, suppose that in studies of motivational development, researchers have uncovered multiple factors that are important to promote student engagement, such as teacher autonomy support, authentic academic work, school climates organized around mastery-oriented learning goals, parent investment in student academic success, and student self-efficacy. These would all be potential candidates for inclusion in interventions to optimize motivation. However, from such research, interventionists have no clues as to the strategies that will allow them to effectively (and permanently) change those developmental conditions. One way to understand the difference between explanation and optimization is that, if explanations focus on the antecedents of a developmental phenomenon, then optimization efforts need to focus on the antecedents of these antecedents.

2.8: How does optimization of human development differ from explanation? is shared under a not declared license and was authored, remixed, and/or curated by LibreTexts.

2.9: Conclusion

How do these three goals of developmental science fit together?

In one way, the tasks of description, explanation, and optimization from their own sequence: If a team of developmentalists wants to understand their target phenomenon, first, they must discover and document its developmental course, including both quantitative and qualitative changes and periods of stability (i.e., describe the development of the phenomenon). Once its course has been charted, researchers can begin searching for underlying (or overarching) factors that produce these patterns of change and stability, working toward causal accounts of both normative development and differential pathways (i.e., explain the development of the phenomenon). Then when the explanatory network is sufficiently well-established, researchers can begin building interventions that target the creation of developmental conditions that support and maintain these explanatory factors (i.e., optimize the development of the phenomenon). In practice, research is more recursive, of course. Descriptive research suggests targets for optimization; experimental study of interventions can be used to identify causal factors; the analysis of explanatory factors suggests additional potential descriptive pathways; and so on. In fact, the active pursuit of all three of these tasks simultaneously characterizes the most generative research areas.

2.9: Conclusion is shared under a not declared license and was authored, remixed, and/or curated by LibreTexts.

3: Developmental Equivalence- Measurement and “Developmentally-friendly” Conceptualizations

This page titled 3: Developmental Equivalence- Measurement and “Developmentally-friendly” Conceptualizations is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

3.1: What is developmental measurement equivalence?

As developmentalists, whatever our target phenomena may be, we are interested in comparing people of different ages (cross-sectional) or following people across different ages (longitudinal). So, our goal with developmental measurement equivalence is to validly measure that target phenomena at different developmental periods/ ages. It sounds simple: As shown in Figure 20.1, we just want to measure a construct in a way that is both: (1) valid at each age and (2) comparable across ages. It seems like the most straightforward solution to maximize comparability is simply to use the same measure at different ages. But the problem is, when you use exactly the same measure, you may actually be measuring *different* constructs at *different* ages.

[Insert Figure 2 here]

How is that possible?

Let's think of an example. In early cross-sectional studies of intellectual functioning, researchers used standardized tests of intelligences, kind of like the SAT or GRE exams with which most students are familiar. Researchers gave the exact same tests to people of age 20 to age 80. So you would expect the tests, since they were exactly the same, to measure just what is the items on the test were designed to capture, namely, intellectual functioning. But even a few moments' reflection suggests that the 20-year-olds and the 80-year-olds are likely to experience such tests differently. For example, let's consider recent practice effects. When would we guess is the last time that the typical 20-year-old has taken a test like our intelligence test, namely, one that uses a Scantron-type form where the answers are bubbled in? The answer might range from "yesterday" (if they are in college) to "a few years ago" (while they were in high school). But in any case, the format of the test looks familiar. Now, let's think about a typical 80-year-old. The last time they took such a test would likely be "never." Even if they got a Ph.D., the last exam would have been completed 50 years ago.

So how well participants perform on our intelligence test also depends on things like familiarity and other performance factors, which turn out to be very different between age groups. For example, performance includes a variety of "test-taking skills"—older people tend to be more cautious, so if they don't know the answer, they are less likely to guess than younger people, and so miss out on the random correct choices; older people care more about their performance, and so tend to be more worried, which may impair performance. One very big difference with age is just plain speed—speed of processing. So any assessments that are timed put older people at a disadvantage.

Taken all together, this makes us rethink the connection between our target construct (i.e., intellectual functioning) and the measure we are using to map it (namely, participants' answers to the multiple choice questions on our intelligence test). Performance on that test taps intelligence all right, but it turns out that it also taps familiarity-caution-anxiety-and-speed as well, all of which are factors that weigh differentially on people of different ages. And very clever intervention research by Paul Baltes and his team demonstrated just how much (Baltes & Lindenberger, 1988). They showed that (at least for the young-old), it is possible to systematically peel back those performance factors—if researchers allow older people to become familiar with how the tests look and work, give them practice using the Scantrons, add instructions that encourage them to guess on items even if they are not sure, help reduce worry by underplaying the importance of what the tests measure, and allow them to take the tests under "power" (untimed) conditions. And if researchers do this-- lo and behold. Those elderly people get smarter and smarter and smarter. Their performance improves markedly. So exactly the same test measures different constructs (or combinations of constructs) depending on the age of the participants.

Is this a problem for non-developmental researchers, too?

Yes, just like sampling equivalence, measurement equivalence is everywhere. It is an issue for any researcher who wants to make comparisons between groups. It is very common to think about cross-cultural equivalence of measures, or gender equivalence, or racial and ethnic equivalence. The issue of equivalence is at the heart of discussions about tests (and especially tests with consequences—like ones that decide whether students will get into and out of special services or advanced placement courses or college or graduate school) that are "biased"—against people who were not part of the group on which most tests are created (i.e., the dominant group—typically white middle class native-English speaking groups). The definition of a "biased test" is one that does not measure the same thing across groups, and almost always, this means tests that inadvertently privilege the dominant group.

This page titled 3.1: What is developmental measurement equivalence? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

3.2: Before we get into the details, could we think about another developmental example?

Yes, let's work through an in-class activity we often use to illustrate the challenges of measurement equivalence. Say we are going to conduct a lifespan study of aggression. And we decide to measure aggression using an observational coding system, so we want to generate behaviors that we think would be good markers of aggression at different ages. We usually divide students into groups of 2 or 3, assign each one an age group, and have students generate three or four key behaviors for their age group and list them on the board. In Table 21.1, you can see how we organize this information in the board as well as some typical examples of the categories of behaviors our students have suggested.

Table 3.2.1: Examples of categories of behavior that capture aggression at different ages.

Age group	**Approx. Age**	**Examples of behavioral categories that tap aggression**
Infancy	0 - 6 mon.	
Infancy Toddler	6 - 8 mon. 18 - 24 mon.	Hitting people with hand or object, biting people. Grabbing objects away from others.
Childhood		
Young	3 - 5 yrs.	Hitting or kicking people, throwing objects at people, yelling or name calling, hair pulling.
Middle Late	6 - 8 yrs. 9 - 10 yrs.	Threatening, verbal taunts, and name calling. Chasing, bullying.
Adolescence		
Young	11 -13 yrs.	Gossiping, shunning, threatening. Fist fights. Cyber-aggression.
Middle Late	14 - 16 yrs. 17 - 19 yrs.	Verbal bullying, exclusion. Sexual aggression. Swearing at someone
Adulthood		
Emerging Young	20 - 25 yrs. 25 - 35 yrs.	Road rage. Verbal and emotional mistreatment during marital fights. Pushing underlings around in the job.
Middle Late	35 - 55 yrs. 55 - 65 yrs.	Cutting in line. Telling someone off. Blowing up at own kids. Dismissive and demeaning comments.
Old age		
Young-old Old	65 - 76 yrs. 77 - 89 yrs.	Refusing to cooperate (e.g., taking out hearing aids). Cheating at cards. Verbal harassment. Name calling.
Old-old Centarians	90 - 99 yrs. 100+ yrs.	

When we start off this exercise, the group of students assigned to “Infancy” typically begin by complaining about the injustice of being saddled with that age period; they usually spent their group time arguing about whether it is even possible to label any newborn behavior as “aggressive.” If aggression involves intentionally hurting others, are infants even capable of those kinds of intentions? The toddler and preschool groups are typically smug and rattle off their lists, which we recognize as “prototypical” aggression—hitting, biting, and (when their walking is stabilized) kicking other people. We are sobered by descriptions of bullying and cyber-bullying in late childhood and middle school, and start to chuckle when we think about how we express our own grown-up aggression while driving, at work, or on the sports field, and so on.

This page titled 3.2: Before we get into the details, could we think about another developmental example? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

3.3: Why isn't there a bigger bruhaha about this problem in the developmental literature?

The most interesting discussions come when we suggest that, to conduct this lifespan study, all we have to do is use the entire set of behavioral categories in our observational catalog and then we will have the coding system we need to observe at any age. One or two students invariably point out that we can't just do that. The behaviors that are prototypical aggression at one age—like biting at age 2--- if we see them in older children or adults are a marker of something completely else. A 12-year-old who bites someone is not only showing aggression, they are showing signs of psychopathology. Do we think that preschoolers gossip? And a 20- year-old who punches someone is not at all the same as a 3-year-old who hits—the law even codifies this—the 20-year-old can be arrested for the same behavior that would get a three-yearold a 10-minute time out. So the point is that the same behaviors at different ages are likely to be markers of different constructs.

So what are our options?

We usually then consider the alternative: creating behavioral indicators that seem just right (i.e., valid) for our age ranges and then just sticking to those. On the one hand, that seems like an excellent idea, who could be faulted for prioritizing validity? But on the other hand, then how do we trace changes in aggression across age? How do we create estimates of those differential trajectories that developmentalists are always searching for ? Every time we cross a developmental period, we leave our previous behavioral categories behind and fall over a cliff— we lose comparability across time. How can a researcher draw a meaningful line from hitting at age 3 to social exclusion at age 13? It just doesn't make sense.

So that's the developmental measurement equivalence problem, right?

That's it in a nutshell. If we measure things in exactly the same way, it can mean that we are measuring something different for people of different ages, so we have a validity problem. However, if we measure things in different ways, we never know if we are measuring the same thing at different ages, so we have a comparability problem.

So how do developmentalists typically solve this problem?

Believe it or not, they typically respect the problem of measurement equivalence by staying within the age groups circumscribed by their key measures. They define their age group of interest based on the range of ages for which their key measure is valid. That is, they follow their participants up to the gap created by the new and different measure, and they stop and turn around. By respecting the age-delimited validity of measures, researchers have successively cut up age into narrower and narrower bands. The downside of this strategy is also apparent—if each research group only focuses on a small age range (and you would probably be surprised by how small an age range can be sliced—witness researchers who specialize in studying the second half of the first year of life), then we have inadvertently converted all "developmental analyses" to the cross-sectional sort, in which we have to compare findings for participants of different age groups. Of course, Taken together, this creates the equivalent of a cross-sectional study in which we have used different measures for each of our age-graded sub-samples-- so this makes knitting together our developmental story a very dicey proposition. It is true that, by each of us sticking to our age-valid measures, we are individually safe, but together we have no metric with which to bridge the age groups we have created. And, in fact, we would argue that, partly based on this strategy, so-called developmental research over the last twenty years has devolved into a greater and greater focus on individual differences within smaller and smaller windows. As you can imagine, cumulatively such as strategy prevents the accumulation of any truly developmental information—that is about age changes across developmental periods and different pathways across those periods.

Why isn't there a bigger bruhaha about this problem in the developmental literature?

There are probably many reasons, but mostly because researchers have found ways around the problem, without always thinking carefully about the consequences of their solutions. One of the most common strategies, based on the current dominance of cognitivist meta-theories, is, once we enter the age ranges where they easily can be measured via surveys, to reconceptualize our phenomena up to the level of appraisals. So many researchers who are interested in proximal processes, like social support or parent-child interactions or teacherstudent interactions or peer groups, have decided to study them using measures of children's and adolescents' appraisals of these proximal processes. These appraisals are everywhere (remember Sameroff's ubiquitous "representations"?) and researchers reasons for relying on them are often based on pragmatic grounds: Surveys are much more

easily administered than observations, and it is not what parents or teachers or peers are actually doing that shape children's development, but what children and youth perceive or take away from those interactions, as captured by their appraisals, for example, of parental warmth ("My Mom let me know she loves me") or teacher autonomy support ("My teacher is always telling me what to do").

Some of the earliest trends in this direction can be traced to the measurement of social support in adults. In research on stress and coping, it was assumed that social support was a good thing (as is apparent from its label) but it turned out that people who actually utilized social support were not better off; they tended to be worse off, in terms of emotional distress and other indicators of functioning. It turns out that greater utilization of social support is a marker for trouble—it crops up when a person is dealing with more severe stressful events, when a person has fewer psychological resources or is more fragile, and so on. It also turned out that not all social support is that supportive—it can be intrusive or controlling or make recipients feel incompetent (Ryan & Solky, 1996). In response to this pile of surprising findings, researchers turned to the construct of perceptions of the availability of social support. Now there was a measure that was well-behaved—it was positively correlated to well-being and high functioning.

What's wrong with studying appraisals instead of actual proximal processes?

The goals are understandable. Researchers have created developmental comparability by measuring appraisals all right, but in order to exclude the messy bits (the proximal processes) that are changing with age, researchers have also unintentionally excluded the part of our phenomena that is doing most of the heavy lifting. The easiest way to see the problem is to do a thought experiment in which we as researchers have completed our excellent program of study showing the crucial nature of children's appraisals of the supportiveness of their interactions with (pick one or more) teachers, parents, or peers in shaping, for example, their academic selfperceptions, motivation, engagement, coping, learning, and school success. So now we move from the "explanation" to the "optimization" phase of our research program, and we suddenly realize that we have no advice for teachers, parents, or peers because we have learned nothing about the real day-to-day interactions that shape appraisals. In fact, as mentioned in earlier chapters, if we follow our train of research to its logical conclusion, our interventions would consist in working directly with children and youth themselves and trying to influence their appraisals (since that was our explanatory mechanism)-- maybe by trying to persuade them that their parents and teachers really do like them, even if they don't think so. It is obvious that such interventions would offend our sensibilities: We want to improve the context itself so that children and students are having interactions with their teachers and parents that naturally result in them feeling loved and supported. However, once we get out of our participants' heads, and back to where we belong, which is amidst proximal processes, we can see that the pesky problem of measurement equivalence is rampant. The kinds of interactions with a teacher than make a first-grader feel cared about are very different from those that would make a fifth- or ninth-grader feel cared about, as any parent knows who has tried to kiss their fifth-grader good-bye when dropping them off at school. So the take-home message of this long story is that the strategies that researchers use to solve the problem of measurement equivalence can inadvertently throw out the proverbial baby with the bath water.

Are there any good options?

Yes, let's start with two technical solutions. The first is to conduct longitudinal studies, and just use the measure that is most valid for each age group as you go (Measure A for the youngest ages, followed by Measure B, and so on). Then, analyses focus on inter-individual cross-time connections between the two measures—the extent to which participants' position on Measure A at age 1 predicts their position on Measure B at age 2. So these measures are valid but not directly comparable. The good news is that this strategy has allowed us to cross over into new developmental periods—that's why it is a favorite strategy in long-term longitudinal studies. At the same time, however, its two downsides are (1) when correlations are relatively low or non-significant, it is not possible to determine whether this is due to discontinuity in the phenomena or to lack of comparability in the measures; and (2) it produces no information about intra-individual change in the level of the phenomena (i.e., trajectories) or different pathways.

The second strategy is pictured in Figure 21.2: Build a bridge by creating a series of overlapping age groups and measures. This strategy takes advantage of the fact that most measures are not valid for only a single age point, but typically cover a range of ages. This would allow researchers to use the measure that is valid for the younger ages on children when they are younger, then start the measure that is valid for the next age group while continuing to use the previous measure. As a result, researchers would have information from the age groups that are at the "seam" between the two measures on both of them and it should be valid for both. This allows researchers to directly and empirically examine of the comparability of the two measures, as shown in the ovals in

Figure 21.2. Of course, the downside of this strategy is the extra work for researchers, and especially for participants, in using multiple measures of the same construct.

Insert Figure 21.2

This page titled 3.3: Why isn't there a bigger bruhaha about this problem in the developmental literature? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

3.4: What would a relational organismic-contextualist systems-thinking type researcher do to deal with the problem of developmental measurement equivalence ?

You can probably guess the two prongs of the response: (1) don't try to get rid of it by sticking to a narrow age range or focusing on appraisals, instead look it dead in the eye; and (2) and then look it dead in the other eye and the other eye, that is, from many different perspectives. Let's consider three options.

First, it would be possible to take a category of behavior, for example, any one from our catalog in Table 21.1, say "biting," and follow it along its little lifespan, noting its first appearance as a strategy of aggression, its changing frequency and the proximal processes it gets itself into—what elicits it, what alternative responses the individual has in the same situations, its contingencies, the kinds of responses it prompts from peers and adults, what kinds of situations and states pull it out after it has virtually disappeared, and so on. We could follow the individual arcs of all these aggressive behaviors—their emergence, usage, integration, substitution, demise, and resurrection. We can use individuals' ages as an index and so see how biting (and other forms of aggression) appear and disappear, as well as the proximal processes (e.g., attacks by older siblings or parental socialization) that prolong their use or support more socially-acceptable alternatives. This kind of a research strategy, pictured in Figure 21.3, is thinking bottom-up, from behavior to proximal processes, and allows us to watch behaviors appear or disappear, and change or remain the same in their functions and meaning with age.

What is the second strategy?

A second option, pictured in Figure 21.4, is to think top-down, for example, from appraisals to proximal processes. This kind of program of study allows researchers to stick with their beloved appraisals, but to ask the musical question: "What are the proximal processes that give rise to these appraisals and how do they change with age?" So, for example, researchers working within self-determination theory have shown that students' experiences of autonomy support in their classrooms and from their teachers create contexts that allow intrinsic motivation, identified self-regulation, enthusiastic engagement, constructive coping, conceptual learning, and other good things, to flourish. So Johnmarshall Reeve set out to discover "what autonomy supportive teachers do" by conducting a series of observational studies in which he examined the kinds of teacher behaviors, curricula, assignments, proximal processes, and so on, that appear in classrooms students appraise as "autonomy supportive" (Reeve, 2006; Reeve, & Jang, 2006; Reeve, Bolt, & Cai, 1999). This is exactly the kind of information that interventionists need to help teachers support students' autonomy, and it would be possible to examine whether there are regular developmental changes in the kinds of teacher behaviors, academic activities, and proximal processes that lead students to feel autonomy support in their classrooms.

Insert Figure 20.4

The development of perceived control: Adding experiences of control

Another excellent example of how to combine the study of appraisals and proximal processes to create a developmental story can be found in work on perceived control. The beginning of the story doesn't seem very developmental: Researchers point out that perceptions of control are an important marker and predictor of good things (e.g., effort and engagement, constructive coping, positive emotions) across the lifespan— clearly documented from 4-months of age (when babies vigorously kick their legs to operate a mobile whose movement is contingent on their actions and who give up and gaze sadly at the mobile when the contingencies are cut) to oldest age (when interventions in which visitors come contingently have been shown to prolong life expectancy). These kinds of claims sound like the workings of a universal ageindependent human need—the need to be effective in one's interactions with the context (White, 1959).

Not particularly developmental, eh? In fact, the vast majority of research (and the research on control is seriously vast) looks at individual differences in perceptions of control and their differential effects. Almost no developmental literature exists.

However, a huge developmental swarm of ideas swoops into this area when researchers add the idea of proximal processes, in the form of "experiences of control." Suddenly the question becomes—what kinds of experiences contribute to a person's feelings of efficacy, competence or control? And the answers to that question differ mightily by developmental level. We need to think about the representational and cognitive strategies infants, children, and adolescents use to extract causal information out of strings of interactions with the context, the changing means that individuals have to exert control, the varying roles that

participation by other people play (for example, when help from others boosts a sense of control at younger ages but then subsequently undermines in), when inferential processes allow causes of effort to be differentiated from causes like task difficulty, luck, and one's own ability, and when such inferential processes start to create a closed loop, such that beliefs launch actions that create experiences that verify the originating beliefs.

We could go on. But you get the idea. We are not trying to create equivalence, we want to see how the experiences that generate perceptions of control change with age. We use the "constant" (i.e., the power of perceived control) as a compass to guide the study of the changing parts that continually recreate that constant.

What is the third strategy?

The third strategy is to stick with the same construct and then ride it through all the peaks and valleys of its transformations—which require qualitatively different measures at different ages. In this, admittedly challenging strategy, the comparability or glue between these measures are "developmentally-friendly conceptualizations" that create a space to hold the changing manifestations of the construct. A great example can be taken from attachment research which includes the important construct of "proximity-seeking," a species general biobehavioral strategy that brings infants in contact with their caregivers when the infants are distressed. This construct becomes developmental as soon as we start to wonder how infants can seek proximity at different developmental periods using the capacities that are available to them at those periods. So, for example, the earliest forms of "proximity seeking" are actually carried out by the caregiver in response to newborns cries, diffuse body movements, and other expressions of distress (can you detect the proximal processes happening here?). As newborns apprehend these contingencies, they can start to direct their expressions so that they become communications. We will spare you the blow-by-blow, but just keep asking the same question as new capacities develop—Now how can you seek proximity? And you will see as reaching, calling, and finally locomotion are added, and the balance shifts from the caregiver to the infant in seeking proximity. If you keep going long enough, you will end up with adolescents texting or imagining what Dad would say in this difficult situation.

This page titled 3.4: What would a relational organismic-contextualist systems-thinking type researcher do to deal with the problem of developmental measurement equivalence ? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

3.5: How did attachment researchers blow up that developmental balloon so successfully?

They identified an “organizational construct” with an important function, and then they followed across development the ways that the actions of infants, young children, older children and adolescents can serve that function with the capacities available to them at different ages. It is a combination of thought experiment (“how do we imagine they could do that?”) and empirical question (“how are you doing that?”) and it can be applied to any function. We provide another example of this idea in the research on coping during childhood and adolescence over the last decade, which has come to rely on “developmentally-friendly” conceptualizations of coping-- ones that move away from notions of coping as a list of strategies people can call on to solve problems and relieve distress, and toward views that highlight the basic adaptive functions of coping in detecting and appraising threats, mobilizing and tuning action, and learning from stressful encounters (see box).

This shift to conceptualizations that focus on higher-order functions characterizes research across many domains, so-called “functional perspectives” on may interesting phenomena—such as the functions of emotion, attention, and neurological subsystems. It is easy to see how this larger functional view can unite actions that have a very different surface appearance, such as when the study of language has replaced by the study of “communication,” which then incorporates pre-language verbal and non-verbal means of expression, or the study of walking is replaced by the study of “locomotion,” which then incorporates creeping and crawling as well. Perhaps not as immediately obvious, these functional theories shift the focus of researchers from the structure of individuals’ behaviors or actions to their goals—the reasons why agentic individuals are motivated to pursue these activities, in service of their own intentions, such as to get to Mom, to allow me to get my eyes and hands on that attractive object, to relieve my distress, to let Dad know what I want. An illustration is provided in Figure 21.5 for the development of coping (see box).

Insert Figure 20.5 about here

Developmentally-friendly families of coping

In the research on coping, the building blocks of the area are considered to be “ways of coping,” which depict how people actually deal with real stressors right on the ground, and they include ways like problem-solving, escape, seeking support, or distraction. A problem that has bedeviled the area is the identification of core ways of coping. Dozens of sets of coping strategies have been proposed that include hundreds of ways of coping (Skinner, Edge, Altman, & Sherwood, 2003). This massive drift of potential strategies has made it difficult to integrate studies on coping, which utilize a wide variety of partially overlapping coping categories. Recent theoretical and empirical work has resulted in the idea of a small set (maybe a dozen) of higher-order “families” of coping that are defined by their functions in dealing with stress. For example, the family of “problem-solving” coping includes lower-order ways of bringing one’s actions in line with current contingencies, like effort, instrumental action, strategizing, and so on. Or the family of “accommodation” coping includes lower order ways that bring one’s preferences in line with currently available options, like focus on the positive, cognitive reappraisal, distraction, and so on. Researchers can hypothesize and discover age-graded members of these families by using developmental analyses to identify the ways that individuals can carry out these functions at different ages depending on the capacities available to them. For example, infants can “seek information” through social referencing or they can “escape” using gaze aversion. This line of research promises to create a body of developmental research on coping, that allows us to propose and study important constructs that show qualitative shifts in their manifestation (and hence in their measurement) across age.

This page titled 3.5: How did attachment researchers blow up that developmental balloon so successfully? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

3.6: All these strategies seem to imply that with development, some things are changing and some are staying the same. Is that right?

Exactly right, and this is where our relational systems meta-theory can give us eyes to see what is changing and what is staying the same. In the first strategy, in which we follow the same behavior across its lifespan, the part, that is the behavior (e.g., biting), is staying the same, but the role in plays in the whole (i.e., aggression) is changing, for example, first is plays a less important part, then it is replaced by other actions, then it may disappear, and its utilization at older ages reveals that it is part of a different whole (maybe psychopathology). The second strategy, in which we trace the changing proximal processes that lead to certain kinds of appraisals, it is the whole that we are holding constant, that is the appraisals, and the parts (i.e., the proximal processes that give rise to the appraisals) that are rapidly changing, even as the whole (i.e., the appraisals) continue to enable and constrain the parts (i.e., the subsequent proximal processes).

In the third strategy, in which organizational constructs guide our search across different developmental terrain, it is the concept, that is the function, that remains the same (e.g., proximity-seeking or communication) and everything else can be changing—the actions, the means, their structure or interrelations, the appraisals that guide them. These discussions start sounding very systems-y in that we start theorizing about the differentiation of new means to serve old functions, the integration of old means to serve functions in new ways, the substitution of new means, the emergence of new structures to serve functions, new uses for old means, and so on.

Whatever the strategy, the take home message is that the “problem” of developmental equivalence can be turned into an asset when researchers use it as a signpost, telling them that – here is some qualitative development—and urging them not to turn back. The recognition that developmental researchers are all interested in these pesky multilevel systems, that include lower-level actions that serve immediate goals, proximal processes in which they are embedded, appraisals to which these interactions give rise which in turn guide subsequent proximal processes, and the structures of these episodes are all bound up in the larger functions of the system. Lines of sight.

If we can keep our finger on one of these levels (the actions, the appraisals, or the functions) to hold it “constant,” we can cope with the frenetic movement at the other levels. For example, if we hold appraisals still, then they become like the duck sailing along smoothly on the surface of the water (seemingly continuous and so available to be captured with “equivalent” measures) whereas the proximal processes are busily churning up action below the surface, guided by the appraisals, but also feeding into them. If we pursue this metaphor long enough, we have to give our duck swimming lessons in that the means used to propel the appraisals change radically over time; maybe we will give our duck swim fins and then oars and then a small outboard motor. Anyway, we will need qualitatively different measures to capture them.

As you know by now, relational researchers realize that none of the parts of this complex and dynamic system are actually constant. Nevertheless, our finger holding a part still, temporarily creates a line of sight that we can use to capture one interesting view of our developing phenomena. And then we can move our finger to create another view and another. We will begin to see how the dynamic parts are creating some of the stability, for example, how children can experience the love and affection of their parents as constants only if the parents continually change the way that they interact with their child as he or she develops. Or how, for children to experience themselves as competent, they must have a series of systematically changing experiences in which they

succeed, then they must succeed without help, then they must succeed at hard task without help, and then succeed at hard tasks without help when other's don't, and then succeed at hard tasks without help when other's don't using little effort.

What would mechanistic and organismic researchers say about developmental measurement equivalence?

Mechanistic	What problem? A behavior is a behavior is a behavior. Come on down from "aggression" and look at the specific behaviors, like "hitting" or "verbal theats." We should be looking at their antecedents and consequences, the contingencies that shape and reinforce them, the discriminative stimuli that elicit them, and how they generalize across situations. If you want, you can compare how these antecedents and consequences differ or change across different ages.
Organismic	What problem? We are interested in qualitative changes—they are not only the rule, they are the point. Development is inherently "nonequivalent," so we should be looking for transformation, reorganization, or restructuring. We want to see how something turns into something else—for example, how aggression is transformed from physical to verbal, or transformed to words and negotiation.
Example	Development of emotion regulation (Kopp, 1989, Table 2)

	Phases	Approx. ages	Features	Cognitive requisites
	Neurophysiol-ogical modulation	Birth to 2-3 mo.	Modulation of arousal, activation of organized patterns of behavior	
	Sensorimotor modulation	3-9 m. +	Changing behavior is response to events and stimuli in the environment	
	Control	12-18 m. +	Awareness of social demands of a situation & initiate, maintain, & cease physical acts, communication, etc. accordingly; compliance, self-initiated monitoring	Intentionality, goal directed behavior, conscious awareness of action, memory of existential self
	Self-control	24 m. +	As above; delay upon request; behave according to social expectations in the absence of external monitors	Representational thinking and recall memory, symbolic thinking, continuing sense of identity
	Self-regulation	36 m. +	As above, flexibility of control processes that	Strategy production, conscious introspection, etc.

			meet changing situation demands	

This page titled 3.6: All these strategies seem to imply that with development, some things are changing and some are staying the same. Is that right? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

3.7: It doesn’t seem like you are solving the problem of developmental measurement equivalence. Are we missing something?

You are right. We don't want to “solve” it. We want to convert the problem into theoretical and empirical growth—the creation of “developmentally-friendly” conceptualizations that make it possible to use qualitatively different measures of constructs (be they actions, appraisals, or proximal processes), and render this information useful for creating differential pathways or trajectories by contextualizing them as parts of larger wholes and functions.

Table 3.5.1: Goals, Problems, and Strategies for Dealing with Developmental Measurement Equivalence.

Goal	Recruit and create representative samples of people of different ages who are the same on everything but age.
Problem	People of different ages are differentially easy to recruit.
	People of different ages are inherently different on many things besides age.
Stratagies	Cross-sectional
	Recruitment. Recruit hard-to-get participants to create representative age-graded samples.
	Statistical control. Measure attributes on which age-graded samples are selected and statistically control for them in examining age differences.
	Matching. Create matching samples of older participants and younger versions of themselves.
	Longitudinal
	Recruitment. Recruit hard-to-get participants to creating representative longitudinal samples. Retention. Retain the heck out of longitudinal samples to maintain representativeness.
	Replacement. Replace longitudinal drop-outs with similar participants.
	Differential development. Examine how patterns of developmental change differ for participants from different niches (combinations of gender, race, class, education, ethnicity, and immigration status).
	Assortativeness. Examine attributes that explain how people select and are selected into their specific contexts and length of stay in these contexts.
	Survivors. Examine the attributes that separate “survivors” from the nonsurvivors and consider their effects of differential development. If any of the non-survivors (e.g., workers who quit their jobs or were fired) are still alive, find them and study them.

This page titled 3.7: It doesn’t seem like you are solving the problem of developmental measurement equivalence. Are we missing something? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

4: Experimental Designs- Lab and Field

This page titled 4: Experimental Designs- Lab and Field is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

4.1: Study of Development- Explanation- Experimental Designs- Lab and Field

If you have decided to organize and conduct your developmental research program by connecting the dots provided by this textbook, you will, after reading the previous section, have completed the descriptive portion of your work. We congratulate you on many fronts. You have attended zealously to recruiting and maintaining samples that are representative of their age grades, going beyond standard recruiting strategies to find those participants who are typically overlooked. You have mentally interviewed your participants, settings, and times about how they got together, how long they have been involved with each other, and whom they ended up excluding. You have assessed the heck out of your participants on all manner of selection variables (but not all of your participants, so you can check whether your assessment battery has done any permanent damage). You have all manner of devices ready (e.g., Facebook pages, birthday cards, and pizza parties) to keep your participants in the study, and you stand ready to add new participants, if any old ones should slip through your fingers.

You have been through the wringer with your measurement decisions, building a "developmentally-friendly" conceptualization as a frame to help you figure out who is going to be the duck on the surface and who is going to be the changing propulsion devices (and you dedicated a whole meeting of your research team in order to discuss metaphors like ducks and icebergs and what it means to measurement to "put your finger" on something to hold it still for a minute). You have figured out which constructs are parts and which are wholes (for the time being) and you knew that you could not show your face around here without including the measurement of some proximal processes. You have wrestled with the meaning of "function" and "adaptive function" and "functional theories," and ended up taking a brisk walk around the block to clear your head.

You have made peace with the idea that you and your team are unlikely to conduct a 70- year longitudinal study, and are convinced that there is no shame in starting with a crosssectional study, especially if your "cohorts" are one year apart. You identified some potential time windows where interesting age/cohort differences seem to be hovering, and noted that these locations happen to coincide with some age ranges that seem to be seismically active (e.g., the 5- to-7 year shift or early adolescence) and some time points that include transitions (e.g., starting school or transitioning to middle school) as well as some (e.g., third grade and age 15) that seem to be out in the middle of nowhere. Following our instructions, you have conducted a series of short-term longitudinal studies across these time windows and have in your possession some of the most beautiful data known to developmentalists—patterns of intra-individual change that differ across your participants. You know where you are—you are at Grand Central Station — your participants have come from somewhere and are going somewhere, you get it, but you were able to track them for a little while and you can see how they are changing. If your measures allow you to, you can see them as trajectories, as growth curves, one for each participant, some of them improving, some declining, some staying the same, kind of jumbled. If your measures permit, you may also see some transformations—differentiations, integrations, or reorganizations.

You have muscled and cogitated your way through "Description" and your reward is more hard work-- now you have been promoted to "Explanation."

What is the difference between "description" and "explanation" again?

As we mentioned in the first chapters of the book, description is the task of depicting, portraying, or representing patterns of development in the target phenomena, including patterns of normative age-graded changes and continuities, as well as the variety of different quantitative and qualitative pathways. (Have another look at Figure 2.1.) In contrast, explanation refers to an account of the causes that together are necessary and sufficient to produce the patterns of changes and stability that we have described: What sets of factors cause, influence, or produce these different patterns of normative and differential change or stability over time? Explanation focuses on the weighty question of "Why?". Brace yourself. We have reached the thorny problem of "causality" (Pearl, 2009).

This page titled 4.1: Study of Development- Explanation- Experimental Designs- Lab and Field is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

4.2: What makes causality such a difficult issue?

It continues *ad infinitum*, like everything else that we encounter in relational meta-theoryworld. Shadish, Cook, and Campbell (2002) give us words to understand the importance of this issue when they distinguish "causal description" in which researchers identify the causal factors, from "causal explanation" in which researchers specify the mechanisms or mediating processes by which causality operates (see box). Some researchers refer to these as "the active ingredients;" we think of them as "what is on the arrows" between antecedents and outcomes," the critical question of "how does that work?".

Shadish, Cook, & Campbell (2002) on Causal Description vs. Causal Explanation.
The unique strength of experimentation is in describing the consequences attributable to deliberately varying a treatment. We call this causal description. In contrast, experiments do less well in clarifying the mechanisms through which and the conditions under which that causal relationship holds-what we call causal explanation (p. 9).
For full explanation, they would then have to show how the causally efficacious parts of the treatment influence the causally affected parts of the outcome through identified mediating processes (p. 10).
This benefit of causal explanation helps elucidate its priority and prestige in all sciences and helps explain why, once a novel and important causal relationship is discovered, the bulk of basic scientific effort turns toward explaining why and how it happens. Usually this involves decomposing the cause into its causally effective parts, decomposing the effects into its causally affected parts, and identifying the processes through which the effective causal parts influence the causally affected outcome parts (p. 10).

But the whole causality thing can't really be so hard, right?

Yes, it seems like researchers should be very good at identifying causes. In fact, when we think of humans as a species, it seems like we all are already good at this—at figuring out who is doing what to whom—or how would be have survived so long? Hey, and what about those 4- month-olds we read about in the last chapter, who fell into a deep depression when the dangling mobiles were no longer tied to their little kicking feet? They were detecting causality all right, and acting on it.

So what's the big deal?

