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I. THEORY SECTION

1. Theories of Development

Freud: Psychoanalytic Theory

Overview

- Energy Model: Psychological energy → anxiety → symptoms
  - Psychic energy arise from biological energy (instincts: Eros & Thanatos)
  - Freud’s theory = “sort of economics of nervous energy”
- Levels of the Mind
  - Unconscious: Thoughts and feelings that are repressed and therefore unknown
  - Preconscious: Capable of being conscious
  - Conscious: What a person is aware of at the moment. Tip of the iceberg
- Structures of the Mind
  - “driven by the id, confined by the superego, & repulsed by reality”
  - Id: Pleasure Principle
  - Ego: Reality Principle
    - Develops id’s inability to produce the desired object
      - Becomes more dominant & differentiated over time (acquires more energy)
    - Makes tough, high-level decisions (aided by feelings of anxiety)
      - Anxiety comes from threats of id and the environment
      - Ego is able to use defense mechanism to alleviates anxiety
  - Superego
    - Composed of 2 parts:
      - Conscious (Negative): composed of parents’ prohibitions
      - Ego ideal (Positive): composed of standards toward which the child strives
- Mechanisms of Development
  - Development proceeds because of disequilibrium,
    - Children continually try to reestablish equilibrium: resistance to change
  - Sources of conflict:
    1. Maturation: new possibilities = new problems
    2. External Frustration: people or events that do not allow immediate gratification painful buildup of tension
    3. Internal Conflicts: between id, ego, & superego
    4. Personal Inadequacies: child lacks certain skills/experience/knowledge
    5. Anxiety: Occurs when child anticipates physical or psychological pain

Position On Developmental Issues

- Human Nature: Organismic, but more mechanistic than Piaget
  - Passive in that drives force them into action
  - Active in that they attempt to reach equilibrium
- Nature vs. Nurture: Interactionist!
  - emphasizes maturation & biologically based drives
  - expression of drives modified by the social milieu
    - not all environmental experiences make an equal impact
    - variations in social environment or physical constitution → personality differences
- Qualitative vs. Quantitative Change: Qualitative transformational change in stage/structure
Some quantitative change – gradual strengthening of the different structures

What Develops?
- Structures: these structures are both affective and cognitive

**Strengths & Weaknesses**

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<td>Discovery of central developmental phenomena: developmental stages, psychological structures, unconscious motivation, importance of early experience</td>
<td>Uncertain testability of central claims concerning development, Founded in retrospective/casestudy, biased by believers – lacks objectivity, experimenter error – memory distortion in records, Ambiguous terminology/vague terms, uncertain relationships between Freud’s notions and observable behavior, a particular bx can stem from several different psychological attributes, Overemphasis of childhood sexuality, little generality today, feminist issues</td>
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<td>Stimulated research in: moral development, sex typing, identification, parent-child relations, attachment, aggression, self-regulation, how emotions affect thinking in children</td>
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**Additional Issues: Promise of Psychoanalysis (Fonagy & Target, 2000)**

- The challenge of genetics: A more balanced view of genetic data has reestablished the potential for psychoanalytic accounts. Main features:
- Unconscious intentionality: Cognitive neuroscience has shown that most of the work of the brain in nonconscious
- Unconscious motivation: Assumption that human bx is motivated by multiple goals simultaneously
  - in line with contemporary connectionist: multiple independent processing units work alongside each other, in conflict or in collaboration, to generate both conscious and unconscious decisions
  - both neuropsychological and developmental models are consistent with psychoanalytic ideas and moreover highlight the desirability of adaptive resolution of these conflicts
- Close ties to interpersonal reality: therapist’s experience provides a valuable vehicle for creating understanding of thoughts, feelings, and behavior that lie beyond the normal range of conscious experience and common sense psychology
- Unique appeal
  - Generativity within the field (inspiring many empirical investigations)
  - Unique explanations of diverse overt behavior
  - Development as dynamic

**Erikson: Psychosocial Theory**

**Overview**

- Life span theory: Personality develops through adulthood
  - Conflicts are “life crises” of ego development.
  - Goal is achievement of positive identity
    - Crises result from dialectic interaction of person / society
  - There is a multidirectional process between ego development and culture: ego influences culture while the ego is influencing the culture
- Differences from Freud
  - Ego is energy or “life force,” not the ID.
Ego is influenced by culture and culture influenced by ego
Focus on normal development
As opposed to abnormal development.

Stages / Goals
Overview
- Physical maturation has personal and social repercussions.
  - Maturation brings a new skill that opens up new possibilities but also increases society’s demands.
- Psychosocial development is culturally relative in 2 ways:
  1. Although children in all cultures go through the same sequence of stages with each culture having its own idiosyncratic.
  2. There is cultural relativity within a culture as it changes over time.
- Psychosocial development proceeds according to the epigenetic principle (emergence).
- Personality becomes increasingly differentiated and hierarchically organized as it unfolds in, and is shaped by, a particular environment.

Position On Developmental Issues
- Human Nature: Similar to Freud’s but different in emphasis.
  - Erikson more optimistic view of human nature.
  - Unlike Freud, Erikson has elements of contextualist world view.
    - changing child in a changing world and a system of culturally constructed contexts devoted to socialization of children into that culture.
- Qual vs Quant:
  - Qualitative: changes are stagelike
  - Quantitative: one’s identity becomes stronger and one’s convictions solidify.
- Nature vs Nurture:
  - Like Freud, Erikson believed that nature determines sequence of stages and sets limits within which nurture operates.
  - If heredity ensures that certain crises arise, then env determines how they are resolved.
    - Erikson, emphasized role of culture in nurturing and shaping development.
- What Develops:
  - Formation of an identity that gives coherence to one’s personality.

Strengths and Weaknesses
- Contributions
  - Intuitively appealing
  - Describes central issues of life / developmental tasks.
- Criticisms
  - Difficult to test empirically
  - Processes of development vague

Overview
- Key Features
  - Life course theory provides a way to study the myriad changes that bear upon children in today's world (see Hernandez, 1993).
  - Integrates social change, life pathways, and individual development as modes of behavioral continuity and change.
  - Trajectories and Life Course
    - Life transitions are always part of social trajectories.
      - Transitions are frequently a succession of choice points (e.g. motherhood)
    - The multiple trajectories of individuals and their developmental implications are basic elements of the "life course".
All life choices are contingent on the opportunities and constraints of social structure and culture.

- Historical forces shape the social trajectories of family, education, and work, and they in turn influence behavior and particular lines of development.

Primary concepts
- Historical Time and Place: development is embedded in the life course and historical time.
  - A relational perspective towards individual <-> context.
- Linked lives
  - Lives are lived interdependently, and social and historical influences are expressed through this network of shared relationships and socialization.
- Timing in Lives
  - The developmental impact of a succession of life transitions or events is contingent on when they occur in a person's life for better or worse.
- Human agency
  - Individuals construct their own life course through the choices and actions they take within the opportunities and constraints of history and social circumstances.

Additional Issues: Life Course Theory Comparison
- Elder highlights more stringently the embodiment of development in a context and strongly emphasizes the role of agency and the active organism.
- Unlike Baltes or Heckhausen, Elder’s Life Course is not a theory but a framework by which research may operate.
- Elder’s theory provides a broad higher level of analysis in which Baltes’ or Heckhausen’s theories can be embedded within.

Baltes

Overview
- Key Features
  - View of contextualism (i.e., biocultural contextualism as co-constructivism)
  - Cumulative interactions and co-productions of contextual influences contribute (Age-graded normative, history graded normative and non-normative) too much commonality and continuity as well as the inter-individual and subgroup differences in status and to differences in the direction and level of intra-individual change over time.
  - Plasticity was defined as the range of human development that was possible under varying constellations of age-graded, history-graded, and non-normative influences multidimensional, multilevel), transactional, and dynamic nature of contextual influences on individual change.
- Structural Scripts of influences of lifespan development
  - Scripts
    - Normative age-graded (ontogenetic) influences
    - History-graded Influences
    - Non-normative (idiosyncratic) Influences
  - None of these classes of biologically and environmentally based influences operates independently from the other.
- Level 1 Biology–Culture Dynamics Script
  - Links basic principles of developmental biology to proposals about mechanisms and contexts of psychological development and aging.
    - Specifically, postulates that the incompleteness of biological ontogenesis
  - Biological plasticity and genetic fidelity decrease as individuals reach the higher ages of the life course.
  - Genetic base & culture of old age are least developed in the gene/env interplay
    - Thus, human development to extend into the higher ages, requires cultural resources
  - Paradoxically, social competency/efficacy decreases with age
- Level 2 Dynamics Of Gains And Losses: Allocation of Resources Script
Three general functions of development:
- Growth
- Maintenance, including repair and recovery; and
- Regulation of loss.

With increasing age individuals need to invest more and more of their internal and external resources into maintenance and management of loss as opposed to growth in order to assure adaptive efficacy and success.

Level 3: Metatheoretical Propositions
- Development = selective age related change in adaptive capacity
- Development is multidirectional and cannot necessarily be predicted across time
  - there is no specified end point in development (open system/multifinality)
- In addition highlights the potential for equifinality
- Development involves ontogenetic selection from a pool of constrained potentialities: some pathways are optimized, and others are foreclosed.

Level 4: Script of Adaptive Development and Aging (SOC)
- Three components:
  - selection of goals or outcomes,
  - given the scope of biocultural plasticity would permit in principle.
  - optimization of means to reach these goals,
  - processes aimed at the generation and refinement of means-ends resources and motivational-goal explication
  - and compensation through the use of substantive means.
  - 2 functional categories
    o Enlist new means as strategies to reach same goal
    o Change goals of development themselves.
  - 2 causes
    o conditioned by selection and optimization (negative transfer)
    o env-associated changes in resources and age associated changes in behavioral plasticity

Level 5: Domain Specific Theories (E.G., Self, Intelligence, Etc.)

Additional Issues
- Baltes while recognizing the fact development is contextually based is more focused on universal principles of human development that can account for optimal or positive development.
- There is little emphasizes on the types of transitions that humans go through and whether they are age related or history-graded normative.
- While those scripts are recognized, Balte’s Life-Span Theory specifically focuses on the individual processes associated with development in the form of scripts.
- Little emphasis is given to role of agency as compared to Elder’s Life Course Theory/Framework.

Watson: Radical Behaviorism

Overview
- Umbrella for many different theories, approaches
  - Hullian line: focus on drive, motivation
  - Tolman line: focus on spatial learning, cognitive maps
  - Thorndike line: focus on environmental contingencies
  - Pavlov, Watson line: focus on classical conditioning
- Shared ideas:
  - Focus on antecedent-consequent processes
  - Methodological behaviorism
  - Reciprocal determinism
Focus on prediction, control of individual behavior
- Biology may constrain or afford learning
  - but biological determinism promotes caste structure antithetical to notions of human adaptability, ability to profit from experience (ex. attachment as trait)

- **Horowitz on Watson:**
  - Advocated view of psychology as study of *observable behavior with goal of prediction and control.*
  - Influenced Hull, Skinner, positivist operationism.
  - Cognitive revolution (Piaget, Chomsky) led to rejection of behavioral theory, but not methodological behaviorism.
  - *Behavior analysis* continued to develop outside mainstream, strong in intervention.