The kind of causality that humans are really good at detecting is called "generative transmission." It's an "experience of control" in which we directly feel the power of our actions transmitted into the objects or people in our immediate context, and we can see the energy create effects in front our eyes. Prototypical experiences of generative transmission include the baby leaning over the tray of her highchair and dropping the spoon, calling Mom and having her turn around, the hand reaching the apple and pulling it off the branch, the crack of the bat against the baseball and the baseball soaring off in a completely new direction, touching a match to a candle wick, hurling mean words into your little brother's face and watching him crumple into tears. We are designed to detect the effects of our actions (so we can be effective in our interactions with the social and physical context). But our actions are rarely either necessary or sufficient causes for target outcomes. They are not necessary—in that my little brother will cry when he encounters other provocations (in fact, for just about any reason, if you ask me) and when I light the candle I see only the match as a cause—but it is not sufficient, the flame needs fuel and oxygen, which I am unlikely to perceive as part of my causal experience (which is why no one ever answers the question, "What caused this forest fire?" with "Trees"). People are good at answering the question, "Can I make this happen?" and "How can I make this happen?" and "What is added to this scenario to create a change?" but we are not as equipped to figure out "What are the necessary and sufficient causes to produce this outcome?".

It turns out, perhaps surprisingly, that causality is quite the inferential feat. We need to integrate information from multiple contrasting combinations of experiences before we can come to a conclusion about causes. In the study of the development of causal reasoning, we can see the progressive complexity from "How often does X happen when I do Y?" to "Does X happen more often when I do Y compared to when I do not do Y?" and so on. The cause "ability" is so highly inferential that it has its own developmental course. Initially high ability is inferred from high performance, then high performance without help, then from high effort, then from high performance on hard tasks (in which task difficulty is in turn inferred from other's performance—difficult tasks are ones that few people do well on), then finally from high performance on difficult tasks with low effort. No wonder determining causality, when we do not directly experience the generative transmission of our causes, is quite a challenge.

Is it worse for relational meta-theorists?

Maybe a little. In relational meta-world, causal inference is messy: Things are always multiply determined, rarely is any one cause really necessary, there are lots of packages of sufficient causes, who work only under certain conditions and for certain people at certain times. And, worst of all, many of these effective factors turn out to be imposters, but they have already snuck into the empirical party created by the design of our study and so we have to spend our time rooting them out or we have to call the whole party off. In fact, entire branches of psychological science are dedicated to the issue of how to design your studies so that you can rule out all these alternative explanations, so you can validly make causal inferences about whether your hypothesized antecedent is actually producing your target outcome (Campbell Stanley, 1963; Shadish, Cook, & Campbell, 2002), or in the case of developmental science, your target trajectory.

So what do they have to tell us?

Well, read the classics yourself by all means, but one of the things that you will learn in all design classes is that the best design (and some will say the only design) for proving causality is the experiment, in fact, a particular kind of experiment, the randomized control trial (RCT), the so-called "gold standard." And, in the olden days, it was assumed that experiments happened in the laboratory, so experimental designs and laboratory settings often get merged in students' minds. So let's take a minute to consider experiments and labs and relational meta-theories. Let's let all our descriptive trajectories for all of our cohorts and age groups sort of bump into each other and pile up behind us as we stop to stare into the window behind the one-way mirror into our lab.

This page titled 4.2: What makes causality such a difficult issue? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

4.3: Experimental Designs and Research Settings

Of the many features of research designs, the ones relevant to experiments and laboratories refer to the "where" and "how" of collecting data. In order to answer the causal questions of interest to relational meta-theorists, we want to create designs that allow us to make valid inferences about causes and effects as they unfold in the actual contexts of daily life. As usual, we will discover the tensions in our goals, the balances we can strike among them, and the multiple strategies that can be used to create clear lines of sight.

Didn't we get rid of experiments and labs in 1977 when Bronfenbrenner basically demolished experimental child psychology?

In a way. At the very least it introduced a healthy dose of skepticism about lab settings. Instead of thinking about the lab as a place where the researcher could get more pristine information about his target phenomenon (i.e., the child and his or her behavior), the lab came to be regarded as one context with its own attributes (e.g., novelty) and set of social partners (i.e., the experimenter) that were exerting their own effects on the child. Moreover, contextualists like Bronfenbrenner argued that by removing the child from his or her familiar surroundings and interaction partners, researchers have inadvertently left much of the phenomena of interest behind.

Relational meta-theorists would likely go further. To us, contexts are not just geographic and architectural "settings" in the sense that you can pick people up and "set" them down in new places. Contexts have tentacles that reach out and wind themselves around people, and people have roots that reach down into places. They are connected, interpenetrated even, so that our most likely causal forces, our proximal processes, cannot even be constituted when we look at only one without the other. When researchers split the child from his or her context, it destroys the phenomenon itself, like removing the heart from the body in order to see how it works. You can't. Once you remove it, it doesn't work any more.

So developmentalists don't conduct research in laboratory settings any more?

Not at all. Contextualists are just very wary about the idea of the "setting" and very aware of what is lost by leaving the "scene of the crime," that is, the contexts of daily life.

Well, when would relational meta-theorists bring participants to the lab?

One important reason is to measure a construct that you can't capture outside of the lab. There are some phenomena of great interest that are not visible without specialized instrumentation or procedures that can only be administered in the lab setting. All manner of neurophysiological constructs can only be measured in the lab setting using complex equipment, like fMRI, as well as the assessment of internal states and capacities, like IQ or executive function or delay of gratification. In fact, precisely because people and their contexts are so intertwined, we sometimes bring our participants into the lab to see what they can do without the scaffolds or interference of social partners.

A second important reason is to get more detailed information about proximal processes themselves. In this case, researchers have the task of re-creating the relevant proximal processes under more controlled conditions. They bring both the target person and their social partners into the lab setting, help a proximal process get started, and then are in a position to collect more information they could access in the field. Many studies of relationships include lab components, in which both partners (for examples, spouses, parents and adolescents, or children and their friends) are brought in to participate jointly in (what are hopefully) interesting activities, such as to discuss marital issues, work jointly on teaching and learning tasks, play competitive games, and so on. These exchanges are often videotaped or observed closely, and in some cases, simultaneous physiological measures are collected, such as heart rate or blood pressure.

A third reason researchers might turn to lab settings is to create conditions where they can trigger and then observe interactions that are relatively rare in field settings. For example, research on learned helplessness often brings children into controlled settings where researchers can watch them work with solvable and then with unsolvable puzzles, mazes, and concept tasks, while monitoring their strategies, efforts, and actions over time. (And, of course they always end with success experiences.) Another example is the Strange Situation in which researchers trigger the attachment system in the living-room-like lab setting, by sending in a stranger and asking the caregiver to leave, and then observe the child's actions.

In all these cases, naturalistic observation may seem preferable, but because of assortativeness and the responsiveness of contexts, social processes can be impossible to tease apart. For example, mastery-oriented kids run into fewer tasks that they cannot solve than helpless-prone kids and so it is harder to catch them in failure situations, and in schools teachers do not assign impossible tasks, and so observers could go for weeks without seeing their phenomena. And, by the way, after about five years of age, kids are busy trying to hide their true reactions to negative events (a phenomenon called “masking”), which makes it harder for observers to actually detect undesired states (like anxiety or boredom).

4.3.1: Distinguishing between settings and designs.

	Setting	
Design	*Lab*	*Field*
Experimental	Lab experiment	Field experiment
Naturalistic	Observation in lab	Field observation

These sound like access or measurement issues. Where is the causality?

Part of causality is a measurement issue—where you can get the best view of your potential causal processes or your potential effects, and when you get there how deeply you can see into the steps of the process you are trying to understand. So the lab, and all its lovely paraphernalia, often offers the best strategies we have for how to measure our target causes and effects.

Cool inventions: Neurophysiological vests?

Are labs good for other parts of detecting causality?

Indeed they are. They are handy locations for experiments. They cannot be beat for settings in which the researcher has more or less complete control over two key features of the design: (1) the random assignment of participants as to whether they will receive the causal treatment or not; and (2) the administration of the hypothesized causal variable.

Do contextualists care about random assignment?

Do we ever. Remember all those selection effects and assortativeness issues we talked about in previous chapters? Those are shorthand for the huge problems created by the fact that in the contexts of daily life people are not randomly assigned to causal conditions—there are particular personal characteristics that go with people who get in the way of particular causal factors, or who participate in them directly. And so, if we are going to distinguish pre-existing conditions that launched someone on a particular developmental trajectory from the causal factors that we are interested in deciphering, we have to create groups that are “the same on everything” before we start our causal show. Randomized assignment is one strategy to accomplish this, as well as its more systematic options, such as block randomization (randomly assigning different categories of people), matching, propensity score matching, and so on.

Aren’t there better strategies?

Okay, here’s what we would really like to do. We would really like to take our complete sample and expose them to the treatment (the potential causal factor) and see what happens to them, for however long we are interested in detecting effects. Then we would like to load them all into a time machine and take them back to a point in time before the treatment occurred and leave them alone, and see how they would have changed without the treatment. That’s what we are always trying to approximate, a time machine: Let’s see what this groups of people’s development would have been like with this factor and then compare it to the development of the same people without that factor. Pesky time, again. So we have to try to create groups of different people who are the same on everything we can imagine (matching) as well as everything we can’t (random assignment).

Why are we so excited about exact control of the causal factor?

Well, that’s the cool feature of the experimental design. The researcher is like the fairy godmother who waves her magic wand and introduces the potentially new future for the treatment group. So the researcher knows that the treatment group got the potential

causal factor, and how much of the factor, and so on (like in a drug trial—the doctor administers the drug and its dosage). And then the researcher has approximately a bazgillion control groups, who got shades of everything but the hypothesized active ingredient (and these can be so creative, the control group with nothing, with only attention, with a visit to the lab but no causal factor, with a causal factor that looks like the actual causal factor but really isn't, and so on).

Is it easier to control the administration of the causal factor in the lab? So much easier. Once researchers get out in the field, and especially if they decide that the treatment (often as an intervention program) will be administered through intermediaries (like teachers or parents or social workers), it can be a giant headache. There is a whole area of research called "implementation research," and a focus on "implementation fidelity"—or how the heck you would know and could measure whether the participants actually made contact with the causal factor that you are studying. It's like doctors who send the treatment pills home with their patients and then hope for the best, but never get to count the pills that are left in the bottle at the end of the trial, and if patients do not improve, they can't really say whether the drug didn't work or whether the patients just didn't take their pills. Very unsatisfactory from a causal inference perspective.

So we are starting to warm up to labs, right?

Yes, we are regarding them at arm's length but with respect and appreciation. They can be our ally in measurement and they can give us a leg-up on our simulated time machine for creating groups who are the same, so we can send the different groups on their separate (and with many control groups—their varieties) of carefully calibrated and dosed causal experiences.

And what about experimental designs-- are we starting to warm up to them, too?

Yes, we respect and appreciate them, too. But both lab and experimental studies have serious limitations when it comes to the kinds of questions that contextualists and developmentalists want to answer.

What are those limitations?

Let's think about three big limitations. First, we already mentioned that labs and fields are not just settings to us. The "field" is an intrinsic and crucial part of the target we are trying to understand, and if we are going to bring our whole phenomenon into the lab, we have to know all the relevant elements of the context and effectively simulate them in the lab. For us, it is an issue of internal validity.

Second, we assume that all our causal factors, that is, our proximal processes, are embedded in contexts and shaped by them. So if we are looking at the functioning of proximal processes in the lab, we can be sure that the lab context is shaping then, which means we can't be sure that they will operate the same way in the contexts of daily life. So we always have to admit that any causal links we may have watched operating in the lab have to be couched as "can cause" our target and not as "does cause" our target. We have to wait and see if these same processes are operating in the actual contexts that form the natural microsystems for our participants. This is a problem of external validity.

Third, the time span over which developmentalists assume that causal effects accumulate cannot be easily simulated in the lab. The causal processes of interest to developmentalists unfold over months and years and decades, across multiple contexts, so although we can use the lab to measure the long-term effects of causal factors by bringing our participants back to the lab as many times as we want to, if we want to actually look at the causal processes having their effects over months or years, it will be difficult to achieve that in the lab setting.

Please say that these problems are not just for developmentalists.

You are right. They apply to everyone. But there is one problem with typical lab research that in general does not apply to developmentalists.

What is that?

Much of the lab research that is conducted by university researchers uses convenience samples. And who could be more convenient to university researchers than college students? So a great deal of research, for example, in social psychology or on cognition or decision making or perception or education relies on samples of college sophomores—psychology majors, no less. If researchers take their populations seriously and worry about selection effects, then this is a big problem. However, most developmentalists dodge this particular bullet—they do not imagine that the average college sophomore could be considered a reasonable facsimile

for an 8-year-old or an 80-year-old or a parent with three children or a person who has experienced the Great Depression. So developmentalists who work in the lab typically import participants from their actual target populations to the laboratory setting.

Then what is the fatal flaw with experimental research? As noted by many methodologists, the seemingly insurmountable problem with experimental designs is that it is not possible to randomly assign or manipulate the causal forces that are of biggest interest to developmentalists. No one can randomly assign their participants to a particular age group ("I have flipped a coin and you will be in the five-year-old group" "Oh no, I wanted to be 10!") or to a particular cohort or developmental history.

In fact, most of the causal factors that are of interest to us can't ethically be manipulated at all—the happy single-parent family or the unhappily married parents, the delinquent or theatre-obsessed friends, school failure or indifference, peer rejection or popularity, high stress reactivity, dangerous neighborhoods, perfect pitch, or height. Before you ask, we will just add that this same issue applies to all areas of psychology. Many applied problems cannot be manipulated—divorce, PTSD, dangerous job conditions, psychopathology, work-family conflict, serious medical diagnosis, intimate partner violence, and so on. So there are limits to how much experimental designs can help applied researchers study the conditions and causes that most interest us.

Rutter, Pickles, Murray, & Eaves (2001) on the interplay of risk and protective factors in designs for testing complex hypotheses about the causal effects of environmental risk:
It is evident from numerous reviews that causal processes usually involve a complex interplay among risk and protective mechanisms, with indirect chain reactions, bidirectional influences, gene-environment interactions, and synergism between chronic and acute risk factors the rule rather than the exception…[T]he interplay concept means that there are certain further design implications, of which we emphasize four as especially important.
First, putative risk variables must we conceptualized and measured in sufficiently broad terms to encompass the risks that may rely on a combination of factors. The extent to which that is the case, plus the delineation of which elements carry the main risk, is better done by subtraction techniques than by the addition of micorelements, each of which on its own might carry no significant risk.
Second, Designs, samples, and analytic techniques must be chosen on the basis that they can test for the possibility of both gene-environment interactions and personenvironment interactions based on the effects on the person of prior experiences or of maturational features or gender…
Third, appropriate designs must be used to examine the ways in which different forms of gene-environment interactions and person-environment correlations play a part in the causal processes associated with environmental risk mediation…
Fourth, attention must be paid to the phenomenon of resilience, meaning a degree of resistance to psychosocial adversities, operationally defined as relatively good outcomes despite experiencing major environmental risks… The reality of the phenomenon has been well demonstrated, but the protective factors have been little explored as yet despite their potential implications for prevention and intervention" (Rutter et al, 2001, p. 297-298.

Wait! What about optimization studies?

Yes, indeed. Those are rightly considered field experiments, and they can even be conducted as randomized control trials (the gold standard!). And it is correct that we can ethically study any old target we please as long as we are trying to optimize development—to remediate unfavorable developmental trajectories, to maintain resilient ones, and in general to prevent adverse and promote healthy development. So we can learn a great deal and do a great deal of good by trying to create and study interventions designed to optimize development.

At the same time, such optimization studies have two important limitations for developmentalists. First, one thing that such studies cannot tell us is what caused these unhealthy pathways of development in the first place, any more than studying aspirin can tell us what causes headaches or how to prevent them. So additional work will always be needed to fill in the causal puzzle of the factors that contribute to and maintain non-optimal development or lead to psychopathology. It seems that such studies would be essential to prevention efforts.

Second, we have a bone to pick with randomized control trials (RCT) as the ideal methodology for studying causal relationships. As you may know, this methodology was borrowed from clinical trials of medical treatments, and it is cool in many ways. It has time in its design, which is always welcome news to developmentalists. RCTs compare (at least) two groups who should be equivalent to each other (based on random assignment), one of which has received the drug and the other probably a placebo, so that researchers can examine the effects of the drug over and above the effects of knowing that one is being treated. Then after a

sufficient amount of time for the drug to do its work, changes in the treatment and control group can be compared over however many time points the design includes.

This sounds very time-machine-esque. What is the problem?

The problem is that, at the end of the day, the only thing that this design can tell you is “yes” or “no,” that is, the only information it yields is whether the two groups are different. You can add many features, for example, many indicators of disease or health, you can measure dosage and its effects, over several time periods, and so on. However, developmentalists would say that, after all this work, the only thing we have in our hands is a causal description but not the thing that we most want, that is, a causal explanation. For the drug companies, everything they want to know about causal explanations is contained in the drug itself; to the extent that they care about how the drug works, its mechanisms of effects have already been studied (and of course, we take many drugs that are effective, but whose mechanisms of effects are unknown).

Limitations of Randomized Control Trails for Studying Causal Processes

But as developmentalists, our interventions contain hundreds of potential active ingredients. And so we want to poke our heads in under the hood and look all around, watching the cogs engage and the wheels turn. (Whoops! Wrong metaphor for relational meta-theorists!) We want to watch the tennis game or the dance, and see who is hitting the ball the hardest and how the players adapt to each other’s style over time and who is playing the music. In other words, we are on the trail of causal explanation and so we can’t really be satisfied with “yes” or “no.” We will forever be asking “why?” or “why not?” and especially “how did that work?”. So we will always be supplementing experimental and lab studies, and even RCT studies, with studies using designs that can provide us with more complex process-oriented accounts of the multiple causes of differential developmental trajectories and transformations.

Table 4.3.2: Advantages and disadvantages of different settings and designs.

Laboratory Experiment	Advantages	Control and precision Unambiguous causal inference.
		Precise control of hypothesized causal factor.
		Precise measure of hypothesized effect.
	Disadvantages	Artificiality
		May change phenomena.
		Limited to “can cause” versus “does cause” causal conclusions.
		May or may not work in actual contexts.
		Most potential causal factors cannot be manipulated.
Naturalistic Laboratory Study	Advantages	Precision Measure constructs that are “below the surface” (e.g., neurophysiology, capacities, knowledge).
	Disadvantages	Distortion
		Splitting of person from context may have destroyed causal factors.
		Hard to locate “active ingredient” of causal packages.
		Artificiality and novelty of context, instrument, or trigger distorts causal phenomena.
Field Experiment	Advantages	Control and Actual context Potential for causal inference.
		Potential to see how causes operate in situ.
		Potential to see effects in situ.
	Disadvantages	Messiness
		Hard to precisely control the implementation of the potential causal factor.
		Especially if delivery agents are also naturalistic (i.e., parents, teachers, social workers)
		Limited to “can cause” versus “does cause” causal conclusions.
		Most potential causal factors cannot be manipulated.
		Limited account of causal process.

Naturalistic Field Study	Advantages	Authenticity Whole phenomena is intact.
		Can discover causes that were not expected.
	Disdvantages	Murkiness
		Hard to specify “active ingredient” of causal packages.
		Impossible to control all selection effects.
		Limited to “may cause” versus “does cause” causal conclusions.

This page titled 4.3: Experimental Designs and Research Settings is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

CHAPTER OVERVIEW

5: Naturalistic Designs and Causal Inferences

5.1: Naturalistic Designs and Causal Inferences

5.2: Okay, can you break down the reasons that correlations do not prove causation?

5.3: What is the specific problem that researchers working within relational meta-theories have created?

5.4: Adding Time to the Design of Naturalistic Studies

5.5: Use of Time Series Designs for Casual Inference

5.6: Getting Rid of Developmental Differences and Changes

This page titled 5: Naturalistic Designs and Causal Inferences is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

5.1: Naturalistic Designs and Causal Inferences

So we had a good visit with laboratory settings and experimental designs, and although we will meet up with them again at the end of this section (when we arrive at “converging operations”), for now let’s just focus on their limitations in providing detailed process-oriented causal accounts involving conditions we can’t randomly assign and potential causal factors we can’t manipulate. In this chapter, we consider the potential utility of field settings and alternative naturalistic designs. What we appreciate about naturalistic field studies is obvious already from the limitations we encountered with lab and experimental designs: In naturalistic studies we can examine the effects of potential causes that we can’t manipulate directly (e.g., maltreatment, ability tracking, peer rejection). Moreover, we can watch these processes operate in their actual multi-level contexts, and we can follow them for months and years.

But after we sow our wild oats, freely roaming this interesting space and documenting some of the fascinating pathways our participants are taking, we will want to turn from description to explanation. And as soon as we do, we will start to feel homesick for our familiar labs and experiments. In the field, the causes we want to analyze come in annoying piled up clumps of conditions, whereas in our experiments, we had the capacity to create treatment and control groups that we exposed to carefully distinguished and calibrated causal strands. And in the field, these causal clumps land on particular people, sometimes in a “rich get richer” or other complex pattern, whereas in our experiments, they were randomly assigned to groups of people who are the same on everything else. So in naturalistic studies, any causal exposure is always confounded with participants’ pre-existing differences.

One broad way to characterize the difference between lab experiments and naturalistic studies in the field, is that in lab experiments researchers have front row seats and very clear lines of sight on a phenomenon, but we can never be positive if it is exactly the one that we are interested in observing; whereas in naturalistic field studies, researchers can be certain that the actual phenomenon we want to understand is happening right in front of us, but it is all happening so fast and in so many directions (and maybe we are in the balcony and seated behind a pole) that we can never be sure of exactly what we are seeing. In other words, to get causal information out of naturalistic field studies takes quite a bit of work—conceptual, inferential, and empirical.

Wait a minute. Aren’t experiments the only way to show causality?

Yes, experiments can provide important evidence of causal processes. But let’s consider the kinds of causal evidence that can be provided by naturalistic studies.

Wait another minute. Are we talking about correlational studies? Because we know for a fact that “correlation does not prove causation.”

Right, it is correct that correlation by itself does not prove causation. But let’s take a minute to understand why this is true, and then to see whether there are some things that researchers can do to improve the designs of their studies so that naturalistic studies, using more than correlations, can provide evidence about causes. Because, remember—correlation may not prove causation, but causal processes do generate correlations- causes create effects and so effects covary with their causes. In fact, this covariation is one of the defining condition of causality (see box). As a result, correlations (or covariation or contingencies, however you want to label them) may be the smoke that leads us to our causal fires. The problem is that many things besides causation lead to correlations, and so we have to work hard to decipher the causal evidence among all the other kinds of covariation information we are examining.

> John Stuart Mill (1843) on causality. To establish causality, three basic conditions must be met: 1. The presumed effect(s) must covary with their presumed cause(s); 2. The presumed cause(s) must precede their effects in time; and 3. All other plausible alternative explanations for the effect must be excluded.

This page titled 5.1: Naturalistic Designs and Causal Inferences is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

5.2: Okay, can you break down the reasons that correlations do not prove causation?

Okay, can you break down the reasons that correlations do not prove causation?

Yes, let's start with a consideration of a typical bivariate concurrent correlation between two variables, and let's pick variables that tap constructs we think could be causally connected, say, teacher involvement and student engagement (see Figure 23.1). Let's say that in this research we get a robust correlation between good measures of both variables. Why can't we conclude that teacher involvement influences student engagement? There are two main reasons. First, as also shown in Figure 23.1, the connection between these two variables could be due to a reciprocal causal effect, in which student engagement influences teacher involvement. This direction of effects is conceptually plausible, since more engaged students may attract more positive teacher attention and interaction whereas students who are more disaffected may lead teachers to withdraw from interactions or treat students more harshly. Of course, the correlation could be due to both feedforward (i.e., teachers' influences on students) and feedback (i.e., students' influences on teachers) effects.

Insert Figure

The second possibility is that there is no causal effect (forward or backward) between these two variables because they are both actually produced by another cause all together (the ominously named "third variable"); because they are both effects from the same cause, they covary, but the covariation is not causal, so it is called spurious. In our example, also shown in Figure 23.1, we selected students' gender as our third variable because gender it is a plausible cause of both variables—girls are more engaged and teachers show more involvement with them whereas boys are less engaged and teachers show less warmth toward them. In this scenario, as in all other scenarios involving concurrent bivariate correlations, there are a very large number of third variables (alternative causes) that could be in play—it could be achievement (engaged students perform better in school and teachers attend more to high performing students) or social class or student sense of relatedness—as well as a large number of third variables that we can't immediately imagine.

So does this example tell us something about the problems we face in trying to get causal information out of naturalistic studies?

Yes. In trying to extract causal information from a situation in which we just observe what is going on (i.e., a naturalistic design), we have two general problems, as well as a set of special issues that we have created for our own selves by choosing to belong to the relationalmeta-theory-club. The two general ones are: (1) causes naturally happen to people who were different before the causes ever landed on them, so we have to distinguish the pre-existing differences that may have attracted the causes to specific people from the effects of the causal experiences themselves; and (2) our potential causes naturally come in clumps and so we need to peel them apart in order to distinguish the active causal ingredients in these tangles.

This page titled 5.2: Okay, can you break down the reasons that correlations do not prove causation? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

5.3: What is the specific problem that researchers working within relational meta-theories have created?

We assume that there are many different causal bundles that are sufficient to produce the same developmental pathway, and we assume that all of them are biopsychosociocultural packages. If we lived in a world where we were hunting for a single necessary and sufficient cause (like the tubercle bacillus as a cause of tuberculosis), our job would be easier because those kinds of causes create a recognizable signature of covariation (in which the outcome never occurs when the cause is absent, and always occurs if the cause is present). Before we get to feeling too sorry for ourselves, however, we should note that almost no one in the social sciences, or even in epidemiology or medicine, believes that important outcomes are caused by single necessary and sufficient causes (see box). Even exposure to our tubercle bacillus won't cause TB if there is sufficient host resistance. As pointed out by Rutter (2007), “With very few exceptions, there is no such thing as a single necessary and sufficient cause. It is not just that multifactorial traits or disorders have multiple causal influences, but also that several different causal pathways may all lead to the same endpoint” (p. 378). So we are looking for a “constellation of components acting in concert” (p. 378) or actually several constellations since there are always several different pathways. That means that we will need to sort out the possible causal factors into effective (or sufficient) bundles (what Judea Pearl, 2009, calls “causal beams”), including the identification of factors that can’t be in the bundles or else they will preempt or nullify the impact of the causal beam.

“Necessary and Sufficient” or “Insufficient but Necessary Components of Unnecessary but Sufficient Causes”?

Despite the fact that most people would start out by defining a cause as something that is both necessary and sufficient to produce its effects, it turns out that the kinds of causes studied by social scientists almost never satisfy those claims (Mackie,1965).

Mackie examines this idea through the illustration of a house fire that investigators conclude was caused by an electrical short-circuit, even though the short-circuit was not enough by itself to start the fire (i.e., it was not sufficient) and the fire could have started in a variety of other ways (i.e., it was not necessary).

“At least part of the answer is that there is a set of conditions (of which some are positive and some are negative), including the presence of inflammable material, the absence of a suitably placed sprinkler, and no doubt quite a number of others, which combined with the short-circuit constituted a complex condition that was sufficient for the house's catching fire-- sufficient, but not necessary, for the fire could have started in other ways. Also, of this complex condition, the short-circuit was an indispensable part: the other parts of this condition, conjoined with one another in the absence of the short-circuit, would not have produced the fire. The short-circuit which is said to have caused the fire is thus an indispensable part of a complex sufficient (but not necessary) condition of the fire. In this case, then, the so-called cause is, and is known to be, an insufficient but necessary part of a condition which is itself unnecessary but sufficient for the result. The experts are saying, in effect, that the short-circuit is a condition of this sort, that it occurred, that the other conditions which conjoined with it form a sufficient condition were also present, and that no other sufficient condition of the house's catching fire was present on this occasion. I suggest that when we speak of the cause of some particular event, it is often a condition of this sort that we have in mind. In view of the importance of conditions of this sort in our knowledge of and talk about causation, it will be convenient to have a short name for them: let us call such a condition (from the initial letters of the words italicized above), an INUS condition” (Mackie, 1965, p. 245).

We should also keep in mind that, as explained by Rutter, “almost all causal pathways involve several different phases. For example, the pathway to the psychological or psychopathological end point does not begin with a causal risk factor, it must be preceded by the pathway leading to exposure to the risk factor” (2007, p. 378). As a result, the causes that lead to one step may not be the same ones that lead to another. Moreover, the causes that lead to even the same step may also be different if they happen during different developmental periods. For example, the most common way for a 17-year-old girl to get access to beer may be through association with older boys, but the most common way for a 10-year-old girl to get access to beer may be through stealing the beer from her parents. And finally, remember that lovely metaphor of the “conversation” or “dance,” which we liked so well as relational meta-theorists? Well, that metaphor implies that most of the causal effects we find are likely to be reciprocal-- meaning for example, in our illustration in Figure 23.1, that we should expect that, not only does teacher involvement influence student engagement, but student engagement is also likely to reciprocally influence teacher involvement. That does not mean, of course,

that we are supposed to manufacture reciprocal causation, but it does mean that when we look for it, we have to look for it in a way that can distinguish between these two directions of effects.

Causality and Causal Beams

In his fascinating book on causality, Judea Pearl (2009) distinguishes several shades of causality which are important to consider:

1. ***Production***: capacity of a cause to bring about the effect in situations where both are absent. Requires us to step outside the world momentarily and imagine a new world where the particular cause and effect are absent. We apply the cause and see if the effect sets in.
2. ***Dependence***: an aspect of causation that appeals to the necessity of a cause in maintaining certain effects of in the face of certain conditions that would otherwise negate these effects.
3. ***Sustenance***: enriches the notion of dependence with features of production while remaining in a world where both cause and effect are true. The cause alone would be sufficient for maintaining the effect no matter what the other circumstances. The cause takes responsibility for sustaining the effect under such adverse conditions.
4. ***Causal beam***: Set of sustaining parent variables that are effective under each set of conditions.
5. ***Natural beam***: Sustaining set of parent variables that are effective when we freeze all the variables outside the sustaining set at their actual values.
6. ***Actual cause***: Exists as a natural beam.
7. ***Contributing cause***: Causal beam but no natural beam. (p. 316- 319)

So how do we deal with these issues?

Let's take them one at a time, starting with the issue of "pre-existing conditions" or the issue that people may have been different even before they encountered the potential causal factor. Let's just take an obvious example. We discover that people who go to hospitals are much more likely to die than people who stay home, and so we wonder whether spending time in hospitals can be fatal. Before we get carried away, of course, someone will immediately point out that the reason that people go to hospitals is that they are very sick or injured, so hospitalized people are very different from non-hospitalized people before they ever even arrive at the hospital, and it is this pre-existing condition that is more likely to cause death than the hospital stay—both the hospital visit and death are likely to be the effects of pre-existing illness or accident.

In fact, that is one of the mains reason we are grateful to experimental methods-- because random assignment helps us with this problem. As we mentioned previously, the ideal test of causality requires a time machine, or a "reality bifurcation device" in which we could split reality in two and send the exact same participants on two different trains simultaneously, one in which they encounter the potential causal factor and one in which they do not. As explained by Rutter (2007), "All causal reasoning requires an implicit comparison of what actually happened when an individual experienced the supposed causal influence with what would have happened if simultaneously they had not had that experience. Even in a controlled experiment, that observation can never be made" (p. 378). And, because we can't do this, we are always stuck with the fact that we have to send different groups of participants on those two trains, and that's why we appreciate random assignment, because it means that our groups are as similar as we can possibly make them before they go, and we can even estimate (and, if needed, adjust for) that similarity by comparing treatment and control groups on their pretest measures before they board their trains (i.e., before they are exposed to the potential causal factor).

But in naturalistic designs, we only get to watch our participants take their different trips, and since we know that different people prefer different vacations, we are forever fretting about whether they were already different to begin with before they even encountered the cause (or did not encounter the cause). Because if they were different (and we have every reason to believe that they would be), it could be that it is those pre-existing differences that are creating the differences we detect between the two groups that took the different trains and not the effects of the different trains (the cause) at all.

Any third variable could represent a selection effect, that is, the reason that the person took that particular train, and so provide an alternative possible explanation for the observed covariation between the potential cause and the outcome (besides a causal connection between the potential cause and outcome). For example, if we are interested in determining whether American students who spend their junior year abroad in England versus in Zimbabwe come back with a broader worldview, we can look at differences in their worldviews when they return. Say that we find one: the students who stayed in Zimbabwe have broader worldviews than the students who spent time in England. It is plausible that their different experiences may have produced the differences in their worldviews. But it is just as likely that students with a broader worldview would be more likely to choose

Zimbabwe over England, and it could be those preexisting differences selected them into the different experiences. So the students were already different in their worldviews before they even embarked on their different experiences, and it is these pre-existing differences that we detect upon their return, and not any causal effects of their different experiences while they were away.

Well, why not just look at them before and after they went, and see how they changed?

Yes! You have stumbled across one of our secret weapons in the fight to document causal processes, and that is time. If we include time in the design of our naturalistic studies, we have several advantages.

This page titled 5.3: What is the specific problem that researchers working within relational meta-theories have created? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

5.4: Adding Time to the Design of Naturalistic Studies

What do you mean by “adding time” to a design?

Remember the data cube proposed by Cattell (pictured in Figure 17.3)? When we say we are “adding time” to a design, we mean that we are adding “occasions” or “times of measurement” or “repeated measures” to a design.

Like in a longitudinal study?

Yes, that is one excellent way to add time, but we are referring to all kinds of studies that add a second, third, or fourth measurement wave, whether or not those waves are far enough apart to satisfy the conventional understanding of “longitudinal” (which typically implies that enough time has passed for some kind of development to have occurred). Maybe the most general description is “time series” because the design includes a series of different times of measurement.

What are the advantages of adding time? Let’s say that we add just one more time of measurement, so we have two waves in our study. The first advantage is that now we have a way to check the first condition of causality, namely, that causes precede their effects. So we can check out a time-ordered correlation. Continuing with our example from Figure 23.1, with time in the design, we can look at whether the potential cause at Time 1 predicts the potential outcome at Time 2. This is depicted in Figure 23.2. So we are excited to be able to use the word “predict” correctly to describe our correlation. However, this is still just a zero-order bivariate correlation, so it does not allow a causal inference—it still has all the problems with so-called “third variables,” the term we use to stand in for all the alternative causal explanations that could underlie the connections between our predictor and its possible consequence.

Insert Figure 23.2

But we can use our two time points to start looking for how people change from Time 1 to Time 2 in our consequence and to see whether those changes can be predicted from where each person was on the potential cause at Time 1. This is also pictured in Figure 23.2, and has been referred to as a “launch” model because it tries to examine whether an individuals’ initial levels on an antecedent can predict the individuals’ (mini)-trajectory on the target consequence (see Figure 23.3, from Skinner, Zimmer-Gembeck, & Connell, 1998). The term “launch” is used because such a model assumes that the initial levels of the potential causal variable may act like a slingshot or catapult or rocket launcher to create the direction and angle of change in the object that is hurled, that is, the target outcome (in our analogies, the stone, or ball, or rocket).

So what do we like about this kind of “launch” design?

Well, this design is bringing us a little closer to our time machine. We get to look at developmental trajectories as our outcomes (and if we add more time points, they will look more like trajectories), we are looking directly at individual differences in trajectories, and we are looking at predictors of individual differences in those trajectories. So, in our example, we can ask, “Does teacher involvement at the beginning of the school year predict changes in students’ engagement from the beginning to the end of the school year?”. And if the empirical answer is “yes” (i.e., the antecedent is a significant predictor of change from Time 1 to Time 2), we can say things like “Students whose teachers were warmer and more involved with them at the beginning of the school year, also showed increases in their engagement over the school year; whereas students whose teachers were less involved with them at the beginning of the school year, showed corresponding declines in their engagement as the year progressed.” This is a descriptive statement, but is is consistent with a causal hypothesis.