**Skinner/Gewirtz**

**Overview**

- Organisms ability to learn from experience (Selection by Consequences; Skinner)
  - // to Darwin’s natural selection
  - Allows organism to adapt to the demands of the environment
- Focus on PROCESS over content
  - There is no universal goal or endpoint to development
  - One culture may encourage a certain type of behaviors whereas another may discourage it
  - What is universally developed is a skilled ability to learn by observing or listening to other people (or by attending to symbolic characters-in TV and in books in some societies – Bandura)
  - In traditional dev. psych. the developmental outcomes become the subject matter. For behavior analysis, the subject matter consists of the analysis of the processes that produce behavioral outcomes

**Position On Developmental Issues**

- What is Development?
  - Within a behavioral perspective, time is incidental and age is simply part of dependent variable.
  - Orderly changes in the way an organism’s behavior interacts with the organism’s characteristics and environment.
  - Thus development is behavior change over time!
- Qualitative vs. Quantitative Development
  - Quantitative change emphasized
  - Learning gradually accumulates over time
  - Shaping - the environment changes not only the frequency of behavior but also its form
  - Stages – draw attention away from individual differences and differences in the way of given child functions in different environments (Bandura)
  - Failure to learn → lack of cognitive readiness → poor learning environment
- Nature vs. Nurture
  - Children are malleable, but within limits
  - Within biological constraints, experience provides data for forming rules through models (Bandura) and instruction and help them polish the component skills needed for observational learning
  - One’s behavior can change one’s environment
  - Biology constrains learning but also makes learning possible
Overview

- Focus on learning:
  - Included traditional principles of learning (Respondent + Operant/Enactive)
  - Second, importance of observational learning (OL).
    - Learn through abstract modeling or abstracting a general rule
    - Reinforcement/punishment to child or model not necessary
    - A model causes imitative behaviors by:
      1. Teaching new behaviors
      2. Strengthening or weakening children’s inhibitions
      3. Drawing attention to particular objects
      4. Increasing emotional arousal

- Cognitive Process Underlying Modeling
  - Attention and retention processes:
    - Ability to attend selectively and past experience influence
  - Retention/Symbolic Encoding
    - Little influence unless retained for when model is no longer present.
    - Children must translate event into symbols, integrate into their cognitive organization, and rehearse cognitively
  - Production: mental selection and organization of responses to serve as a representational model with which to compare performed behavior
    - Children modify initial response by receiving feedback
  - Motivational processes: Reproduce behavior seen resulting in desirable outcomes.

  - After children acquire new behaviors by vicariously, they can combine these behaviors to form more complex behaviors
    - Children cognitively reorganize behaviors learned earlier
      - By mentally manipulating symbols
    - Also possible to learn whole complex behaviors all at once

- Bandura’s triadic reciprocal causation
  - Components
    - P = Biological, psychological characteristics of the person, and cognition
    - B = The person’s behavior
    - E = Environment (3 types: Imposed, Selected, Created)
  - Factors interact: children symbolically represent the relationships among the situation, their behavior, and the outcome (cookie example)

- Bandura versus Traditional Learning Theories
  - Bandura highlighted the cognitive factors as driving learning.
  - In addition to those underlying OL, Bandura highlighted the role our expectancies and perceptions have on our capacity to learn
    - Self-efficacy: Perception of competence in dealing with environment; affects all types of behavior (academic, social, or recreational).
  - Two implications
    - Efficacy judgments most conducive to development are slight overestimations, motivate children to try moderately challenging tasks -> increase skill
    - Children construct self-knowledge about efficacy via 4 main ways
      1. Mastery Experience: Success/failure of previous similar attempts
      2. Vicarious experience of observing others fail/succeed on similar tasks
      3. Verbal persuasion
      4. One’s physiological and affective states
  - Beginning in infancy, humans gradually develop a sense of personal agency

- Mechanism of Development
  - Development occurs because of 3 main factors
Position on developmental issues

- Human nature: “people are self-organizing, proactive, self-reflective, and self-regulating” (Bussey & Bandura, 1999, p. 691)
  - People filter experiences through current knowledge and expectations about world,
    - create own environment as their own behavior influences environment, and generate
      new behavior by reorganizing previously learned behaviors.
  - People are also active in their self-regulation: Set own standards, reinforce themselves when they
    act in accord with these standards, and use feedback to judge their success
  - SLT has elements of Contextualist worldview: emphasizes influence of social contexts on
    children. Little attention paid to historical cultural influences

- Quantitative versus Qualitative Development: Mainly Quant, very lil Qual
  - Quantitative: learning episodes gradually accumulate over time; thus, development involves a
    multitude of short term changes.
  - Qualitative: in that sometimes one acquires a new rule or adopts a new strategy of gathering info

- Nature versus Nurture: BOTH
  - Roles of biology and experience are captured in triadic reciprocal causation
  - Environment, person, and person’s behavior are interdependent forces operating in any event
  - Biology not only constrains learning but also makes learning possible

- What Develops:
  - Because what is learned depends on what environment affords, few universal behaviors are
    proposed. SLT appears to be almost content free directing their energy toward process instead
  - There is no universal goal or endpoint to development
  - What universally develops: an ability to learn by observing/listening to others

Strengths and Weaknesses

- **Strengths of SLT**
  - Focus on Situational Influences on Behavior
  - Testability (although more conceptual than traditional behavioral theories)

- **Weaknesses of SLT**
  - Inadequate Account of Cognitive Development
  - Inadequate Description in Natural Settings

Overview

- Nested Contextual structures, developing-person-in-context theory, active-child in environment
  - 5 systems interact with each other and co-develop.
    - Microsystem: pattern of activities, roles, and interpersonal relations experienced by the
      developing person in a given face-to-face setting.
    - Mesosystem: linkages and processes taking place between two of more settings containing the
      developing person. The interaction between microsystems.
    - Exosystem: encompasses the linkage and process taking place between two or more settings, at
      least one of which does not ordinarily contain the developing person. The exosystem also
includes institutions and governmental bodies that directly influence a system in which the child is present.

- Macrosystem: consists of the overarching pattern of micro-, meso-, and exosystems characteristic of a given culture, subculture, or other broader social context. This includes overarching beliefs, values, resources, hazards, life styles, and patterns of social interchange.
- Chronosystem: The co-evolution of the external systems over time

- Bronfenbrenner concentrated on social and cultural contexts, but also gave credit to biological factors although he did not explicitly explore them in his theory.
  - Different children engage in different types of contexts dependent on biological factors
- Suggested child development research is better informed when institutional policies encourage studies within natural settings and theory finds greater practical application when contextually relevant

**Vygotsky: Cultural Theory**

**Overview**

- The child is viewed as an active agent in their development, interacting with a social environment that is necessarily culture-laden
  - Smallest unit of measure is an active child in a cultural context; however broader spheres (sociohistorical, phylogenetic) are also important units of analysis.
- Culture is comprised of current beliefs, customs, and values or the society, but also physical (geography, climate, population density, roads), historical (wars, economic depressions, civil rights movements), institutional (schools), and availability of objects (computers, art). So, culture is pretty much the whole environment, past and present.
  - Culture is product of history, provider of contexts
  - Affects childrearing -> future of culture
- The child and their culture are interrelated (reciprocally determined)
  - The mind is seen as intrinsically social; experiences we have with social world affect our cognitive styles, beliefs, attitudes, and perceptions
    - The path from child to object and object to child passes through another person
  - In contrast to previous interactionist accounts of environment/organism, the sociocultural approach is the first to infuse the two together, viewing the separatist/interactionist model as artificial/distorted.
- Emphasizes how children exploit opportunities offered by the culture (cultural affordances)
  - culture offers tools optimal for functioning within that environment
- Zone of Proximal (nearby)Development (like scaffolding)
  - “learning awakens a variety of internal developmental processes that are able to operate only when the child is interacting with people in his environment and in cooperation with his peers”
  - A move competent person helps the child learn by way of prompts, modeling, explanations, questions, discussion, joint participation, etc.
- The Importance of Language
  - Vygotsky interlinked the mind and language
    - Before (enough) language develops thought, or inner speech, does not exist.
    - As language becomes more complex and abstract, so does cognition
      - Recent work on Theory of Mind, autonoetic consciousness, autobiographical episodic memory, etc has supported the importance of language and the cultural variation therein.
  - Since language is necessarily culture-laden, the extent to which cultural values is expressed in the language so too will be thought, memory, and moral development
Position On Developmental Issues

- Contextualist
- Active Organism
- Interactionist
- Systems Develop

Strengths and Weaknesses

- Does not concentrate on the biological.

Piaget: Genetic Epistemology

Overview

- Epistemology: branch of philosophy concerned with study of knowledge.
  - Piaget’s theory is termed genetic epistemology: Study of developmental changes in process of knowing and in organization of knowledge.
  - Knowledge is a process, not a state; Knowledge is a relationship b/w the active knower and the known; people construct knowledge and are active in the process of knowing and contribute to the form that knowledge takes. Active selection and interpretation of information in the env.
  - Knowledge of the world changes as the cognitive system develops.
- Biological Approach
  - Cognitive growth becomes more and more differentiated over time.
  - Organismic-dialectic model: Active organism → Evolving systemic structure.
- Structuralism:
  - Structuralists look at the organizational properties of whatever they are studying
  - Concerned with relationships b/w parts and the whole and b/w an earlier and later state.
  - Proposed that a small set of mental operations underlie a variety of thinking episodes;
    - there is an underlying structure to the apparent diversity of content.
  - Cognitive Structures = schemes & operations
- Stage approach:
  - Cognitive development proceeds through a series of stages.
  - A stage is a period of time in which the child’s thinking and behavior in a variety of situations tends to reflect a particular type of underlying mental structure.
  - Stages are sequential levels of adapting.
  - Characteristics of stages: Stages are structured that emerge from and transform a previous stage, follow an invariant and universal sequence, and proceed from an unstable to a final stable period.
- Mechanisms of development:
  - Knowledge of the world develops through a series of discrete states of equilibrium
  - Mental structures, in equilibrium, are acquired as the org interacts with physical and social objects in an organized way (structuralism).
  - Finally, the particular stages are an inevitable outcome as a result of the nature of human organization and nature of environment, thus development not random or innately organized
  - In Piaget’s theory, small steps are spurred by the functional invariants, which are the intellectual functions that operate throughout development and are biological innate tendencies/processes
    - Cognitive Organization: tendency for thought to consist of systems whose parts are integrated to form a whole. Systems are interrelationships among cognitive activities.
      - View of the world becomes more coherent and interrelated
      - Nature of cognitive organization of thought change from stage to stage.
      - As development proceeds, thought may be organized into: schemes, regulations, functions, concrete operations, or formal operations.
    - Cognitive Adaptation: interaction b/w organism and environment.
      - Organization (internal) and adaptation (external) are 2 complementary processes of a single mechanism
It is by adapting to things that thought organizes itself and it is by organizing itself that it structures things.