Any other advantages?

Yes. We can also, using the same design, look at the “reciprocal” predictions, in that we can take our antecedent variable and examine how it changes from Time 1 to Time 2, and see whether the variable we had been thinking of as a consequence (which we now consider as a possible antecedent) predicts these changes. This sounds more confusing than it is—see Figure 23.3. In our example, we would be asking “Does students’ engagement at the beginning of the year predict changes in how involved their teachers are with them over the year?” And, if the empirical answer is “yes,” we can say things like “Students who were more engaged in fall experienced increasing involvement from their teachers as the year progressed, whereas students who started the school year lower in engagement experienced declines in their teachers’ involvement from fall to spring.” Again, descriptive, but causally interesting.

One of the most important things about a design with two points of measurement (remember, we just added one more point) is that it allows researchers to begin to pull apart the different directions of effects. A concurrent correlation contains information about both direction of effects, which cannot logically be untangled, but these two analyses that we just ran—the first looks at the feedforward prediction of teacher involvement on change sin subsequent student engagement, whereas the second looks at the feedback prediction of student engagement on changes in subsequent teacher involvement. So the answers to the questions posed by these two sets of analyses could be different—we could get two "yeses" or two "noes" of one of each. And if we get two yesses, we have the possibility of a feedback loop, which feels like we are getting some hints about potential dynamics in the system.

What about all those pesky third variables, those alternative explanations?

Well, we have good news and bad news about them.

What is the good news?

The good news is that we have reduced them some. If you start thinking about the third variables in the concurrent correlation in our illustration, that is, all the factors that are positively correlated with both teacher involvement and student engagement, an enormous number come to mind (e.g., achievement, SES, supportive parents, IQ, a sense of relatedness, and so on), and here is the kicker, these are only the ones we can imagine, there are also unknown confounders. However, when we include in our design and analyses intra-individual change over time, we are using people as their own controls. This means that out of our potential consequence at Time 2, we are taking the consequence at Time 1, which has in it by definition everything (known and unknown) that led up to the consequence at Time 1 (e.g., achievement, SES, supportive parents, IQ, a sense of relatedness, and so on) as well as all the unknowns that created or predicted the consequence at Time 1.

So, for example, if we think that achievement is a possible alternative causal explanation for the zero-order correlation between teacher involvement at Time 1 and student engagement at Time 2 (meaning that high performing students are more engaged and teachers pay more attention to them), when we control for student engagement Time 1, we take out all of the achievement that was responsible for engagement up to that point, so we have controlled for that as a potential confounder. By controlling for the same outcome at an earlier point in time, we have scraped off all the known and unknown predictors of engagement up until Time 1 that could be a potential confounder, or a plausible pre-existing difference, or an alternative causal chain. (We still have all the measurement problems as before—about practice, reactivity, and developmental equivalence, of course, but the list of possible third variables is considerably shorter.)

So then what is the bad news?

The bad news is that the nortorious third variables are not completely eliminated. Since we are still kind of looking at a correlation —the correlation between teacher involvement at Time 1 and changes in student engagement from Time 1 to Time 2, we are still on the hunt for possible alternative causes of both. Remember, before we were looking for things that were correlated with both teacher involvement and student engagement, but now, with this design, we can narrow down our candidates for third variables to those that are correlated with both teacher involvement and changes in student engagement (see Figure 23.4). An excellent example of the incorporation of such variables in research designs that examine change over time can be found in the study of effects of children's peer groups on their engagement (see box).

Insert Figure 23.4

Peer groups and individual development: Selection or group influences?

The study of the effects of children's peer groups on their development presents researchers with a series of knotty problems. This area starts with a very well-known state of affairs, called homophily, which means that "birds of a feather flock together." In other words, kids hang out with other kids who are like them in lots of ways. So we see a high correlation between a child's characteristics and those of the peers in his or her group. But what does this mean? Do kids select other kids who are like themselves to hang out with? Or do kids become more similar to each other over time?

If kids are socializing each other, then we have an intervention lever. For example, if kids are smoking and hanging out with other kids who are smoking, we just have to pry them away from these "bad influences" and then they will quit smoking. However-- if these are primarily selection effects, then we can pry them away from their smoking friends, but as soon as our backs are turned, they will go out and find new friends who smoke. Because parents and teachers often have the impression that "good" kids go "bad" when they hang out with "bad" peers, the research area was mired in the idea that homophiliy was evidence for peer influences for a long time.

By now, however, you can see that homophiliy could be due to either selection or socialization or both. One strategy for teasing these effects apart is the one we have been discussing (for other strategies that also use within-individual change, see Rutter, 2007). Once we have good measures of children on some important characteristic (and let's take student engagement again) and of their peer groups on the same characteristic, we can start with our concurrent bivariate correlation—and land on homophily again, in that engaged students tend to hand out with other engaged students and disaffected students with other disaffected students. If we stop here, we are stuck, but if we add measures of both individual and peers at a second time, we can look at the extent to which peer group engagement at Time 1 predicts changes in individual engagement form Time 1 to Time 2. If we keep the correlation between individuals and their groups at Time 1 in our model, we are essentially controlling for initial similarity or for selection effects.

Now we need to think through the third variables that might be correlated with both peer groups at Time 1 and with individual change in engagement. What about achievement again? Smart kids may hang out with more engaged peers (who are also presumably smart) and they may also become increasingly engaged over time. What about teacher support? Teachers may provide more support to students who hand out with more engaged peers and so promote the student's individual engagement; or teachers may be unsupportive to students who hang out with disaffected peers and so undermine their own engagement. We can check whether these variables are correlated with both peer group engagement at Time 1 and changes in individual engagement. If they are, we can add them to our models as control variables.

What should be thinking about in adding time to our study design?

So many things. But let's start with some basic questions that we almost never know the answer to—What are the right windows and the right time gaps between measurement points to capture the action the causal process and its possible cyclicity (both feedforward and feedback)? If we are thinking about teacher involvement and student engagement, it seems like the beginning of a new school year would be a good moment for them to be calibrating to each other, but how long would that take—a week, a month, six weeks? Who knows? One rule of thumb is to use more measurement points than you think you will need, so you can look over different time gaps for your possible process.

This page titled 5.4: Adding Time to the Design of Naturalistic Studies is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

5.5: Use of Time Series Designs for Casual Inference

What do you mean more? Weren't we excited to be adding just one more time of measurement?

Well, two is qualitatively different from one, so that's good. But more really is merrier. Additional times of measurement allow researchers to look at these predictors of change across additional time gaps (from a predictor at Time 2 to changes form Time 2 to Time 3), to use growth curves to look at trajectories of mean level change (from a predictor at Time 1 to a trajectory from Time 1 to Time n),

Can we even use these designs to look at how changes in our antecedents predict changes in our outcomes? Yes, these have been called "Change-to-change" models (Skinner et al., 1998), but you should stop using the word "predict" to describe these connections. They are actually like correlations between growth curves, and then we land back in our concurrent correlations puddle. So it would probably be better to look at the connections between time-lagged growth curves, for example, the connection between a growth curve from Time 1 to Time n to predict an outcome from Time 2 to Time n+1 (see Figure 23.5). Then you could also look at reciprocal change-to-change effects by switching around your antecedents and consequences. Just like with the designs that incorporate only two measurement points, these two analyses can provide different estimates of the connections between the different portions of the growth curves.

---------- Insert Figure 23.5 about here ----------

What is happening with all our third variables in these analyses?

We can control for them, but it may be more interesting to look directly at their effects, by organizing our data into a "niche" study, where we look at the connections we are interested in for subgroups of children—for boys or girls separately or for students high or low in achievement. If the connection between teacher involvement and student engagement is due to gender, it will disappear when we look at boys and girls separately. Looking directly at the developmental patterns of different groups is more consistent with a relational meta-theory which holds that development is differentially shaped by the characteristics of the people and their contexts (see box).

Perceived control, teacher support, engagement, and achievement.
An example of a "niche" design using growth curves can be seen in a study that examined the connections between teacher context (involvement and structure), students' perceived control, their engagement, and achievement from the beginning of grade 3 to the end of grade 7 (Skinner et al., 1998). As you would expect, these variables were positively intercorrelated with each other at each time point and also predicted changes in each other over time.
To get a feeling for how the processes were working over time, some "niches" were created by pulling apart the variables that usually go together. This was accomplished by selecting groups of students that were high versus low in perceived control at the beginning of third grade and who were in the top versus bottom quartiles of their slopes of teacher context. Then their growth curves in perceived control are plotted over time (see Figure 23.7).
As you can see, at the beginning of third grade, the students whose teachers were supportive differed very little from students whose teachers were unsupportive. However, as students moved from grade to grade, the cumulative effect of teacher support becomes visible. Two trajectories told the typical story of positive correlations between teacher support and perceived control: Students who started high on perceived control and continuously received high levels of teacher support (which is the typical case with a positive correlation between these two variables) maintained high and steady levels of perceived control. In a similar fashion, the students who started off low in perceived control and received little teacher support over the years showed deteriorating levels of perceived control over the years. However, in these typical pathways, because student perceived control and teacher support go together, we can't really see the effects of one versus the other.
That's where the beauty of the unusual case or the off-diagonals comes in. We can also describe the trajectories of perceived control for combinations of conditions that are not very common: Students with high control who do not receive teacher support and students with low control who do. In the figure, we can see the "main effects" of perceived control in that students who started low tended to stay low and students who started high tended to stay high, at least until the end of fourth grade. But starting in fifth grade, the trajectories took a different direction, with students who experienced their teachers as unsupportive are losing ground in their perceived control whereas students who experienced their teachers as supportive started gaining ground, until by the end of seventh grade the trajectories had crossed over each other.

Do we ever get to causal inferences in these time series designs?

It is understandable that you might think that we can never get from here to there, but there is one kind of time series design that gets us within shouting distance. It is called the "interrupted time series" or "regression discontinuity" design. You can almost guess what it looks like form the name. Researchers have many repeated measures of the potential consequence, enough that we begin to be confident about being able to predict the level and directionality of the phenomenon. Then this series is "interrupted" by the occurrence of the potential causal variable. We have our time machine, in that we think, from the past history of the consequence, that we can estimate where the consequence was headed without the interruption. And then we see whether the consequence shows an abrupt and unexpected shift after the interruption. In a regression discontinuity design, researchers test whether the slope of the consequence was changed at the point of the interruption, so that the slope before the interruption is significantly different from that after. We included a few examples of these kinds of designs in Figure 23.8 and 23.9.

Insert Figure 23.8 and 23.9

Such a design is considered to allow causal inference in intervention studies, where the intervention is the interruption. It is not used as often in naturalistic studies because it is harder to locate naturally-occurring "interruptions" that are both sufficiently perturbing and regular enough to allow researchers to collect their time series measures before the interruption takes place. One area in which naturally-occurring "interruptions" have been well-studied are school transitions, for example, the transition to middle school and the transition to high school. Students' academic, motivational, and social functioning show sharp declines across these transitions, although it has taken several decades to figure out what it is about these transitions that cause declines in functioning (see box). Researchers have long been on the hunt for "natural experiments" in which unselected populations are subject to abrupt shifts in environmental factors (Campbell, 1969; Rutter, 2007).

Transition to Middle School: Stage-Environment Fit

What is responsible for the dramatic losses observed in students' motivation, engagement, academic performance, and self-confidence across the transition to middle school?

Researchers were interested in the factors that could explain these regular and significant declines in functioning. One group of researchers begin by examining the characteristics of schools that shifted from the organization of elementary schools to middle schools, things like larger schools, a variety of subject-specific teachers for shorter periods of time. Because school transitions take place across specific age ranges, a competing explanation was neurophysiological development—the idea that declines were the result of the tolls of puberty and adolescence, which would have taken place with or without a school transition.

Very clever researchers used designs that allowed studies to separate the age changes of adolescence from the environmental transition across middle school. Researchers compared students from school districts that were organized in three different ways: (1) K-8 schools in which buildings included kindergarten through eighth grade; (2) elementary and middle schools in which districts reshuffled students from all elementary schools (K-5) into larger middle schools (6-8); and (3) elementary and junior high schools in which districts reshuffled students from all elementary schools (K-6) into larger junior high schools (7-8).

The results of these kinds of studies were definitive (Eccles & Midgley, 1989). Adolescence was not the primary risk factor for declines in functioning—precipitous drops were apparent at whatever age the school transition took place (6th grade for districts with middle schools or 7th grade for those with junior high schools) and, most important, such drops were not seen (or were greatly reduced) across the same ages in districts that did not require school transitions (K-8 schools).

The best account of these issues seems to be provided by stage-environment fit (Eccles et al., 1993) in which the typical changes over the transition to middle or junior high school include features (e.g., more distant and less caring teacher-student relationships, more competitive and performance-oriented learning goals, more impersonal discipline, fewer choices about academic work) that are a very bad match for the changing needs of adolescents (for stronger adult relationships outside the family, more intrinsic motivation, and greater autonomy in learning).

Is there an elegant way to get information about both dynamics and development into one model?

Good question. That is exactly what methods that model latent change scores (LCS) are designed to do (Ferrar & McArdle, 2010; McArdle, 2009; McArdle & Grim, 2012). These methods allow researchers to look at several things of great concern to developmentalists at the same time. Imagine a standard developmental data set that has measures of possible antecedents and outcomes at many time points. If you didn't know any better, you would look at different parts of your causal questions using all different kinds of analyses. For example, you would ask whether antecedents at one time point could predict changes in a possible outcome from that time point to the next, and then whether it could predict changes in a growth curve (i.e., launch model). Then

you would go back and see if changes in the antecedent could predict changes in the outcome (change to change model) and you might lag the growth curves. Then, to examine reciprocal effects, you would go back and start at the beginning again, with your antecedents and consequences reversed. Whew!

It was as if you could only “spend” the time that was in your design in one way at a time: It could either be used as a marker of interindividual differences in the analysis of predictive dynamics from one time to the next, or it could be used as a marker of developmental time to create a slope or growth curve. With LCS, both of these questions can be examined in the same model. For example, in our trying to answer our question about the potentially reciprocal effects of teacher involvement and student engagement, let’s imagine that we have measures of both of these variables at the beginning and the end of fifth, sixth, and seventh grades. With LCS, we can examine: (1) whether teacher involvement in fall of fifth grade predicts changes in students’ engagement across the school year; (2) whether it also does so across sixth and across seventh grades; and (3) whether those predictive effects differ. At the same time, it can examine (1) whether changes in teacher involvement predict changes in student engagement across each of those time gaps, as well as (2) whether the reciprocal pattern, that is, from student engagement to subsequent teacher involvement, also holds or is different. Of greatest interest to developmentalists, researchers can use LCS to model whether changes in teacher involvement or in engagement seem to act as leading or lagging indicators, so that one could examine whether, for example, teachers’ involvement drops as students start middle school, followed by declines in students’ engagement; or whether students’ engagement declines over the transition to middle school after which teachers begin to withdraw their support.

Does this mean that LCS models can be used to answer all the questions that we have considered so far?

Yes. They can be used with classic developmental designs to provide descriptive information about normative and differential trajectories, and then they can go on to chew their way through time-lagged predictions of growth curves, looking at whether they are the same or different over different developmental swaths of time. LCS models can be further enhanced through the addition of “interruptions” and hypothesized discontinuities.

At what point are we done with “alternative plausible causal explanations”?

In naturalistic designs? Never. The process of digging for potential causes is a never ending story. As explained by Shadish et al.

"In quasi-experiments, the researcher has to enumerate alternative explanations one by one, decide which are plausible, and then use logic, design, and measurement to assess whether each one is operating in a way that might explain any observed effect. The difficulties are that these alternative explanations are never completely enumerable in advance, that some of them are particular to the context being studied, and that the methods needed to eliminate them from contention will vary from alternative to alternative and from study to study. (2002, p. 14)"

That is why there is no substitute for knowledge and careful thinking about the target phenomenon, and why multiple research teams working on the same target can jostle and spur each other to examine a variety of possibilities. Some of the most useful writings on design are ones in which researchers try to outline the likely alternative explanations or threats to validity (e.g., Shadish

ate al., 2002); for developmentalists, these are slightly different (e.g., Rutter, 2007; Rutter et al., 2001; Foster, 2010; Jaffee, Strait, & Odgers, 2012).

Plausible alternative explanations for the effect.
Given that one of Mill's criteria for causal inference was the exclusion of other plausible alternative explanations, it is very helpful to borrow lists of such plausible alternatives, such as that provided by Michael Rutter (2007), who offers five key alternative explanatory hypotheses that should be ruled out before concluding that environmental risk factors contribute to the development of psychopathology.

1. ***Genetic mediation***. Risk stemming from an environmental factor is caused by genetics.
a. Passive. Risky environments are created by adults who also pass on genetic risk.
b. Active. People at genetic risk tend to select and create risky environments.
2. ***Social selection or allocation bias***. The outcome (e.g., psychopathology) is not the effect but the cause of the potential risk factor (e.g., low SES).
3. ***Reverse causation***. The outcome (e.g., child defiance) elicits the potential risk factor (e.g., harsh parenting).
4. ***Risk feature misidentified***. The risk factor is an umbrella for many components but only some of them actually cause the outcome.
5. ***Confounding variables***. Additional variable that both distinguishes groups to be compared and is associated with the outcome.
a. Use of hypothesis-driven analyses to identify and test alternative pathways.
b. Use of propensity score matching.
c. Use of sensitivity analysis to quantify how strong a confounder must be to overturn causal inference.
d. Use of diverse strategies and samples with different sets of potential confounders.
e. Consider regression discontinuity to account for unmeasured confounders (despite limited applicability).

This page titled 5.5: Use of Time Series Designs for Casual Inference is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

5.6: Getting Rid of Developmental Differences and Changes

At the same time, in developmental designs, there are two interesting kinds of study designs that may seem counter-intuitive, but can be useful in compiling a causal case: one in which the researcher tries to get rid of age effects and one in which the researcher tries to separate age and the potential causal variable.

Why would a researcher want of get rid of age effects?

We know it sounds paradoxical, but getting rid of age differences or changes in your data may be an effective strategy for identifying a sufficient causal bundle. Let's think of an example with which we are already familiar—we see age differences in our cross-sectional study of cognitive performance and wonder whether these could be cohort effects. We know that there are cohort differences in education and health care, and so we can do use two strategies to see whether these cohort effects may underlie our age differences: (1) control for education and health status and see if our age differences disappear; or more interesting for relational developmentalists, (2) look for age differences within groups of our sample stratified by these conditions. We used the same strategy in our longitudinal study, remember? We looked within the conditions we thought might be contributing to our different pathways and found (to a contextualist, not surprisingly) that these groups showed different pathways.

This strategy can be used in any kind of study that includes a pattern of age differences or age changes, to look more closely at the factors that researchers think may contribute to these patterns. A simple example can be found in a study of cross-year changes in children's use of help-seeking and concealment as ways of coping in the academic domain (Marchand & Skinner, 2007). Across the transition to middle school, students in sixth grade showed higher use of concealment and lower use of help-seeking compared to fifth graders. One possibility was that losses in motivational resources across this transition could be contributing to these age differences in coping, so two analyses were run: (1) one in which the same grade differences were examined, but with level of motivational resources held constant; and (2) groups who were high and low in motivational resources were created and grade differences within each group were examined. For both analyses, grade differences disappeared. The separate analysis of each of the motivational resources individually revealed that only a subset of them were effective in getting rid of the grade differences, suggesting that they might be more central in explaining the losses in coping capacity over the transition.

How else can a researcher get rid of age differences or changes?

We saw lifespan researchers trying to get rid of age differences that may have been based on performance factors that disadvantaged older individuals, through massive practice, untimed tests, and so on. Unfortunately, there is no list of strategies for trying to get rid of age differences or changes. Researchers must use their knowledge of the phenomenon and alternative possible explanations to systematically test which ones might be effective in wiping out age differences or changes. And, of course, only a subset of factors can be remediated in the present moment.

What are the strategies for separating age from causal processes?

Despite the fact that developmentalists are always looking for age-graded changes, none of us actually think that age per se causes anything. Age is an index for time at a particular biopsychosocicultural window, and so we think of it as a marker for some causal process that is taking place during that window. One of the most interesting causal designs is an attempt to separate age and the potential causal variable. A great example if provided by Baltes et al. (1977) in their introduction to lifespan research methods: As people age, their hearing normatively declines, but how much of this decline is inevitable and how much due to a history of exposure to noise? In typical samples, as participants get older, they have more of both: more age and more noise exposure. However, researchers can search for and select samples for whom those two factors are not confounded: young people who have very noisy jobs or who spend their time in noisy rock concerts, and older people who have very quiet jobs and live in very quiet areas. This allows researchers to "simulate" those age-graded factors that they think may be involved and see if they end up with no age differences-- or (more likely) different patterns of hearing loss for participants with different histories of noise exposure at different ages.

A second way of separating age and developmental factors is to zoom in on a particular narrow age range and to use a careful assessment of a specific developmental accomplishment that is scheduled for that age range. This assessment can then be used to distinguish people of the same age who have "crossed over" the developmental accomplishment from those who have not. Researchers can then see whether age or the developmental change is more important to the potential outcome of interest. One

accomplishment that has been used this way is the differentiation between effort and ability, which typically takes place between 10 and 12 years of age (see box).

Separating Age and the Effort-ability differentiation. Children's views of their ability make a big difference to their participation and success in school. An important developmental change underlying these perceptions is the cognitive shift in inferential reasoning that allows children to differentiate the cause of effort from that of ability. This development accompanies the shift to formal operational reasoning, which typically takes place between 10 and 12 years of age (Nicholls, 1984). Before this point, children see effort and ability as mutually diagnostic, in that greater effort implies more ability and vice versa; after they are differentiated, children come to believe that they have an inverse compensatory relationship in that more effort implies less ability, and greater ability entails less effort. So researchers could look at age-graded changes from ages 10 to 12, such as changes in ways of coping or the correlates of perceived control, and see whether these changes follow age or the developmental shift (Band & Weisz, 1990). Two such studies showed that age differences between these age groups disappeared after controlling for performance on tasks of effort-ability differentiation. More interesting, direct examination of differences according to levels of effort-ability differentiation revealed that differences in functioning walked right along those developmental steps. For example, before children differentiated effort from ability, their cognitive performances were correlated with their beliefs about their capacity to exert effort, but as effort was successively differentiated from ability, the primary correlate of performance shifted to beliefs about ability (Chapman & Skinner, 1989).

This page titled 5.6: Getting Rid of Developmental Differences and Changes is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

6: Proximal Processes and Sequential Observations

This page titled 6: Proximal Processes and Sequential Observations is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

6.1: Proximal Processes and Sequential Observations

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 6.1: Proximal Processes and Sequential Observations is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

6.2: What are the important conceptual points about proximal processes?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 6.2: What are the important conceptual points about proximal processes? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

6.3: How are naturalistic observations connected to our meta-theories?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 6.3: How are naturalistic observations connected to our meta-theories? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

6.4: What are the most common types of observational methods?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 6.4: What are the most common types of observational methods? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

6.5: Sequential Observations

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 6.5: Sequential Observations is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

6.6: Design Decisions with Sequential Observations

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 6.6: Design Decisions with Sequential Observations is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

CHAPTER OVERVIEW

7: Individual Time Series- Trajectories and Episodes

7.1: Individual Time Series- Trajectories and Episodes

7.2: What are some strategies for collecting and analyzing our bread-and-butter, that is, dense time-ordered data?

7.3: What are intra-individual time series studies?

7.4: What are “inter-individual questions"?

7.5: In what way do relational meta-theories converge on that assumption?

7.6: Do correlations also differ depending on whether they are inter-individual and intraindividual?

7.7: Strategies for Charting Individual Trajectories Over Developmental Transitions

7.8: Strategies for Charting Individual Proximal Processes

7.9: Is there a take-home message from time series designs?

This page titled 7: Individual Time Series- Trajectories and Episodes is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

7.1: Individual Time Series- Trajectories and Episodes

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 7.1: Individual Time Series- Trajectories and Episodes is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

7.2: What are some strategies for collecting and analyzing our bread-and-butter, that is, dense time-ordered data?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 7.2: What are some strategies for collecting and analyzing our bread-and-butter, that is, dense time-ordered data? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

7.3: What are intra-individual time series studies?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 7.3: What are intra-individual time series studies? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

7.4: What are “inter-individual questions"?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 7.4: What are “inter-individual questions"? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

7.5: In what way do relational meta-theories converge on that assumption?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 7.5: In what way do relational meta-theories converge on that assumption? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

7.6: Do correlations also differ depending on whether they are inter-individual and intraindividual?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 7.6: Do correlations also differ depending on whether they are inter-individual and intraindividual? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

7.7: Strategies for Charting Individual Trajectories Over Developmental Transitions

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 7.7: Strategies for Charting Individual Trajectories Over Developmental Transitions is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

7.8: Strategies for Charting Individual Proximal Processes

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 7.8: Strategies for Charting Individual Proximal Processes is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

7.9: Is there a take-home message from time series designs?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 7.9: Is there a take-home message from time series designs? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

CHAPTER OVERVIEW

8: Person-centered Analysis- Configurations, Lifespaces, and Life-paths

8.1: Person-centered Analysis- Configurations, Lifespaces, and Life-paths

8.2: Okay—so what are “variable-centered” analyses?

8.3: Can you give an example of a variable-centered approach?

8.4: Are person-centered methodologists operating from a set of larger principles?

8.5: Person- and Pattern-Centered Methods- Cluster Analyses

8.6: Pattern- and Person-Centered Approaches To Development

8.7: Lifeplace Analysis

8.8: Lifespan Analysis

This page titled 8: Person-centered Analysis- Configurations, Lifespaces, and Life-paths is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

8.1: Person-centered Analysis- Configurations, Lifespaces, and Life-paths

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 8.1: Person-centered Analysis- Configurations, Lifespaces, and Life-paths is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

8.2: Okay—so what are “variable-centered” analyses?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 8.2: Okay—so what are “variable-centered” analyses? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

8.3: Can you give an example of a variable-centered approach?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 8.3: Can you give an example of a variable-centered approach? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

8.4: Are person-centered methodologists operating from a set of larger principles?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 8.4: Are person-centered methodologists operating from a set of larger principles? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

8.5: Person- and Pattern-Centered Methods- Cluster Analyses

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 8.5: Person- and Pattern-Centered Methods- Cluster Analyses is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

8.6: Pattern- and Person-Centered Approaches To Development

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 8.6: Pattern- and Person-Centered Approaches To Development is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

8.7: Lifeplace Analysis

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 8.7: Lifeplace Analysis is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

8.8: Lifespan Analysis

Your page has been created!

Remove this content and add your own.

- Edit page

  Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

- Drag and drop

  Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

- Classifications

  Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

- Working with templates

  CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

- Visit for all help topics.

This page titled 8.8: Lifespan Analysis is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

CHAPTER OVERVIEW

9: Development of Contexts

9.1: Optimization of Development

9.2: Don't we already have the idea of “changing contexts” incorporated into our meta-models?

9.3: Models of Contexts That Are Indifferent to Change

9.4: Models of Context Development

This page titled 9: Development of Contexts is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

9.1: Optimization of Development

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 9.1: Optimization of Development is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

9.2: Don't we already have the idea of “changing contexts” incorporated into our meta-models?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 9.2: Don't we already have the idea of “changing contexts” incorporated into our meta-models? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

9.3: Models of Contexts That Are Indifferent to Change

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 9.3: Models of Contexts That Are Indifferent to Change is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

9.4: Models of Context Development

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 9.4: Models of Context Development is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

CHAPTER OVERVIEW

10: Developing Brains - Experience and Neuroplasticity

10.1: Introduction

10.2: Okay, but haven’t we already incorporated the brain as the “bio” in our “bio-psycho-sociocultural” people?

10.3: What does “plasticity” mean when applied to the brain?

10.4: Neural Architecture

10.5: Experience Expectant Development

10.6: Experience Dependent Development

10.7: Development, Neuroplasticity, and Interventions

This page titled 10: Developing Brains - Experience and Neuroplasticity is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

10.1: Introduction

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 10.1: Introduction is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

10.2: Okay, but haven’t we already incorporated the brain as the “bio” in our “bio-psycho-sociocultural” people?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 10.2: Okay, but haven’t we already incorporated the brain as the “bio” in our “bio-psycho-sociocultural” people? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

10.3: What does “plasticity” mean when applied to the brain?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 10.3: What does “plasticity” mean when applied to the brain? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

10.4: Neural Architecture

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 10.4: Neural Architecture is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

10.5: Experience Expectant Development

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 10.5: Experience Expectant Development is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

10.6: Experience Dependent Development

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 10.6: Experience Dependent Development is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

10.7: Development, Neuroplasticity, and Interventions

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 10.7: Development, Neuroplasticity, and Interventions is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

CHAPTER OVERVIEW

11: Developing Individuals- Transformation and Branching Cascades

11.1: Introduction

11.2: Agency and Individual Transformation

11.3: Developmental Cascades

This page titled 11: Developing Individuals- Transformation and Branching Cascades is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

11.1: Introduction

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 11.1: Introduction is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

11.2: Agency and Individual Transformation

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 11.2: Agency and Individual Transformation is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

11.3: Developmental Cascades

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 11.3: Developmental Cascades is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

CHAPTER OVERVIEW

12: Goals of Developmental Science

12.1: What are the goals of developmental science?

12.2: Description of Human Development- What does it mean to describe human development?

12.3: What does it mean to describe qualitative changes in development?

12.4: How can the description of stability be part of the goals of developmental science?

12.5: Explanation of Human Development- How is the explanation of development different from its description?

12.6: Why do developmentalists need to explain stability?

12.7: What is meant by explanations of differential patterns of stability and change?

12.8: Optimization of Human Development- How does optimization of human development differ from explanation?

12.9: Conclusion- How do these three goals of developmental science fit together?

12.10: References

This page titled 12: Goals of Developmental Science is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

12.1: What are the goals of developmental science?

For most students (and for many established researchers), the highest level at which they have thought about their target phenomenon is the level of the conceptualization or theory. That makes the analysis of theories a good starting point for meta-theoretical reflection. In order to analyze a theory for its underlying assumptions about the nature of people, their contexts, and the meaning of development, however, we have to be clear on how theories fit into the goals of developmental science, and to deeply understand the theories themselves.

Developmental science has three goals: to describe, explain, and optimize human development (Baltes et al., 1977; see Table 2.1). There two target of human development: (1) patterns of normative change and stability and (2) patterns of differential change and stability. Patterns of normative change refer to regular age-graded constellations of intra-individual change, including quantitative changes, often referred to as "trajectories," and qualitative changes, such as reorganizations or the emergence of new forms. Patterns of normative stability refer to regular age-graded periods of constancy, including quantitative consistency, or flat trajectories, as well as continuity in qualitative organization or functioning. We illustrate what it means to describe, explain, and optimize these kinds of development using examples from the area of children's motivation for school (Wigfield, Eccles, Schiefele, Roeser, & Davis-Kean, 2006).

Table 2.1. Goals of Developmental Science

1. **Description** of patterns of intra-individual change and stability
   - Depiction of patterns of *normative* change and stability
     - Delineation of typical *quantitative* trajectories
     - Delineation of typical *qualitative* shifts
   - Depiction of *differences* between people in their developmental pathways
     - Delineation of range of quantitative trajectories
     - Delineation of different kinds of qualitative shifts
2. **Explanation** of patterns of intra-individual change and stability
   - Account of the set of causes that produce *normative* change and stability
     - Specification of influences that generate typical *quantitative* changes
     - Specification of influences that give rise to typical *qualitative* shifts
   - Account of the sets of causes that produce *different* pathways
     - Specification of influences that generate different *quantitative* trajectories
     - Specification of influences that give rise to different kinds of *qualitative* shifts
3. **Optimization** of intra-individual development
   - Identification of conditions that promote optimal *normative* and *differential* development
     - Specification of influences that generate optimal trajectories and qualitative shifts
     - Specification of influences that give rise to resilience
   - Discovery of strategies and levers to create such optimal developmental conditions
     - Discovery of ways to remediate or compensate for non-optimal conditions
     - Discovery of ways to promote occurrence of optimal developmental conditions

This page titled 12.1: What are the goals of developmental science? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

12.2: Description of Human Development- What does it mean to describe human development?

The task of description for developmental scientists involves depicting, portraying, or representing patterns of development in the target phenomena. As shown in Figure 2.1, this includes description of normative development, or typical quantitative and qualitative age-graded changes and continuities, as well as identifying the variety of different quantitative and qualitative pathways the phenomena can take. In the area of academic motivation, many decades of descriptive research reveals that, normatively, children's enthusiasm, interest, valuing, and engagement in academic activities show quantitative declines, starting the day they enter academic classes and ending when they graduate from high school or drop out. These declines can be depicted as relatively steady linear decreases, punctuated by steeper declines at school transitions, typically around the transition to academic curriculum (during Kindergarten or first grade), around grade 3 (considered the transition from "learning to read" to "reading to learn"), over the transition to middle school (about grade 6), and the transition to high school (grade 9).

In terms of differential pathways, these quantitative declines are less pronounced for girls, for high achieving children and youth, for white middle class students, and for students who attend schools that include kindergarten through eighth grade in the same building. In contrast, declines are more pronounced, and more likely to lead to dropping out prior to high school completion (which can be seen as a qualitative shift), for boys, for children and youth who struggle with the dominant language or academic material, for students who are low in socioeconomic status, or from some ethnic minority and immigrant groups, and for students who attend schools in districts that separate elementary from middle schools.

This page titled 12.2: Description of Human Development- What does it mean to describe human development? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

12.3: What does it mean to describe qualitative changes in development?

In general, describing qualitative change involves depicting the age-graded organizations and re-organizations in the constituents of a phenomena, sometimes referred to as phases, stages, structures, or developmental tasks. The clearest descriptions of qualitative shifts can be found in Piagetian and neo-Piagetian accounts of development, which depict sequences of qualitatively different structural reorganizations of cognitive and affective processes (e.g., Case, 1985). In terms of academic motivation (and many phenomenon not as directly tied to cognitive developments), relatively less consensus exists about how to characterize the pattern of normative qualitative changes. Some examples can be found in work on the normative development of self-perceptions that seem to underlie children's motivation and engagement, for example, self-perceptions of ability, which during early childhood are initially high and unrealistic, and subsequently come to be tied more directly to actual levels of performance (e.g., Stipek, Recchia, & McClintic, 1992), and children's conceptions of effort and ability, which initially are fused, but, with the onset of formal operations, come to be differentiated and take on an inverse compensatory relationship, in which low performance under conditions of high effort implies low ability (e.g., Nicholls, 1978).

This page titled 12.3: What does it mean to describe qualitative changes in development? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

12.4: How can the description of stability be part of the goals of developmental science?

Sometimes it may seem surprising that developmentalists would be interested in identifying time windows during which phenomena are stable or unchanging. Doesn't it seem like stable phenomena would be left to non-developmental scientists to study? Such questions makes sense if one subscribes to certain assumptions, namely, the assumption that stability is the default state of all phenomena; if so, then of interest are states that differ from this default, namely, states of change. However, it is also possible to assume that the natural state of affairs is movement, flux, or change; from this perspective, it is important to describe not only the qualities and directions of these changes, but also to document states that manage to differ from this default, namely, periods of stability, continuity, or constancy.

This page titled 12.4: How can the description of stability be part of the goals of developmental science? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

12.5: Explanation of Human Development- How is the explanation of development different from its description?