Adaptation involves 2 complementary processes:
- Assimilation
- Accommodation

Cognitive equilibration:
- Equilibration is grand process that puts together all elements of development.
- In Piaget’s view, every organism strives toward equilibrium with the env and equilibrium within itself (among cognitive elements).
- When assimilation and accommodation are in balanced coordination so neither one is dominant, equilibrium is achieved.
  - This balance achieved through development of organized structures that provide ways of interacting with the world.
  - A change in either the org or the env leads to a state of disequilibrium, which must be corrected. Equilibrium is dynamic rather than static.
- Equilibration integrates and regulates the 3 main factors of development: Physical maturation, experience with phys environment, and influence of the social env. All of these factors together propel child through the stages => Development

Position On Developmental Issues
  - Children are intrinsically motivated. Self-regulating organized whole striving to maintain equilibrium both within self and with env. Parts can be understood only in terms of whole.
- Qualitative VS Quantitative Development: Both
  - Qualitative changes in structures from stage to stage.
  - Quantitative changes occur as schemes, operations, or other cognitive skills become stronger, more easily activated, more efficient, and more consistent (ex, increased number of schemes or habits in repertoire).
- Nature vs Nurture: Interactionists.
  - All knowledge is a byproduct of the intertwined influences of innate and experiential factors.
- What develops:
  - structural change in schemes, regulations, functions, and various logicomathematical structure of the concrete and formal operational periods. Structural change gives meaning to and influences change in the content of thought. Change is emphasized on a molar level, which leads to change at various more molecular levels.

Strengths and Weaknesses
- Strengths:
  - Recognition of central role of cognition.
  - Discovery of surprising features of children’s thinking
  - Wide scope.
  - Ecological validity
- Criticisms
  - Lack of support for stages, in terms of concurrent changes across all content areas
  - Inadequate acct of mechanisms of development (both within a stage and from stage to stage).
  - Little attention paid to social and emotional realms of development
  - Underestimation of abilities.
  - Loose research style: used the clinical method, which involves a chainlike verbal interaction bw experimenter and child; begin by asking a question and next questions guided by answers child gave to previous one and experimenter tries to understand underlying reasoning of child’s answers. Problems with this is that examiners may be too leading in questions or not leading enough and that difft children often are asked difft questions. Also did not report descriptive stats.
Overview

- Humans are active perceivers—perception is goal-oriented (match b/w goals and info extracted from env); perception is an event.
  - Perception directed toward discovering affordances: what an env offers or provides for an organism; affordances are opps for action.
  - Person and environment have reciprocal relationship; fit together to form a whole.
    - With acquisition of new motor skills during dev, new affordances are discovered; there is a fit bw what env provides and organism’s actions, goals, and abilities.
  - Experience creates new affordances.
    - Evolutionary heritage of organism provides perceptual equipment and motivation to perceive; or learn to perceive, the particular objects, events, and spatial layouts that the child needs in that setting.
    - By exploring, affordances of objects, events, and surfaces are learned.
  - Interactionists view of perception and action: Actively extract affordances and by using them discover new affordances.
- Two senses of perceptual learning:
  - Development occurs thru learning to perceive (improvement in perception as a function of experience) – becoming more economical at perception
    - Whereas Piagetian believed that knowledge is constructed by forming schemes based on motor behaviors with objects,
      - Gibson believes complex info is inherent in stimulation.
      - As children perceive, they differentiate info.
    - Stimulation is a field of available info about affordances to be differentiated.
      - Stimulation carries many levels of info
        - Discrimination of objects by one or several distinctive features/attributes
          - At more abstract level, we can perceive a h/o structure.
        - Perceptual learning is a process of learning to perceive what has always been there.
      - Stimulation remains same throughout, what changes is info we have extracted.
  - Perceiving to learn (change in performance as a function of perceiving in a new or different way) – active & selective attention
    - Developmental trends are linked to increased motor development, locomotion, exploratory action, leading to increased specificity/differentiation of perceptual field.
    - Perception becomes more efficient with development.
      - Involves optimization of attention (activities that gather info, esp info about affordances of objects), increased economy of info pick – up.
        - More deliberate, selective attention
        - Detection of distinctive features (e.g., that can be used to discriminate b/w objects) in stimulation.
        - Extraction of invariants/contingencies (search for relations that remain constant over change) over time.
        - Perception of larger units of structure (world is structured and we gradually become aware of this structure; our perception extracts the structure).
      - Selection of appropriate level of analysis
        - Perception becomes more exact
        - Perception becomes more differentiated. As children explore objects in difft envs, they learn about impt props of objects and affordances of them.
        - Directed toward discovery of affordances.
Position On Developmental Issues

- Human Nature: Organismic like Piaget.
  - People inherently motivated who actively explore and try to extract sense from environment.
  - Organized and efficient process in which needs and goals mesh with nature of env.
  - Capacity to learn from exp and adapt to env.
  - Complex org sensitive to complex structure of env. child learns to detect this structure
    - Piaget = nature of interaction bw child and world constructs the structure.
- Qual VS Quant: Quantitative; perception gradually improves with practice. Does not progress in stages.
- Nature VS Nurture: both inseparable. Do not just interact but fit together.
  - What info children extract from env depends on evolved species-specific genetic endowment, and maturational level, immediate goals, and unique set of learning experiences. Innately equipt to find out what world is like and what it lets them do.
- What develops?
  - Agency: self in control, quality of intentionality in behavior.
  - Prospectivity: intentional, anticipatory, planful, future-oriented behaviors.
  - Search for order: children’s tendencies to see order, regularity, and pattern
  - Flexibility: as one moves from one setting to another, there is a change in activities to seek whatever affordances needed in that situation.

Strengths and Weaknesses

- Strengths:
  - focus on ecological context of perception
  - puts the body back into developmental psych
- Weaknesses:
  - unclear acct of cognition
Overview

- The nature versus nurture debate concerns the relative importance of an individual's innate qualities (nature/nativism) versus personal experiences (nurture/empiricism) in determining or causing individual differences in physical, behavioral, and psychological traits.
- Developmental research for the last many centuries has been based on the nature/nurture dichotomy (Overton, 2006). This debate goes back to centuries to before developmental psychology existed. Specifically,
  - Descartes: who postulated that ideas are innate
  - Locke: as opposed to Locke that highlighted tabula rasa

Nature/ Nativism

- An extreme view places developmental processes as solely innate
- Specifically, development is seen as the unraveling of the organism’s genes, which come to serve as the ‘blueprint’ for human development

Nurture/ Empiricism

- The definition of nurture is not clear in the developmental field.
  - Some interpret it as the physical, social and cultural environment that is outside of an individual
  - While others also include the non-genetic components within the organism as part of nurture.
- However, put broadly, the empiricist perspective postulates that developmental processes are acquired solely through interaction with the environment.
  - Extreme empiricists will (e.g. Watson), like Locke, view the infant as starting with a blank slate.

Change in the debate over time

- Original question was "Does heredity or the environment cause a behavior?"
- However, few now take on either extreme perspectives and, at the very least, believe that environment and heredity interact.
  - Thus, the question was replaced by
    - "How much of the variation in behavior across people is due to hereditary differences and how much is due to environmental differences?"
  - "How do nature and nurture interact to produce development?"
- "Which are the environmental triggers for the expression of genes, and how do these triggers have their effect on genes?"

Positions of Developmental Theorist

Piaget (Pgs 69-71)

- Piaget rejected nativists and empiricist’s views in lieu of a relational perspective
- As described by Overton (2006), Piaget provides one of the most relational accounts of human development
  - According to Piaget, all knowledge is a by-product of the intertwined influences of innate and experiential factors.
- Thought is constructed through interactions with physical and social world, through process of discovery in which the child is an active agent
  - With given active biological system and ordered environment, these interactions will result in specifiable mental organization
- Piaget’s four-factor formula for development:
  - Development = Physical Maturation + Experience with the Physical Environment + Social Experiences + Equilibration
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- Physical Maturation- How the brain, muscular system, etc. develops to create new possibilities for the cognitive system and requires certain adjustments of the system.
- Physical Environment- Piaget emphasized "logico mathematical experience"- Refers to reflecting on one's own actions on objects rather than on the objects themselves.
- Social Experiences- The effect of the culture or educational environment.
- Equilibration (Organization & Adaptation) - Ties together and controls the interaction of the innate and experiential factors. Through reestablishing equilibrium after disequilibrium, the cognitive system reaches a higher level.

Gibson (Pg. 397)

- They not only interact but fit together
- Nature and nurture are inseparable: fit between environment and the person=affordances
- Her theory of progressive differentiation depends on the interaction between innate factors that allow affordances and the environment.
  - Children are complex organism sensitive to complex structure of environment
    - Stimulation is structure and child learns to detect it
  - What information children extract from the environment depends on their evolved species-specific genetic endowment, in addition to their maturational level, immediate goals, and unique set of learning experiences.
  - Child makes use of abilities they have (biological constraints)
  - Babies are innately equipped to find out what the world is like and what it lets them do.
  - Their growing control over their bodies and their awareness of their bodies in space is a big part of the story of perceptual learning and development.

Skinner (Pgs. 230-231)

- Created Operant Conditioning and highlights experience as driving development
- Learning occurs through interactions with the environment through reinforcement, punishment, and extinction of behaviors.
- The environment changes not only the frequency of behavior, but also its form through shaping.
- Development involves the accumulation of operantly and classically conditioned responses. Learning changes behavior, and thereby causes development.
  - limited emphasis on the influence of innate factors
  - However, states that some biological predispositions modify the laws of learning. Some kinds of learning are easier for some species than for others. (Ex. Species specific behaviors)

Vygotsky (Pgs. 193-194)

- Sees nature and nurture as intertwined
  - "Biological and cultural forces "coincide and mingle with one another... The two lines of change interpenetrate one another and essentially form a single line of sociobiological formation of the child's personality" –Vygotsky (1960)
- For socioculturalists, the question is not "how much" culture affects development... the question is "By what process do biology and culture co-construct development?"
  - Although socioculturalists acknowledge the importance of biology, they choose to concentrate on environmental forces- particularly cultural ones.
    - The activities of others, such as communication, formal and informal instruction, and the use of technical and psychological tools, engage children in collaborative activities.

Contemporary Perspectives

Evolutionary Psychology

- Views individual ontogeny as the process by which genotypic specification is translated or expressed into a given phenotype
  - Proponents of a interactionism, viewing genes as having biologically preprogramed behaviors by which the environment serves as a trigger mechanism
The genotype and environment operate together to produce changes in children over their lifetimes.

Genotypes can be expressed differently in different environments, and the environment selects for or against genetic mutations that occur.

- Each species, including humans, has a set of innate behaviors specific to that species. These behaviors have evolved phylogenetically because they have increased that species' chances of surviving in its particular environment.
- Experience has more of an impact if it occurs during a relevant (genetically determined) sensitive period.

Gottlieb/ Lickliter Systems Approach (Lickliter & Honeycutt, 2003)

- Reject genetic determinism of evolutionary psychology as well as their instructionist explanations of human behavior and clarify that a developmental system is self-organizing.
- Genetics, embryology, and developmental biology have combined to provide a new appreciation of the magnitude of the gap between genetic activity and phenotypic outcomes. Genes cannot be characterized as occupying a privileged position in the development of an organism.
  - Genes are not the sole source of developmental information transmission across generations.
  - Genes can activate/remain inactive due to non-genetic internal and external factors
    - Example of animals changing sex due to environmental factors
  - Proposes individuals inherit in reproduction is a developmental system, a complex of coacting influences, some internal and some external to the individual organism.
- Development of an individual organism results from the bidirectional and dynamic transaction of genes, cells, tissues, organs, and organisms during the course of individual ontogeny.
- Key Terms
  - Proximate causes: those acting during the life of the organism
  - Ultimate causes: those acting before the organism was conceived
  - Phylogeny Fallacy:
    - Phylogeny and ontogeny are alternative processes by which information is made available to the developing individual and
    - Specification for an organism’s phenotype can exist independently and in advance of its real-time developmental processes
- Within this perspective, development and evolution can effectively be viewed as two sides/same coin.
  - Traits or phylogeny must be generated in individual ontogeny
    - Changes in development that are responsible for generating novel phenotypes, must then pass through the filter of natural selection which acts on phenotypes (not genotype)
  - Development guides and constrains evolution in at least two major ways:
    - Constrains phenotypic variation
    - Provides variants in traits/characters that may lead to enduring alterations
    - As opposed to natural selection operating on random mutations and genetic drift.
- Developmental dynamics approach abandons the proximate–ultimate distinction in favor of an explicit concern with the epigenetic processes of development within and between generations.

Utility of the Debate

- Majority now agree on an interactionist viewpoint
  - However those that a interactionist perspective as highlighted by the evolutionary approach still adhere to a split-meta theory defined by dualism (Overton, 2006)
    - This perspective reflect the additive operation of two separate sources of information: one that is internal, formative, and relatively fixed (genetic) and one that is external, supportive, and relatively variable (environmental).
    - And it does so in a decidedly one sided way, genes determine form and nature of phenotypic characteristics, and nongenetic factors simply activate or trigger them
- Are we any closer?
  - Closer in that it is no longer seen as solely a one sided dichotomous relationship
  - Instead, questions have changes from nature vs. nurture to how much, why, and when
The future of development though must move towards a more relational perspective, where nature and nurture as seen as two ends on a relational matrix.

Dynamic Systems Theory: a step in the right direction towards a relational perspective
  - Understanding that the process of development requires studies at all levels of organization and the interactions between them
3. Multiple Levels of Analysis and Systems Theory

Developmental Systems Theory (DST)

Overview

- DST is a theoretical framework that provides an alternative to the very pervasive tendency to think about behavior in dichotomous terms (Nature vs. Nurture, Qualitative vs. Quantitative, etc).
- DST integrates not only the multi-linear reality of development,
  - but also the bi-directional relationships among developmental influences and outcomes.
- Crucially, it also embraces the fact that all the factors that play a role in determining developmental outcomes are largely inseparable from each other.
- Developmental Systems Theory does not, by any means, provide all the answers
  - What it does do is provide a far improved framework for understanding the development of the physical and mental traits of individuals.

Six Themes of DST

The following list of themes is a modification of that provided by Oyama, Griffiths, and Gray (2001):

1. **Behavior is jointly determined by multiple causes:**
   - Behavior cannot be attributed separately to individual developmental causes (such as genes or experience).
   - Every pattern of behavior has multiple determinants or developmental resources and the task of analysis is to specify the ways in which those determinants act together in particular cases.

2. **Genetic influences are not privileged in development:**
   - Although this theme can logically be subsumed under the first,
     - it is worth identifying separately (because of people like Pinker)

3. **Development is context sensitive:**
   - The way in which one developmental factor affects development depends on the current state of the developing system and on the presence of other developmental factors.
     - A single factor may affect via multiple mediated, moderated, mediated-moderated, and moderated-mediated pathways

4. **Organisms inherit resources for development, not traits or specifications of traits:**
   - Inheritance involves not just a set of genes but a variety of other developmental resources
   - These resources support the construction of the behavioral phenotype, which is neither inherited nor specified by inherited programs or instructions.

5. **The developing system extends beyond the skin of the organism:**
   - All behavior itself, involves interactions between the organism and its environment, including a social environment made up of conspecifics.
   - Those interactions are themselves part of the developing system and also serve as resources supporting developmental change.

6. **Evolution involves change over time in entire developmental systems:**
   - Because DST rejects the idea that genes alone specify any aspects of behavior, it also has been critical of the idea that behavioral evolution can be explained in genetic terms alone.
   - While DST does not deny that change in the genetics of populations is one important source of behavioral evolution, it also postulates additional, non-genetic sources of evolutionary change

A DST Perspective on Developmental Change (Lerner, 2000)

- From a DST framework, change is a necessary, inevitable feature across levels of analysis
  - Developmental change has two basic characteristics – it is systematic and successive.
    - Systematic change rather than random, chaotic, disorganized or dispersive change.
    - Successive change when change that occurs at a later point in time is influenced by change that occurs earlier in time.
The concept of development implies systematic and successive change in the hierarchy, structure, or organization of the ordered subsystems that make up a specific developmental system.

- More specifically, change lies in the relations that exist among the multiple levels of organization that constitute the substance of human
  - These levels range from the inner biological level, through the individual or psychological level and the proximal social relational level
  - to the sociocultural level
  - and the natural and designed physical ecologies of human development

- These levels are structurally and functionally integrated, thus requiring a systems view of the levels involved in human development
  - The change component of these units derives from the ideas that all of the biological, psychological, and social and physical ecological levels of organization involved in human development are embedded in history,
  - that no level of organization functions as a consequence of its own isolated activity

- The concept of developmental change has been extended and refined to include the concept of developmental change as progressive change, or systematic, successive change over time in the organization of an organism that serves an adaptive function

- Structural organizational change emerges as the result of adaptive developmental regulation through the dynamic process of individuals acting on their contexts and contexts acting upon individuals (Gestsdottir & Lerner, 2007).
  - The individual’s contributions to developmental regulation are referred to as self-regulation, which can be either organismic or intentional.
    - Unlike organismic self-regulations that are primarily physiological,
    - intentional self-regulation refers specifically to goal-directed actions that can be actively selected and controlled by the person to transform situations
      - “contextualized actions that are actively aimed toward harmonizing demand and resources in the context with personal goals to attain better functioning and to enhance self-development” (Gestsdottir & Lerner, 2008, p. 204).
  - Contextual contributions to developmental regulation of the person ↔ context relationship may also be intentionally directed.
    - An intervention process is a specific type of person ↔ context (structural-interactive) exchange intended to have an effect on a specific outcome process.

- During adolescence, newly emergent cognitive and communicative capacities transform the individual’s contributions to developmental regulation,
  - in part because their emergence also brings the challenge (and responsibility) of forming an integrated and coherent sense of identity (Kurtines et al., 2008).
  - A child’s self-regulations are primarily observed in terms of attention and inhibition,
    - whereas an adolescent’s self-regulations involve increased intentions to promote his or her own development in a way that is consistent with his or her identity.
  - More developmentally advanced intentional self-regulations involved in the development of individuals as active producers of, or contributors to, their own development
    - and in doing so, the formation of an increasingly integrated—and therefore an increasingly complex, coherent, and cohesive—sense of identity.

Stability vs Change & Continuity vs. Discontinuity

- Dynamic system emphasizes a preferred state (stability) – a state in which the system tends to reside.
  - Although behaviors can vary, the organism tends toward a preferred form.
- In large time frames, even stages such as Piaget’s can be considered preferred states with periods of instability between them.
  - These preferred states are still changeable (softly assembled).
- Stability permits continuity but not discontinuity.
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Quals Revision Sheet 1

Change

- Change
  - Degree to which early characteristics vary through life.
- Really stable states are resistant to change (not going to stop walking completely—something really severe can happen; going up a very steep hill—walking no longer useful so have to walk on all fours).
  - However, fluctuations or change inevitable—fluctuations are the evidence is that system is dynamic.
- Nonlinearity is a threshold effect—small change in a controlled parameter at a critical value presents a qualitative shift.

Stability and Change in the Developmental Perspective

- The total person-env system of operating factors, in the individual and in the env, changes across time.
- Stability and change can be:
  - Inter-individual: rank order stability/change, group membership stability/change.
  - Intra-individual: ipsative stability/change, changes configurationally within the self.
- In addition
  - You can have change in some areas and stability in others, or you can even have stability in function of a set of behaviors but a qualitative change in those behaviors from T1 to T2.
- In ecological systems theory, development is a function of forces emanating from multiple settings and from the relation among these settings.
  - Individuals and environments change and interact as totalities.
  - Mental changes do not take place in isolation
  - Developmental process dependent on contextual characteristics
- Transition into new states during the life-time takes place in a balance b/w
  - a) built-in resistance to change in the subsystems and the total system of the individual, once they have been established
  - and b) sensitivity to the individual and environmental factors that press for change.
- A certain class of complex dynamic systems, characterizing individuals, has inherent constraints in terms of states that cannot occur.
- Recognition of such states is of importance for understanding functional systems and may be more important than finding typical developmental sequences.
  - What cannot occur sets boundaries to what can occur.
- Extent to which individual development is affected by env factors varies for diff elements.
- Changes during the life span of an individual characterized by lawful

Amplification of Minimal Effects

- Long term effects (similar to the “butterfly effect” in chaos theory) that may result from marginal deviations in the individual’s behavior or appearance, as judged against what is regarded as normal. (see page 705 for an example). A small change also causes changes throughout system. Moreover, quant change can lead to qual change as a skill gradually changes until it passes a critical threshold and then seems to emerge as a qual diff’t skill.

Continuity

- Can involve stability and change: Extent development involves gradual cumulative change
  - Homotypic continuity:
    - stability and continuity in both behavior and function same behavior at T1 and T2 with the same function
  - Heterotypic continuity:
    - change, (no continuity/stability) in behavior, behavior X at T1 and behavior Y at T2, but same developmental function (stability in functions, not in behavior)
- Continuities occur b/c kids carry with them results of earlier learning and earlier structural and functional change. Doesn’t mean that a person’s characteristics at one age will predict degree or type of change over a later time period,
o does mean that a person’s characteristic is likely to predict later levels of functioning, b/c they will incorporate earlier levels

**Discontinuity**
- Extent development involves distinct stages/emergent properties.
  - Typically people think of continuity as gradual shifts over time and discontinuity as qualitative change/stages/emergent properties.
- If you have sudden qualitative (form) change in a behavior—then that behavior is DISCONTINUOUS and not stable. You can only have quantitative (frequency) change and continuity in behavior.
  - Qualitative change is discontinuity; could have continuous change and discont. Change.

**How can these concepts be demonstrated?**

X is behavior 1; Y is behavior 2. S = person (lines represent rank order interindividual stability)

I. I is CONTINUITY in behavior at time 1 and at time 2 AND rank order stability at time 1 and at time 2. No changes have occurred in continuity or stability.

II. II is CONTINUITY in behavior at time 1 and at time 2 with rank order stability change from time 1 to time 2. This could represent a QUANTITATIVE change in behavior from time 1 to time 2, which caused a change in rank order stability, but the behavior is continuous in its existence over time.

III. III is DISCONTINUITY in behavior from time 1 to time 2 but with rank order stability. If you are stable on an attribute like extroversion, When you are 7 at time 1 you could be inviting other kids to play, and when you are 15 at time 2 could be involved in extra-curricular activities; your behaviors are developmentally related to your point in life so they naturally change, but the stability of these types of behaviors in relation to others remains the same.