Although, when studying any phenomenon, it is an important step to describe age-graded patterns of change and stability, age by itself (that is, time since birth) cannot explain why these patterns occur. Age (and other measures of time) can provide a metric along which change and stability can be plotted, but they are only considered to be markers for the temporally-graded causal factors that give rise to development patterns in the target phenomenon. Hence, explanation differs from description in that it refers to an account of the causes that together are necessary and sufficient to produce the patterns of changes and stability that have been described or observed. If descriptions answer questions like “what?” (i.e., the nature of the target phenomena), “how?” (i.e., the ways in which phenomena can change or remain the same), and “when?” (i.e., the ways in which these patterns appear as a function of age or time), then explanations focus on the “why?” questions: What sets of factors cause, influence, or produce these different patterns of change or stability over time?

Explanations of normative development focus on the causes that underlie typical patterns of change and stability. In the example of motivation, explanatory theories and research would focus on the causes of the steady declines in students’ academic engagement and motivation, and why sharper declines are typically evident during school transitions. They would also focus on the causes that maintain engagement or compensate for losses in motivation, and so produce patterns of normative stability. Causal processes can remain the same over development, resulting in what can be called “explanatory continuity,” or different causal processes may be involved in explaining similar phenomena at different ages, resulting in “explanatory discontinuity.”

Explanations are completely different from descriptions. Researchers can compile the most elaborate description of the development of a phenomena, and not have discovered anything about the causes that underlie it. In the motivational area, general consensus exists about normative and differential changes in academic engagement over the school careers of children and youth, but a great deal of lively debate persists about the causes of these developments—neurophysiological, psychological, social, and contextual factors have all been nominated. Of course, description and explanation are linked—the search for explanations are guided by signposts originating in the patterns of development that have been described-- but even when normative descriptions have been ascertained for decades (e.g., the sequence of locomotion from creeping to crawling to walking described by Gesell in the 1930s; Gesell & Ames, 1940), it often takes many more decades for causal accounts to be well-established and accepted (Thelen & Adolph, 1992; Thelen, Ulrich, & Wolff, 1991).

This page titled 12.5: Explanation of Human Development- How is the explanation of development different from its description? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

12.6: Why do developmentalists need to explain stability?

Just as with descriptions of stability, it may seem that the search for explanations for stability would be a waste of developmentalists' time. And indeed, if researchers assume that the natural state of all phenomena is constancy or continuity, that is, if they assume that all phenomena are inherently at rest, then no explanations for this state are needed. However, if, on the other hand, change is assumed, then the natural state of all phenomena is considered to be movement or flux, and explanations are needed for how constancy could be accomplished. In general, such states of stability or constancy are often described as "steady states," and they are considered to be achieved through active means, such as are visible in all those activities needed to maintain the steady state of "balance" when walking on a narrow ledge or, over longer periods of time, all those activities needed to maintain a constant weight. These active processes are captured in concepts such as maintenance, conservation, preservation, compensation, equilibrium, homeostasis, or homeorhesis.

This page titled 12.6: Why do developmentalists need to explain stability? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

12.7: What is meant by explanations of differential patterns of stability and change?

In addition to explaining normative patterns of development, researchers are also interested in providing a causal account for why a target phenomena should take any of the variety of different pathways it has been observed to follow. Sometimes this task is relatively straightforward—especially when pathways differ only in mean level or age of onset. Then it can be the case that the same factors that explain normative change and stability also can account for different pathways. Pathways are traversed at earlier ages or at higher mean levels because some individuals have more of the factors that promote the phenomena and less of the factors that undermine it, whereas pathways are traversed at later ages or at lower mean levels because some individuals have less of the factors that promote the phenomena and more of the factors that undermine it. In the case of motivation, this kind of "explanatory continuity" has been found for some of the differences between girls and boys in motivational development. In general, many of the same factors that predict and explain engagement in girls (who start and remain higher in motivation) also predict and explain engagement in boys; they just operate on a lower plane for boys.

The task of differential explanation is made more challenging when the causal factors that produce normative development are not the same ones as those that generate the different pathways. Such "explanatory discontinuity" seems to be the case for differences in motivation, engagement, and achievement for students from different socio-economic classes and ethnic groups. Explanatory models for white middle class students simply did not include factors like affordable medical care (e.g., to treat ear infections which otherwise produce high rates of school absence), dangerous neighborhoods (e.g., which can interfere with getting to school and completion of homework), and discrimination from teachers and peers.

This page titled 12.7: What is meant by explanations of differential patterns of stability and change? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

12.8: Optimization of Human Development- How does optimization of human development differ from explanation?

The goal of optimization of human development refers to research and intervention activities designed to figure out how to promote healthy development (also referred to as flourishing or thriving) and the development of resilience. This task goes beyond description and explanation in two ways. First, in order to optimize development, trajectories and pathways must be identified as targets—targets that represent “optimal” development. These kinds of trajectories are often better than normative development, and so represent rare or even imaginary pathways, especially for groups with many risk factors. The search for optimal pathways reflects the assumption that individuals hold much more potential and plasticity in their development than is typically expressed or observed.

The second way that optimization goes beyond description and explanation is that even when explanatory theories and research have identified the necessary and sufficient conditions likely to promote optimal development, researchers and interventionists still need to discover the strategies and levers that can consistently bring about these developmental conditions. For example, suppose that in studies of motivational development, researchers have uncovered multiple factors that are important to promote student engagement, such as teacher autonomy support, authentic academic work, school climates organized around mastery-oriented learning goals, parent investment in student academic success, and student self-efficacy. These would all be potential candidates for inclusion in interventions to optimize motivation. However, from such research, interventionists have no clues as to the strategies that will allow them to effectively (and permanently) change those developmental conditions. One way to understand the difference between explanation and optimization is that, if explanations focus on the antecedents of a developmental phenomenon, then optimization efforts need to focus on the antecedents of these antecedents.

This page titled 12.8: Optimization of Human Development- How does optimization of human development differ from explanation? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

12.9: Conclusion- How do these three goals of developmental science fit together?

In one way, the tasks of description, explanation, and optimization from their own sequence: If a team of developmentalists wants to understand their target phenomenon, first, they must discover and document its developmental course, including both quantitative and qualitative changes and periods of stability (i.e., describe the development of the phenomenon). Once its course has been charted, researchers can begin searching for underlying (or overarching) factors that produce these patterns of change and stability, working toward causal accounts of both normative development and differential pathways (i.e., explain the development of the phenomenon). Then when the explanatory network is sufficiently well-established, researchers can begin building interventions that target the creation of developmental conditions that support and maintain these explanatory factors (i.e., optimize the development of the phenomenon). In practice, research is more recursive, of course. Descriptive research suggests targets for optimization; experimental study of interventions can be used to identify causal factors; the analysis of explanatory factors suggests additional potential descriptive pathways; and so on. In fact, the active pursuit of all three of these tasks simultaneously characterizes the most generative research areas.

This page titled 12.9: Conclusion- How do these three goals of developmental science fit together? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

12.10: References

Baltes, P. B., Reese, H. W., & Nesselroade, J. R. (1977). Life-span developmental psychology: Introduction to research methods. Oxford, England: Brooks/Cole.

Case, R. (1985). Intellectual development. New York: Academic Press.

Gesell, A., & Ames, L. B. (1940). The ontogenetic organization of prone behavior in human infancy. The Pedagogical Seminary and Journal of Genetic Psychology, 56(2), 247-263.

Nicholls, J. G. (1978). The development of the concepts of effort and ability, perception of academic attainment, and the understanding that difficult tasks require more ability. Child Development, 800-814.

Stipek, D. J., Recchia, S., & McClintic, S. M. (1992). Self-evaluation in young children. Monographs of the Society for Research in Child Development, 57 (2, Serial No. 226).

Thelen, E., & Adolph, K. E. (1992). Arnold L. Gesell: The paradox of nature and nurture. Developmental Psychology, 28(3), 368.

Thelen, E., Ulrich, B. D., & Wolff, P. H. (1991). Hidden skills: A dynamic systems analysis of treadmill stepping during the first year. Monographs of the Society for Research in Child Development, i-103.

Wigfield, A., Eccles, J. S., Schiefele, U., Roeser, R., & Davis-Kean, P. (2006). Development of achievement motivation. In W. Damon (Series Ed.) & N. Eisenberg (Volume Ed.), Handbook of child psychology, 6th Ed. Vol.3. Social, emotional, and personality development (pp. 933-1002). New York: John Wiley.

This page titled 12.10: References is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

CHAPTER OVERVIEW

13: Converging Operations and Multiple Lines of Sight

13.1: Converging Operations

This page titled 13: Converging Operations and Multiple Lines of Sight is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

13.1: Converging Operations

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 13.1: Converging Operations is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

CHAPTER OVERVIEW

14: Understanding a Theory

14.1: What are the steps to “understanding a theory”?

14.2: Why does understanding start with articulating the “theoretical question”?

14.3: What is meant by “theoretical context”?

14.4: What are the key constructs of the theory and their definitions?

14.5: What is the target phenomenon and what is its developmental trajectory?

14.6: What are the parts of “explanation”?

14.7: What are the parts of a theory that focus on optimization?

14.8: What happens next-- “beyond understanding”?

14.9: Is it really necessary to draw theories?

This page titled 14: Understanding a Theory is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

14.1: What are the steps to “understanding a theory”?

The goals of developmental science are to describe, explain, and optimize human development, including quantitative and qualitative topographies of stability and change, both as these unfold normatively and as they follow differential pathways. These worthy goals fit within the larger goals of science and of social science, which are to describe, explain, and optimize whatever target phenomena, that is, whatever aspects of the social and natural world, we have chosen to study. There are great ethical responsibilities that come with these goals. As scientists, we must bring as much clarity to our work as possible, describing and explaining what we are studying as truthfully and accurately as we are able. We must also bring compassion to our work—taking the full picture into account, including the perspectives and interests of all involved. And we must try to carry out our work mindfully, with full awareness of how we are conducting our science, and the historical and social pressures that shape our work. Hence, to prepare us for our profession as scientists, we require training in both ethics and science.

Empirical science, as a way of knowing, offers us a set of tools. Two of the most important are theories and methods. Theories, at their core, are ways of thinking about phenomena, representations or working models of our targets, if you will. Methods, at their core, are ways of looking at phenomena, rules for observation. These two sets of basic tools, for thinking and looking, are reciprocally connected to each other (see Figure 3.1): Theories guide us about the “who,” “what,” “when,” “where,” and “why” we should look or observe. As the German saying goes, “Das Auge schläft bis es der Geist mit einer Frage weckt,” which means “The eye sleeps until the mind wakes it with a question.” If our eyes are open, we then see things through our observations that, if our minds are open, should inform what we think, or update our working models.

An important step in our scientific training is the realization that we are not studying theories or constructs; we are studying whole people functioning in the real world, or the slices of the real world delineated by our target phenomenon. Theories are highly selective and impoverished representations of these real world phenomena, and we should always be trying to rework our conceptualizations to more truthfully, compassionately, fully, and clearly map onto our targets. Our theories will get “better,” that is more useful, to the extent that they can more fully integrate all the empirical information that is currently known about our phenomena and suggest new avenues for research. As has often been noted, theories become more useful as they expand in scope (the range of phenomena they map), precision (the exactness of the mapping), and generativity (the new territory they open up for exploration). If we believe that the social and natural worlds are complex intertwined dynamic systems, then we will naturally be attempting to construct theories that can more clearly capture more of this complexity and change. To do this, however, we first need to carefully and deeply understand the theories that currently guide our developmental science.

For the process of “understanding theories,” this text offer a set of strategies for unpacking and analyzing theories that allows us to look at the components of theories and distinguish their micro-developmental processes from their macro-developmental processes. This kind of analysis allows us to deconstruct theories—to identify the elements that are descriptive and explanatory, and to examine their implications for optimization. Importantly, we can also analyze the assumptions about humans and their development that underlie theories. Once completed, we can go “beyond understanding” to processes of critique, elaboration, and generation of conceptual and empirical questions. Such an analysis is the basis for locating places where a theory can be “developmentalized,” “complexified,” and “systematized,” bringing it closer to our target real world phenomenon and rendering it more useful to finding solutions to important applied problems.

14.1.1

The steps to understanding a theory are pictured in Table 3.1. They include a set of questions that allow us to focus on the goals of the theory, its historical context, its key constructs, the parts of it that are relevant for description, explanation, and optimization, and its underlying assumptions. In addition, we also encourage students to draw theories, focusing especially on “what is on the arrows,” namely causal or micro-developmental processes. After such an analysis, students are ready to go “beyond understanding,” for example, by critiquing and elaborating the theory, or using it to derive research questions or intervention ideas.

14.1.2 Why would it be important to “understand” theories? Why can't we just start using them?

Because we have meta-theoretical lenses that we bring to the study of our phenomena, it is easy to “misunderstand” theories, that is, to assume that they are more comprehensive or dynamic that they really are. It is also easy to dismiss theories with which we are not as familiar, if they raise our meta-theoretical hackles. We are likely to accept the theories that our mentors use, that are dominant in our areas, or that reflect current historical conventions. When we read theoretical papers (which are still in the minority

in our scientific journals, Slife & Williams, 1997), we typically just follow the ideas as they are presented and often do not question them or notice what is missing. To begin seeing theories clearly and afresh, and to become aware of what they are (and are not), it is helpful to take them through the understanding process.

To illustrate the process of understanding a theory, we use the theory of attachment, as presented in Mary Ainsworth's 1979 article in the American Psychologist. We selected this theory because it is applicable to a wide range of phenomena and because it was part of a "metatheoretical duel" with social learning theorists in the late 1960s and early 1970s (Gewirtz, 1969). We discuss these ideas and events more completely in the next chapter, in which we contrast these perspectives. We also offer alternative "dueling formulations" in theories of intrinsic and extrinsic motivation (e.g., Ryan & Deci, 2000). In terms of understanding a theory, it is always necessary to specify the source article because theories are themselves developmental phenomena, and different papers, even by the same author(s) can present different versions of the theory (e.g., see Chapman, 1988, for a historical analysis of Piaget's changing theoretical views on cognitive and affective development). We selected Ainsworth's American Psychologist article because it was suitable for general readers. We also provide a relatively general understanding of Ainsworth and of the differences between Bowlby and Ainsworth, but we encourage readers to follow up on these theories and theorists in more detail (e.g., Bretherton, 1992).

This page titled 14.1: What are the steps to "understanding a theory"? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

14.2: Why does understanding start with articulating the “theoretical question”?

It is important to start the understanding process with a clear perspective on the goals of the theory, what it is trying to do, as reflected in the “theoretical question” it is intended to answer. This provides a frame for analyzing the parts of the theory and insures that we begin our analysis at the right “grain size.” Sometimes we zoom in too quickly and get stuck on specific concepts or methods. Focusing on the theoretical question allows us to zoom out and get a feeling for the whole package before we consider its elements. Alternatively, we sometimes zoom out too far, and end up disliking a theory because it is not helpful to us, when it was never designed to answer the questions we would like it to address. In this case, focusing on the actual theoretical question allows us to get oriented to the goals of the theory’s authors, instead of our own. When trying to understand a theory, we often put up pictures of the theory’s authors and laughingly pretend that they are with us in the classroom, to remind us to be as accurate and constructive as we can be in analyzing their work.

Table 3.1. Steps to Understanding a Theory

1. **Theoretical question**. What is the theory trying to do? What is the purpose of the theory?
2. **Theoretical context.** What are the main theoretical tradition(s) within which this theory is situated or from which this theory was derived?
3. **Key constructs and definitions.** What are the most important terms, phenomena, or objects of study? How are they defined?
4. **Description.** What is the target phenomenon and what is its developmental trajectory?
5. **Explanation**. Draw a picture.
   a. **Antecedents**. What causes, produces, or influences the target phenomenon?
   b. **Consequences**. What does the target phenomenon cause, influence, or produce?
   c. **Mechanisms**. What processes are on the arrows?
6. **Optimization**. How can we improve or produce the best target phenomena? What are the implications for intervention?
7. **Meta-theoretical assumptions**. What does the theory assume about the nature of development and change?
8. **Beyond understanding**
   a. **Theory**: Question, critique, compare, integrate, enhance, elaborate, improve
   b. **Research**: Design, select variables, hypotheses, next steps
   c. **Optimization**: Antecedents, consequences, mechanisms
   c. **Self-reflection**: Understand, question own assumptions, views

It is surprisingly difficult to read an entire theory paper (even one as short as an article in American Psychologist) and then to pull back and figure out what the authors were trying to do. Rarely do authors directly state their theoretical questions. In trying to articulate Ainsworth’s central question, students often land on the term “attachment” and suggest guiding questions such as “Where does attachment come from?” and “Why are babies attached to their mothers?” These are not Ainsworth’s questions, of course, but we usually let students’ ideas sit on the whiteboard as possibilities, and suggest that continuing with the “Understanding” process may help to surface Ainsworth’s guiding questions, which it usually does.

This page titled 14.2: Why does understanding start with articulating the “theoretical question”? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

14.3: What is meant by “theoretical context”?

The second step in understanding a theory is to identify the theoretical tradition from which the theory emerged or within which it is currently situated. Often we can gain more appreciation of the goals and constructs of a theory when we know about the theory’s general precursors, or what the theorist was reacting against or trying to supplement or replace. It can be difficult for students to figure out the theoretical context of a specific theory. Often the authors do not explicitly identify the root theoretical traditions, and students are not familiar enough with the history of psychology to know the “lineages” of specific theories or theorists, nor do they have mental models of the range of families of psychology that are elaborated enough to allow them to recognize that specific terms, such as “drive” or “trait” or “appraisal” or “reinforcement,” are important clues to a theory’s larger context. In fact, this process is often students’ first introduction to the idea of “families” of theories or theoretical traditions, like constructivism or social learning theory or motivational theories of fundamental needs or trait personality theories. Here, classes or readings on the history of psychology would be helpful (e.g., Cairns & Cairns, 2006), although students should not be surprised if alternative accounts of the history of a field are provided by narrators representing different traditions (e.g., histories of the field of motivation provided by Edward Deci and Bernard Weiner at AERA in 1990).

Understanding Ainsworth: Theoretical context.

Luckily, Ainsworth (1979) is explicit about the theoretical tradition upon which her work builds. In fact, the first word in her 1979 paper is “Bowlby” as in “Bowlby’s (1969) ethological-evolutionary attachment theory implies that it is an essential part of the ground plan of the human species-- as well as that of many other species—for an infant to become attached to a mother figure” (p. 932). Ainsworth tells readers directly that her theoretical and empirical work relies on the previous work of John Bowlby. At this point in the class, we usually pause to “understand” Bowlby and then return to “understanding” Ainsworth—a task made easier once we have analyzed Bowlby.

Understanding Bowlby: Goals and theoretical context.

John Bowlby’s theory of attachment (Bowlby, 1969/1973) was focused on the question, stated in colloquial terms, “Why do infants love their mothers, and why do mothers love their infants?”. Posed in a more scientifically exact manner, his question was, “Why do infants form attachments to their caregivers, and why do caregivers form attachments to their infants?”. As pointed out by Ainsworth, Bowlby approached these questions from the theoretical context of ethological and evolutionary traditions. Ethology, sometimes considered a sub-topic of zoology, focuses on the study of animal behavioral processes in their natural contexts; and evolutionary psychology focuses on the role of natural selection and survival in shaping the current functions of human behavior, cognition, and neurophysiology in adapting to changing physical and social environments. When considering attachment from these perspectives, Bowlby was focused on two issues: (1) What is the function of caregiver-infant attachments in allowing infants to survive to reproductive age? and (2) What are the kinds of species-wide biobehavioral systems (initially called “instinctual response systems”) that typically guarantee the normative formation of attachments between infants and caregivers?

This page titled 14.3: What is meant by “theoretical context”? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

14.4: What are the key constructs of the theory and their definitions?

Key constructs are the building blocks of any theory. They are simply the specialized terms used to label the elements in the theory. They are called “constructs” in order to emphasize that they are theoretical representations of real objects and processes. In a good description of a theory, authors provide a comprehensive list of the key constructs used in the theory along with careful and precise definitions of these concepts. For example, in Bowlby’s theory, such key constructs would include “attachment,” “infant distress,” “proximity seeking,” “protection,” and “responsiveness.” Identifying the key constructs and locating their definitions are important steps in getting a handle on the pieces of a theory. For Bowlby and Ainsworth, these are listed in the examples of “Understanding a theory” summaries at the end of this chapter.

The search for key constructs and their definitions is an important step during which students often discover that theorists’ presentations of their theories have “holes” in them. The definitions, even of key terms, are often incomplete, or they are missing all together. Sometimes definitions can be inferred from how terms are used, but sometimes, in understanding a theory, we must refer to other papers or just leave definitions blank. In preparation for drawing a theory, we often ask students to place each key construct and its definition on an index card—this deck of cards can then be used to create alternative depictions of the relationships among these constructs, as prescribed by the theory.

This page titled 14.4: What are the key constructs of the theory and their definitions? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

14.5: What is the target phenomenon and what is its developmental trajectory?

The target phenomenon of any theory is the heart or core of the theory, the central thing or construct around which the theory is formed. When getting straight on one's own program of research, this target phenomenon often seems to be moving. We can shift our interest from attachment itself to the characteristics of the infant or caregiver or higher-order contexts that shape it, or from attachment itself to its short-term or long-term consequences. However, when understanding a theory, getting a bead on its central target is usually not too difficult. Typically theories are named for their target phenomenon—such as self-efficacy theory, emotional selectivity theory, transactional coping theory, and so on. In the case of Bowlby, the target phenomenon is "attachment." One way to begin to graphically represent a theory is to place the target phenomenon is the middle of the drawing, as shown in Figure 3.2.

The developmental trajectory of the target phenomenon is the descriptive part of the theory—depicting (as presented in more detail in the previous chapter) the way that the phenomenon changes over age or time. From its description of development, one can already start to get a feeling for the assumptions underlying the theory. Does the description involve a single progressive quantitative trajectory of age-graded change? Does it involve qualitative shifts? Different pathways? Patterns of stability and continuity? Each of these kinds of descriptions of how the target phenomenon develops reveals the authors' beliefs about the nature and course of development.

Understanding Bowlby: Target phenomenon and description of its developmental course. In Bowlby's theory, as might be expected if one is thinking of attachment as a connection between infant and caregiver that allows for greater chances of survival, the developmental course of attachment is a relatively universal normative progression. Less obvious from an ethological-evolutionary perspective, the formation of all attachments are hypothesized to proceed through several qualitatively different phases, from undiscriminating and then discriminating social responsiveness to the emergence of a strong affectionate bond that binds the infant to a specific intimate companion (sometimes referred to as "full-blown attachment").

This page titled 14.5: What is the target phenomenon and what is its developmental trajectory? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

14.6: What are the parts of “explanation”?

The next step in understanding a theory is to analyze its “explanation” by pulling out (from the list of key constructs if such constructs are presented comprehensively in the theory paper) the antecedents and consequences of the target phenomenon, and the mechanisms or processes that causally connect them. Antecedents are the proposed causes of the target phenomenon and its pattern of developmental change(s). What produces, influences, or generates the target? Here again, clues can be found as to the assumptions underlying the theory. Are the causal antecedents all to be found within the person, perhaps all in the individual’s biology or in their psychology or in their social cognitions? Conversely, are the causal antecedents all to be found within the environment? Or in a mix of person and environment? In drawing a theory, the antecedents are usually placed to the left of the target(s) and connected to them via an arrow pointing from the antecedent to the target (see Figure 3.2).

Understanding Bowlby: Explanation and antecedents.

For Bowlby, again not surprising given the theoretical context, the antecedents are found in the biobehavioral predispositions of all humans (in fact, of all mammals who do not cache their young). Newborns come with a set of characteristics and action tendencies that make them attractive to caregivers, such as their “baby-ness” (as seen in their small bodies, large heads, big eyes, soft skin, floppy movements, and so on), their sociability, and their preference for and interest in other humans. They also come with the capacity and willingness to vigorously express their distress as well as with reflexes that allow them to physically attach or fasten themselves to caregivers when distressed, through grasping and huddling. They also bring with them the capacity to be comforted by other people, through, for example, close physical contact, rocking, and humming. Correspondingly, caregivers come with the capacity to be attracted by infants’ “babyness” and the desire to draw near to, comfort, and protect newborns when they are distressed. These are the proposed antecedents of attachment. See Figure 3.3.

14.6.1 What are the consequences of the target phenomenon?

The consequences of the target are the outcomes that the target itself causes, generates, or produces. These are usually the reason that the target is of interest to researchers—because it has a positive or negative impact on people’s lives. For example, in Bowlby’s theory, attachment to a caregiver has the infant is more likely to survive to reproductive age, as depicted in Figure 3.3. In drawing a theory, the consequences are usually placed to the right of the target, with an arrow connecting them, that starts at the target and goes to the consequences. Sometimes two arrows would be included, one to the positive consequences and one to the negative consequences. Sometimes two sets of consequences might be considered—the short-term consequences and the long-term consequences of the target. These options are shown in Figure 3.2.

14.6.2 What are the processes that connect the target phenomenon to antecedents and consequences?

In depicting theories, arrows have a special meaning. They denote influences or causes. One of the most interesting questions about any theory is “What is on the arrows?” or in other words, “What are the processes or mechanisms by which influence is transmitted?”. A theory can posit multiple answers to the question of how causes produce their effects. For example, the mechanisms through which the antecedents produce the target phenomenon are different from the mechanisms through which the target phenomenon produces its consequences. It is also possible for a theory to posit multiple mechanisms through which either of these causal chains operate—for example, multiple pathways through which an attachment increases the chances of the survival of offspring.

Understanding Bowlby: What is on the arrows?

In the case of Bowlby’s theory, the processes that connect biobehavioral predispositions to the formation of an attachment are well-specified. Newborns, when distressed, express this directly through crying or fussing. Caregivers, who are attuned to these signals, approach the newborn, figure out what is wrong, and provide comfort and care (e.g., feed the newborn or change a wet diaper). The newborn expresses relief and happiness in having his or her needs met. The caregiver also experiences relief and happiness at the infants’ satisfaction. After many such interactions, the infant learns to direct their communications to their caregiver with the expectation that the caregiver will respond sensitively; at the same time, the caregiver becomes more adept at “reading” the infant’s signals and so becomes more effective in calming and caring for the infant. This positive feedback loop leads to thousands of infant-caregiver interactions from which emerges the specific affectionate bond between caregiver

and infant. Over time, these interactions organize the infant's behavior, so that when distressed, it seeks proximity to the caregiver; and this proximity in turn acts to calm the infant's distress and stabilize the infant's behavior. These interactions are depicted in Figure 3.4. In terms of the other set of arrows in the depiction of Bowlby's theory, namely, from "attachment" to "survival," a different set of mechanisms are proposed. For immature offspring, and especially in times of distress, proximity to a caring adult (whether accomplished by attracting, gripping, staying near, or getting to a caregiver) makes it more likely that the baby will be taken care of and protected from threats, and so survive to reproduce.

14.6.3 What is on the arrows?

It is worth highlighting that the mechanisms of transmission in Bowlby's theory are processes of reciprocal social interaction, in the form of thousands of exchanges between the newborn and its caregiver. In general, we argue that "what is on the arrows" is most often a set of social interaction processes, reciprocal exchanges between the target person and others in his or her natural and social contexts, or their surrogates, like books, academic tasks, work assignments, television, Facebook, or other social tools. In subsequent chapters, we will return to the idea that reciprocal social interactions, also called "transactions" (Sameroff, 2010) or "proximal processes" (Bronfenbrenner & Morris, 2006), are the "engines" of development. BY this we mean that they have the power to shape development, and may be the only forces that can accomplish this.

14.6.4 Why does this theory seem to be operating on two different time scales?

All developmental theories operate on multiple time scales. In many theories, two time scales are made explicit: (1) the "micro-developmental" portion of the theory is grounded in "real time," and depicts the moment-to-moment exchanges between the target individual and their social partners; these exchanges can be captured, for example, by in vivo observations or digital recordings of social interactions; and (2) the "macro-developmental" portion of the theory is grounded in "developmental time," and depicts the time scale over which these social interaction episodes aggregate to cumulatively shape the trajectory of the target developmental process (which we sometimes refer to as "moving the dial") or cumulatively lead to the reorganization and emergence of qualitatively new states.

Understanding Bowlby: Micro- and macro-development

In Bowlby's theory, the micro-developmental part is depicted in the reciprocal social interactions between caregiver and infant, which become more attuned with practice. The macrodevelopmental part is depicted in the emergence of the attachment bond, which takes place over a much larger time scale and requires the development of additional underlying antecedents, such as the infant's neurophysiological, attention, memory, and cognitive subsystems.

This page titled 14.6: What are the parts of "explanation"? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

14.7: What are the parts of a theory that focus on optimization?

"Optimization" refers to the implications of the theory for prevention and intervention efforts aimed at producing the best target phenomenon possible. Most developmental theories, because they focus on progress in normative development, are pretty good at identifying "ideal" or "optimal" development trajectories (although there are often many alternative optimal pathways and end states). Sometimes the theory's optimization implications are not stated directly, but have to be inferred from the antecedents specified by the theory—these are the intervention levers. For example, theories positing that personal attributes (e.g., cognitive level, self-efficacy, personality) are key antecedents imply that healthy development could be achieved by promoting those personal attributes, although the theory may not specify how this can be accomplished.

Understanding Bowlby: Optimization of attachment

Bowlby is clear on the optimal developmental outcome—a secure attachment between caregiver and infant. At the same time, because the antecedents posited by Bowlby are species-wide biobehavioral predispositions, it may seem as if there is no room for optimization. However, this theory would suggest that any infants or caregivers who do not come with these characteristics may be at-risk for difficulties in the formation of a secure attachment. So infants who do not have a reasonable amount of "baby-ness" (e.g., preterm newborns) or who cannot demonstrate their interest in caregivers (e.g., blind infants) as well as caregivers whose natural protectiveness and responsiveness have been undermined by illness or exhaustion might need supports to establish the kinds of exchanges that will lead to the formation of a secure attachment.

Discussion of a theory's implications for optimization are also interesting places to discover what is missing from a theory. For example, many theories posit that the antecedents to certain sets of target actions are beliefs. An illustration of this kind of conceptualization can be found in theories of academic engagement (i.e., students' enthusiastic participation in academic activities), some of which hold that a key antecedent of students' classroom engagement is their perceptions of the extent to which teachers respect and appreciate them. Sometimes we encourage our own students to think about whether these perceptions are the "real" antecedents in such theories, pushing them to consider whether teachers' actual treatment of students is more relevant. Our students correctly point out that the "active ingredient" that shapes students' engagement is not what teachers are doing but what students think teachers are doing. However, it is instructive to consider the optimization implications of such a position. Focusing on students' perceptions as the ultimate antecedents implies that intervention efforts should be focused on students themselves, for example, by systematically attempting to persuade them that teachers really do respect and appreciate them. This is not the strategy that interventions to optimize engagement utilize, of course. Instead, they focus on working with teachers to change the ways that they interact with students, with the assumption that improved teacher-student exchanges (in which teachers are warmer, listen more closely to students points of view, and so on) will cumulatively lead students to change their minds about whether teachers like and respect them. In such cases, it becomes clear that the theory has not yet fully articulated all the strings of antecedents that are involved in generating the target phenomenon. It also suggests that sometimes the analysis of standard intervention practices can be helpful in filling out the missing pieces of a "theory of change"—as the basis for optimization.

What are a theory's "meta-theoretical" assumptions?

The endgame of this text is to help researchers articulate their own assumptions about development and to begin re-tooling their conceptual and empirical work to align more fully with those assumptions. A good first step is to begin to surface the assumptions about the nature of development that are contained in the theories we rely upon most often. Throughout the description of the understanding process in this chapter, we have tried to indicate the places in a theory where these assumptions are most apparent—for example, in the description of the nature of the development of the target phenomenon (e.g., as a quantitative trajectory or as emergence) and the location of its key antecedents (e.g., in the person, the context, or their transactions). In subsequent chapters on meta-theories, we will consider some schemes for grouping and labeling these assumptions. But the first step in this direction can be part of the "understanding" process, in which, once we analyze the theory, we start locating and discussing the assumptions it includes—assumptions that are so easy to overlook.

Understanding Bowlby:

Meta-theoretical assumptions. Consistent with other ethological-evolutionary theorists, Bowlby is focused on attachment as an outcome of inherent species-wide neurophysiological subsystems that have evolved as part of the human “ground plan” because they have provided an evolutionary advantage. If newborns and caregivers come with “standard biological equipment,” attachments will be formed. These assumptions (which since the introduction of Bowlby’s theory have been substantiated by research on the nature of this neurophysiological equipment) suggest the primacy of biology in the development of attachment.

This page titled 14.7: What are the parts of a theory that focus on optimization? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

14.8: What happens next-- “beyond understanding”?

After the process of careful analysis required to really understand a theory, we have now achieved a clear picture of the “map” that the theory provides for its target phenomenon. We can use understanding as a launching pad for further theory construction—by clarifying construct definitions, critiquing what is present as well as what is absent, and filling in holes. We can use it as a basis for comparing and contrasting different theories that focus on the same target phenomenon. We can integrate the theory with others that we have previously understood, or we can go in search of additional theories to shore up, enhance, or elaborate the current one. We can also use the theory to design research studies and intervention efforts. Chapter 3: Understanding a Theory 18 An important accomplishment in understanding theories and reflecting on their assumptions, is that we are beginning to differentiate our thinking. We distinguish elements that are often “fused” in our everyday research practice. We separate our target phenomena (which function in the real world beyond our immediate grasp) from our theories or representations of these phenomena, which are always highly selective and simplified. We can separate the theories from their constructs, and both of these from their operationalizations and measurement in specific variables. We can then examine the assumptions packed in all of these elements. This kind of “defusing” allows us to become more flexible in considering multiple perspectives— meta-theoretical, theoretical, operational, and analytical—in studying and trying to optimize our corner of the world.

This page titled 14.8: What happens next-- “beyond understanding”? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

14.9: Is it really necessary to draw theories?

Is it really necessary to draw theories? Theories are representations of our phenomena, and drawing theories forces us to make explicit all of our (or the theorist's) decisions about the key constructs and their relationships. When "drawing," we don't need to worry about our artistic skills—boxes and ovals, stick figures, and arrows are typically sufficient for depicting even complex theories and models. There is a clarity to drawing, or to moving around our pack of index cards (containing key constructs), that scaffolds clear thinking. We consider how constructs are potentially grouped according to individual and/or contextual attributes; we notice whether some constructs are embedded in other higher-order constructs. We register temporal and causal priority based on the convention that the time course moves from left to right, and that causes precede their effects. We indicate reciprocal relations by including both feedforward arrows and feedback arrows.

One of the things that we noticed about our students' drawings is that the only context in which they have systematically been exposed to visual representations of their phenomena is in Chapter 3: Understanding a Theory 19 their statistics classes. And they have tended to adopt those depictions—based on multiple regressions, latent path models, hierarchical linear modeling, and so on. This can create a kind of "statistical creep" in which certain analytic techniques come to dominate our representations— and so shape our theories of phenomena. Instead of looking for analytic methods that allow us to test our genuine theoretical questions, we end up asking the theoretical questions that our statistical methods are designed to answer. So it was important to "defuse" conceptual form statistical representations, so that we could consider their fit in making decisions about design and analysis.

Finally, it was great fun to ask all our students to draw the same theory and then examine all the different ways that it could be represented. Some of the representations were "better" than others, in that they contained more information, were more consistent wit the theory's propositions, or were easier to understand. And sometimes, some of the student representations were actually better in all those ways than the graphics offered by the theorists themselves! But often times, all the variety of representations were equally good—but just very different. Again, this allowed us to reflect on the multiple perspectives that can be brought to bear on any phenomena, and to seek out and appreciate ways of looking at them that are different from our own.

This page titled 14.9: Is it really necessary to draw theories? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

CHAPTER OVERVIEW

15: Contrasting Theories- Attachment

15.1: What is Ainsworth's conceptual question and theoretical context?

15.2: What are Ainsworth's key constructs and target phenomenon?

15.3: What are the antecedents, consequences, and mechanisms in Ainsworth's theory?

15.4: What are the optimization implications of Ainsworth's theory of attachment?

15.5: What are the meta-theoretical assumptions of Ainsworth's theory of attachment?

15.6: Why do we need to learn about Gerwitz's theory of attachment?

15.7: How do we draw Gewirtz's theory of attachment?

15.8: Why are the theories of Bowlby, Gewirtz, and Ainsworth so very different?

This page titled 15: Contrasting Theories- Attachment is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

15.1: What is Ainsworth's conceptual question and theoretical context?

Contrasting Perspectives on Attachment: Bowlby, Ainsworth, and Gewirtz

In order to illustrate how assumptions about humans and their development shape theories, research, and interventions, we selected sets of theories on which students could practice their "understanding" skills that are all focused on the same target phenomena, but that approach it from different meta-theoretical perspectives. There are many such sets of theories, and we offer descriptions and analyses of a few examples in subsequent chapters (see Chapter 6 for contrasting theories of motivation and learning). In this chapter, we follow up on theories of attachment, and finish "understanding" Ainsworth and Gerwirtz, before we begin comparing and contrasting their assumptions about infants, caregivers, and the development of attachment relationships.

What is Ainsworth's conceptual question and theoretical context? Although students sometimes have difficulty articulating the "theoretical question" guiding Ainsworth's view on attachment, we often find that once the class has finished understanding Bowlby, Ainsworth's theoretical question becomes clear. Since Ainsworth builds on Bowlby, and Bowlby is focused on the species-wide bio-behavioral predispositions that underlie the general formation of attachment relationships, it becomes clear that Ainsworth's theoretical question is something like, "What is the basis for individual differences in the quality of attachment relationships, and how do these individual differences shape children's subsequent development?" So Bowlby is asking the normative question (i.e., "How do attachment Chapter 4. Contrasting Theories: Bowlby, Ainsworth, and Gewirtz 2 relationships typically form?") whereas Ainsworth is asking a question about differential pathways of development ("How do different kinds of attachments form?").

This page titled 15.1: What is Ainsworth's conceptual question and theoretical context? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

15.2: What are Ainsworth's key constructs and target phenomenon?

The building blocks, or key constructs, of Ainsworth's theory and their definitions are presented in an example of an "understanding paper" on Ainsworth, which appears in Table 4.1. The target phenomena of Ainsworth's theory are the different qualities of attachment, as shown in Figure 4.1.

Table 4.1.Example Paper: "Understanding Ainsworth"

1. Theoretical question:
What is the basis for individual differences in the quality of attachment relationships, and how do these individual differences shape infants' subsequent development?

2. Theoretical context:
Built on John Bowlby's evolutionary ethological perspective.

3. Key constructs
Different qualities of attachment:

- Secure attachment relationship (Group B)**:** "use their [caregivers] as a secure base form which to explore in the pre-separation episodes; their attachment behavior is greatly intensified by the separation episodes so that exploration diminishes and distress is likely; and in the reunion episodes they seek contact with, proximity to, or at least interaction with their [caregivers]" (Ainsworth, 1979, p. 932)
- Ambivalent/ Resistant attachment relationship (Group C): "show some signs of anxiety even in the pre-separation episodes; they are intensely distressed by separation; and in the reunion episodes they are ambivalent with the [caregiver], seeking close contact with her and yet resisting contact or interaction" (Ainsworth, 1979, p. 932)
- Avoidant attachment relationship (Group A): "rarely cry in the separation episodes and, in the reunion episodes, avoid the [caregiver], either mingling proximity-seeking and avoidant behaviors or ignoring her altogether" (Ainsworth, 1979, p. 932)

Different qualities of caregiver behavior:

- Sensitive responsive caregiving: contingent and appropriate responding to infant signals about their needs (e.g., food, stimulation, tiredness, wet diaper), letting infant behavioral cues determine the onset, pacing, and termination of interactions. Chapter 4. Contrasting Theories: Bowlby, Ainsworth, and Gewirtz 3
- Rejecting, angry caregiving: Insensitive, unresponsive caregiving; painful rebuff when infant seeks bodily contact; restricted in expression of affect.
- Neglectful caregiving: Insensitive, unresponsive caregiving; disregarding signals or responding in grossly inappropriate fashion.

Internal working model of attachment figure: "inner representation"

- Secure internal working model: inner representation "of his or her [caregiver] as generally accessible and responsive to him or her" (Ainsworth, 1979, p. 933).
- Insecure working model: anxious inner representation. Outcomes: Exploration, learning, interactions with environment.

4. Target phenomena: Individual differences in quality of attachment relationships.

5. Explanation: Antecedents, consequences, and mechanisms.
Antecedents: Individual differences in maternal behavior: "in our sample of normal babies there is a strong case to be made for differences in attachment quality being attributable to maternal behavior" (Ainsworth, 1979, p. 933).
Consequences: healthy development: "the way in which the infant organizes his or her behavior toward the mother affects the way he or she organizes behavior toward other aspects of the environment, both animate and inanimate" (Ainsworth, 1979, p. 936).

- *Securely attached:* More exploration and learning from the environment, healthy self-reliance; more cooperative, affectively positive; more competent, sympathetic in peer interactions; longer bouts of exploration, more exploratory interest, problem-solving, more enthusiastic and persistent; better able to elicit and accept help from mother; more curious, self-directed, ego resilient, better scores on developmental tests and language development.
- *Avoidant:* more aggressive, non-compliant, and avoidant.
- *Ambivalent:* more easily frustrated, less persistent, generally less competent.

Mechanisms:

- Between caregiver behavior and formation of attachment: History of (in)sensitive (un)responsive interactions.
- Between quality of attachment and healthy development: Construction of secure or insecure internal working models of attachment figures.

6. Optimization:
Optimal attachment: Secure. To optimize attachment, improve quality of caregiver-infant interactions, by helping caregivers become more sensitive, more responsive, and more comfortable with bodily contact.

7. Meta-theoretical assumptions:
Biological basis, but context and social interactions critical to the quality of the attachment that will be formed.

This page titled 15.2: What are Ainsworth's key constructs and target phenomenon? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

15.3: What are the antecedents, consequences, and mechanisms in Ainsworth's theory?

These are most easily seen in the graphic representation of the theory, as pictured in Figure 4. 1. The antecedents are individual differences in maternal (or caregiver) sensitive responsive behavior; and the consequences are summarized as "health development"—the specifics of which are listed in the Understanding paper (see Table 4.1; and have been elaborated in research following the publication of the theory). Together, these targets, antecedents, and consequences comprise the outlines of Ainsworth's "macro-developmental theory" of individual differences in attachment.

The "micro-developmental theory" is depicted by the mechanisms describing what is "on the arrows." As shown in Figure 4.2, the mechanism on the arrow between individual differences in caregivers' behavior and the formation of different qualities of attachments are differential histories of social interactions. The different qualities of caregiver behaviors initiate different sets of experiences for their infants: (1) the normative experiences depicted by Bowlby, in which caregivers respond to infant distress signals with sensitive caregiving, leading infants to develop feelings of trust and security, so that they will seek the caregiver when distressed; (2) experiences in which caregivers respond to infant distress signals with insensitive and rejecting caregiving, leading infants to develop a feeling of insecurity or indifference to caregiver support, so that they avoid the caregiver when upset; and (3) experiences in which caregivers either do not respond to infant distress signals or respond inconsistently, leading infants to develop a feeling insecurity and anxiety, so that they are ambivalent and resistant to contact with the caregiver when they are distressed.

The mechanism on the arrow between quality of attachment and its consequences is shown in Figure 4.3—the internal working model, in which the history of interactions between caregiver and infant lead the infants to construct an internal representation of what they can expect from the social world created by their caregivers, whether or not they can expect consistently safe, loving, sensitive, and contingent responses to their signals and needs. Infants and then young children are posited to take these internal working models with them into subsequent interactions with the animate and inanimate environments, where it guides their expectations and interpretations of interactions, especially through its effects on exploration, wariness, emotional reactivity, and coping through proximity seeking. Consistent with the theme started in earlier chapters, it is important to point out that, in both cases, social interactions are a key part of this theory's explanations— caregiver-infant interactions are essential ingredients in the mechanisms or pathways through which the antecedents and consequences of attachment exert or register their effects.

This page titled 15.3: What are the antecedents, consequences, and mechanisms in Ainsworth's theory? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

15.4: What are the optimization implications of Ainsworth's theory of attachment?

According to Ainsworth, the antecedents of attachment formation rest squarely on the mother. She states, "in our sample of normal babies there is a strong case to be made for differences in attachment quality being attributable to maternal behavior" (Ainsworth, 1979, p. Chapter 4. Contrasting Theories: Bowlby, Ainsworth, and Gewirtz 6 933). As a result, the optimization implications are stationed there as well. In order to help more infants and their caregivers achieve an optimal attachment, that is, a secure dyadic attachment relationship, researchers should target caregivers, helping them to become more sensitive and responsive. (Of course, if this is to be accomplished in a theory-guided manner, then an additional theory is needed, namely, one that explains the antecedents of caregiver behavior.)

This page titled 15.4: What are the optimization implications of Ainsworth's theory of attachment? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

15.5: What are the meta-theoretical assumptions of Ainsworth's theory of attachment?

It is easy to consider Ainsworth's assumptions about the antecedents of attachment (i.e., caregiver behaviors) as evidence that she privileges environmental or contextual factors in her account of attachment. However, she also states explicitly that she is building on Bowlby's evolutionary-ethological perspective, which means that she also assumes that infants come with bio-behavioral predispositions that are "experience expectant," (Greenough, Black, & Wallace, 1987), in that these neurophysiological systems expect (and require) the experience of a sensitive responsive caregiver to become well-organized for dealing adaptively with distress and stressful encounters. If these bio-behavioral imperatives did not exist, the experience of insensitive and nonresponsive caregiving would not be so serious.

Hence, Ainsworth assumes that both neurophysiological systems (which are characteristics of the infant or individual) and individual differences in caregiver behaviors (which are characteristics of the context or environment) are essential to the formation of different kinds of attachments. Although not used consistently in the work that follows from Ainsworth's theory, Ainsworth herself never considered "quality of attachment" to be an attribute of the child (as is implied by the use of phases like "securely attached infant"); instead she thought of it as a dyadic quality that characterizes the relationship between an infant and a specific caregiver.

This page titled 15.5: What are the meta-theoretical assumptions of Ainsworth's theory of attachment? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

15.6: Why do we need to learn about Gerwitz's theory of attachment?

The reason that we have thrown an "old-fashioned" theory like Gewirtz's (1969) into the mix is to illustrate alternative learning theory perspectives on the formation of attachment. The essential elements of Gewirtz's theory are summarized as an example of an Understanding paper in Table 4.2. Like Bowlby and Ainsworth, his theoretical question was "How does an infant acquire and maintain a bond (tie, relationship) to a caregiver?" (Gewirtz, 1969, p. 160-161). However, as can be seen from the title of his chapter, he derived the answer to this question using concepts provided by social learning theory. According to Gewirtz, "dependence and attachment are best conceptualized as abstractions for classes of functional relationships involving the positive stimulus control over a wide variety of an individual's responses by stimuli provided either by a class of persons (dependence) or by a particular person (attachment)… In attachment, the efficacy of discriminative or reinforcing stimuli in controlling an individual's behavior systems depends upon the unique physical and/or behavioral characteristics of a particular "object" person dispensing those stimuli (e.g., his facial stimuli, tactile characterstics)" (1969, p. 161).

Table 4.2. Example Paper: “Understanding Gewirtz”

1. Theoretical question:
How does an infant acquire and maintain a bond (tie, relationship) to a caregiver? (Gewirtz, 1969, p. 160-161)

2. Theoretical context:
Social learning theory (in title). Influenced by dependency research, operant conditioning, and drive theory.

3. Key constructs and definitions:
Attachment: “a form of (social) dependence of the behavior systems of one person upon the unique physical or behavioral stimuli provided by a particular other person (or a very few individuals)” (p. 162)
Also called “person-specific dependency”
Infant response/behavior system: approaches, visual orienting, regard, tracking,smiles, and directed vocalizations (p. 165)
Caregiver discriminative and reinforcing stimuli:

- Proximal: being held, touched, caressed, waved in the air, warmth, etc.
- Distal: Sight of person, appearance (hair color, facial features, size), behaviors (gait, approach, movements in space, auditory stimulation (sounds made by approach, vocalizations), olfactory stimulation

4. Target phenomenon:

5. Explanation:
Antecedents: Infant is hungry and caregiver provides food, so caregiver becomes a secondary drive in which caregiver stimuli comes to control infant response system.
Consequences: Infant’s positive responses to caregiver reinforce caregiver behavior systems, so infant stimuli comes to control caregiver response system.
Mechanisms:

- ***From caregiver behavior to bond:***

Primary drives: Food satisfies infant’s primary drive for hunger.
Secondary drives: Because mother feeds infant, she is associated with primary drive until mother acquires properties of primary drive, and controls infant’s behavior systems.

- **From bond to mutual control of behavioral systems:**

Discriminative stimuli: Caregiver stimuli preceding reinforcing event (food) come to control infant behavior, and so presence of caregiver stimuli increase the likelihood that that infant behavior will occur.
Reinforcing stimuli: Infant’s positive response following caregiver behavior increases the likelihood that that caregiver behavior will occur in the future.
Discriminative stimuli: Infant stimuli preceding reinforcing event (infant positive response) come to control caregiver behavior, and so presence of infant stimuli increase the likelihood that that caregiver behavior will occur.
Reinforcing stimuli: Caregiver’s positive response following infant behavior increases the likelihood that that infant behavior will occur in the future.

6. Optimization: “stronger” attachments are ones that have:

- Greater number of behavior systems of child under caregiver control
- Greater number of behaviors under control relative to others’ control
- Greater degree of control over behavioral systems
- Greater number of stimulus settings in which control operates

7. Meta-theoretical assumptions:
Social learning theory assumes that primary drives elicit behavior, associations between contiguous events lead to learning, external stimuli trigger behavior, and external contingencies control behavior.

This page titled 15.6: Why do we need to learn about Gerwitz’s theory of attachment? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

15.7: How do we draw Gewirtz's theory of attachment?

Gerwirtz's macro-developmental theory, presented graphically in Figure 4.4, places the target phenomena, namely, the attachment or bond between infant and caregiver, in the center of the picture. As antecedents, infants bring their primary drives (such as hunger), and caregivers bring the means to satisfy these primary drives (such as food). Together these produce a bond (the target). This bond allows a set of consequences to unfold, in which the response systems of the interaction partners come under each other's control. As shown by the return arrow, these consequences in turn feed back to the target, strengthening the bond or attachment.

Gewirtz's micro-developmental theory specifies the mechanisms, or what is on the arrows. The explanatory mechanisms depicting how the antecedents cause the target are pictured in Figure 4.5. According to this perspective, all newborns arrive with a desire for food, warmth, safety, and so on. These are considered "primary drives" or "unconditioned reinforcers," because the presence of these commodities increases the likelihood of infants' behaviors without any prior experience. When caregivers provide food, warmth, physical comfort, and so on, they become associated with the satisfaction of these primary drives, and take on their properties. Through classical conditioning, the caregiver (or more precisely, their attributes, such as their physical appearance, voice, and smell) acquire the status of a secondary drive: These are reinforcers that are conditioned on their association with the satisfaction of primary drives.

Gewirtz explains the essential elements of the notion of "acquired" or "secondary drive:" "The central features of this theory were the concepts of discriminative and conditioned (generalized) reinforcing stimuli (e.g., provided by incidental caretaking appearance characteristics which acquired and maintained their reinforcing value by being discriminative for a limited set of apparently unconditioned reinforcing stimuli thought to be the satisfiers of physiological needs (in particular food, water, and the removal of noxious stimuli)" (1969, p. 164). Over time, through continued social interactions, this connection creates a bond between infant and caregiver.

The mechanisms hypothesized to create a causal link between the target and its consequences are pictured in Figure 4.5. The attributes of the caregiver become discriminative stimuli for the arrival of primary reinforcers, like food, and so now the caregiver and his or her attributes (even in the absence of primary reinforcers) trigger a host of positive anticipatory baby behaviors, such as tracking, vocalizations, and wiggling. These baby behaviors in turn serve to reinforce the caregiver's caregiving behaviors (such as responding to cries, feeding, and holding the baby). As a result, the baby's attributes (such as their physical appearance, characteristic movements, or the feel of their skin) themselves become discriminative stimuli that trigger caregiving behavior.

As Gewirtz explains, "It is assumed also that the behaviors of the object person or persons who function in a caretaking-socializing role at the same time will come under the control of the behaviors and appearance stimuli provided by the child. These processes will account for the progressively longer S-R chains between the infant's responses and the stimuli provided by his caretaking environment" (1969, p. 165). These positive caregiving behaviors then reinforce the baby's behaviors. Through these mechanisms, operating in the social interactions between newborns and their caregivers, the behavior systems of each party come under the control of the physical characteristics (discriminative stimuli) and behaviors (reinforcing stimuli) of the other party, which feedback into the attachment or bond.

What are the optimization implications of Gewirtz's theory?

There is nothing in Gerwirt's theory to suggest that there are multiple kinds of attachment or that one would be better than another, so Gewirtz does not specify an "optimal" attachment per se. However, he does indicate what would qualify as "more" of an attachment: A "stronger" attachment is one in which mutual control over behavior systems is stronger or more extensive— for example, when a greater number of behaviors and behavior systems of the infant are under caregiver control and vice versa, when partners exert a greater degree of control, or when control operates in a greater number of settings. All of these kinds of "increases" in attachment behavior would be achieved through the same procedures that are described in his theory—processes of reinforcement. So presumably teaching parents how to be more contingent and consistent in their responses to infants would be one optimization strategy, or perhaps reinforcing them for doing so.

Why are the assumptions underlying Gewirtz's theory?

As is made clear by the name of the theory (i.e., social learning) and the explanatory mechanisms that he proposes, Gewirtz assumes that behavior change is a function of associative learning (e.g., acquisition of the status of secondary reinforcers) and the

operant reinforcement of behaviors that were initially elicited by biological reflexes. As Gewirtz explains, “the analysis proceeds in simple conditioning terms, using the concepts of responses, discriminative and reinforcing stimuli, and the conception of sequential contingencies or chaining” (1969, p.160).

This page titled 15.7: How do we draw Gewirtz’s theory of attachment? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

15.8: Why are the theories of Bowlby, Gewirtz, and Ainsworth so very different?

Although they have in common a focus on the construct of "attachment," these three theoretical perspectives were selected to illustrate that theories ostensibly focusing on the same phenomenon can be very different from each other. Table 4.3 provides a side-by-side comparison of these theories, considering how each one would answer fundamental questions about attachment—what it is, its antecedents, consequences, the mechanisms that connect these processes, how it develops. For example, in response to the question, "What is attachment?", Bowlby would describe it as a system preprogrammed by biobehavioral predispositions selected by evolution that allows the newborn (and later the infant) to seek proximity and protection from its caregiver when distressed. Gewirtz sees it as a set of responses systems that are under the mutual control of infant and caregiver; and Ainsworth sees it as a dyadic affective bond, shaped by maternal sensitive responsiveness.

As is clear from Table 4.3, Bowlby emphasizes species-wide biology and genetic programming, whereas Gewirtz highlights social conditioning and environmental programming. Ainsworth focuses on different pathways that species-wide predispositions can take depending upon the contextual conditions in which they emerge. About the only thing that all three theorists agree on is that the mechanisms of effects can be found in social interactions, but Bowlby emphasizes the regularity with which they play out, Gewirtz posits that the are contingent antecedent-consequence chains, and Ainsworth focuses on how the tenor of these interactions leads infants to construct different kinds of "working models" about the social worlds they inhabit.

These differences are not just academic. They represent fundamental differences in the way these theorists think about human functioning and development. Highly instructive in this regard is Gewirtz's analysis of Bowlby's and Ainsworth's theories, presented in the second part his chapter (Gewirtz, 1969, p. 166-173). It is interesting to see the evolutionary-ethological perspective through the lens of learning theory, as exemplified by how Gewirtz chooses to label it—"Pre-learning theories." These disagreements came to a scientific head in a series of critiques, rejoinders, and replies exchanged by Gewirtz and Ainsworth (Ainsworth & Bell, 1977; Gewirtz & Boyd, 1977a, 1977b) following a study Ainsworth published with Bell in 1972 (Bell & Ainsworth, 1977). The fundamental disagreement was straightforward and focused on a simple question—"Does maternal prompt responsiveness to an infant's crying increase or decrease the likelihood of future crying?" From a learning theory perspective (and consistent with pediatricians' advice of the day), responsiveness is hypothesized to reinforce crying and so increase its frequency and duration—if a mother wishes to see crying decrease, she should extinguish it by ignoring it. From Ainsworth's perspective, sensitive responsiveness should reduce crying, because it allows the infant to build a generalized expectation that care is forthcoming, and this security should provide equanimity and foster other means of communicating distress.

No empirical resolution of this disagreement was reached through this series of exchanges, but they are very revealing about how easily discussions about data and statistical analyses can flare into meta-theoretical disputes. Particularly informative are differences in opinion about the kinds of studies (design, data, and analysis) that could actually answer the target question. Gewirtz and Boyd (1977) outline the empirical requirements of an investigation of a learning theory account of maternal reinforcement of expressive and "non-distress" crying, and point out the differences between these kinds of studies and the one conducted by Bell and Ainsworth (1972). Not surprisingly, disagreements continue about the interpretation of date, conclusions that can be drawn, and practical implications. The two camps seem to be operating in different worlds, with little common ground. One factor that made these discussions more challenging is the assumptive bases of these two groups of researchers, and the fact that they reflected different meta-theoretical worldviews.

alt

Table 1. Contrasting Multiple Perspectives on Attachment: Theories of Bowlby, Gerwirtz, and Ainsworth

	BOWLBY	GEWIRTZ		AINSWORTH
UNDERSTANDING the THEORY				
What is attachment? TARGET	Proximity seeking Protection	Behaviors of infant and parent		Affective bond
ANTECEDENTS	Bio-behavioral predispositions Preprogrammed instincts	Secondary reinforcement Discriminative stimuli Reinforcement		Maternal responsiveness
CONSEQUENCES	Survival	Dependence of behaviors		Individual differences in success
MECHANISMS	Social interaction	Social interaction		Social interaction
How does it DEVELOP?	Unfolding of biological program	More behaviors Stronger control		Internal working model
ANALYZING the UNDERLYING ASSUMPTIONS: DESCRIPTION				
Unit of ANALYSIS of CHANGE	Behavior systems selected by evolution	Discrete behaviors		Dyadic interaction
Nature of PERSON	Reactive (to biological program)	Reactive (to environmental program)		Active partner
Nature of ENVIRONMENT	Reactive (to biological program)	Active and reactive to discriminative stimuli and reinforcement		Active partner
Course of DEVELOPMENT	**Quantitative** change **Continuity** over time	**Quantitative** change **Continuity** over time		**Qualitative** change Emergence of bond
ANALYZING the UNDERLYING ASSUMPTIONS: EXPLANATION				
Role of PERSON in development	**Passive** reaction to biological program	**Passive** reaction to environmental program		**Working together**
Role of ENVIRONMENT in development	Provide fuel for growth from **inside**	Extrinsically motivate and shape growth from **outside**		**Working together**
Underlying Hypothesized Cause of DEVELOPMENT	**Genetic programming** Unfolding over time leading to a mature form	**Social conditioning** Occurring over time leading to observable behavior		**Joint activity**
UNDERLYING ASSUMPTIONS: OPTIMIZATION				
Focus of efforts	Improve **biological** underpinnings	Improve **environmental** program		Improve **interaction**

This page titled 15.8: Why are the theories of Bowlby, Gewirtz, and Ainsworth so very different? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

CHAPTER OVERVIEW

16: Contrasting Theories- Motivation and Learning

16.1: Motivation

16.2: Learning

16.3: Section 3-

16.4: Section 4-

16.5: Section 5-

16.6: Section 6-

This page titled 16: Contrasting Theories- Motivation and Learning is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

16.1: Motivation

Acquired vs. intrinsic motivation

- Bandura, A. (1997). Self-efficacy: The exercise of control. New York: W. H. Freeman. Deci, E. L. (1992). On the nature and function of motivational theories. Psychological Science, 3, 167-171.
- Deci, E. L., & Ryan, R. M. (1985). Intrinsic motivation and self-determination in human behavior. New York: Plenum Press.
- Hickey, D. T., & McCaslin, M. (2001). A comparative, sociocultultural analysis of context and motivation. In Volet, S. & Jaervelae, S. (Eds.), Motivation in learning contexts: Theoretical advances and methodological implications. Elmsford, NJ: Pergamon.
- White, R. W. (1959). Motivation reconsidered: The concept of competence. Psychological Review, 66, 297-333.

This page titled 16.1: Motivation is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

16.2: Learning

Sfard, A. (1998). On two metaphors for learning and the dangers of choosing one. Educational Researcher, 27 (2), 4-13.

This page titled 16.2: Learning is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

16.3: Section 3-

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 16.3: Section 3- is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

16.4: Section 4-

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 16.4: Section 4- is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

16.5: Section 5-

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 16.5: Section 5- is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

16.6: Section 6-

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 16.6: Section 6- is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

CHAPTER OVERVIEW

17: Assumptions About Humans and their Development

17.1: Metaphors and Meta-theories in Human Development

17.2: What did Reese and Overton think was going on?

17.3: What is a meta-theory?

17.4: What kinds of assumptions guide the study of human development?

17.5: Assumptions About Description

17.6: Assumptions About Explanation

This page titled 17: Assumptions About Humans and their Development is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

17.1: Metaphors and Meta-theories in Human Development

In the late 1960s and early 1970s, a paradigm shift was taking place in developmental psychology in the United States, although most researchers were not aware of it at the time. As was true for the rest of psychology, behaviorism and experimental child psychology continued to dominate developmental psychology (Cairns & Cairns, 2006) during this decade. However, new perspectives were knocking on the doors of behaviorism. As discussed in the last chapters, ethological evolutionary perspectives were replacing social learning accounts of attachment. In 1959, Robert White published a seminal article questioning the supremacy of acquired motivation and presenting a case for intrinsic motivation, which would usher in the motivational revolution (Deci, 1975).

Nowhere was this sea change felt more keenly than in the area of learning, which was at the core of the behaviorist agenda. With the publication of The Developmental Psychology of Jean Piaget in 1963, John Flavell had introduced American developmentalists to a grand European theory of cognitive development, and it was proving to be a contender to theories of learning. In fact, the late 1960s were awash in dueling studies attempting to empirically adjudicate this clash (for reviews, see Brainerd, 1972; Strauss, 1972). They took the general form in which Piagetians would assert as evidence for structural limitations in preoperational children's cognition, their reasoning and rationales about the conservation of properties of objects over transformations in their appearance. For example, children would assert that the volume of a liquid was increased when it was poured into a taller thinner glass, or that the number of pieces of a cracker increased when the pieces were spread farther apart. In response, learning theorists would conduct studies showing that, with sufficient practice, young children could be trained not only to give the reply indicating that there had been no transformation (namely, "they are the same") but also to provide the correct rationale (namely, "You didn't add any or take any away, so they are still the same").

Although couched in more scientific terms, it is possible to see in these exchanges behaviorists' satisfaction in disproving Piaget's theory, an implied "So there!—now we have demonstrated that there are no structural limitations operating in children's performance." And the replies from Piagetians are equally instructive, basically "Pah! You have trained these children to say some words—but because you taught children to say them, they are meaningless as indictors of children's underlying reasoning-- and so prove nothing." And so on, back and forth. It was in this atmosphere of acrimonious and baffled exchanges that two well-respected researchers, one learning theorist, Hayne Reese, and one Piagetian, Willis Overton, joined forces to examine the basis of these claims and counter-claims, and especially to try to understand why researchers from these two areas seemed to be so successfully talking right past each other.

This page titled 17.1: Metaphors and Meta-theories in Human Development is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

17.2: What did Reese and Overton think was going on?

The resulting chapter—Models of Development and Theories of Development (Reese & Overton, 1970) and its accompanying methodological chapter (Overton & Reese, 1973) were not the first discussions of paradigms and paradigm shifts in psychology and science (e.g., Kuhn, 1962; Pepper, 1942), but they were the first to lay out the issues for developmental psychologists. They argued that the state of mutual incomprehension exhibited in these empirical exchanges was based on the fundamental incompatibility of the underlying assumptions about human nature and human development that each side unintentionally brought to the discussion. Each side had its own "model" of humans and of reality.

As explained by Reese and Overton,

> The most general models, variously designated as "paradigms" (Kuhn, 1962), "presuppositions" (Pap, 1949), "world views" (Kuhn, 1962, Seeger, 1954), and"world hypotheses" (Pepper, 1942), have a pervasive influence throughout the more specific levels, as noted by Kessen (1966) and others before him (Black, 1962; Peppper, 1942; Toulmin, 1962). The different levels of models are characterized by different levels of generality, openness, and vagueness. At one extreme are implicit and psychologically submerged models of such generality as to be capable of incorporating every phenomenon. These metaphysical systems are … basic models of the essential characteristics of [humans] and indeed of the nature of reality" (1970, p. 117).

Such models, which we refer to as "meta-theories," have advantages and disadvantages.

Such models, which we refer to as "meta-theories," have advantages and disadvantages. As Reese and Overton go on to explain, "any model limits the world of experience and presents the person with a tunnel vision. Being committed to a particular model may make a person blond to its faults… However, a good model increases the horizon, since one of its functions is to aid in the deployment or extension of a theory… A good model acts like a pair of binoculars ... Models provide rules of inference through which new relations are discovered, and provide suggestions about how the scope of the theory can be increased" (1970, p. 120). The most important feature of meta-theories is that they are sets of assumptions that are often hidden from our own awareness. They help us as scientists, but they also create a filter that forces us to "see through a glass darkly" (1 Corinthians 13:12). The first step in recognizing our own assumptive world views is to understand what meta-theories are, to become familiar with the kinds of assumptions they contain, and see the different families of theories that are derived from them. In this chapter and the next, we draw heavily on a piece we created for another class on human development (Skinner, Richardson, Pitzer, & Taylor, 2011).

This page titled 17.2: What did Reese and Overton think was going on? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

17.3: What is a meta-theory?

Meta-theories are sets of assumptions that underlie theories. “Meta” means “above” or “beyond,” like “meta-physics.” Other terms used to describe meta-theories are “world views,” “world hypotheses,” “models,” “cosmologies,” or “paradigms,” as in “paradigm shifts.” Explicit discussions of meta-theories are found most often in philosophy.

What are meta-theories of human development?

Meta-theories in human development are sets of assumptions about the nature of humans and the meaning of “development”-- what it looks like, how it happens, what causes it. An example of a meta-theoretical assumption about human development would be the idea that all development ends at 18, or that aging is a process of loss and decline.

Why are meta-theories important?

Meta-theories are important because their assumptions influence everything about how theories are constructed and research is conducted: the questions that are asked, the measures and methods that are used, and the interpretation of data (see Figure 6.1). For example, if researchers assume that development ends at 18, they do not look for developmental changes after that age. Or, if researchers assume that aging is a process of decline, then they never look for characteristics that might improve as people get older.

This page titled 17.3: What is a meta-theory? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

17.4: What kinds of assumptions guide the study of human development?

There are many assumptions about humans and about development that underlie developmental meta-theories—some tell us about what development looks like and so are descriptive, and some refer to the causes of development, and so are explanatory (see Table 6.1)

Table 6.1. Examples of Assumptions Underlying Developmental Meta-theories

DESCRIPTION

1. What is the nature of the person?
2. What is the nature of the environment?
3. What is the unit of analysis of change?

EXPLANATION

5. What is the role of the person in development?
6. What is the role of the environment in development?
7. What is the underlying hypothesized cause of development?

This page titled 17.4: What kinds of assumptions guide the study of human development? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

17.5: Assumptions About Description

What are assumptions about human nature?

Assumptions about human nature refer to beliefs about whether people are born as blank slates (tabula rasa) or whether people bring their own intrinsic characteristics with them into the world. One of the most important assumptions about human nature is whether people can be considered "active" or "reactive." A "reactive" nature suggests that humans are inherently at rest, and so they tend to be relatively passive, non-conscious, and non-agentic. In contrast, an "active" nature suggests that humans are inherently and spontaneously active and energetic; that humans by nature are goal-directed, agentic, self-regulating, conscious, and reflective beings. These differences in assumptions can be clearly seen in theories of motivation—in which some families of theories assume that motives and motivation are acquired, and some assume that humans are intrinsically motivated.

What are assumptions about the nature of the environment?

One of the most important assumptions about the nature of the environment also refers to how "active" or "passive" it is. This notion in reference to environments is very much like the idea of active and passive humans. "Active" environments are ones that have goals and an agenda, and so are energetically trying to shape the developing person in particular directions, whereas "passive" environments do not have a specific agenda that they are using to make decisions about how to interact with the developing person. In school contexts, an example of an "active" environment would be teachers, who have an agenda and goals for their students; in contrast, students' peer groups, who may also be important contexts for their academic development, generally do not have an agenda for the development of their members.

What are assumptions about the "unit of analysis of change"?

These refer to assumptions about the nature of the entities that are developing and which ones are most important to study. Some meta-theories assume that the most important units to study are the fundamental building blocks that make up humans, such as their genes and their related phenotype expressions, or human neurophysiological structures (like the brain), or stable traits and attributes (like intelligence, temperament, or personality). Other meta-theories focus attention on observable behaviors and responses. Others suggest that the key developing entities that deserve our attention are bio-psychological structures and their functions in regulating actions. Yet others suggest that the fundamental units to consider are the interactions between the person and the context.

These presumptions about the nature of the focal system and "where the developmental action" is located are among the most basic assumptions of meta-theories of development. They are visible in each theory's choice of target phenomena as well as in each study's object of investigation. In analyzing these assumptions, it is, of course, important to note the "bull's eye" that theories and studies consider to be the focal point of their activities. However, it is equally important to notice what these theories dismiss as irrelevant, as evidenced in their decisions about what not to include in theories and what not to study. For example, theories of parenting obviously focus on the role of parents in shaping children's development, but some of them also consider how children shape their parents behavior and some do not. In a similar vein, almost all theories of psychopathology currently include a place for the neurophysiological differences that underpin the presentation of behavioral problems, but some also consider the experiences that shape those neurophysiological systems and some do not.

What are assumptions about the "course of development"?

These are the fundamental parameters that describe the way that development proceeds. One of the most important features of the course of development, as shown already in Figure 2.1, is whether development involves quantitative continuous incremental change or discontinuous qualitative shifts. Some meta-theories assume that development is "more" or "less" of some characteristic, as reflected in descriptors like "trajectories" and the analysis of mean level changes or growth curves. Other meta-theories assume that development involves qualitative changes in the form, structure or organization of a system, as reflected in descriptors like "phases," "stages," or "developmental tasks," and the empirical search for age-graded shifts. A second is assumption about the course of development, also depicted in Figure 2.1, is whether (1) pathways of development are presumed to be normative and universal, meaning that all people pass through them in the same sequence (and sometimes even the same rate), or (2) pathways are presumed to be differential or individual- and context-specific, meaning that a variety of different pathways are possible and that different people show different patterns of developmental change. Sometimes assumptions about the course of development also refer to its directionality and presumed end state—whether development always refers to positive healthy growth and progression or whether it encompass changes in many different directions, sometimes toward gains but sometimes toward declines or losses.