IV. IV is no continuity or stability so behavior is changing and rank order is changing and this happens for some kids, there is a qualitative change in behavior and a quantitative relative to others. (this is like different trajectories).

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**Figure 1**—Dimensional continuity and individual stability combinations.
X and Y represent dimensions; Ss are individuals.

III (discontinuity/stability) is what Rutter would call heterotypic continuity (I think). EX: Let’s say a child is an antisocial conduct disorder kid. When that child is 7 he maybe burns animals, but when he is 15 he is breaking and entering. The behavior changed from time 1 to time 2, but the rank order stability (in relation to others) of these behaviors remains the same.
Definition of continuity and change

- Rank order stability (differential consistency; or continuity and stability): refers to the level of Ordering consistency maintained by a population over time.
- Mean level change: refers to changes in the quantity of some attribute demonstrated by a group over time. For example, longitudinal studies have shown adolescents typically should more behavioral constraint over time. Here they are taking about changes in average group functioning.
- Individual level change: refers to the magnitude of increase or decrease exhibited by an individual over the course of time on any given trait. A pop. could have no mean level change but robust individual change. Subgroups of individuals are changing. There can also be individual level change even when there is substantial differential consistency at the population level.
- Ipsative change: denotes changed in the configuration of variables for a given individual over time: PERSON CENTERED CHANGE, differential organization. Relative only to the individual being assessed, not the sample; reflect how much the organization changes rather than how much any given trait changes.

What methodological and analytic strategies commonly have been employed to do so?

- Rank order stability (differential consistency): test-retest correlation and then rankings. Coeff excellent broad based indicators of continuity of dispositions over time. What they cannot tell us is the extent to which individuals grow and mature with time. Also chi-square...
- Mean level change: Do they increase or decrease over time? Can use t-tests, ANOVAs.
- Individual level change: Often gauged through the use of individual difference scores or residuals.
- Ipsative change: Uses correlations also, higher correlation the more stable a person is said to be over time. Also, cluster analysis.

Evaluation of Dynamic Systems Theory (DST)

Role of DST in Human Development

- Given that DST aims to be a comprehensive approach to studying human development,
  - it can be used to explore any developmental research question.
- It is precisely this inclusiveness of many aspects of development and levels of analysis that separates systems theory from other theories.
- However, this admittedly makes it difficult to conduct research from this perspective.
- Psychology towards becoming more interdisciplinary makes research using a systems approach more viable than ever before.
- The DST principle of context being crucial to development can address this limitation by widening the scope of what is currently labeled “environment,” and examining the effects of, and interactions involving, a number of systems - biological, cognitive, psychological, and social.

Strengths of DST

- The value of dynamic systems is that it provides theoretical principles for conceptualizing, operationalizing, and formalizing these complex interrelations of time, substance, and process.
  - It is a metatheory in the sense that it may be (and has been) applied to different species, ages, domains, and grains of analysis.
- Another strength of a dynamic approach is its great generality and thus its potential application across many domains and levels of analysis.
- The major contribution of a dynamic approach to development is the potential to bring theoretical coherence to a field that has been beset by dialectics!

Weaknesses of DST

- That dynamics is a framework and a language rather than a specific theory of the development of something --both a strength and a weakness.
A dynamic approach does little of the real work. It suggests a way of thinking, a strategy for collecting developmental data, and, some analysis and modeling techniques.

- DST provides an account that incorporates the dynamic interaction of all factors, and thus forms an appreciation of the actual complexity of development.
- At the same time, it is a matter of fact that it is very difficult to get a grip on complex interactions, so the optimal approach would be one in which the representation of the full complexity of the systems is linked to attempts to reduce that complexity separating highly relevant information from arguably less relevant information – something that DST does not necessarily do.
Defining Development

- Before a relational metatheory can be applied to developmental science the concept of ‘development’ itself needs to be examined and revised.
- In the simplest terms, development is all about the change.
  - In developmental psychology, the focus of change though becomes on observable behaviors, and thus development psychology is ‘the study of change in observable behaviors’.
    - This definition is vague and conceptually ambiguous.
    - It does not define what observable behavior is, nor what is the nature of change (Overton, 2006)

Types of Behavior

  - Expressive action reflects some fundamental organization or system.
    - Process whereby we come “to have the world we have,”
  - Instrumental action is behavior that serves as a means to attaining some outcome;
    - Instrumental-communicative is the process whereby “we order the things in that world”
- Neither the expressive-constitutive nor the instrumental-communicative are given to direct observation, both are drawn and refined from commonsense understandings, and each are legitimate focus of inquiry.
- However, the prevailing split-metatheory has led theories to take a “nothing-but” solution.
  - Any theory that advocates an exclusively instrumental perspective,
    - explicitly denies/ marginalizes the status of mental structures/organization, or biological systems
  - While any theory that advocates an exclusively expressive perspective,
    - offer biological and/or mental systems as both necessary and sufficient
- From a relational metatheory though, expressive and instrumental behaviors are co-equal and complementary processes that function with the relational matrix.
  - Expressive and the instrumental are accepted, not as dichotomous competing alternatives, but as different perspectives on the same whole, separable only as analytic points of view.

The Nature of Change – Transformative (Qualitative) versus Variational (Quantitative)

- With regards to the nature of change, two types of changes have been highlighted:
  - Transformational change is change in the form, organization, or structure of any system
    - Relatively enduring, irreversible, nonlinear/discontinuous, & results in the emergence of novelty
  - Variational change refers to the degree/extent that change varies from a standard, norm, or average.
    - Linear, and completely additive in nature.
- At any given level of analysis, there are quantitative and qualitative variants of change.
  - When change is considered both in terms of life forms and physical systems,
    - Transformational change is identified with what has been called the “arrow of time,”
    - and variational change is identified with the notion of the “cycles of time” (Overton, 1994).
- In the past, theories have taken two solutions that fall under the same split-metatheoretical perspective.
  - In the first they have privileged variational change while marginalizing transformational change by claiming that it is mere description (e.g. Skinner & Bandura).
  - On the other end, some theories have placed transformational change as the bedrock reality and marginalized the significance of variation (at times seen as nothing more than irrelevant white noise).
- A third solution exists built on a relational metatheory sees both transformational and variational as coequal
  - Transformational systems producing variation and variation transforming the system.
When these two dimensions are combined in a relational matrix, a complete and unambiguous definition of development can be created.
- While the expressive-constitutive and the instrumental-communicative articulate what changes,
- the transformational-variational dimensions described the nature of the change taking place.

Put together,
- Development refers to formal (transformational) and functional (variational) changes in the expressive-constitutive and instrumental-communicative features of behaviors.

Via this broad definition,
- The study of development extends beyond psychology to other disciplines including sociology, anthropology, history, philosophy, biology, neurobiology, etc.
- Under this broad definition of development classical developmental controversies built upon antinomies evaporate with each conceptual pair becoming co-equal/inseparable complementarities.
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5. Meta-Theory

What is a Metatheory?

- While theories seek to describe, explain, and organize observations into meaningful ways, metatheories transcend the theories by defining the contexts in which theories are constructed.
- **Definition**
  - Metatheory: set of rules that describes & prescribes what is acceptable & unacceptable as theory.
  - Metamethod: set of rules that describes & prescribes what is acceptable & unacceptable means of scientific observation.
- When metatheory and metamethod are closely related, a model or a paradigm is established.
  - It is these models that serve to function as worldviews or coherent sets of epistemological (i.e., issues of knowing) and ontological (i.e., issues of reality) principles.
- Overton (2006) sought to bring forth and outline two metatheoretical perspectives that have prevailed in the field of developmental science, a split and relational metatheories.
- The split-metatheory has been the pervasive world view in the field of developmental science and psychology as a whole.
- In reaction to a split metatheory, Overton (2006) introduces a relational world view that views the paints the world as active, ever-changing, and dynamic.
  - A relational metatheory goes beyond these false antinomies and stresses self-organization and an overall synthesis of wholes.

**Split Metatheory**

**Overview**
- A split metatheory highlights is based around key philosophical assumptions:
  - Splitting: as a concept was first discussed by Descartes in his efforts to separate the whole into its component parts that are mutually exclusive ‘pure forms’.
    - By doing so, the framework for understanding became one ruled by an either/or postulate or the law of exclusivity (a ≠ not a).
  - Foundationalism: postulates that there exists a rock bottom
  - Atomism: This rock bottom is composed of ‘pure forms’ which preserve their form independently and regardless of context.
- As a whole, these three philosophical assumptions make up the principles of decomposition or reductionism.
  - All antinomies emerge from a split metatheoretical.
- Even theories that emphasizes the ‘interaction’ between dichotomies often make the assumption that both are pure entities & function independently or in competitive ways.
- This assumption thus transforms the conversation not an either-or debate
  - but instead a battle over the relative merits of each other’s essential contribution (i.e. Pinker)

**Overton’s Issues with the Split Perspective**
- This approach elevates one concept of the pair to a privileged position, builds a research program on this concept, and then strives to demonstrate observationally that the non-privileged concept can be denied or marginalized.
- This standard approach to the antinomies has never been successful because it ultimately represents merely an attempt to suppress one concept.
  - and one research program’s suppressed concept becomes another program’s privileged base.
Overview

- A Relational metatheory is the combination of Pepper’s (1942) contextualistic and organisimic worldviews.
  - A relational metatheory takes the “middle kingdom” position where entities and ideas are represented not as pure forms, but as forms that flow across ‘fuzzy boundaries’.
- Within this framework,
  - A relational metatheories heals splits by transforming all antinomies into co-equal, in-dissociable complementarities.
  - In doing so, a relational metatheory rejects also rejects atomism and replaces it with holism as a fundamental guiding principle.
- Under holism, the whole is not an aggregate of discrete elements, but an organized and self-organizing system of parts, each part being defined by its relations to other parts and to the whole.
- Thus, a relational framework moves towards examining the relations among parts and the relation of the parts to wholes through three related principles: (a) the identity of opposites, (b) the opposites of identity, and (c) the synthesis of wholes.

Identities of Opposites

- Identity of opposites is the means by which a relational metatheory is capable of ‘healing’ false dichotomies.
- Within the identities of opposites,
  - The identity among fundamental parts of a whole are not seen exclusive contradictions but differentiated polarities that are co-equal, unified, and indissociable.
  - Each category contains and is its opposite (A = not A);
  - Each pole is defines and is defined by its opposite (Escher Hands)

Opposites of Identity

- While the identity of opposites dissolves all splits, it also eliminates the previous base for inquiry provided by split metatheory.
- As such, a relational metatheory examines the moment of analysis by which the figures are dominated by exclusivity, and the lack of contradiction is reasserted
  - The acknowledgment that there is a right hand and there is a left hand, and thus A ≠ not a
- In doing so, the unique identities that differentiate each from the other can be examined as standpoints, points of view, or lines of sight, in recognition that they do not reflect absolute foundations.

Synthesis of a Whole

- While this allows for the development of a relatively stable standpoint for empirical inquiry, both identity of opposites and opposites of identity omit the relation of parts to the whole.
- The relational solution is to discover a novel system that will coordinate the two conflicting systems.
  - A third invisible hand drawing and being drawn by the two hands
- A third standpoint that coordinates and resolves the tension between the other two members of the relation (e.g. person standpoint in biology/culture; biology standpoint in person/culture; etc).
- The relational framework promotes a truly multidisciplinary, multimethod approach to inquiry in which each individual approach is valued not as a potentially privileged vantage point, but as a necessary line of sight on the whole.

History

Overview

- One emerges from the Newtonian-Humean split epistemological-ontological tradition.
  - reason enters only as an analytic heuristic; a tool for overcoming conflicts by generating ever more pristine observations, free from interpretation
- The second route emerges from the Leibnizian-Hegelian relational tradition.
Those who follow this route are directed toward a relational dialectical path on which interpretation and observation interpenetrate and form an identity of opposites. On this path, interpretation and observation, become co-equal complementary partners in conflict resolution.

**Split**

- **Galileo and Descartes 17th c** originated narrative (subject-object) and were rationalists (knowledge gained by reason)
  - Descartes most influential with his splitting with privileging Real as foundation
    - interactionism and reductionism followed
- **Enlightenment 18th c**
  - Locke, Hume, Berkeley reason split from observation, all knowledge reduced to the senses
  - Kant: relational view in some regards, but preserved split between real object and representation of object and provided ground for nativist views (Chomsky)
- **Marx**: fan of Hegel, but placed material world in privileged position, maintaining split; social and bio constructivism
- **Pragmatism**: Dewey—largely split
  - Positivism and Instrumental-Conventionalism which reduced sci from reason and observation to reason alone, theory a heuristic device only

**Relational**

- **Plato and Aristotle** were relational, though not always viewed that way
  - no radical split between ontology and epistemology
  - focus was ‘knowing’
  - relational view of inactivity-fixity
  - Aristotle: relational understanding of being and becoming
- **Leibniz**: 18th c refused split of being/becoming
  - analysis is not suppressed, not privileged
  - rationale that knowing precedes from point of view
  - activity change and organization as fundamental as stability fixity and uniformity
- **Hegel**: the dialectic—a process through which concepts or features of a system differential move towards integration
  - replaced Kant’s metaphor of mind as a filing cabinet with metaphor of organic growth
  - known and knowing in dialectic relation, mismatch leads to change
  - conceptual base for phenomenological constructivism
- **Gadamer and Taylor**
  - Hermeunetic Circle—transformational change; unity of parts; understanding moves from preunderstanding to understanding in circular motion
  - based on Hegel
  - action expressive-constitutive and instrumental-communicative
  - centrality of embodiment
- **Hanson** wrote blueprint for today’s relational theory in 1958

**How to Rectify Split View in Theory**

**Use Relational Metatheory**

- **Hanson’s (1958) blueprint for theory**
  - no absolute demarcation between interpretation and observation, theory and facts or data
  - scientific explanation consists of the discovery of patterns,
    - as well as discovery of causes
  - the logic of science is neither a split-off deductive logic,
    - but rather a logic of science is abductive in nature
- **Understand development in inclusive way** (relational’s def of dev)
  - no forced dichotomies
Use relational methodology

- Identity of opposites: int/obs
- Look at validity like Escher’s hands
  - Construct validity (interpretive meaning)
  - Content validity (denotive validity)
- Hanson (again)
  - All data is theory-laden
    - complementary analysis and synthesis, inquiry moves in circular motion
  - causality and action patterns
    - establish justifiable coordination of two modes of explanation
  - Abduction-trancendental argument
    - Hermeneutic circle: moving phenomenological level to explain in ever-widening circle
    - Abduction operates by arranging observation under consideration and all background ideas as two Escher hands
  - again, no forced dichotomies

Social and Philosophical Values in Science

Gould
- Blatant example of values guiding (pseudo)science.
- Both recapitulation and neoteny theories used to support racist views, even though theories are opposed to each other.

Shields & Bhatia
- Part of special issue reflecting on Darwin’s contributions to psychology.
- Similar to Gould – Darwin’s theory used inappropriately to support widely accepted views of racial, gender, and cultural inferiority.
- Further note Darwin’s own attempts to reconcile his theory on human origins with these accepted views (i.e. common origin with differences based on environmental-experiential factors).

Overton
- Overton borrows heavily from the philosophical assumptions of seventeenth century dualism to highlight the influence of philosophical concepts on current day psychology.
  - He shows how philosophical concepts have shaped psychological theories and the methods used to prove/disprove them.
    - Overton highlights the paradox in how even the split off between psychology and philosophy is primarily determined by philosophical assumptions.
- Through the understanding of metatheory and metamethods in the context of their historical origins, we can see how philosophy underlies current research theories and methods.
  - Metatheoretical assumptions about ‘what is right’ will influence the theoretical construct at different levels.
  - For example, Overton (2006) argued that the philosophical assumption that grounds scientific research embraces empiricism over all things philosophical.
    - As a result, empiricism is deemed a more privileged position and philosophical domain is marginalized.
    - Consequently, the latter becomes discouraged in future research.

Ways to Address the Role of Value and Philosophy
- Relational metatheory is a sound approach to ensure that antinomies are looked at as co-equal and thus used as different points of view to the same whole.
- Research conducted and repeated during different time frames have acted as a self-regulatory process in ensuring that values and biases stay out of the scientific process.
  - Since societal values change over time, the research in time frame B will address the values of time frame A.
• With researchers of the less represented cultures now being involved, there is a more balanced view taking into account the data/research coming in from different parts of the world.
• A regular comparison of literature of different cultures and the historical context in which they were born can help ensure a better understanding of the message that was meant to be conveyed by the authors of that time.
• The parallel development of literature of other related fields like anthropology, sociology, philosophy, etc could also go a long way in addressing this issue.
6. Equifinality and Multifinality

Overview

- Derived from general systems theory (Cicchetti & Rogosch, 1996).
- highlight the important diversity in development within a sample
- help investigators understand diverse outcomes by emphasizing the unique developmental trajectories of each individual, or groups of individuals
- bring to light the dynamic interactions that exist in development
- help explain why some subgroups are more amenable to treatment than others, or why some individuals have outcomes of psychopathology, while others, having similar experiences, do not
- suggest that investigations examining psychopathology should occur within a broad framework
  - psychopathology conditions and adaptive outcomes should be considered potential results of a common risk condition and specific forms of psychopathology may develop in different individuals through alternate processes (Cicchetti & Rogosch, 2002)

Equifinality

- In any open system, a diversity of pathways including chance events or non-linear epigenesis may lead to the same outcome.
- The same end state may be reached from a variety of different initial conditions and through different processes.
  - Multiple origins. Common outcome.
- This principle has been evoked to explain why a variety of developmental pathways lead to a given outcome.

Multifinality

- Any one component may function differently depending on the organization of the system in which it operates
- The effect on functioning of any one component’s value may vary
- The actual effects are dependent upon the values of additional components to which a factor is structurally linked.
- One event may not lead to the same outcome in every individual.
- People may begin on same pathways and as a function of their subsequent choices exhibit very different patterns of adaptation / maladaptation.
  - Ongoing dynamic interaction of risk & protective variables

7. Universalism versus Contextualism

Overview

Universalism

- Focus on universal laws of behavior and development
- Universal stages, mechanisms of development
- Historical and cultural context are irrelevant
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**Contextualism**
- Dev is embedded in contexts
- Socio-historical factors are important
- Behavior can be different in different contexts
- Children’s patterns of dev can differ between cultures

**Theorists**

- **Universalist**
  - Piaget
    - Proposed universal stages and mechanisms of development (functional invariants, cognitive organization, equilibration)
  - Baltes
    - Context can be noise
    - Context can distract you from what you are studying
  - Freud
    - Stage theory
    - Mechanisms of development
    - Unconscious motivation

- **Contextualist**
  - Elder
    - Social structure ‘constitutive force in dev’
    - Cannot consider context noise
    - Life transitions, historical events alter dev trajectory
      - May involve emergence of novel adaptations
    - Need to study dev longitudinally in context of change in ecologies
    - Life course embedded in historical events and culture
  - Vygotsky
    - person develops within ‘social matrix’
    - unit of study is child-in-activity-in-context
    - system-levels of context where change in one affects others
    - Social interaction and cultural tools shape child’s cognition
  - Bronfenbrenner
    - Bioecological model
    - Process and person and context and time
    - Systems

**Bridging the Gap**

**Universal or Context-Dependent Preferable?**

- Place for both types of theories
  - Need theories with different levels of analysis, with different viewpoints
- Baltes’ point about context as noise: cannot get too wrapped up in looking at context that forget to look at development
  - Impossible to parse out all contexts->why sociocultural research is so hard and why a lot of the research
  - Bronfenbrenner suggested years ago still has not been conducted
- Has to be some universals,
  - but other aspects of dev may be very context-dep

**Is there a viable solution?**

- Most theories do not fit into one category or the other:
  - Have aspects of both (stage theory but also envir influence)
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- Piaget: dev equation includes environmental influence; three factors (phys maturation, experience with physical world, social experience, and equilibration) and show what is universal about cognitive development and lesser extent social environment -> four major stages same all cultures
  - Variation across cultures lies in rate go through stages, not in stages themselves
- Erikson: universal stages, but crises are because of conflict between individual and society
- Recognition of when appropriate to include context (easier said than done)
- Relational metatheory
  - Does not have to be an either or
  - Co-equal, indissociable complementaries
II. METHOD

1. Six Casual Pathways

1. Direct causal relationship
   - Given variable (x) is direct cause of another variable (y)

2. Spurious relationship
   - Variable (x) and variable (y) are related but only because of a common cause, variable (z).
   - No causal relationship between (x) and (y)
   - (x) and (y) are correlated but no causation.
   - EXAMPLE:
     - higher shoe size (x) – higher your language ability (y) but age (z) is the common cause

3. Bidirectional/reciprocal causal relationship
   - Given variable (x) has causal influence on variable (y) which in turn has causal impact on (x).
   - EXAMPLE:
     - good relationship with your parents (x) probably use fewer drugs (y); use drugs (x) probably have bad relationship with your parents (y)

4. Unanalyzed relationship
   - Given variable (x) and variable (y) are related but the source of the relationship is unspecified.
   - No causality but correlation; not interested in correlation
   - EXAMPLE: salary (x) and quality of research facility (y) directly influences job satisfaction—these variables are correlated but we are not interested in this relationship, we want to find what factors influence faculty job satisfaction.