This page titled 17.5: Assumptions About Description is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

17.6: Assumptions About Explanation

What are assumptions about the role of the person in development?

The causal role of the person in development generally involve two points that follow from a view of the person as “reactive” versus “active” in their own development. A “reactive” model assumes that stability is the natural state of affairs, and that development is something that primarily happens to people— based on their genetic or environmental programming, and it is these factors, external to the self, that instigate change, which people receive passively. This can be taken to imply that genetics, traits, characteristics, and experiences early in life can have permanent irreversible effects. In contrast, an “active” model assumes that the essence of substance is activity, so that is the natural state of affairs is continuous transition or change. From this perspective, development is something that people participate in directly as active agents, choosing and shaping their own development. This can also be taken to imply that people should be malleable and remain open to change throughout life.

What are assumptions about the role of the environment in development?

These assumptions involve the causal role of the environment, specifying what is “on the arrows” from the environment to development of the target. The role of the environment can be one of “background” in which it operates only to provide fuel that will spur development from the inside (for example, by providing nutrition for consumption and digestion, leading to growth). A more active role for the environment is one in which it supports intrinsic motivations and growh tendencies by providing developmental affordances, that is, by essentially “handing the organism” what it intrinsically needs for the next steps in its development. Even more active are environments that support intrinsic motivations but also introduce their own socialization agenda through processes such as attunement and apprenticeship. Most active are environments that are assumed to be “running the show,” in that they are seen as external forces that actively instigate, motivate, and shape growth from the outside.

What are assumptions about the underlying hypothesized cause of development?

Most people have heard of these assumptions—these are the ones that introduce our favorite dichotomies—nature versus nurture, heredity versus environment, genes versus experience, maturation versus learning, biology versus society, preformed versus epigenetic, innate versus acquired, nativist versus empiricist, and so on. Some meta-theories emphasize one over the other of these poles, and some are more towards the middle—that is, they insist on “and” formulations which emphasize the importance of both organism and environment. If you are interested in reflecting a bit about your own assumptions, we have included a set of questions in Table 6.2 about the nature of humans and their development. You can use your answers to these questions to see which way you are leaning on these issues.

Table 6.2. What are Your Assumptions about Human Development?

	True?	False?
What is the Nature of Human Nature?		
1. Humans are naturally selfish and self-interested.		
2. Human beings are naturally active curious creatures.		
3. Humans arrive as "blank slates" with no inherent characteristics.		
4. At birth, people's personalities are already determined.		
5. At birth, all people have the potential to develop in any direction, positive or negative.		
6. Human beings are predisposed to both good and bad behavior.		
Nature or Nurture?		
7. It's mostly biology—genetics and maturation—that shapes human nature and development.		
8. It's mostly environment—families and society —that shapes human nature and development.		
9. Genetic and environmental factors shape human nature and development equally.		
Active or Reactive?		
10. People's development is a product of forces outside our own control.		
11. People are actively engaged in their own growth and development.		
12. People are mostly reactive and are molded by other people and their environments.		
13. People actively choose and shape themselves and their environments, and are shaped by their environments in equal measure.		
Stability or Change?		
14. Traits and experiences early in life have a permanent effect on people's development.		
15. People are malleable and can be changed by their environments and experiences at any age.		
16. People are malleable and can change themselves at any age.		
Continuity or Discontinuity?		
17. Humans develop gradually through incremental changes, moment by moment, bit by bit, day by day.		
18. Humans develop in fits and spurts over a lifetime through qualitative stages of growth.		
19. Humans develop continuously day by day as well as through stage-like progressions over a lifetime.		
Universal or Context Specific?		
20. There are universal stages we all go through from infancy to childhood to adolescence to adulthood.		
21. An individual's pathway of development depends on that person's specific culture and combination of experiences.		

This page titled 17.6: Assumptions About Explanation is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

CHAPTER OVERVIEW

18: Meta-theories of Human Development

18.1: Metaphors and Meta-theories in Human Development
18.2: What are Mechanistic meta-theories of human development?
18.3: What are Organismic meta-theories?
18.4: What are Contextual meta-theories?
18.5: What are Maturational meta-theories of human development?
18.6: Which researchers have meta-theories?
18.7: Does the field of psychology have meta-theories?
18.8: What is the dominant meta-theory in the field today?
18.9: Who else has meta-theories?
18.10: Where can meta-theories be seen most clearly?
18.11: What is the meta-theory that guides our class and our book?
18.12: Do I have a meta-theory about development?
18.13: How do I get rid of my meta-theory?
18.14: What is the correct meta-theory?

This page titled 18: Meta-theories of Human Development is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

18.1: Metaphors and Meta-theories in Human Development

When we consider these assumptions all at once, it becomes clear that they seem to cluster into “packages” of assumptions that go together. These clusters are organized around metaphors— “as-if” statements that liken humans and their development to other entities and processes. For example, the metaphor of the “river:” “Human development is like a river, always flowing, never the same.” Or the metaphor of the “scientist:” “Humans are like little scientists, exploring, investigating, and testing out their theories.” A wide variety of metaphors have been used to depict humans over the centuries—humans are like demi-gods, like grasshoppers and ants.

Metaphors are at the root of meta-models of humans and their development. These metaphors anchor our subject matter in analogues that call up rich associations. As pointed out by Reese and Overton (1970), “the characteristic of models that permits their utilization in the deployment of theories, and increase in their scope, is that they have ‘excess meaning’ (p. 120), meaning that can be useful in suggesting new ideas for theories and places to look for empirical investigation. As long as scientists do not reify these metaphors and come to think that they are the targets of study, the use of metaphors can expand and enrich our work. To do so, we must surface the metaphors that are guiding our current thinking and study.

Reese and Overton (1970) suggested meta-models that are inspired by two metaphors: Humans as machines, as depicted in Mechanistic meta-theories, and humans as butterflies, as depicted in Organismic meta-theories. We consider two more meta-models and their metaphors: Humans as seeds, as depicted by Maturational meta-theories, and human development as a tennis game or dance, as depicted by Contextualist meta-theories (Lerner, 1977). The key characteristics of each meta-theory are presented in Table 7.1. Each of these higher-order meta-theories has sets of lower-level theories that are nested within it. These are called “families” of theories to denote that they share common properties, based on their similarity to the root metaphors and characteristics of the guiding meta-models. Table 7.2 contains several examples of “big” theories of development and provides an analysis of their defining features according to the set of meta-theoretical assumptions we have been discussing. Based on this analysis, we indicate the higher-order family to which we think each big theory belongs.

This page titled 18.1: Metaphors and Meta-theories in Human Development is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

18.2: What are Mechanistic meta-theories of human development?

Mechanistic meta-theories can be understood using the metaphor of a machine. It is as if humans are composed and change the same way as machines. As summarized in Table 7.1, people are assumed to be made up of parts that can be removed and studied apart from the rest of them. In the social sciences, those parts are typically discrete behaviors or responses. People are assumed to be generally static and passive, with the energy coming from external forces (like gasoline for a car).

The person can only react to the environment that is controlling them (like a car responding to the gas pedal or the brake). All causes for development come from the outside, from environmental forces, which have their own agenda for the machine (like a driver has a destination). From this perspective, development is continuous (a car stays a car) and any changes are quantitative and incremental (like adding new seat covers). The underlying hypothesized cause of development in Mechanistic meta-theories is social conditioning that occurs over time, leading to changes in observable behavior.

The prototypic Mechanistic theories are behaviorist, operant, and classical conditioning learning theories (see Table 7.2), like the social learning theory described by Gewirtz and analyzed in the previous chapter. This family of theories dominated psychology from the early to the mid 20th century (Cairns & Cairns, 2006), and was in the middle of being overthrown when Reese and Overton (1970) wrote their seminal chapter. It is important to note, however, that Mechanistic theories are still alive and well in many areas, such as learning and motivation, and especially those theories that have been adapted for use in educational systems. In fact, the default for theories of the effects of people of higher power on people of lower power (e.g., adults on children, parents on offspring, teachers on students, supervisors on workers, leaders on followers, mentors on apprentices) seems to reflect a mechanistic cast which largely assumes unidirectional external forces emanating from people higher in the hierarchy and exerting an impact on people at lower levels.

As the popularity of behaviorism waned in the mid-1900s, new classes of machines have begun to serve as prototypes for mechanistic theories of memory, learning, and automatic functioning—focusing, of course, on the computer, the robot, and the automaton, as detailed in Bargh and Chartrand's (1999) cleverly titled paper, "The unbearable automaticity of being." Such assumptions have even pervaded our metaphors for biological systems, as seen in metaphors like "the brain is a computer." There are also traces of mechanistic assumptions in certain progressive and feminist analyses of the effects of societal and social conditions, such as poverty, oppression, and discrimination, which sometimes seem to imply that these external forces are the sole determinants of development.

Metaphor: reflex; human as "host" to behaviors

"Cognitive revolution" human as an information processing machine? Slife & Williams

This page titled 18.2: What are Mechanistic meta-theories of human development? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

18.3: What are Organismic meta-theories?

Organismic meta-theories can be understood using the butterfly as a metaphor for development. This metaphor is helpful for illustrating one of the most important assumptions of the organismic perspective, namely, that development progresses through discontinuous qualitatively different steps pr stages (like from the caterpillar, to the chrysalis, to the butterfly). Other writers simply use “the organism” or the “living organized system” as the root metaphor (e.g., Reese & Overton, 1970). This analogue is helpful in emphasizing the interconnectedness of the parts of the system and the impossibility of decomposing them. If, from a Mechanistic perspective, one wishes to understand a carburetor, one can remove it from the car, study it, understand it, and put it back. If, from an Organismic perspective, one tries this with part of an organism, say its heart, one will permanently destroy the object of study, while learning nothing about the heart, because it ceases to have its properties of “heart-ness” (i.e., to function as a heart) once it is removed from the rest of the body.

From this perspective, as summarized in Table 7.1, the target units of analysis are structured parts-wholes, which are organized in specific ways to serve certain functions. Improvements in these parts or their relationships take place through individuals’ active exchanges with their contexts directed by their own goals and interpreted through their current levels of understanding. People are assumed to be inherently active and to construct their own next steps in development based on the affordances and opportunities provided by the environment. Development is caused by structural dynamics, such as successive differentiation, imbalances, or integrations, that lead to the emergence of new (re)organizations. In general, development is assumed to be progressive (gets better), unidirectional (goes only from caterpillar toward butterfly), and irreversible (butterflies do not turn back into caterpillars). Because these developments are guided largely by internal forces (sometimes referred to as “inherent growth tendencies”), Organismic meta-theories often posit that development follows one set of universal stages, steps, phases, or tasks. The underlying hypothesized causes of development in Organismic meta-theories are active goal-directed exchanges with the environment leading to successive reorganizations of bio-psychological structures over time in the direction of adaptive developmental endpoints.

The prototypical Organismic theory, and the one that was causing all the trouble documented by Reese and Overton (1970), is Piaget’s constructivist theory of cognitive and affective development, and the many developmental theories that were based on Piaget, for example, Kohlberg’s theory of moral development reasoning. Other Organismic theories include Werner’s comparative psychology as seen in his orthogenetic principle, and Erikson as seen in his universal age-graded developmental tasks. Other theories that claim kinship with Organismic meta-theories (e.g., theories of intrinsic motivation) do not typically include notions of universal stages or tasks, but focus instead on Organismic assumptions about the human nature, specifically, that humans are innately active, curious, and interested, and inherently desire to explore, understand, and fit in with their social and physical environments. With the rise of radical contextualism and cultural relativism in psychology, theories of “universal” anything (e.g., psychological needs, stages, developmental tasks) have come increasingly under attack.

This page titled 18.3: What are Organismic meta-theories? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

18.4: What are Contextual meta-theories?

Contextual meta-theories can be understood as having as their root metaphor the tennis game. In these meta-theories, the target unit of analysis is the game-- the back and forth between the person and his or her context, both of which are assumed to be proactive and acting on their own agendas. Both of them are also assumed to be in motion, so contextualist theorists often describe their task as understanding “developing people in a changing world.” Sometimes the exchange between person and context is captured in other dyadic metaphors—such as the conversation or the dance. All of these metaphors have in common the central notion that you cannot make sense of the conversation (tennis game, dance) by looking at only one of the partners. Because it is co-constructed through their joint activity, development takes its form and directionality from the interaction between the person and context, and can be continuous or discontinuous depending on how the game is played.

Within the contextualist meta-model, as summarized in Table 7.1, the person is seen as an agentic, reflective, self-regulating, socially connected being interacting with a context that is itself active, structured, and dynamic. These partners mutually operate on and are operated on by each other in service of competence and cultural membership. The hypothesized underlying causes of development in these meta-theories are the joint activity of both person and environment leading to the transformation of both. Some of the better known members of the contextualist family include Bronfennbrenner’s bio-ecological model and the lifespan approach. The “contextualist” moniker reflects these perspectives’ concern with development as unfolding within and shaped by multi-level ecological or contextual forces, such as microsystem settings, society, and historical contexts.

This page titled 18.4: What are Contextual meta-theories? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

18.5: What are Maturational meta-theories of human development?

Maturational or biological meta-theories can be understood using the plant as a metaphor. It is as if humans develop the same way as plants. The important units of analysis to study are people's "seeds," that is, their genetic make-up. People are assumed to be passive and non-agentic; their development is biologically determined, the product of their genes. As summarized in Table 7.1, the role of the person is to be reactive—to their genes. The role of the environment to provide support and nutrition (rain, sun, and soil); the environment is structured—as a developmental niche for the genome). It provides nutriments that the seed will then use as fuel for growth from the inside. However, the environment is essentially passive (soil does not have an agenda for the seeds that are dropped there) and can't change a person's nature (poppy seeds will always produce poppies). The course of development will be quantitative and continuous, fully reducible to and determined by the organism's genetic and neurophysiological make-up and inherent characteristics, such as inborn temperament, personality, talents, intelligence, and so on.

Another good analogue for Maturational meta-theories can be found in the metaphor provided by brain coral. Brain coral has many of the same features as plants; in addition, its development is explicitly continuous and incremental in ways not demonstrated as clearly by plants, in each head of brain coral grows in size by adding genetically identical polyps (bits of brain coral) to its colony. Because they are based in biology, maturational meta-theories also tend to subscribe to notions of normative development that channel change along one universal pathway; however, since developmental psychology became so focused on individual differences, theories from these families also include the idea that different neurophysiologies (typically based on different genetics) are the determining factor in prescribing different pathways of development. The underlying hypothesized cause of development in maturational meta-theories is genetic programming which unfolds over time leading to a mature form. Although maturational meta-theories were prevalent in the beginning of the 20th century (e.g., Gesell, 1928; Parten, 1933), they have taken on many different forms since then that have waxed and waned in their popularity, including some formulations of behavioral genetics, sociobiology, evolutionary, ethological, neuroscience, temperament, and personality theories. As described in the previous chapter, Bowlby's evolutionary ethological perspective on attachment would be an example of a maturational meta-theory because of its focus on species wide bio-behavioral predispositions. Maturational assumptions are signaled by concepts such as "trait," the search for "the aggression gene," the discovery of the brain system, hormone, or neurotransmitter responsible for a specific condition, or any other terms that suggest development is solely the product of innate or immutable characteristics of individuals. Although they are not typically referred to as "maturational," there exist many classes of theories that place all the active ingredients of behavior or development inside the head (or more specifically the social cognitions) of the person. Even if they are not direct descendants, these theories can be considered cousins of Maturational meta-theories, based on the exclusive focus on the role of the individual.

This page titled 18.5: What are Maturational meta-theories of human development? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

18.6: Which researchers have meta-theories?

All researchers have meta-theories. However, these assumptions are usually implicit and unacknowledged, and researchers are often unaware of the assumptions that are built into their thinking and the theories they are using. Typically researchers think that their assumptions are self-evident truths. Meta-theories are not typically cold cognitions or beliefs. They are often deeply held convictions that researchers will fiercely defend. Researchers are typically convinced that their assumptions are right and everyone else's are wrong.

As pointed out by Reese and Overton (1970), researchers holding different meta-theories can have difficulty communicating with each other. Since they are asking different questions and using different truth criteria for research, they often argue past each other or misunderstand each other. One group of researchers will offer what they consider to be irrefutable proof of their ideas, which other researchers then dismiss as irrelevant. Discrepancies, inconsistencies, arguments, and furor often characterize an area of study in which researchers from multiple meta-theories are working.

Table 7.1. Key Characteristics of Four Meta-theories

META-MODELS	REDUCTIONIST MODELS		INTERACTIONIST MODELS	
	Maturational Biological Meta-Model (Genes or "G x e" Model)	Mechanistic Contextual Meta-Model (Environment or "E" Model)	Organismic Living Systems Meta-Model (Person or "P x e" Model)	Contextual-Dialectic Developmental Systems Meta-Model ("G x E x P" Model)
METAPHORS	***Plant or Brain Coral***	***Machine***	***Butterfly***	***Tennis Match***
DESCRIPTION OF DEVELOPMENT				
Unit of ANALYSIS of CHANGE	**Genes** (entities) and related phenotypic expressions	**Observable behaviors** and related incentives	**Bio-psychological structures and processes** that motivate and regulate observable behavior	**Gene-person-environment interactions** that motivate and regulate observable behavior
Nature of PERSON	Non-conscious, **reactive** Non-agentic, passive Biologically determined	Non-conscious, **reactive** Non-agentic, passive Socially determined	Conscious, reflective Agentic, **active** Self-regulating	Conscious, reflective Agentic, **active** Self-regulating Socially/emotionally connected
Nature of ENVIRONMENT	**Passive but structured** as developmental niche for genome	**Active and structured** **Operates on** the person in the service of socialization and social control	**Passive but structured** and more less attuned with developing organism's needs and goals **Operated upon** by person in service of needs, goals, and competence	**Active, structured, dynamic** and more or less attuned with developing organism's needs and goals **Operates on and is operated upon** by person in service of competence and cultural membership
Course of DEVELOPMENT	**Quantitative** change **Continuity** over time	**Quantitative** change **Continuity** over time	**Qualitative** changes, stages **Discontinuity**/ emergence over time	**Quantitative and qualitative** change **Continuity and discontinuity** **Peripheral to central** social membership
EXPLANATION OF DEVELOPMENT				
Role of PERSON in development	**Passive** reaction	**Passive** reaction	**Conscious, active person** pursuing goal-directed behavior and competence; Person **constructs** development through activity	**Conscious active partner** becoming a member of a cultural system and its normative goal-directed behavior Person **co-constructs** development through intentional activity with others
Role of ENVIRONMENT in development	Provide fuel for growth from **inside**	Extrinsically motivate and shape growth from **outside**	Support **intrinsic** motivation and development through **affordances**	Support **intrinsic** motivation Internalization of **extrinsic** motivations and development through **affordances** and **apprenticeship**
Underlying Hypothesized Cause of DEVELOPMENT	**Genetic programming** Unfolding over time leading to a mature form	**Social conditioning** Occurring over time leading to observable behavior	**Activity** and related reorganizations of bio-psychological structures over time in the direction of adaptive-developmental endpoints	**Joint activity** and reciprocal transformations in gene-person-environment interactions over time in the direction of person's attainment of "mature status"

Chapter 7. Meta-theories of Human Development 9

Table 7.2. Examples of theories and their underlying assumptions.

	THEORY: THEORIST					
	Ethological Theory: Bowlby's Theory of Attachment	**Erikson's Psychosocial Theory**	**Learning Theory: Skinner's Behavioral Theory**	**Bandura's Social Cognitive Theory**	**Cognitive Developmental Theory: Piaget's Constructivism**	**Bronfebrenner's Ecological Systems Perspective**
MESSAGE	Development is the product of biologically-based species-general programs shaped by human genetic and evolutionary history.	Humans progress through eight psychosocial conflicts, from trust vs. mistrust to integrity vs. despair.	Development is the product of learning from the consequences of one's behavior through operant conditioning.	Development is the product of cognition, as illustrated by observational learning and human agency.	Development proceeds through four stages of cognitive development, from sensorimotor to formal operations.	Development is the result of reciprocal social interactions between an active person and their social partners from in a series of nested contexts.
Human Nature-Blank, Good, or Bad	In our physiology as shaped by evolution	Good (capable of growth)	Blank (neither good nor bad)	Blank (neither good nor bad)	Good (active, curious)	Good, bad, & blank (biological predispositions toward both)
Nature-Nurture	Nature	Nature and nurture equally	Nurture	Nurture	More nature (maturational constraints) but also nurture (experience is also important)	Nature and nurture equally, although more focus on nurture
Active-Passive	Passive (humans are influenced by biological forces beyond their control)	Active	Passive (humans are shaped by environment)	Active (humans influence their environment)	Active (constructing own understanding)	Active and passive (Reciprocally initiate and receive)
Continuity-Discontinuity	Tends to be continuous, but may have sensitive periods	Discontinuous (stagelike)	Continuous (habits gradually increase or decrease in strength)	Continuous	Discontinuous (stagelike)	Both continuous and discontinuous
Universal-Context Specific	Universal	Universal (although stages may be expressed differently in different cultures)	Context specific (direction of development depends on experiences)	Context-specific	Universal	Context-specific and universal, but more focus on context
Meta-Theory	**Maturational**	**Organismic**	**Mechanistic**	**Contextual**	**Organismic**	**Contextual**

This page titled 18.6: Which researchers have meta-theories? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

18.7: Does the field of psychology have meta-theories?

Does the field of psychology have meta-theories?

During different historical periods, specific meta-theories dominated the field of psychology. For example, during the 1940s and 1950s, behaviorism held sway. In the 1960s, Piaget's theories were introduced to the United States and captured the field's attention. When a specific meta-theory governs the field, it becomes very difficult for researchers from opposing meta-theories to work—they have trouble getting funding, they have trouble getting their research findings published, and they are marginalized by other researchers. For example, when the area of motivation was dominated by behaviorists (who believed that all behavior was motivated by rewards and punishments), it was very difficult for researchers to study and publish research on intrinsic motivation.

This page titled 18.7: Does the field of psychology have meta-theories? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

18.8: What is the dominant meta-theory in the field today?

Since the 1980s, “cognitivism” is one of the guiding meta-theories in the field of psychology. “Cognitivism” is the assumption that all the causal factors that shape human behavior and development are inside the mind or belief system of the person. You can hear the assumptions in the theories of the field: self-efficacy, self-esteem, attributions, perceived social support, values, sense of purpose, goal orientations, internal working model, identity, and so on.

Some cognitivist theories (e.g., health beliefs) are Maturational, in that they only include constructs from the individual’s belief system, whereas others (e.g., self-efficacy theory) are more Contextual in that they include a large role for the environment. Some theories that started out focusing on the environment (e.g., theories of stress or social support) have “disappeared into the head” as the study of these phenomena has relied more and more on people’s opinions about their occurrence (i.e., stress appraisals and perceptions of social support).

Starting in the 1990s (with the introduction of the fMRI), the paradigm that is currently taking over the field of psychology is neuroscience. At its most extreme, this view assumes that the brain is solely in charge of behavior, and neurophysiology is destiny (which would be a Maturational meta-theory). However, many researchers studying the brain see it as a crucial piece of the puzzle, but also incorporate assumptions about agentic individuals and active environments—which puts them in more contextual or systems camps. In the final section of this book, we include a chapter on neuroplasticity, which focuses on neuroscience research that examines the role of experience in the development of the brain itself, most of this research relies on a systems perspective.

News flash: In the field of psychology outside developmental, most researchers assume that people don’t develop. In personality, social, cognitive, and industrial-organizational psychology, researchers largely examine individual differences as indicators of people’s permanent characteristics. These snapshots, taken at a single point in time, are assumed to contain all the information needed to understand a phenomenon. For developmentalists, it is as if these areas rely on meta-theories that posit a view of reality as a “still-life” whereas developmentalists assume that reality is more akin to a movie, and such snapshots only reflect single frames.

This page titled 18.8: What is the dominant meta-theory in the field today? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

18.9: Who else has meta-theories?

Who else has meta-theories? Everyone has meta-theories about human nature and development: parents, teachers, nurses, social workers, doctors, business people, artists, politicians, and so on. For example,

- doctors assume that weight loss is all about diet and exercise (nurture), so no one can do research on physiological differences in metabolism (nature).
- teachers have assumptions about whether students come with motivation (nature) or have to be motivated from the outside (nurture), and organize their classrooms accordingly.
- parents often argue about the nature of children's development, whether it's just the child's personality (maturational), or the child is going through a normal stage (organismic), or if they are rewarding the wrong behavior (mechanistic).

This page titled 18.9: Who else has meta-theories? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

18.10: Where can meta-theories be seen most clearly?

Once meta-theories become visible to us, we can see them everywhere, but one of the places that they are most evident is in the ways we choose to intervene to improve development. In order to make a positive change, we must select an “intervention lever” or strategy through which we believe we can alter the current course of development. That strategy represents our view of the most important antecedents and so is revealing about our hypothesized underlying fundamental cause of development—which is at the heart of each meta-theory. For example, if we are trying to help families who have children with serious behavioral problems, we could consider a psychopharmacological intervention, which would, because it focuses on biological causes, imply a maturational view. Or we could offer to work with the parents so they could more effectively set limits for their child. This would imply Mechanistic view because of its emphasis on environmental programming.

One exercise that we have found useful in helping students think through the four meta-theories is to assign each student one of the meta-theories and then to answer intervention questions, like the series of questions listed in Table 7.3, from that perspective. If students have a chance to take each perspective, they begin to be able to see patterns in the answers. Some of them are surprising. For example, we tend to be slightly offended by Mechanistic assumptions that we are being run by external forces, but these assumptions are wildly optimistic when it comes to interventions, basically asserting that any change is possible as long as we are clever enough in our social programming. On the other hand, Organismic assumptions are appealing, but more challenging to apply to interventions, because the best way to induce structural shifts is not always apparent. On the third hand, Contextual assumptions seem generally to fit in with our layperson’s take on development, but when it came time to derive an intervention, it was difficult to get beyond such generalities as “all of the above” or “it depends,” leading students to wonder whether that meta-theory was going to be very helpful for optimization efforts.

Table 7.3. Examples of Questions to consider from Different Meta-theoretical Perspectives

1. How can we get our little girl (toddler age) to eat more vegetables?
Examples of responses from each perspective:

- Maturational: don't worry, your toddler will eat them when she is ready.
- Mechanistic: model how delicious the vegetables are and then reward her with dessert once she eats her vegetables.
- Organismic: offer a variety of vegetables and she will select the ones she prefers.
- Contextual: wait until she is hungry and then offer a selection.

2. Can the baby sleep in bed with us when he has a nightmare?

3. Should we make the preschool child share his toys?

Moving up several levels:

4. Why are their racial differences in educational attainment?

5. Late onset dementia—how do we best treat it?

6. After you turn 50, should you exercise like mad or just spread gracefully?

7. Adolescent sex offenders, should they be tried as adults?

8. Should 16-year-olds really be allowed to drive? 85-year-olds?

9. I’m investing in new technology for my business-- Should I fire everyone over 40 or can older workers be retrained?

10. Are you developing now? Will you develop any more?

This page titled 18.10: Where can meta-theories be seen most clearly? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

18.11: What is the meta-theory that guides our class and our book?

One of the goals of this book is to lay out the advantages of developmental systems perspectives on human development. The authors were trained in a variety of systems and contextualist perspectives, including the transactional-dialectic perspective and the lifespan orientation—a view that fought its way through dominant perspectives in child psychology (e.g., development ends at age 18), starting in the 1970s and becoming a well-regarded meta-theory today. (Note that your instructors chose your book, so their meta-theory is influencing the meta-theoretical filter through which you are learning about development.) In subsequent chapters, we touch on several developmental systems perspectives that incorporate organismic and contextual elements, such as the bio-ecological model, transactional-dialectic models, relational perspectives, and dynamic systems.

This page titled 18.11: What is the meta-theory that guides our class and our book? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

18.12: Do I have a meta-theory about development?

Yes, you do. And you can figure out what it is. Although it's not easy, you can discern your own assumptions about development—by thinking about which assumptions make the most sense to you. You can also see which kinds of theories you prefer and what kinds of recommendations you would make about how to optimize development, like how people should parent, teach, or make policies. The hardest part about discovering your own meta-theory is realizing that it is made up of assumptions you have (based on your experiences and messages from society)—that aren't necessarily true. Our meta-theories seem true to each of us.

This page titled 18.12: Do I have a meta-theory about development? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

18.13: How do I get rid of my meta-theory?

It’s not really possible to get rid of all of our assumptions. It is our goal to be aware of our own assumptions or meta-theories, to realize that they are not the truth but are our current working models of how the world operates and people develop. The most important thing is to be explicit about our assumptions and to be aware of how they are guiding our actions. It is a goal of this class to help students figure out their own assumptions and to help them become (or remain) open to alternative viewpoints.

This page titled 18.13: How do I get rid of my meta-theory? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

18.14: What is the correct meta-theory?

There is no single correct meta-theory, just as there is no single correct definition of development. Even the developmental systems approach has its drawbacks. However, as research accumulates, many theories derived from certain meta-theories have been found to be incomplete—so far researchers have not found any significant aspect of development that is caused only by nature or only by nurture. Therefore, most researchers currently say they favor interactive metatheories, like organismic, contextualist, or systems meta-theories. However, it is important to look carefully at researchers' (and our own) actual work, because sometimes we find one meta-theory most compatible with our own assumptions about humans and how they develop, but nevertheless our research (sometimes surprisingly) seems to be more consistent with the assumptions from a different meta-theory, even one we would say that we disagree with in principle.

This page titled 18.14: What is the correct meta-theory? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

CHAPTER OVERVIEW

19: Contrasting Meta-theories

19.1: Comparing and Contrasting Meta-theories

19.2: What are some key issues upon which these meta-theories differ?

19.3: How do the two meta-theories that focus on the organism differ from each other?

19.4: Are there other ways to compare and contrast the four meta-theories?

19.5: What do Maturational and Mechanistic meta-theories have in common?

19.6: What do Organismic and Contextualist meta-theories have in common?

19.7: What is the point of these two “meta-models”?

19.8: Where do developmental systems meta-theories fit on this meta-map?

19.9: Developmentally Systematizing a Phenomenon

This page titled 19: Contrasting Meta-theories is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

19.1: Comparing and Contrasting Meta-theories

So far, we have presented the four meta-theories under consideration in a list, roughly corresponding to their ascendance in developmental psychology, but still just as a serial string. However, it is clear that among this set of meta-theories, some share similar features and some differ. In order to provide a "meta-view" on meta-theories, we will select some important dimensions upon which the theories can be compared and contrasted. We will also discuss in a little more detail those assumptive issues that have led us to advocate for developmental systems meta-theories.

This page titled 19.1: Comparing and Contrasting Meta-theories is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

19.2: What are some key issues upon which these meta-theories differ?

An obvious first place to start in identifying similarities and differences among the four meta-theories is their relative emphasis on nature versus nurture, or on the relative importance of the person and of the environment. Before we embark on this issue, it is important to point that none of the meta-theories assumes that only one of these ingredients (i.e., person or environment) is both necessary and sufficient to generate development. Even the most maturational of meta-theories acknowledges that the environment must provide essential nutrients for the maturational program to unfold. No seeds will germinate without soil, water, and sun. However, it is the seed that contains the developmental blueprint that determines the mature design of the organism. In a similar vein, not even the most mechanistic of meta-theories looses track of the fact that without certain organismic capacities—such as the ability to detect and respond to environmental contingencies—no social conditioning is possible. However, it is the environment that brings the developmental agenda that will shape the trajectory of behavior.

It is the relative weight given to each factor that distinguishes the meta-theories. Figure 8.1 depicts the four meta-theories along two important axes: the horizontal axis represents the relative importance that the meta-theory assigns to the person, and the vertical axis represents the relative importance of the environment. As can be seen by the placement of the meta-theories, Maturational meta-theories assign great weight to the person and very little weight to the environment; these meta-theories assume that any average expectable environment would be sufficient to support the maturational program. For that reason, we sometimes refer to them as “big O” meta-theories (for their overriding emphasis on the “O”rganism). In contrast, Mechanistic meta-theories assign great weight to the environment and very little weight to the person; they assume that normal humans come with the equipment needed to detect and respond to social conditioning. For that reason, we sometimes refer to them as “big E” meta-theories (for their overriding emphasis on the “E”nvironment).

Organismic meta-theories assign great weight to the organism (as might be inferred from the name of the meta-theory) but, since the organism’s goal is to adapt to the environment, these meta-theories assign a more important role to the environment. For that reason, we sometimes refer to them as “big O-little e” meta-theories (for their emphasis on the “O”rganism without forgetting the “e”nvironment). Contextual meta-theories, as the name implies, assign great weight to the context but, since the individual is considered to be an active agent that selects, initiates, and responds to the environment, these meta-theories view the person as also playing an important role. For that reason, we sometimes refer to them as “big E-little o” meta-theories (for their emphasis on the “E”nvironment without forgetting the “o”rganism).

This page titled 19.2: What are some key issues upon which these meta-theories differ? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

19.3: How do the two meta-theories that focus on the organism differ from each other?

As depicted in Figure 8.1, two meta-theories, namely Maturational and Organismic, fall to the extreme right of the figure, indicating that both of them are “big O” meta-theories that assign a primary role to the person in shaping development. How then, do these two meta-theories, which both prioritize the organism, differ from each other? First, as shown by the difference in their positions in Figure 8.1, Organismic meta-theories assume a relatively greater role for environments than do Maturational meta-theories. The importance of the environment is visible, for example, in Piaget’s theory of cognitive development. According to this perspective, the contents of logico-mathematical thinking, such as conceptions of time and causality, have specific universal properties because they are constructed based on interactions with objects that are governed by the specific universal laws of physics; it is likely that the contents of development would be completely different if humans were to construct their schemas and logical operations on planets where these laws did not apply. In such a radically different environment, the basic organismic processes of adaptation, assimilation, accommodation, (dis)equilibration, and (re)organization, would lead to very different developmental outcomes.

A second set of differences between Maturational and Organismic meta-theories are listed in Figure 8.2. Because Maturational meta-theories assume that biology and genetics are running the show, they do not view humans as active or agentic in their own development. (No act of will can force a tulip bulb to produce an iris.) It may seem confusing to argue that Maturational meta-theories assume that people are passive and reactive, when all the developmental action seems to be located right there inside the person. However, the director of this action is the person’s biology—their genes and neurophysiology—over which the person does not exert direct control.

To borrow another metaphor, in Maturational meta-theories, the person (or more precisely, the agentic self) is not in the driver’s seat. The pickup truck of development is driven by the genetic program. The person him or herself is in the passenger’s seat, just along for the ride. What about theories focused on personal attributes that seem closer to the agentic self, like those that concentrate on brain systems, personality traits, or intellectual abilities? Some of these theories can be considered Maturational—if they assume that these characteristics are fixed or immutable—and thus not open to influence from the agentic self. In contrast, one of the most notable features of Organismic meta-theories are their assumptions about human nature—they assume that people are active, curious, goal-directed agentic beings.

A second difference between Maturational and Organismic meta-theories centers of the issue of continuity versus discontinuity. Because Maturational meta-theories assume biological priority and immutability of personal characteristics—this implies two kinds of continuity in development. On the one hand, it is assumed that there is great stability in people, based on their fixed biopsychological attributes. Attributes that were seen in newborns should continue to be apparent in young children, older children, adolescents, and adults. On the other hand, explanatory continuity is also assumed because development can be fully understood by investigating an individual’s biology. The search for causes of development privileges the territory covered by genetics and neurophysiology.

In contrast, a distinctive feature of Organismic meta-theories is their assumption of discontinuity. They assume descriptive discontinuity, because development is seen as the emergence of a series of qualitatively new reorganizations. They also assume explanatory discontinuity, because each successive reorganization is built on the unique configuration of the previous level of development, in combination with new ingredients and activities. As a result, no developmental step can be reduced to any previous steps.

This page titled 19.3: How do the two meta-theories that focus on the organism differ from each other? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

19.4: Are there other ways to compare and contrast the four meta-theories?

These four meta-theories can be distinguished based on their views about the role of the person (whether people are seen as active versus reactive) and the role of the environment (whether it is seen as active or passive). As pictured in Figure 8.4, Maturational meta-theories posit that development unfolds from a reactive person in a passive environment, whereas Mechanistic meta-theories see development as driven by an active environment operating on a reactive person. Organismic meta-theories argue that development emerges from an active person making use of a passive environment, whereas Contextual meta-theories see development as arising from active people negotiating with their active environments.

When arranged this way, it also becomes clear that meta-theories that focus on different active ingredients, such as Maturational and Mechanistic, have in common a view of people as reactive, whereas Organismic and Contextual meta-theories view people as active and agentic. The analysis of the difference between Maturational and Mechanistic models, on the one hand, and Organismic and Contextual models, on the other, reveals a deeper issue underlying these models—that many theorists assume refers to the most important meta-issue in developmental science, namely, dualistic versus relational meta-theories.

This page titled 19.4: Are there other ways to compare and contrast the four meta-theories? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

19.5: What do Maturational and Mechanistic meta-theories have in common?

As depicted in Figure 8.5, the fact that Maturational meta-theories posit that development is the product of genes and neurophysiology (i.e., biological determinism) whereas Mechanistic meta-theories posit that development is the product of social conditioning (i.e., environmental determinism) often lead students to focus on the differences in these two meta-theories (nature versus nurture). However, these two meta-theories also have in common several underlying assumptions—that people are passive and reactive, that people are static and at rest unless moved by efficient causes, that development is driven (by either biology or environment), and that development shows great continuity with changes that are largely quantitative and in amount.

Perhaps most fundamentally, these two meta-theories agree that nature can be understood and studied separate from nurture. Although the two meta-theories differ about the part that can be relegated to the status of background (with Maturational dismissing nature, and Mechanistic dismissing nurture), they share the core notion that person and context can be considered separate parts of the developmental equation. The view that nature and nurture can be dis-assembled and analyzed for their individual contributions reflects a basic underlying assumption that is sometimes referred to as “dualistic” or “reductionistic.” Maturational and Mechanistic meta-theories have in common that they are dualistic and reductionistic world views.

This page titled 19.5: What do Maturational and Mechanistic meta-theories have in common? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

19.6: What do Organismic and Contextualist meta-theories have in common?

As depicted in Figure 8.6, the fact that Organismic meta-theories emphasize the role of the organism in development whereas Contextualist meta-theories emphasize the role of the context should not obscure the several assumptions that these meta-theories have in common: that the person is inherently active and agentic, that change and activity are the natural state of affairs, that development is always co-constructed by interactions between co-active people and their multi-level contexts, and that quantitative changes and qualitative transformations of both are not only possible but likely.

Perhaps most fundamentally, these meta-theories share the assumption that, although people can be distinguished from their contexts, they cannot be separated, without distorting or destroying both. At the most basic level, the notion that nature and nurture are parts of the same whole and so can only be understood and studied in their combination or interaction reflects a basic underlying assumption that is sometimes referred to as “relational” or “interactionist.” Organismic and Contextual meta-theories have in common that they both are relational and interactionist world views.

This page titled 19.6: What do Organismic and Contextualist meta-theories have in common? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

19.7: What is the point of these two “meta-models”?

At the risk of piling “meta-s” upon “meta-s,” we add one more layer of “meta-models.” We are convinced (consistent with many other developmentalists) that the most important distinction to be made among meta-theories is not based on their relative emphasis on nature versus nurture, but instead on their views about whether the universe (including people and their contexts) are made up of dis-sociable parts or of synchronized wholes. These meta-models are pictured graphically in Figure 8.7. On the left side are meta-theories, like Maturational and Mechanistic, that are dualistic or reductionistic; on the right side are meta-theories, like Organismic and Contextual, that are interactionistic and relational.

In their chapter, Reese and Overton (1970) refer to the two sides of this assumption as
“elementarism versus holism” or assumptions about whether (1) a part can be considered a meaningful unit in itself so that it can be removed (disassociated) from the whole and understood by examining only the material identity of the part; or (2) a part derives its meaning from the whole and so part processes can only be understood in the context of whole. In meta-theories that assume elementarism, it is considered reasonable to isolate and focus on individual parts, and to consider as similar two parts that look the same, whereas in meta-theories that assume holism, parts must always be considered in the context of their functioning in the whole, and so two parts, even if they appear to be similar, should not be considered the same if they function as parts of different wholes.

The “parts” that can be considered, shown on the left side of the figure, include “nature versus nurture” and all its variations, as well as “person versus context” and “body versus mind.” As can be seen on the right, relational meta-models reject the very idea that these are dualisms, arguing for the use of “and” instead of “versus,” because development is always nature and nurture, person and context, and body and mind. However, these meta-models go further, positing that the lines implied by “and” should be recognized as artificial, as dotted lines—permeable boundaries--at best, in that minds are always embodied, humans are essential parts of their ecologies, and, through their own actions, people are continuously (and some would argue catastrophically) changing their nature and their nurture, even going so far as to change their local micro-climates through the effects of their body temperatures and by breathing in and out.

We find that this feature of meta-models, namely, the assumption of non-duality or holism, is the most difficult one for students to grasp, so we will provide a few examples here and then revisit the issue repeatedly in subsequent chapters as we discuss meta-theories that take this issue as their centerpiece (e.g., developmental systems, dialectic-transactional, and relational meta-theories). The central point of “non-dualism” is that the two “parts” that we try to separate and that we then rejoin with “versus” or “and,” actually require each other to exist. They are mutually constitutive. A simple example is that of “inside” versus “outside.” The very existence of “inside” depends on the existence of “outside.” If there were no “outside,” nothing could be inside—the idea of a boundary requires the existence of two territories, without both territories, the boundary and the distinction between the territories would not make sense. So it is with, for example, the mind and the body. The mind cannot exist without the body, and the body, without the mind, is a qualitatively different kind of body, it is a cadaver.

“When we try to pick out anything by itself, we find it hitched to everything else in the universe.”

--John Muir, My First Summer in the Sierra

This page titled 19.7: What is the point of these two “meta-models”? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

19.8: Where do developmental systems meta-theories fit on this meta-map?

We view developmental systems meta-theories as interactionistic and relational meta-theories that posit development as the outcome of exchanges between “big-O and big-E.” This idea is pictured graphically in Figure 8.8, in which both Organismic and Contextual meta-theories are in the same quadrant in which importance is given to both person and environment, even though, as their names suggest, Organismic assigns relatively more weight to the organism, and Contextual to the context. We are interested in that corner on upper right, where we have placed Developmental Systems meta-theories, and we have selected the larger orientations which we will present and discuss in subsequent chapters based on the extent to which we judge that they can help us think about and study our phenomena using the precepts the take us ever farther into this corner of the meta-map.

This page titled 19.8: Where do developmental systems meta-theories fit on this meta-map? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

19.9: Developmentally Systematizing a Phenomenon

One of the challenges we set for ourselves was to encourage each student to work on the target phenomenon of their choice, with the assurance that we would help them "developmentalize" it, whatever it was, so that it would be suitable for framing within a variety of systems orientations. This offer was made with the conviction that, since everything really is developmental (i.e., everything really is active, moving, changing, transforming), the process of uncovering or converting a configuration and question from one sub-discipline (e.g., social, industrial-organizational, community, education) to developmental-land would be relatively straightforward. How hard could it be? As it turns out, it could be pretty hard.

At first, it was very interesting to see what kinds of phenomena students initially brought to us to be converted. It was revealing to see the features that students assumed their phenomenon would be required to possess if it was going to be able to be developmentalized. Some students tried to think of questions that interested them about babies, children, or adolescents. Some tried to think of questions that focused on adulthood and aging (e.g., the aging workforce was a prime candidate). It became clear that, for them at this point, the primary defining feature of "developmental" was the target population. It simply did not occur to them that every single phenomenon, including exactly the one that they were studying in their thesis or dissertation research was, from our perspective, inherently developmental, worthy of being hewn out of the static rock where it was trapped by the assumptions of its surrounding sub-discipline and set free to travel across time.

How did you help students developmentally systematize their phenomenon?

In the beginning, we had no real idea about how to accomplish this goal. We simply talked to students individually about their targets, interviewing them about their research questions and variables (which is where they were typically focused) and trying to help them "zoom out" to see the larger conceptual questions and applied problems that they cared about. We kept listening and drew pictures together and after a while something the student said reminded us of something we had once thought about a similar phenomenon and then "presto-change-o!" a sliver of developmental light began to dawn. Eventually, through these interviews, we also learned about the difficulties and barriers to developmentally systematizing phenomena, and we discovered that the barriers were not only in our students, by also in the sub-disciplines of their research questions, and in ourselves.

What were the three main barriers?

A first barrier was limited domain knowledge. Students picked their own topics within psychology, based on their interests and training. However, the topics differed enormously in how much had been discovered about them already. As a rule, domains in which more was known were easier to "systematize." Areas that had identified a wide range of predictors, moderators, and pathways to the target phenomenon were beginning to recognize the complexity of their phenomenon. Some of the areas that included multiple competing perspectives were beginning to realize that more than one of these perspectives was likely valid. These areas were ready for organization and integration.

In contrast, some areas were relatively less mature; they had been guided by single concepts or dominant perspectives. Some of these areas were beginning to wonder whether their approaches might be dead ends; however, most were questioning the specific approaches rather than searching for larger frameworks that would incorporate them. The biggest problem was what Giggerenzer (1998) refers to as one of the "surrogates for theories," namely, "one word explanations." These are "theories" in which all of students' knowledge could be encapsulated by a single concept—like "emotion regulation," "self-efficacy," or "racial stereotype." These concepts actually refer to a broad range of fully-baked theories, but students often did not know about those theories or their near-neighbors. Hence, a barrier to developmentally systematizing a phenomenon is lack of rich domain knowledge.

A second barrier was an over-riding focus on the individual. Some students had trouble getting outside of the individual. When asked for a list of the predictors of their phenomena, it was not uncommon for every element on the list to come from inside the person (e.g., personality, temperament, skills) and often from inside their cognitions (e.g., appraisals, values, self-efficacy, perceptions of social support). When we asked for descriptions of dyadic, group-, or organization-level constructs, we were lucky to get two or three candidates, and they were typically from a narrow band of constructs. We viewed this bias as reflecting the dominance of cognitivist metatheories in psychology today. Hence, a second barrier to developmental systems thinking is impoverished knowledge about theories and constructs outside the individual level.

Finally, a third barrier was specialization. Students had a hard time seeing how conceptualizations and research outside their own sub-areas (or even their individual sub-sub-areas) could be relevant to them. For example, as we discussed the issue of levels in

organizations, some developmental students tuned out. What did the workplace have to do with children? Or when we discussed attachment, community psychology students focusing on support groups failed to make any connection. We could see that their disinterest reflected the compartmentalization of the field of psychology today. Research topics and fields have evolved in relative isolation from each other. Hence, a third barrier to developmental systems thinking is the headset that researchers are responsible only for the knowledge inside their narrow specialization.

In facing the limitations experienced by our students, we faced the limitations experienced in the field of psychology as a whole. As a field, we tend to work in relatively compartmentalized areas, learning only occasionally about the constructs and perspectives outside the traditional boundaries of our topics. Since the individual is the focal unit for psychologists, we tend to over-emphasize that level, looking for our answers inside the person and remaining less knowledgeable about theories and constructs from higher and lower levels of analysis.

How did you help students overcome these barriers?

We tried to develop a series of activities (short writing assignments and discussions) that could help students begin to see their target phenomena, as well as the theorizing and studying they were doing about it, as objects of reflection outside of themselves. The activities are listed in Table 8a.1. As described previously, we started with each student's "elevator speech" in class, followed by the paragraph outlining the problem statement. The next assignment was to write a brief (1-1.5 pages) summary of describing "traditional" research on their target topic. This usually consisted of two parts. The first was a list of predictors, which for some topics had been classified into "good news" (e.g., protective factors) and "bad news" (e.g., risk factors), and for others had been classified by level (e.g., personal vs. social factors).

Table 8a.1. List of Activities to Help Students begin to Developmentalize their Phenomena.

Activity	*Length*
1. Elevator speech in class	2-3 minutes
2. Problem statement	1-2 paragraphs
3. Configuration paper	1-1½ pages
4. Summary of traditional research	1-2 pages
5. Picture with antecedents and consequences	½ page

The second part was a list of models or conceptualizations used on the topic. Sometimes models consisted of putting all the factors in boxes and connecting them with arrows, and sometimes more complex relationships (containing mediators or moderators) had been suggested. Although lists of predictors could be very long, rarely did any area have more than two or three alternative conceptualizations or models. Some of the more mature areas had review articles in which these predictors and models had been collected. These descriptions of "traditional research" were subsequently used as summaries of domain knowledge for each topic.

How did this assignment help "developmentalize" students' phenomena?

This assignment served three functions. First, it encouraged students to see the current research on their topic as "traditional" and not as "correct." For many students, this was the first moment that it occurred to them that what seemed to be "known" about their phenomenon at this moment was not a representation of the static "truth," but a moving window of the current working model of the area. This loosened their hold a bit on the status quo.

Second, it encouraged students to consider the many different lenses that had already been used to capture pictures of their targets, also suggesting to them that multiple perspectives could be useful. If by chance students didn't know about all the perspectives that were currently employed to study their phenomenon, this exercise gave them the chance to go and learn about them (usually by talking to their faculty mentors and getting recommendations form them about good reviews or historical chapters). Moreover, as was sometimes true, if their topics were dominated by a single theory or perspective, this exercise also gave students the opportunity to realize that work on their topic was not currently informed by multiple perspectives—and so they could reflect on what might be missing from their topic areas.

Third, these brief summaries were a big help to us, their instructors, so we could learn the basics about each of their areas—especially ones with which we were not particularly familiar. These short papers also provided the puzzle pieces that we wanted students to use in the next steps of developmentalizing and systematizing their phenomena.

What were the next steps? The next step was for students to turn what they knew about their target phenomenon into a representation of a process, by using the “understanding a theory” process they had learned about previously. For this exercise, students used a rubric like the one pictured in Figure 8a.1 and could basically “fill in the blanks.” Students could fill out as many of these as they needed to complete all the different theoretical frameworks that had been used to conceptualize their target phenomenon. One thing that filling in the blanks allows students to do is notice when they are missing information. The “one word explanations” masquerading as theories began looking less like theories when they came to an end after the concept name was placed in the box labeled
“Target.”

This representation also allowed students to make decisions about where they wanted to focus their attention. When students wanted to develop intervention and optimization strategies, and the “target” was the desired outcome, they sometimes decided to focus on figuring out how to change the target’s antecedents and so added a box to the left representing the antecedents of the antecedents. For example, a student who is initially identifies as their target “Work-family balance” may decide that an important antecedent is “supervisor support,” but as soon as they want to create an intervention to optimize supervisor support, they need an antecedent to this antecedent to figure out how to improve it.

Where’s the development in all this?

Together, as we regarded students’ initial representations of their phenomena as a process, we asked a series of questions. First and foremost, we wondered --which of these constructs is changing? There are two likely suspects, of course—the target should be changing as a result of the application of the antecedents, and the consequences, both short and long-term, should be changing as an effect of the target. In many cases, this sequence could be considered a “micro-developmental” process and we could ask, what accumulates as these episodes unfold over time. We began to think of the applied problem—what an optimization process would, in this case, produce or prevent. We started to talk of “the dial,” as in whether these episodes cumulatively were “moving the dial,” and of what the dial might be an indicator. We looked at the long-term consequence as one option and began thinking about whether it could be described as a trajectory—of good news or bad news.

Then we began questioning, not insisting just questioning, whether the antecedents themselves might also be in motion. Here, we took up any constructs, like personality traits or contextual factors, that are typically assumed to be immutable, or at least stable, and suggested that we should keep an open mind as to whether they might themselves be changing, or if not in motion, whether they might be malleable. It was as if we started oiling all the joints around the constructs so that they could move more freely. We started thinking about feedback loops, whether there might be any return arrows—from the consequences to the antecedent or the target. We didn’t draw any yet, but we traced where they might be with our fingers. We started to see in these process representations the potential of cycles, and how each cycle might “move the dial” just a bit.

We spent a bit of time speculating about “what is on the arrows,” and we noticed that there were lots of arrows and that they, in most depictions of current theories, were largely blank. We noted the many blanks. Finally, we considered those aspects of the process that we felt were likely to remain fairly stable, and instead of skipping over them, we looked them in the eye and asked them how they managed this—what was happening on the arrows, or what was acting as a counterforce to what was on the arrows, that would allow them to hold there place in the rushing stream of developmental change. They usually didn't know at this point, because they were simply assumed to be static, but we told them to be patient. We would think about the hard work of staying the same, that is, the dynamics of stability, by and by.

We did not, at this point in the class, ask students to pull back and look at the whole picture, all that was drawn and all that was implied, and query these parts through the most developmental of questions, namely, how is this phenomena organized-- and how does this specific pattern of the coordination of these parts (this organization) serve a specific set of functions, that is characteristic of a particular point in time, whether that “time” is calibrated to age (e.g., an essential characteristic of “ten-ness), to the beginning of a developmental task (e.g., identity development), to a transition in competence (e.g., novice or expert) or circumstances (e.g., a divorce)? The notion of discontinuity and qualitative stages or states-- this is a fundamental concept that we would have to work our way toward very carefully, or we would lose students on the path.

Table 8a.2. Potential Questions to ask one's Phenomena when Beginning to Convert it to a Developmental System.

1. Which of these constructs is changing?

2. How is the target changing as a result of the antecedents?

3. How are the short-term consequences changing as a result of the target?

4. Can these constructs be seen as creating an "episode"?

6. Do these episodes suggest that they might accumulate —that is, "move the dial"?

7. What is on "the dial"? Long-term development?

8. What constructs does optimization suggest we might consider as outcomes that we could try to change? What options should we be trying to improve, produce, or prevent?

9. Could the antecedents be changing? Could they be malleable?

10. Are there potential feedback loops? Hints of "cycles"?

11. What could be on the arrows?

12. What constructs are likely to be stable? What could be keeping them stable?

Questions for later

13. How are these parts organized, and how does this coordination serve specific functions?

14. How is the whole picture (the whole system) embedded in a larger stream of time— and what are some options about how to think about the kind of "time" that marks systems' changes? What about— "age," "beginning," "ending," or "transitions"?

Did students "get it"? Did they start using developmental systems thinking? Not yet. At this point, all we were hoping to do was help students open up their minds a bit. We wanted to challenge students' views about what constitutes a "developmental phenomena"—to rework the assumption that it's about an age group (i.e., children or the elderly). We were explicit with students that we were going to evangelize about developmental systems, but we did not want them to obediently comply with our meta-theoretical preferences; we wanted them to be able to see the "new world" for themselves and then decide. We even came up with a term to describe whether we thought that each student "got it" yet. It was like popcorn: Students were kernels and the class was the oil and the pan, heating up slowly. We were helping students to "pop," that is, to spontaneously begin to see the world through the lens of developmental systems meta-theoretical assumptions.

We saw the work of developing the class as creating a set of experiences that would consistently help students to "pop." It needed to work for students who were uncomfortable with complexity as well as those who were uncomfortable committing to a specific empirical study. It needed to work with research questions drawn from domains in which complex knowledge structures were not yet available as well as from those in which they currently existed. For the former domains, we needed to identify a set of principles for generating complexity; for the latter domains we needed principles for dealing with it. We needed a set of activities that, working from the inside out, could produce an elaborated conceptualization as well as a series of manageable feasible designs for research that could be accomplished using either standard data collection and statistical methods, and/or current data sets. We saw the course as a microcosm embedded in our own developmental systems meta-theoretical assumptions—so we were using all the principles that we wanted students to consider to help them intentionally shift their way of thinking toward an appreciation of developmental systems meta-theories.

How else did you help students become more aware of the developmental aspects of their phenomena?

We assigned them a "Background paper" in which they were asked to write a short summary of the major developmental issues faced by the people in their configurations (see Table 8a.3). The goals of the paper were twofold: (1) to help them become aware of the "whole persons" they were studying; and (2) to make clear to them that people of all ages have key developmental tasks, and developmental changes in their biopsychosocial characteristics, roles, and relationships. Students who are studying adults often ask us what they should be including in their papers, and are somewhat taken aback when we plonk down whole textbooks on "Adult Development and Aging." They are only required to read the chapters in lifespan textbooks on their particular age group, but even

these chapters provide a great deal of information about the multiple issues their participants are negotiating in the “background,” in addition to whatever target issue the student is focused on in the “foreground.”

Table 8a.3. Background Paper

Goal

To begin to think about people as “whole persons” (that is, as more complex than the particular part you are focusing on). To give you a fuller picture of the developmental tasks and issues with which the people of your developmental level are engaged.

Activity

Write a summary (1 to 2 pages double-spaced) of the main themes in the developmental period of your configuration and phenomenon. If you have a big developmental period (e.g., all of adulthood), it may be longer.

Source

Developmental textbooks.

Content

About 25% of the paper covers the development of your target phenomena (e.g., cognition) and about 75% covers other areas of development (e.g., biological, physical, social, personality development). Consider people as integrated bio-psycho-social beings, so be sure to cover (1) biological characteristics (e.g., neurological, temperament, physical, perceptual, health conditions); (2) psychological characteristics (e.g., cognition, attention, personality/ identity, emotion, regulation/volition, moral/ character, motivation); and (3) social relationships (e.g., parents, family, friendship, peers, intimacy, co-workers, own children).

What are some Examples?

Your target phenomenon is cognitive development during adulthood. You write about major developments in cognition during adulthood (25%) and also about major developments in other domains during the same age period: biological/ physical, personality, social (e.g., work, family), etc. (75%). Your target phenomenon is families and abuse. You write 25% about the normative developments in the family life cycle (e.g., marriage, establishing the family, child-rearing, divorce, etc.) and also 75% about the other major developmental tasks of the individuals (biological/ physical, cognitive, personality, social, etc.). If you are focusing on the parents, use developmental tasks of adulthood. If you are focusing on the children, use developmental tasks of childhood.

This page titled 19.9: Developmentally Systematizing a Phenomenon is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

CHAPTER OVERVIEW

20: Lifespan Perspectives

20.1: Lifespan Developmental Perspectives
20.2: What was the “traditional” view of development?
20.3: Why was the traditional view so appealing?
20.4: What did the lifespan perspective offer as an alternative view of development?
20.5: What are the key features of the proposition that “development is a life-long process”?
20.6: What is the point of “multi-directionality”?
20.7: What are the implications of the proposition that development includes both “gains and losses”?
20.8: What is meant by the notion of “plasticity”?
20.9: What are the implications of the proposition of “historical embeddedness”?
20.10: What are the implications of “Contextualism as paradigm”?
20.11: Why is the study of development a “multidisciplinary” affair?
20.12: Did the lifespan perspective demonstrate that old age is a period of plasticity filled with gains?
20.13: What are the most important take-home messages of lifespan developmental perspectives?
20.14: What are the most important critiques of lifespan developmental perspectives?

This page titled 20: Lifespan Perspectives is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

20.1: Lifespan Developmental Perspectives

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 20.1: Lifespan Developmental Perspectives is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

20.2: What was the “traditional” view of development?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 20.2: What was the “traditional” view of development? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

20.3: Why was the traditional view so appealing?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 20.3: Why was the traditional view so appealing? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

20.4: What did the lifespan perspective offer as an alternative view of development?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 20.4: What did the lifespan perspective offer as an alternative view of development? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

20.5: What are the key features of the proposition that “development is a life-long process”?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 20.5: What are the key features of the proposition that “development is a life-long process”? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

20.6: What is the point of “multi-directionality”?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 20.6: What is the point of “multi-directionality”? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

20.7: What are the implications of the proposition that development includes both “gains and losses”?

Your page has been created!

Remove this content and add your own.

- Edit page

  Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

- Drag and drop

  Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

- Classifications

  Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

- Working with templates

  CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

- Visit for all help topics.

This page titled 20.7: What are the implications of the proposition that development includes both “gains and losses”? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

20.8: What is meant by the notion of “plasticity”?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 20.8: What is meant by the notion of “plasticity”? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

20.9: What are the implications of the proposition of “historical embeddedness”?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 20.9: What are the implications of the proposition of “historical embeddedness”? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

20.10: What are the implications of “Contextualism as paradigm”?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 20.10: What are the implications of “Contextualism as paradigm”? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

20.11: Why is the study of development a “multidisciplinary” affair?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 20.11: Why is the study of development a “multidisciplinary” affair? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

20.12: Did the lifespan perspective demonstrate that old age is a period of plasticity filled with gains?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 20.12: Did the lifespan perspective demonstrate that old age is a period of plasticity filled with gains? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

20.13: What are the most important take-home messages of lifespan developmental perspectives?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 20.13: What are the most important take-home messages of lifespan developmental perspectives? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

20.14: What are the most important critiques of lifespan developmental perspectives?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 20.14: What are the most important critiques of lifespan developmental perspectives? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

CHAPTER OVERVIEW

21: Ecological Model

21.1: Ecological Model- Nested Contexts
21.2: What is an ecological perspective?
21.3: What is a “microsystem”?
21.4: What is a “mesosystem”?
21.5: What is an “exosystem”?
21.6: What is a “macrosystem”?
21.7: Did the ecological perspective reject experimental designs and lab-based studies?
21.8: So what? Did an ecological perspective change anything for developmentalists?
21.9: What use were these environmental maps?
21.10: What are the most important take-home messages of the ecological perspective?
21.11: What are the most important critiques of the ecological perspective?

This page titled 21: Ecological Model is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

21.1: Ecological Model- Nested Contexts

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 21.1: Ecological Model- Nested Contexts is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

21.2: What is an ecological perspective?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 21.2: What is an ecological perspective? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

21.3: What is a “microsystem”?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 21.3: What is a “microsystem”? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

21.4: What is a “mesosystem”?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 21.4: What is a “mesosystem”? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

21.5: What is an “exosystem”?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 21.5: What is an “exosystem”? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

21.6: What is a “macrosystem”?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 21.6: What is a “macrosystem”? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

21.7: Did the ecological perspective reject experimental designs and lab-based studies?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 21.7: Did the ecological perspective reject experimental designs and lab-based studies? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

21.8: So what? Did an ecological perspective change anything for developmentalists?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 21.8: So what? Did an ecological perspective change anything for developmentalists? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

21.9: What use were these environmental maps?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 21.9: What use were these environmental maps? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

21.10: What are the most important take-home messages of the ecological perspective?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 21.10: What are the most important take-home messages of the ecological perspective? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

21.11: What are the most important critiques of the ecological perspective?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 21.11: What are the most important critiques of the ecological perspective? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

CHAPTER OVERVIEW

22: Bioecological Models

22.1: Bioecological Model- Proximal Processes
22.2: What is the reformulated ecological model?
22.3: How can some clarity be brought to this complexity?
22.4: What are “proximal processes”?
22.5: What are some examples of proximal processes?
22.6: Is everything we do a “proximal process”?
22.7: Are all proximal processes good news for development?
22.8: Why are proximal processes so central to this reformulation?
22.9: How do proximal processes fit in with the other components of the model?
22.10: What are the person characteristics that shape proximal processes and their effects on development?
22.11: What are the characteristics of the context that shape proximal processes and their effects on development?
22.12: How do I select the PPCTs that are important to study?
22.13: Where is the target developing person located in this map?
22.14: What use are PPCT maps?
22.15: What are the most important take-home messages of the bioecological model?
22.16: What are the most important critiques of the bioecological model?

This page titled 22: Bioecological Models is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

22.1: Bioecological Model- Proximal Processes

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 22.1: Bioecological Model- Proximal Processes is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

22.2: What is the reformulated ecological model?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 22.2: What is the reformulated ecological model? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

22.3: How can some clarity be brought to this complexity?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 22.3: How can some clarity be brought to this complexity? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

22.4: What are “proximal processes”?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 22.4: What are “proximal processes”? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

22.5: What are some examples of proximal processes?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 22.5: What are some examples of proximal processes? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

22.6: Is everything we do a “proximal process”?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 22.6: Is everything we do a “proximal process”? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

22.7: Are all proximal processes good news for development?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 22.7: Are all proximal processes good news for development? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

22.8: Why are proximal processes so central to this reformulation?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 22.8: Why are proximal processes so central to this reformulation? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

22.9: How do proximal processes fit in with the other components of the model?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 22.9: How do proximal processes fit in with the other components of the model? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

22.10: What are the person characteristics that shape proximal processes and their effects on development?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 22.10: What are the person characteristics that shape proximal processes and their effects on development? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

22.11: What are the characteristics of the context that shape proximal processes and their effects on development?

Your page has been created!

Remove this content and add your own.

- Edit page

  Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

- Drag and drop

  Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

- Classifications

  Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

- Working with templates

  CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

- Visit for all help topics.

This page titled 22.11: What are the characteristics of the context that shape proximal processes and their effects on development? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

22.12: How do I select the PPCTs that are important to study?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 22.12: How do I select the PPCTs that are important to study? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

22.13: Where is the target developing person located in this map?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 22.13: Where is the target developing person located in this map? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

22.14: What use are PPCT maps?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 22.14: What use are PPCT maps? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

22.15: What are the most important take-home messages of the bioecological model?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 22.15: What are the most important take-home messages of the bioecological model? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

22.16: What are the most important critiques of the bioecological model?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 22.16: What are the most important critiques of the bioecological model? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

CHAPTER OVERVIEW

23: Dialectical and Transactional Perspectives

23.1: Dialectic and Transactional Perspectives

23.2: What are we talking about now? Have we left the realm of psychology and landed in philosophy?

23.3: What is a “transaction”?

23.4: What are the components of the transactional perspective?

23.5: What is the Contextual model?

23.6: What is the Regulation model?

23.7: What is the Representational model?

23.8: How do these four components fit together into a unified theory of development?

23.9: What is the process formulation of the unified theory?

23.10: Where is the representational model in the unified theory?

23.11: Any clues about what prompts development in the unified theory?

23.12: What are the important take-home messages from dialectical-transactional meta-theories?

This page titled 23: Dialectical and Transactional Perspectives is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

23.1: Dialectic and Transactional Perspectives

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 23.1: Dialectic and Transactional Perspectives is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

23.2: What are we talking about now? Have we left the realm of psychology and landed in philosophy?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 23.2: What are we talking about now? Have we left the realm of psychology and landed in philosophy? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

23.3: What is a “transaction”?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 23.3: What is a “transaction”? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

23.4: What are the components of the transactional perspective?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 23.4: What are the components of the transactional perspective? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

23.5: What is the Contextual model?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 23.5: What is the Contextual model? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

23.6: What is the Regulation model?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 23.6: What is the Regulation model? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

23.7: What is the Representational model?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 23.7: What is the Representational model? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

23.8: How do these four components fit together into a unified theory of development?

Your page has been created!

Remove this content and add your own.

- Edit page

  Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

- Drag and drop

  Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

- Classifications

  Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

- Working with templates

  CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

- Visit for all help topics.

This page titled 23.8: How do these four components fit together into a unified theory of development? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

23.9: What is the process formulation of the unified theory?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 23.9: What is the process formulation of the unified theory? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

23.10: Where is the representational model in the unified theory?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 23.10: Where is the representational model in the unified theory? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

23.11: Any clues about what prompts development in the unified theory?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 23.11: Any clues about what prompts development in the unified theory? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

23.12: What are the important take-home messages from dialectical-transactional meta-theories?

Your page has been created!

Remove this content and add your own.

- Edit page

  Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

- Drag and drop

  Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

- Classifications

  Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

- Working with templates

  CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

- Visit for all help topics.

This page titled 23.12: What are the important take-home messages from dialectical-transactional meta-theories? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

CHAPTER OVERVIEW

24: Relational Systems Meta-theories

24.1: Relational-Developmental Systems Meta-theories

24.2: What are the key differences between “split” and “relational” worldviews?

24.3: Why is the difference between Split and Relational metatheories important?

24.4: How can everything be 100% biological, 100% psychological, 100% social, and 100% cultural?

24.5: Does this mean we are always studying “biopsychosociocultural” globs?

24.6: Where does Relationism fit on our meta-theory map?

24.7: What are the principles that allow organism and contextualism to be unified?

24.8: What does the relational meta-theory offer in terms of causal explanation?

24.9: Where do all these new terms come from?

24.10: Where did the relational meta-theory come from?

24.11: What are the take-home messages from relational meta-theories?

This page titled 24: Relational Systems Meta-theories is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

24.1: Relational-Developmental Systems Meta-theories

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 24.1: Relational-Developmental Systems Meta-theories is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

24.2: What are the key differences between “split” and “relational” worldviews?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 24.2: What are the key differences between “split” and “relational” worldviews? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

24.3: Why is the difference between Split and Relational metatheories important?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 24.3: Why is the difference between Split and Relational metatheories important? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

24.4: How can everything be 100% biological, 100% psychological, 100% social, and 100% cultural?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 24.4: How can everything be 100% biological, 100% psychological, 100% social, and 100% cultural? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

24.5: Does this mean we are always studying “biopsychosociocultural” globs?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 24.5: Does this mean we are always studying “biopsychosociocultural” globs? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

24.6: Where does Relationism fit on our meta-theory map?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 24.6: Where does Relationism fit on our meta-theory map? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

24.7: What are the principles that allow organism and contextualism to be unified?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 24.7: What are the principles that allow organism and contextualism to be unified? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

24.8: What does the relational meta-theory offer in terms of causal explanation?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 24.8: What does the relational meta-theory offer in terms of causal explanation? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

24.9: Where do all these new terms come from?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 24.9: Where do all these new terms come from? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

24.10: Where did the relational meta-theory come from?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 24.10: Where did the relational meta-theory come from? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

24.11: What are the take-home messages from relational meta-theories?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 24.11: What are the take-home messages from relational meta-theories? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

CHAPTER OVERVIEW

25: Nonlinear Dynamic Systems Meta-theories

25.1: Nonlinear Dynamic Systems Meta-theories
25.2: Okay, if there is no design, then what is there?
25.3: How does this happen?
25.4: What are some examples of “emergence” in psychology?
25.5: And do all NLDS approaches agree on how self-organization happens?
25.6: Why is “circular causality” so important?
25.7: If downward causality doesn't push or pull anything, how does it influence development?
25.8: Okay, then how do these four kinds of causes work together?
25.9: Why do books and papers on NLDS seem like they are written in an alien language?
25.10: What are our “take-home” messages about nonlinear dynamic systems perspectives?

This page titled 25: Nonlinear Dynamic Systems Meta-theories is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

25.1: Nonlinear Dynamic Systems Meta-theories

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 25.1: Nonlinear Dynamic Systems Meta-theories is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

25.2: Okay, if there is no design, then what is there?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 25.2: Okay, if there is no design, then what is there? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

25.3: How does this happen?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 25.3: How does this happen? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

25.4: What are some examples of “emergence” in psychology?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 25.4: What are some examples of “emergence” in psychology? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

25.5: And do all NLDS approaches agree on how self-organization happens?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 25.5: And do all NLDS approaches agree on how self-organization happens? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

25.6: Why is “circular causality” so important?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 25.6: Why is “circular causality” so important? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

25.7: If downward causality doesn't push or pull anything, how does it influence development?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 25.7: If downward causality doesn't push or pull anything, how does it influence development? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

25.8: Okay, then how do these four kinds of causes work together?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 25.8: Okay, then how do these four kinds of causes work together? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

25.9: Why do books and papers on NLDS seem like they are written in an alien language?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 25.9: Why do books and papers on NLDS seem like they are written in an alien language? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

25.10: What are our “take-home” messages about nonlinear dynamic systems perspectives?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 25.10: What are our “take-home” messages about nonlinear dynamic systems perspectives? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

CHAPTER OVERVIEW

26: Three Big Ideas of Developmental Systems- The Big Ideas of Levels and Proximal Processes

26.1: The Big Ideas of Levels and Proximal Processes

26.2: What is holding up the revolution?