5. Mediation Causal Relationship

Definition
   - Mediation can be defined as, “the generative mechanism through which the focal independent variable is able to influence the dependent variable of interest,” (Baron & Kenny, 1986).
   - Always has 3 variables: distal variable (x), mediator (z), and outcome variable (y)
     - Variable (x) influences another variable (y) but only through its a third variable (z)
   - Mediation Regression Equation
     - $Y = i2 + c'X + bZ + e2$
     - $Z = i3 + aX + e3$
     - where, x=Independent Variable, Y = Dependent Variable, Z = Mediator, c' is the direct effect of X on Y after adjusting for M. and the product of a and b is the mediated effect and reflects how much a 1 unit change in X affects Y indirectly through M
   - Example
     - Relationship between number of pubs (x) and job satisfaction (y) is mediated by salary (z).
   - Types of Mediation
     - Full mediation=the only way (x) influences (y) is through (z)
     - Partial mediation= (x) influences (y) in two ways
       - Direct Effect: (x) influences (y) directly
Indirect Effect: (x) influences (y) through (z)

Statistical Techniques Used to Test Mediation

- Baron And Kenny Method (1986)
  - Steps
    1. Test whether the IV directly affects DV (X → Y; path c).
    2. Test whether IV affects M (X → M; path a)
    3. The Mediator must affect the DV when X is controlled for (M → Y; path b)
    4. The Direct effect (c') must become non-significant (total mediation)
      - Partial mediation can be declared if c’ is less than c
  - Criticisms
    - It has been suggested that the Baron and Kenny method is Logically Flawed and Low Powered.
    - Specifically, cannot actually confirm that a variable is a mediator, only disconfirm that a variable is a mediator) and then only if statistical power is adequate).
    - In addition, suppressor effects can lead a researcher to fail to continue pass step 1
      - Relation between X and Y increases when a third variable is adjusted for
      - Thus effect between X and Y may be nonsignificant unless z is controlled for

- Sobel Test
  - Steps
    1. Run the full model
    2. Divide the ab effect by its Standard Error
      - Equation: √(a²S_b² + b²S_a²+S_a²)+S²
    3. Compare to the Critical Value from Standard Normal Distribution for a given α level.
      - If significant, then mediating effect is different from 0
  - Evaluation
    - Sobel test makes the assumption that the Sampling Distribution of the product between a and b is normal.
    - This assumption is often times violated
    - In order to compensate, bootstrapping can be used

6. Moderated Causal Relationship

Definition

- “A moderator is a qualitative or quantitative variable that affects the strength and or direction of the relation between an independent or predictor variable and a dependent or criterion variable.” (Baron & Kenny, 1986).
  - Additionally, the term interaction effect has been used in lieu.

Equation

- Y = i_1 + aX + bM + cMX + e_1
- where Y is the DV, X is the DV, M is the moderator, and MX is the product term

Example

- Eeffects of maternal anxiety (x) on child anxiety (y) which may vary as a function of gender (z)
  - strength of relationship depends on the child’s gender

Statistical Techniques Used to Test Moderation

- Product Term
  - Traditional method used for examining moderation
  - A product term is created between the IV and the moderator.
    - The DV is then regressed on to the product term, the IV, and the moderator.
    - If the product term has a significant effect, then the relationship between the IV and the DV varies as a function of the moderator.
The path coefficient for the IV represents an x unit increase in the DV for every one unit increase in the IV when the moderator is equal to zero
- the path coefficient for the moderator is the same, but when the IV = zero
  - When the moderator is categorical, the analysis can be considered to be examining mean differences.
  - In this case, the slope of x and y changes as a function of Z. A

- Multi-Group Approach
  - When the moderators are categorical in nature, moderation can be examined within a Structural Equation Modeling (SEM) framework through the multi-group approach.
  - In this instance, separate covariance matrixes are created for each level of the moderator and the specified model is evaluated.
  - The constrained model can then be compared to an unconstrained model.
    - If the unconstrained model provides statistically better fit, then there is moderation.
    - Each path can be constrained and unconstrained to evaluate which paths are moderated.
  - Through this approach moderation of specific relationships can be examined without the need of creating product terms.

- Alternative Methods
  - Graphing
    - Comparing levels of the focal independent variable and the outcome variable over different groups. If the slopes of the groups is different (not parallel), there is said to be an interaction.
  - Analysis of Variance (ANOVA)
    - Although widely used, the omnibus F-test used in the ANOVA prior to pair-wise interaction contrasts is less than ideal.

**Moderation and Mediation in Developmental Science**

- Sources of Developmental Outcome
  - Mediation and moderation are used to investigate sources of developmental processes
  - Allows for more precise and pervasive investigation into the sources of variability in inter-individual change.
  - May help answer questions regarding who the effect and through what mechanisms

- Holistic and Comprehensive
  - Gives a more Holistic and Comprehensive profile of developmental processes

- Equifinality /Multifinality
  - Mediators and moderators help explain how individuals experiencing the same developmental processes and exposed to the same conditions can have vastly different outcomes.

- Amenability to Treatment
  - Can help to determine both who and under what conditions an intervention is effective.

- Efficiency, Efficacy, and Effectiveness;
  - In order to gain Efficiency, Efficacy and Effectiveness, it is necessary to know When, Where, How and for Whom Intervention will be effective.
Central Limit Theorem

- Researchers never have access to the full population, and thus must take a sample, however, by chance, samples will vary from the population.
- If an infinite number of samples were taken from the population, and their means were plotted we could see the variability in samples that emerge as a result of chance.
  - The Sampling Distribution would be the plotted histogram of sample means and would resemble a symmetrical distribution.
  - The Sampling Mean would be the mean of this distribution or the average mean observed across the drawn samples, and it would be equal to the population mean.

Central Limit Theorem

- While this is not feasible, statisticians have found that for large enough samples (n>30) the sampling distribution has specific characteristics:
  - Normally distributed
  - Sampling Mean is equal to the Population Mean
  - And the Standard Deviation of the Sampling Distribution is equal to the sample S.D. divided by the square root of the n, or the standard error.
- For samples where the n is less than 30, the sampling distribution takes on a t-distribution.

Null-Hypothesis and Significance Testing (NHST)

- All significance testing is based on this principle of Central Limit Theorem.
- Specifically,
  - NHST takes on the assumption that the null hypothesis is true (thus population mean or mean difference is equal to zero).
  - Given this assumption, the sampling distribution, if the sample is large enough, would have predictable characteristics.
  - NHST evaluates what is the probability of obtaining a sample with observed effect (mean or mean difference) given this sampling distribution.
    - An extreme score on either side would represent a statistically unlikely event.

P-Values

- The p-value tells us the probability of taking a sample from the population where the null hypothesis is true with the results we observed.

Interpreting NHST

- Non-Significant Results
  - A non-significant effect does NOT mean that the null-hypothesis is true.
    - An inherit truth of the Central Limit Theorem is two random samples drawn from the population will nearly always be different.
- Significant Results
  - A statistically significant effect does NOT mean the null-hypothesis is false either.
    - A statistically significant finding should be interpreted in context, it represents a highly unlikely scenario (drawing a sample with observed value) given the null-hypothesis is true.
  - However unlikely, it is still possible.

95% Confidence Intervals

- While point estimates give you one value (sample mean) the 95% CI give you a range of values used to estimate a parameter.
- The 95% C.I. specifically provides a range where by,
Effect Size

- While NHST will inform you as to whether an effect is statistically significant (likely or not likely assuming null),
  - It does not inform you as to whether that effect is meaningful.
- Given a high enough sample size, even the slightest difference would be statistically significant.
  - Thus it is critical to also evaluate the size of the effect and the relative importance.

Alternative to NHST

- Equivalency Testing
  - Equivalence testing DOESN’T assume that the difference between treatment/groups is 0.
  - Instead, equivalence testing seeks to show that two treatments are the same, and places an acceptable range by which we can conclude two groups are equivalent
    - Range should be determined a priori by the research to have some practical purpose.

Type I & Type II Error

Type I error

- False-positive- reject Ho but there’s no association
  - Conclude a relationship exists when in fact is does not
- Probability of committing a Type I error = α (level of statistical significance)
- Research, being conservative, is generally more focused on not committing a Type I error

Type II error

- False-negative- fail to reject Ho and there is an association
  - Conclude there is no relationship when in fact there is
- Probability of committing a Type II error = β

Trade-Off

- Lowering the amount of acceptable error reduces the chance of type I error but increases the type II error

Power

Overview

- Power is the ability of a given study or statistical test to detect a relationship that exists in the population.
  - The likelihood or probability of not committing a Type II error (failing to reject the null hypothesis when it is false).
- Power is related to:
  - Type II/Type I Error through the specified alpha level
  - Sample size: Greater the sample size, lower the standard error, easier to reject Ho
  - Actual effect sizes: Greater the effect size, the easier it is to reject Ho
  - Reliability and Validity of Measure: better measure, lower variability/S.D., thus lower Std. Error, easier to reject Ho
- Using the above information, the power of a given study to detect a finding can be calculated, or a priori power analysis can be conducted in order to determine what ample sample size
Methods to Increase Power

1. Increase Sample Size
2. Increase Measure Reliability or use Latent Variables to model the construct and control for error variance.
3. Increase the strength of treatment, when ethical and possible
4. Increases the probability of detecting a difference and ensures reliable deliverance, reception and observance of the treatment.
5. Use a within-subjects design
6. Controls for variability due to subject differences
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3. Reliability and Validity

## Reliability

### Overview
- The ability of a measure to produce similar results when repeated measurement are made under identical conditions

### Types of reliability
- **Test-Retest Reliability**
  - A test is administered twice on two separate sittings with a relatively long interval of time inbetween
  - Subjective to practice effects
    - Participants may respond same way as last time as they recall how they answered before
  - The time interval may leave the participants open to a whole host of experiential and developmental effects that may change the participant.
    - Best when used on theoretically stable attributes
- **Parallel-Forms or Alternative Form Reliability**
  - Same as test-retest, but an alternative form is used instead.
  - Alternative form theoretically contains items that are equivalent, and thus are able to avoid the issue of practice or recall effects
    - Only feasible if forms are truly equivalent...
  - Still subjected to the issue of individual change in between test and retest.
- **Split-half Reliability**
  - Two tests forms are created to be equivalent, intermingled (e.g. odds = test 1, evens = test 2) and then administered in one sitting.
  - Avoids the issue of change across time affecting the reliability coefficient
  - However, same problem as in alternative form, the form HAS to be equivalent...
- **Inter-Rater Reliability**
- **Internal Consistency**
  - A measure of reliability based on the correlations between different items on the same test/sub-scale
    - Whether several items that propose to measure the same general construct produce similar scores.
  - Conducted in one sitting and does not require alternative forms
    - However, because internal consistency examines the consistency of the items, it is said to be a property of the scores of a measure rather than the measure itself
    - Thus it is sample dependent and cannot be generalized

## Validity

### Overview
- Refers to the approximate truth of an inference
  - Thus validity is a property of inferences NOT of designs or methods for the same design may contribute to more or less valid inferences under different circumstances

### Internal Validity
- **Definition**
  - Refers to degree of covariation between IV and DV resulting from a CAUSAL RELATIONSHIP
  - Whether the independent variable really impacts the dependent variable
- **Establishing Casualty**
  - Show A precedes B
  - A has to covary with B
There is no other plausible explanation for the relationship.