26.3: What are the essential elements of “systems” approaches?

26.4: What are the key tools for keeping our balance?

26.5: Big Idea #1- Levels- What is the “big idea” of levels?

26.6: Big Idea # 2- Proximal Processes- What is the “big idea” of proximal processes?

This page titled 26: Three Big Ideas of Developmental Systems- The Big Ideas of Levels and Proximal Processes is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

26.1: The Big Ideas of Levels and Proximal Processes

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 26.1: The Big Ideas of Levels and Proximal Processes is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

26.2: What is holding up the revolution?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 26.2: What is holding up the revolution? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

26.3: What are the essential elements of “systems” approaches?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 26.3: What are the essential elements of “systems” approaches? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

26.4: What are the key tools for keeping our balance?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 26.4: What are the key tools for keeping our balance? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

26.5: Big Idea #1- Levels- What is the “big idea” of levels?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 26.5: Big Idea #1- Levels- What is the “big idea” of levels? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

26.6: Big Idea # 2- Proximal Processes- What is the “big idea” of proximal processes?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 26.6: Big Idea # 2- Proximal Processes- What is the “big idea” of proximal processes? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

CHAPTER OVERVIEW

27: Three Big Ideas of Developmental Systems- The Big Idea of Dynamics

27.1: Big Idea # 3- Dynamics- What is the “big idea” of developmental dynamics?

27.2: Speaking of “circular causality” -- I can see the bottom-up effects of proximal processes and the “pop” of new actions, but where is the top-down stuff?

27.3: Is there such of a thing as higher-order organization of the context as well?

27.4: Okay, so formal cause is a property of individuals and environments-- but what about “final cause”-- “teleology”?

27.5: What is the difference between locally and developmentally adaptive?

27.6: Is there any developmental directionality implied by the idea of culture?

27.7: These final causes or teleological forces—How do they work? Didn't we decided that they do not actually pull the organism down a predetermined path?

27.8: Is that dialectical interaction what is causing the movement?

27.9: Are we close to understanding the “big enchilada” or qualitative shifts?

27.10: Activity 3. The Observation Project

This page titled 27: Three Big Ideas of Developmental Systems- The Big Idea of Dynamics is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

27.1: Big Idea # 3- Dynamics- What is the “big idea” of developmental dynamics?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 27.1: Big Idea # 3- Dynamics- What is the “big idea” of developmental dynamics? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

27.2: Speaking of “circular causality” -- I can see the bottom-up effects of proximal processes and the “pop” of new actions, but where is the top-down stuff?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 27.2: Speaking of “circular causality” -- I can see the bottom-up effects of proximal processes and the “pop” of new actions, but where is the top-down stuff? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

27.3: Is there such of a thing as higher-order organization of the context as well?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 27.3: Is there such of a thing as higher-order organization of the context as well? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

27.4: Okay, so formal cause is a property of individuals and environments-- but what about “final cause”-- “teleology”?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 27.4: Okay, so formal cause is a property of individuals and environments-- but what about “final cause”-- “teleology”? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

27.5: What is the difference between locally and developmentally adaptive?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 27.5: What is the difference between locally and developmentally adaptive? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

27.6: Is there any developmental directionality implied by the idea of culture?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 27.6: Is there any developmental directionality implied by the idea of culture? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

27.7: These final causes or teleological forces—How do they work? Didn't we decided that they do not actually pull the organism down a predetermined path?

Your page has been created!

Remove this content and add your own.

- Edit page

  Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

- Drag and drop

  Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

- Classifications

  Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

- Working with templates

  CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

- Visit for all help topics.

This page titled 27.7: These final causes or teleological forces—How do they work? Didn't we decided that they do not actually pull the organism down a predetermined path? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

27.8: Is that dialectical interaction what is causing the movement?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 27.8: Is that dialectical interaction what is causing the movement? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

27.9: Are we close to understanding the “big enchilada” or qualitative shifts?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 27.9: Are we close to understanding the “big enchilada” or qualitative shifts? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

27.10: Activity 3. The Observation Project

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 27.10: Activity 3. The Observation Project is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

CHAPTER OVERVIEW

28: From Meta-Theories to Methods

28.1: From Meta-Theories to Methods

28.2: What are the meta-theoretical and theoretical issues that now seem clear to students?

28.3: I thought that meta-theories shape theories and methods. Now you are saying that methods shape theories and meta-theories?

28.4: So is this part of the book full of new tools and (gulp) equations?

28.5: How does time enter into our methodological decisions and strategies?

28.6: Activity 4- Study Sketches for a Program of Research- Makin' a List, Checkin' it Twice

---

This page titled 28: From Meta-Theories to Methods is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

28.1: From Meta-Theories to Methods

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 28.1: From Meta-Theories to Methods is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

28.2: What are the meta-theoretical and theoretical issues that now seem clear to students?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 28.2: What are the meta-theoretical and theoretical issues that now seem clear to students? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

28.3: I thought that meta-theories shape theories and methods. Now you are saying that methods shape theories and meta-theories?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 28.3: I thought that meta-theories shape theories and methods. Now you are saying that methods shape theories and meta-theories? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

28.4: So is this part of the book full of new tools and (gulp) equations?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 28.4: So is this part of the book full of new tools and (gulp) equations? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

28.5: How does time enter into our methodological decisions and strategies?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 28.5: How does time enter into our methodological decisions and strategies? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

28.6: Activity 4- Study Sketches for a Program of Research- Makin' a List, Checkin' it Twice

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 28.6: Activity 4- Study Sketches for a Program of Research- Makin' a List, Checkin' it Twice is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

CHAPTER OVERVIEW

29: Developmental Designs- Cross-section, Longitudinal, and Cross-sequential

29.1: What are developmental designs?

29.2: Why is it challenging to figure how people change with age?

29.3: What is the cross-sectional design?

29.4: What is a longitudinal design?

29.5: Okay, I’m starting to warm up more and more to cross-sectional designs. What are their advantages?

29.6: What is a cross-sequential design?

29.7: What can we do about the big problem in longitudinal and cross-sequential designs-- that people drop out and that we are changing people by testing them repeatedly?

29.8: Which are the best study designs?

This page titled 29: Developmental Designs- Cross-section, Longitudinal, and Cross-sequential is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

29.1: What are developmental designs?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 29.1: What are developmental designs? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

29.2: Why is it challenging to figure how people change with age?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 29.2: Why is it challenging to figure how people change with age? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

29.3: What is the cross-sectional design?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 29.3: What is the cross-sectional design? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

29.4: What is a longitudinal design?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 29.4: What is a longitudinal design? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

29.5: Okay, I’m starting to warm up more and more to cross-sectional designs. What are their advantages?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 29.5: Okay, I’m starting to warm up more and more to cross-sectional designs. What are their advantages? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

29.6: What is a cross-sequential design?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 29.6: What is a cross-sequential design? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

29.7: What can we do about the big problem in longitudinal and cross-sequential designs-- that people drop out and that we are changing people by testing them repeatedly?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 29.7: What can we do about the big problem in longitudinal and cross-sequential designs-- that people drop out and that we are changing people by testing them repeatedly? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

29.8: Which are the best study designs?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 29.8: Which are the best study designs? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

CHAPTER OVERVIEW

30: More Developmental Designs- Time-lag and Time- and Cohort-Sequential Studies

30.1: What is the time-lag design?

30.2: What is a time-sequential design?

30.3: What do you get when you put the time-lag and longitudinal design together?

30.4: Which of the designs described in this chapter are most useful for developmentalists?

30.5: Section 5-

30.6: Section 6-

This page titled 30: More Developmental Designs- Time-lag and Time- and Cohort-Sequential Studies is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

30.1: What is the time-lag design?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 30.1: What is the time-lag design? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

30.2: What is a time-sequential design?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 30.2: What is a time-sequential design? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

30.3: What do you get when you put the time-lag and longitudinal design together?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 30.3: What do you get when you put the time-lag and longitudinal design together? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

30.4: Which of the designs described in this chapter are most useful for developmentalists?

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 30.4: Which of the designs described in this chapter are most useful for developmentalists? is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

30.5: Section 5-

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 30.5: Section 5- is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

30.6: Section 6-

Your page has been created!

Remove this content and add your own.

Edit page

Click the Edit page button in your user bar. You will see a suggested structure for your content. Add your content and hit Save.

Tips:

Drag and drop

Drag one or more image files from your computer and drop them onto your browser window to add them to your page.

Classifications

Tags are used to link pages to one another along common themes. Tags are also used as markers for the dynamic organization of content in the CXone Expert framework.

Working with templates

CXone Expert templates help guide and organize your documentation, making it flow easier and more uniformly. Edit existing templates or create your own.

Visit for all help topics.

This page titled 30.6: Section 6- is shared under a CC BY-NC license and was authored, remixed, and/or curated by Ellen A. Skinner, Thomas A. Kindermann, Robert W. Roeser, Cathleen L Smith, Andrew Mashburn & Joel Steele (Portland State University Library) .

Index

Glossary

Sample Word 1 | Sample Definition 1

Glossary

Sample Word 1 | Sample Definition 1

Detailed Licensing

Overview

Title: Applied Developmental Systems Science (Skinner et al.)

Webpages: 284

Applicable Restrictions: Noncommercial

All licenses found:

- CC BY-NC 4.0: 95.4% (271 pages)
- Undeclared: 4.6% (13 pages)

By Page

- Applied Developmental Systems Science (Skinner et al.) - *CC BY-NC 4.0*
  - Front Matter - *Undeclared*
    - TitlePage - *Undeclared*
    - InfoPage - *Undeclared*
    - Table of Contents - *Undeclared*
    - Licensing - *Undeclared*
  - 1: Introduction - *CC BY-NC 4.0*
    - 1.1: Introduction - *CC BY-NC 4.0*
    - 1.2: What is the purpose of the textbook and the course? - *CC BY-NC 4.0*
    - 1.3: How are the course and the guidebook organized? - *CC BY-NC 4.0*
    - 1.4: How should the book be used? - *CC BY-NC 4.0*
    - 1.5: What should students be getting out of the course and book? - *CC BY-NC 4.0*
    - 1.6: What should instructors be getting out of the course and book? - *CC BY-NC 4.0*
    - 1.7: Why are all the sections headed by questions? - *CC BY-NC 4.0*
    - 1.8: References - *CC BY-NC 4.0*
  - 2: Developmental Equivalence- Sampling and Selection - *CC BY-NC 4.0*
    - 2.1: What is the general idea of “developmental equivalence”? - *CC BY-NC 4.0*
    - 2.2: What does it mean to describe human development? - *CC BY-NC 4.0*
    - 2.3: What does it mean to describe qualitative changes in development? - *CC BY-NC 4.0*
    - 2.4: How can the description of stability be part of the goals of developmental science? - *CC BY-NC 4.0*
    - 2.5: How is the explanation of development different from its description? - *CC BY-NC 4.0*
    - 2.6: Why do developmentalists need to explain stability? - *CC BY-NC 4.0*
    - 2.7: What is meant by explanations of differential patterns of stability and change? - *Undeclared*
    - 2.8: How does optimization of human development differ from explanation? - *Undeclared*
    - 2.9: Conclusion - *Undeclared*
  - 3: Developmental Equivalence- Measurement and “Developmentally-friendly” Conceptualizations - *CC BY-NC 4.0*
    - 3.1: What is developmental measurement equivalence? - *CC BY-NC 4.0*
    - 3.2: Before we get into the details, could we think about another developmental example? - *CC BY-NC 4.0*
    - 3.3: Why isn't there a bigger bruhaha about this problem in the developmental literature? - *CC BY-NC 4.0*
    - 3.4: What would a relational organismic-contextualist systems-thinking type researcher do to deal with the problem of developmental measurement equivalence ? - *CC BY-NC 4.0*
    - 3.5: How did attachment researchers blow up that developmental balloon so successfully? - *CC BY-NC 4.0*
    - 3.6: All these strategies seem to imply that with development, some things are changing and some are staying the same. Is that right? - *CC BY-NC 4.0*
    - 3.7: It doesn’t seem like you are solving the problem of developmental measurement equivalence. Are we missing something? - *CC BY-NC 4.0*
  - 4: Experimental Designs- Lab and Field - *CC BY-NC 4.0*
    - 4.1: Study of Development- Explanation- Experimental Designs- Lab and Field - *CC BY-NC 4.0*
    - 4.2: What makes causality such a difficult issue? - *CC BY-NC 4.0*

- 4.3: Experimental Designs and Research Settings - *CC BY-NC 4.0*

- 5: Naturalistic Designs and Causal Inferences - *CC BY-NC 4.0*
  - 5.1: Naturalistic Designs and Causal Inferences - *CC BY-NC 4.0*
  - 5.2: Okay, can you break down the reasons that correlations do not prove causation? - *CC BY-NC 4.0*
  - 5.3: What is the specific problem that researchers working within relational meta-theories have created? - *CC BY-NC 4.0*
  - 5.4: Adding Time to the Design of Naturalistic Studies - *CC BY-NC 4.0*
  - 5.5: Use of Time Series Designs for Casual Inference - *CC BY-NC 4.0*
  - 5.6: Getting Rid of Developmental Differences and Changes - *CC BY-NC 4.0*
- 6: Proximal Processes and Sequential Observations - *CC BY-NC 4.0*
  - 6.1: Proximal Processes and Sequential Observations - *CC BY-NC 4.0*
  - 6.2: What are the important conceptual points about proximal processes? - *CC BY-NC 4.0*
  - 6.3: How are naturalistic observations connected to our meta-theories? - *CC BY-NC 4.0*
  - 6.4: What are the most common types of observational methods? - *CC BY-NC 4.0*
  - 6.5: Sequential Observations - *CC BY-NC 4.0*
  - 6.6: Design Decisions with Sequential Observations - *CC BY-NC 4.0*
- 7: Individual Time Series- Trajectories and Episodes - *CC BY-NC 4.0*
  - 7.1: Individual Time Series- Trajectories and Episodes - *CC BY-NC 4.0*
  - 7.2: What are some strategies for collecting and analyzing our bread-and-butter, that is, dense time-ordered data? - *CC BY-NC 4.0*
  - 7.3: What are intra-individual time series studies? - *CC BY-NC 4.0*
  - 7.4: What are “inter-individual questions"? - *CC BY-NC 4.0*
  - 7.5: In what way do relational meta-theories converge on that assumption? - *CC BY-NC 4.0*
  - 7.6: Do correlations also differ depending on whether they are inter-individual and intraindividual? - *CC BY-NC 4.0*
  - 7.7: Strategies for Charting Individual Trajectories Over Developmental Transitions - *CC BY-NC 4.0*
  - 7.8: Strategies for Charting Individual Proximal Processes - *CC BY-NC 4.0*
  - 7.9: Is there a take-home message from time series designs? - *CC BY-NC 4.0*
- 8: Person-centered Analysis- Configurations, Lifespaces, and Life-paths - *CC BY-NC 4.0*
  - 8.1: Person-centered Analysis- Configurations, Lifespaces, and Life-paths - *CC BY-NC 4.0*
  - 8.2: Okay—so what are “variable-centered” analyses? - *CC BY-NC 4.0*
  - 8.3: Can you give an example of a variable-centered approach? - *CC BY-NC 4.0*
  - 8.4: Are person-centered methodologists operating from a set of larger principles? - *CC BY-NC 4.0*
  - 8.5: Person- and Pattern-Centered Methods- Cluster Analyses - *CC BY-NC 4.0*
  - 8.6: Pattern- and Person-Centered Approaches To Development - *CC BY-NC 4.0*
  - 8.7: Lifeplace Analysis - *CC BY-NC 4.0*
  - 8.8: Lifespan Analysis - *CC BY-NC 4.0*
- 9: Development of Contexts - *CC BY-NC 4.0*
  - 9.1: Optimization of Development - *CC BY-NC 4.0*
  - 9.2: Don't we already have the idea of “changing contexts” incorporated into our meta-models? - *CC BY-NC 4.0*
  - 9.3: Models of Contexts That Are Indifferent to Change - *CC BY-NC 4.0*
  - 9.4: Models of Context Development - *CC BY-NC 4.0*
- 10: Developing Brains - Experience and Neuroplasticity - *CC BY-NC 4.0*
  - 10.1: Introduction - *CC BY-NC 4.0*
  - 10.2: Okay, but haven’t we already incorporated the brain as the “bio” in our “bio-psycho-sociocultural” people? - *CC BY-NC 4.0*
  - 10.3: What does “plasticity” mean when applied to the brain? - *CC BY-NC 4.0*
  - 10.4: Neural Architecture - *CC BY-NC 4.0*
  - 10.5: Experience Expectant Development - *CC BY-NC 4.0*
  - 10.6: Experience Dependent Development - *CC BY-NC 4.0*
  - 10.7: Development, Neuroplasticity, and Interventions - *CC BY-NC 4.0*
- 11: Developing Individuals- Transformation and Branching Cascades - *CC BY-NC 4.0*
  - 11.1: Introduction - *CC BY-NC 4.0*
  - 11.2: Agency and Individual Transformation - *CC BY-NC 4.0*

- 11.3: Developmental Cascades - *CC BY-NC 4.0*
- 12: Goals of Developmental Science - *CC BY-NC 4.0*
  - 12.1: What are the goals of developmental science? - *CC BY-NC 4.0*
  - 12.2: Description of Human Development- What does it mean to describe human development? - *CC BY-NC 4.0*
  - 12.3: What does it mean to describe qualitative changes in development? - *CC BY-NC 4.0*
  - 12.4: How can the description of stability be part of the goals of developmental science? - *CC BY-NC 4.0*
  - 12.5: Explanation of Human Development- How is the explanation of development different from its description? - *CC BY-NC 4.0*
  - 12.6: Why do developmentalists need to explain stability? - *CC BY-NC 4.0*
  - 12.7: What is meant by explanations of differential patterns of stability and change? - *CC BY-NC 4.0*
  - 12.8: Optimization of Human Development- How does optimization of human development differ from explanation? - *CC BY-NC 4.0*
  - 12.9: Conclusion- How do these three goals of developmental science fit together? - *CC BY-NC 4.0*
  - 12.10: References - *CC BY-NC 4.0*
- 13: Converging Operations and Multiple Lines of Sight - *CC BY-NC 4.0*
  - 13.1: Converging Operations - *CC BY-NC 4.0*
- 14: Understanding a Theory - *CC BY-NC 4.0*
  - 14.1: What are the steps to “understanding a theory”? - *CC BY-NC 4.0*
  - 14.2: Why does understanding start with articulating the “theoretical question”? - *CC BY-NC 4.0*
  - 14.3: What is meant by “theoretical context”? - *CC BY-NC 4.0*
  - 14.4: What are the key constructs of the theory and their definitions? - *CC BY-NC 4.0*
  - 14.5: What is the target phenomenon and what is its developmental trajectory? - *CC BY-NC 4.0*
  - 14.6: What are the parts of “explanation”? - *CC BY-NC 4.0*
  - 14.7: What are the parts of a theory that focus on optimization? - *CC BY-NC 4.0*
  - 14.8: What happens next-- “beyond understanding”? - *CC BY-NC 4.0*
  - 14.9: Is it really necessary to draw theories? - *CC BY-NC 4.0*
- 15: Contrasting Theories- Attachment - *CC BY-NC 4.0*
  - 15.1: What is Ainsworth’s conceptual question and theoretical context? - *CC BY-NC 4.0*
  - 15.2: What are Ainsworth’s key constructs and target phenomenon? - *CC BY-NC 4.0*
  - 15.3: What are the antecedents, consequences, and mechanisms in Ainsworth’s theory? - *CC BY-NC 4.0*
  - 15.4: What are the optimization implications of Ainsworth’s theory of attachment? - *CC BY-NC 4.0*
  - 15.5: What are the meta-theoretical assumptions of Ainsworth’s theory of attachment? - *CC BY-NC 4.0*
  - 15.6: Why do we need to learn about Gerwitz’s theory of attachment? - *CC BY-NC 4.0*
  - 15.7: How do we draw Gewirtz’s theory of attachment? - *CC BY-NC 4.0*
  - 15.8: Why are the theories of Bowlby, Gewirtz, and Ainsworth so very different? - *CC BY-NC 4.0*
- 16: Contrasting Theories- Motivation and Learning - *CC BY-NC 4.0*
  - 16.1: Motivation - *CC BY-NC 4.0*
  - 16.2: Learning - *CC BY-NC 4.0*
  - 16.3: Section 3- - *CC BY-NC 4.0*
  - 16.4: Section 4- - *CC BY-NC 4.0*
  - 16.5: Section 5- - *CC BY-NC 4.0*
  - 16.6: Section 6- - *CC BY-NC 4.0*
- 17: Assumptions About Humans and their Development - *CC BY-NC 4.0*
  - 17.1: Metaphors and Meta-theories in Human Development - *CC BY-NC 4.0*
  - 17.2: What did Reese and Overton think was going on? - *CC BY-NC 4.0*
  - 17.3: What is a meta-theory? - *CC BY-NC 4.0*
  - 17.4: What kinds of assumptions guide the study of human development? - *CC BY-NC 4.0*
  - 17.5: Assumptions About Description - *CC BY-NC 4.0*
  - 17.6: Assumptions About Explanation - *CC BY-NC 4.0*
- 18: Meta-theories of Human Development - *CC BY-NC 4.0*
  - 18.1: Metaphors and Meta-theories in Human Development - *CC BY-NC 4.0*
  - 18.2: What are Mechanistic meta-theories of human development? - *CC BY-NC 4.0*
  - 18.3: What are Organismic meta-theories? - *CC BY-NC 4.0*
  - 18.4: What are Contextual meta-theories? - *CC BY-NC 4.0*
  - 18.5: What are Maturational meta-theories of human development? - *CC BY-NC 4.0*

- 18.6: Which researchers have meta-theories? - *CC BY-NC 4.0*
- 18.7: Does the field of psychology have meta-theories? - *CC BY-NC 4.0*
- 18.8: What is the dominant meta-theory in the field today? - *CC BY-NC 4.0*
- 18.9: Who else has meta-theories? - *CC BY-NC 4.0*
- 18.10: Where can meta-theories be seen most clearly? - *CC BY-NC 4.0*
- 18.11: What is the meta-theory that guides our class and our book? - *CC BY-NC 4.0*
- 18.12: Do I have a meta-theory about development? - *CC BY-NC 4.0*
- 18.13: How do I get rid of my meta-theory? - *CC BY-NC 4.0*
- 18.14: What is the correct meta-theory? - *CC BY-NC 4.0*

- 19: Contrasting Meta-theories - *CC BY-NC 4.0*
  - 19.1: Comparing and Contrasting Meta-theories - *CC BY-NC 4.0*
  - 19.2: What are some key issues upon which these meta-theories differ? - *CC BY-NC 4.0*
  - 19.3: How do the two meta-theories that focus on the organism differ from each other? - *CC BY-NC 4.0*
  - 19.4: Are there other ways to compare and contrast the four meta-theories? - *CC BY-NC 4.0*
  - 19.5: What do Maturational and Mechanistic meta-theories have in common? - *CC BY-NC 4.0*
  - 19.6: What do Organismic and Contextualist meta-theories have in common? - *CC BY-NC 4.0*
  - 19.7: What is the point of these two “meta-models”? - *CC BY-NC 4.0*
  - 19.8: Where do developmental systems meta-theories fit on this meta-map? - *CC BY-NC 4.0*
  - 19.9: Developmentally Systematizing a Phenomenon - *CC BY-NC 4.0*
- 20: Lifespan Perspectives - *CC BY-NC 4.0*
  - 20.1: Lifespan Developmental Perspectives - *CC BY-NC 4.0*
  - 20.2: What was the “traditional” view of development? - *CC BY-NC 4.0*
  - 20.3: Why was the traditional view so appealing? - *CC BY-NC 4.0*
  - 20.4: What did the lifespan perspective offer as an alternative view of development? - *CC BY-NC 4.0*
  - 20.5: What are the key features of the proposition that “development is a life-long process”? - *CC BY-NC 4.0*
  - 20.6: What is the point of “multi-directionality”? - *CC BY-NC 4.0*
  - 20.7: What are the implications of the proposition that development includes both “gains and losses”? - *CC BY-NC 4.0*
  - 20.8: What is meant by the notion of “plasticity”? - *CC BY-NC 4.0*
  - 20.9: What are the implications of the proposition of “historical embeddedness”? - *CC BY-NC 4.0*
  - 20.10: What are the implications of “Contextualism as paradigm”? - *CC BY-NC 4.0*
  - 20.11: Why is the study of development a “multidisciplinary” affair? - *CC BY-NC 4.0*
  - 20.12: Did the lifespan perspective demonstrate that old age is a period of plasticity filled with gains? - *CC BY-NC 4.0*
  - 20.13: What are the most important take-home messages of lifespan developmental perspectives? - *CC BY-NC 4.0*
  - 20.14: What are the most important critiques of lifespan developmental perspectives? - *CC BY-NC 4.0*
- 21: Ecological Model - *CC BY-NC 4.0*
  - 21.1: Ecological Model- Nested Contexts - *CC BY-NC 4.0*
  - 21.2: What is an ecological perspective? - *CC BY-NC 4.0*
  - 21.3: What is a “microsystem”? - *CC BY-NC 4.0*
  - 21.4: What is a “mesosystem”? - *CC BY-NC 4.0*
  - 21.5: What is an “exosystem”? - *CC BY-NC 4.0*
  - 21.6: What is a “macrosystem”? - *CC BY-NC 4.0*
  - 21.7: Did the ecological perspective reject experimental designs and lab-based studies? - *CC BY-NC 4.0*
  - 21.8: So what? Did an ecological perspective change anything for developmentalists? - *CC BY-NC 4.0*
  - 21.9: What use were these environmental maps? - *CC BY-NC 4.0*
  - 21.10: What are the most important take-home messages of the ecological perspective? - *CC BY-NC 4.0*
  - 21.11: What are the most important critiques of the ecological perspective? - *CC BY-NC 4.0*
- 22: Bioecological Models - *CC BY-NC 4.0*
  - 22.1: Bioecological Model- Proximal Processes - *CC BY-NC 4.0*
  - 22.2: What is the reformulated ecological model? - *CC BY-NC 4.0*
  - 22.3: How can some clarity be brought to this complexity? - *CC BY-NC 4.0*

- 22.4: What are “proximal processes”? - *CC BY-NC 4.0*
- 22.5: What are some examples of proximal processes? - *CC BY-NC 4.0*
- 22.6: Is everything we do a “proximal process”? - *CC BY-NC 4.0*
- 22.7: Are all proximal processes good news for development? - *CC BY-NC 4.0*
- 22.8: Why are proximal processes so central to this reformulation? - *CC BY-NC 4.0*
- 22.9: How do proximal processes fit in with the other components of the model? - *CC BY-NC 4.0*
- 22.10: What are the person characteristics that shape proximal processes and their effects on development? - *CC BY-NC 4.0*
- 22.11: What are the characteristics of the context that shape proximal processes and their effects on development? - *CC BY-NC 4.0*
- 22.12: How do I select the PPCTs that are important to study? - *CC BY-NC 4.0*
- 22.13: Where is the target developing person located in this map? - *CC BY-NC 4.0*
- 22.14: What use are PPCT maps? - *CC BY-NC 4.0*
- 22.15: What are the most important take-home messages of the bioecological model? - *CC BY-NC 4.0*
- 22.16: What are the most important critiques of the bioecological model? - *CC BY-NC 4.0*

23: Dialectical and Transactional Perspectives - *CC BY-NC 4.0*

- 23.1: Dialectic and Transactional Perspectives - *CC BY-NC 4.0*
- 23.2: What are we talking about now? Have we left the realm of psychology and landed in philosophy? - *CC BY-NC 4.0*
- 23.3: What is a “transaction”? - *CC BY-NC 4.0*
- 23.4: What are the components of the transactional perspective? - *CC BY-NC 4.0*
- 23.5: What is the Contextual model? - *CC BY-NC 4.0*
- 23.6: What is the Regulation model? - *CC BY-NC 4.0*
- 23.7: What is the Representational model? - *CC BY-NC 4.0*
- 23.8: How do these four components fit together into a unified theory of development? - *CC BY-NC 4.0*
- 23.9: What is the process formulation of the unified theory? - *CC BY-NC 4.0*
- 23.10: Where is the representational model in the unified theory? - *CC BY-NC 4.0*
- 23.11: Any clues about what prompts development in the unified theory? - *CC BY-NC 4.0*
- 23.12: What are the important take-home messages from dialectical-transactional meta-theories? - *CC BY-NC 4.0*

24: Relational Systems Meta-theories - *CC BY-NC 4.0*

- 24.1: Relational-Developmental Systems Meta-theories - *CC BY-NC 4.0*
- 24.2: What are the key differences between “split” and “relational” worldviews? - *CC BY-NC 4.0*
- 24.3: Why is the difference between Split and Relational metatheories important? - *CC BY-NC 4.0*
- 24.4: How can everything be 100% biological, 100% psychological, 100% social, and 100% cultural? - *CC BY-NC 4.0*
- 24.5: Does this mean we are always studying “biopsychosociocultural” globs? - *CC BY-NC 4.0*
- 24.6: Where does Relationism fit on our meta-theory map? - *CC BY-NC 4.0*
- 24.7: What are the principles that allow organism and contextualism to be unified? - *CC BY-NC 4.0*
- 24.8: What does the relational meta-theory offer in terms of causal explanation? - *CC BY-NC 4.0*
- 24.9: Where do all these new terms come from? - *CC BY-NC 4.0*
- 24.10: Where did the relational meta-theory come from? - *CC BY-NC 4.0*
- 24.11: What are the take-home messages from relational meta-theories? - *CC BY-NC 4.0*

25: Nonlinear Dynamic Systems Meta-theories - *CC BY-NC 4.0*

- 25.1: Nonlinear Dynamic Systems Meta-theories - *CC BY-NC 4.0*
- 25.2: Okay, if there is no design, then what is there? - *CC BY-NC 4.0*
- 25.3: How does this happen? - *CC BY-NC 4.0*
- 25.4: What are some examples of “emergence” in psychology? - *CC BY-NC 4.0*
- 25.5: And do all NLDS approaches agree on how self-organization happens? - *CC BY-NC 4.0*
- 25.6: Why is “circular causality” so important? - *CC BY-NC 4.0*
- 25.7: If downward causality doesn't push or pull anything, how does it influence development? - *CC BY-NC 4.0*
- 25.8: Okay, then how do these four kinds of causes work together? - *CC BY-NC 4.0*
- 25.9: Why do books and papers on NLDS seem like they are written in an alien language? - *CC BY-NC 4.0*

- 25.10: What are our “take-home” messages about nonlinear dynamic systems perspectives? - *CC BY-NC 4.0*

- 26: Three Big Ideas of Developmental Systems- The Big Ideas of Levels and Proximal Processes - *CC BY-NC 4.0*
  - 26.1: The Big Ideas of Levels and Proximal Processes - *CC BY-NC 4.0*
  - 26.2: What is holding up the revolution? - *CC BY-NC 4.0*
  - 26.3: What are the essential elements of “systems” approaches? - *CC BY-NC 4.0*
  - 26.4: What are the key tools for keeping our balance? - *CC BY-NC 4.0*
  - 26.5: Big Idea #1- Levels- What is the “big idea” of levels? - *CC BY-NC 4.0*
  - 26.6: Big Idea # 2- Proximal Processes- What is the “big idea” of proximal processes? - *CC BY-NC 4.0*
- 27: Three Big Ideas of Developmental Systems- The Big Idea of Dynamics - *CC BY-NC 4.0*
  - 27.1: Big Idea # 3- Dynamics- What is the “big idea” of developmental dynamics? - *CC BY-NC 4.0*
  - 27.2: Speaking of “circular causality” -- I can see the bottom-up effects of proximal processes and the “pop” of new actions, but where is the top-down stuff? - *CC BY-NC 4.0*
  - 27.3: Is there such of a thing as higher-order organization of the context as well? - *CC BY-NC 4.0*
  - 27.4: Okay, so formal cause is a property of individuals and environments-- but what about “final cause”-- “teleology”? - *CC BY-NC 4.0*
  - 27.5: What is the difference between locally and developmentally adaptive? - *CC BY-NC 4.0*
  - 27.6: Is there any developmental directionality implied by the idea of culture? - *CC BY-NC 4.0*
  - 27.7: These final causes or teleological forces—How do they work? Didn't we decided that they do not actually pull the organism down a predetermined path? - *CC BY-NC 4.0*
  - 27.8: Is that dialectical interaction what is causing the movement? - *CC BY-NC 4.0*
  - 27.9: Are we close to understanding the “big enchilada” or qualitative shifts? - *CC BY-NC 4.0*
  - 27.10: Activity 3. The Observation Project - *CC BY-NC 4.0*
- 28: From Meta-Theories to Methods - *CC BY-NC 4.0*
  - 28.1: From Meta-Theories to Methods - *CC BY-NC 4.0*
  - 28.2: What are the meta-theoretical and theoretical issues that now seem clear to students? - *CC BY-NC 4.0*
  - 28.3: I thought that meta-theories shape theories and methods. Now you are saying that methods shape theories and meta-theories? - *CC BY-NC 4.0*
  - 28.4: So is this part of the book full of new tools and (gulp) equations? - *CC BY-NC 4.0*
  - 28.5: How does time enter into our methodological decisions and strategies? - *CC BY-NC 4.0*
  - 28.6: Activity 4- Study Sketches for a Program of Research- Makin’ a List, Checkin’ it Twice - *CC BY-NC 4.0*
- 29: Developmental Designs- Cross-section, Longitudinal, and Cross-sequential - *CC BY-NC 4.0*
  - 29.1: What are developmental designs? - *CC BY-NC 4.0*
  - 29.2: Why is it challenging to figure how people change with age? - *CC BY-NC 4.0*
  - 29.3: What is the cross-sectional design? - *CC BY-NC 4.0*
  - 29.4: What is a longitudinal design? - *CC BY-NC 4.0*
  - 29.5: Okay, I’m starting to warm up more and more to cross-sectional designs. What are their advantages? - *CC BY-NC 4.0*
  - 29.6: What is a cross-sequential design? - *CC BY-NC 4.0*
  - 29.7: What can we do about the big problem in longitudinal and cross-sequential designs-- that people drop out and that we are changing people by testing them repeatedly? - *CC BY-NC 4.0*
  - 29.8: Which are the best study designs? - *CC BY-NC 4.0*
- 30: More Developmental Designs- Time-lag and Time- and Cohort-Sequential Studies - *CC BY-NC 4.0*
  - 30.1: What is the time-lag design? - *CC BY-NC 4.0*
  - 30.2: What is a time-sequential design? - *CC BY-NC 4.0*
  - 30.3: What do you get when you put the time-lag and longitudinal design together? - *CC BY-NC 4.0*
  - 30.4: Which of the designs described in this chapter are most useful for developmentalists? - *CC BY-NC 4.0*
  - 30.5: Section 5- - *CC BY-NC 4.0*
  - 30.6: Section 6- - *CC BY-NC 4.0*
- Back Matter - *Undeclared*
  - Index - *Undeclared*
  - Glossary - *Undeclared*
  - Glossary - *Undeclared*
  - Detailed Licensing - *Undeclared*