- **Threats to Internal Validity**
  - **Ambiguous Temporal Precedence**
    - Lack of clarity about which variable occurred first makes it hard to determine causality
    - A huge problem in correlation designs
      - In addition, some relationships are bidirectional
  - **Selection Bias**
    - Refers to the possibility that the systematic difference in participants over conditions, and not the changes in the IV, may be responsible for the changes observed in the DV.
    - **Random Assignment**
      - Ensures the assumption of the Distribution of Errors, which is necessary for parametric statistics.
      - Problematic in quasi-experimental designs
  - **History Effect**
    - Refers to the events that occur simultaneously with the implementation of treatment that may be responsible for changes in the Dependent Variable.
      - Regardless of the implementation of treatment/manipulation
    - Can act on the individual or cohort level.
    - Can be resolved by
      - Isolating respondents from outside events or choosing DV rarely affected
      - By selecting individuals from same general area at same time
  - **Maturation Effect**
    - Naturally occurring changes over time could be confused with a treatment effect.
      - Developmental studies / long-term studies have to take these into account a lot.
  - **Regression (to the Mean)**
    - Problem in quasi experiment that select participants for their extreme scores,
      - Often have less extreme scores on other variables
        - simply by statistical probability
      - Can be confused with a treatment effect.
    - To reduce randomly sample from the sample from extreme scores
  - **Attrition**
    - Loss of respondents to treatment or to measurement can produce artifactual effects if that loss is systematically correlated with conditions.
    - Can be thought of as a problem of selection bias - people select out
  - **Testing**
    - Exposure to a test can affect scores on subsequent exposures to that test, a
      - In other words, practice effect can have an influence
    - Can be reduced by
      - using having many practice trials at start until they get mastery and then start trial or alternatively,
      - use equivalent measurement forms
      - create a Cond by Assess (Pre-Test Only vs. Pre/Post-Test) to examine differences
  - **Change in instrumentation over time**
    - Testing refers to change in participant, instrumentation to change in the study design

### External Validity

- **Definition**
  - Refers to the validity of inferences concerning whether the causal relationships is maintained over variations in settings, people, measurement and treatment variables.
    - How well can the findings be generalize to settings and persons not directly tested.
  - **External Validity can focus on different types of generalizations**
    - **Narrow to Broad: Sample to Population**
    - **Broad to Narrow: From Sample to sub-samples or a specific single person**
At a Similar Level: From one sample to a similar sample at about same level of aggregation.

In addition, External Validity can be split into subtypes

- Population Validity
  - How well the sample used can be extrapolated to a population as a whole.
  - Random selection is used to ensure that the sample is representative of the population and can be used to generalize to the population.
  - Looks at whether the study can be generalized to other situations.

- Ecological Validity
  - Looks at the testing environment and determines how much it influences behavior
    - The artificial nature of the testing environment leads to confounds when trying to generalize across settings into “real world” environments.
  - To increase ecological validity, the research setting must approximate the real-life situation under investigation.

Threats to External Validity

- Interaction of Causal Relationships with Units
  - An effect found within certain kinds of units might not hold if other kinds of units had been studied.
    - Moderation at the level of the participant (i.e. Gender, Ethnicity)
  - Multiple units in order to observe whether or not changes in the DV are due to manipulations of the IV or the Units

- Interaction of Casual Relationship Over Treatment Variation
  - Does the size/direction of a causal relationship vary over different treatment variations
    - Moderation at the level of the treatment (i.e. dosage effect, treatment duration, etc.)
  - The same treatment /manipulation of the independent variable should be applied in multiple settings

- Interaction of Causal Relationships with Outcomes
  - Can a causal relationship with one type of outcome be generalized to another type of outcome
    - Example: an intervention that has a positive effect on one outcome, no effect on related outcome, and a negative effect on a third.
  - Multiple, theoretically related outcomes should be evaluated

- Interaction of Causal Relationships with Settings
  - Treatment effect is found to occur in one type of setting and may not occur in others
  - The same treatment /manipulation of the independent variable should be applied in multiple settings

- Context-Dependent Mediation or Moderated Mediation

Statistical Conclusion Validity

- Definition
  - Concerned with two related statistical inferences that affect casual inferences
    - Does presumed cause and effect covary
    - How strongly do they covary
  - In other words, the validity of inferences about the relationship between treatment and outcome.

- Threats to Statistical Conclusion Validity
  - Power
    - Low power
    - Increase sample size, use more reliable measures
  - Violated Assumptions
    - Violations of assumptions
    - Randomly sample, test normality.
  - Fishing and Error Rate Problem
    - Repeated tests for significant relationships, if uncorrected for the number of test, can inflate statistical significance
Example: Post hoc tests on a ANOVA
- Apply a Bonferroni Correction where the error rate for a set of tests is divided by the number of tests
  - Unreliability of Measures
    - Measurement error weakness the relationship between 2 variables and can strengthen or weaken the relationships among 3+
    - Latent variable with multiple indicators to take care of measurement error
  - Restriction of Range
    - Reduced range on a variable affects relationship
    - Flooring & Ceiling Effects
      - Avoid dichotomous or trichotmies, use continuous whenever possible.
      - Analyze treatment in terms of dosage as opposed to intervention vs. control
  - Unreliability of Treatment Implementation
    - If treatment is not implemented equally in a standardized manner
  - Extraneous Variance in the Experimental Setting
    - Features or confounds of the experimental setting (e.g. distractions, faulty heating, etc)

Construct Validity
- Definition
  - The degree to which an Operational Definition accurately corresponds to the construct it is intended to measure.
  - Measuring what you are actually measuring.
  - Defining the construct and then deciding on a way of measuring it.
- Types of Construct Validity
  - Face Validity
  - Content Validity
  - Criterion-Related Validity
    - Convergent Validity
    - Divergent Validity
    - Predictive Validity
- Threats to Construct Validity
  - Inadequate Explication of Constructs
    - Maybe as a result of
      - Using a construct at too general a level
      - Too specific a level
      - Using the wrong construct
      - Using only one construct when really two (or more may be more appropriate)
  - Mono-Operation Bias
    - Refers to the use of a single operationalization for the construct of interest, which may both measure extraneous constructs or underrepresent the target construct.
  - Mono-Method Bias
    - Refers to the use of a single method of operationalization (e.g. self-report)
  - Treatment Sensitive Factorial Structure
    - Structure of a measure may change as a result of treatment
  - Reactive Self-Report Changes
    - Self-reports can be affected by participants motivation to be in treatment or social desirability effects
  - Reactivity to the Experiment Situation
    - How individuals might react in a given experimental situation (e.g. a participant unmasking a confederate)
  - Experimenter Expectations
  - Compensatory Equalization
If there are any differences between goods and services provided for those not receiving treatment
  o Compensatory Rivalry
    ▪ Participants may be motivated to show they can do as well as those receiving treatment
  o Resentful Demoralization
    ▪ Participants not receiving treatment may be so resentful or demoralized they respond more negatively.

Tradeoffs and Priorities
- There is no research design to rule them all.
  - A research study is much like a dynamic system, by addressing one threat to validity you may spur new threats to other types of validity
    - Multiple measurement in order to improve construct validity may lead to participant fatigue and non-random drop out.
- Internal and External
  - Cronbach (1982) found a priority on internal validity as trivial, past-tense, and local, as opposed to external validity which was highlighted as progress and general
- The key is to be knowledgeable of the threats and attempt to place priority to key types of validity that are essential for the study in question.
  - Important to remember that “knowledge growth is more cumulative than episodic” Shadish, Cook, Campbell 2002
- Design choice has multiple consequences for validity, not always ones we anticipate
4. Person versus Variable Centered

**Person-Centered (Descriptive)**

- **Assumptions**
  - Preserves Individuality
    - Focuses attention on whole person and on specific dimensions of behavior/adversity
    - Seeks to group people based on similarities and differences (data-driven clusters)
  - Regards the person as an active and relatively unique cluster of hierarchically organized person-environment interactions
  - An individual cannot be broken down into smaller pieces but must be studied holistically
- **Goals**
  - Preserve & describe the individual with all characteristics and complexity
  - Groups individuals with similar patterns/trajectories in order to explain broader developmental phenomenon
  - Categorization of differences of heterogeneity found in the population will reveal how variables are related to each other
- **Analytic Techniques**
  - Individual is primary unit of analysis
  - A subsystem is defined and studied incorporating as many theoretically-meaningful interacting components as methodologically and practically possible (casts a wide net).
  - Creates qualitatively different groups; analysis between variables within and between these groups is the primary objective
  - Cluster Analysis
  - Profile Analysis
  - Latent Class Analysis
  - Growth Curve Modeling
- **Related References**
  - Bergman & Trost, 2006
  - Hair et al., 2009

**Variable-centered (Predictive)**

- **Assumptions**
  - Concentrates on the casual relationships between variables.
  - Assumes homogeneous population that responds identically in predictor-outcome chains
  - Little to no variability in how individuals respond to levels of a particular variable
  - Individual has a passive role, individual is just the aggregate of variables over time
- **Goals**
  - Ascertain causal relationships in all members of a group or population
  - Singular focus on how levels of one particular variable contribute to a particular outcome
  - Concentrates on predicting change in A from a change in B
- **Benefits**
  - Has more statistical power
  - Employ specific, more sensitive measures of a particular construct and can discriminate better linkages between independent variable and dependent variable in terms of cause and effect (Masten et al, 2004)
- **Analytic Techniques**
  - Universally applicable predictor-outcome models
  - Correlation & regression
  - SEM allows for analysis of more complex causal chains, but still assumes homogeneity
Healing the Split

- Person-oriented and variable-oriented approaches to the study of development represent polar opposite but necessarily complimentary scientific dispositions.
  - However, from a relational perspective, this is simply another false dichotomy which modern statistics have emerged that are able to take on both perspectives
  - As described in Laursen and Hoff (2006), variable-centered analysis is similar to a pair of binoculars, looking at the big picture of developmental processes across the population, whereas person-centered is akin to a magnifying glass, examining the fine differences between individuals.

- Variable centered (SEM/regression) can be used in conjunction with longitudinal methodology to establish a causal link from a particular resources factors to positive outcome

- Moderation analyses using interactions terms (SEM/regression) could be conducted in order to see if other potentially relevant variables moderate the relationship between resource/risk factors and outcome

- Person centered approaches can provide us with information that variable centered approaches cannot relating to group differences/group membership
  - Respondents can be grouped in meaningful categories based on more than one variable and then compared via ANOVA
5. Multi-Level Modelling

Overview

- Multilevel models or hierachical linear model are able to examine multiple models that are nested within each other, creating hypothesized relationships at each level
- Each level contains its own hypothesized relationship
  - Nested within aggregate units:
    - Hierarchical Groups: individual to cohort to school to district to state to national
      - Replaces ANCOVA
    - Repeated measures within an individual
      - Replaces MANOVA-R
    - and capable of doing both
      - an individual over time AND nested within a hierarchical group
- Thus, multilevel modeling can be applied to account for individual differences across time and between group differences simultaneously:
  - Level 1, a longitudinal multilevel model would examine the trajectory of individuals across multiple time points in well-being and compute a general slope and intercept
  - Level 2 this slope and intercept would then be regressed on other variables (e.g. gender, ethnicity, participation in intervention). Thus it becomes possible to examine change in the slope (level 1) for a unit change in the predictors at level 2.

Mechanics

- Models the intercept (starting/baseline values) and slope (rate of change)
- Produces a regression coefficient for the relationship at each specific location.

Analysis

Estimators

- Ordinary Least Squares (OLS)
  - Problems with autocorrelation with repeated measures designs
- Generalized Least Squares (GLS)
  - Relaxes assumptions of hereroscedasticity and autocorrelation
- Restricted Maximum Likelihood (REML)
  - Assumes normalcy
  - Ignores uncertainty about the estimation of fixed effects
- Full Information Maximum Likelihood (FIML)
  - REML for missing data

Model Fit

- Once a model is run, what is the best model to both fit the data and be theoretically meaningful comes into question
  - $R^2$ statistics can be used to compare models by providing a description of the amount of variance explained by the predictors of the model.
  - Model fit estimates
    - Nested: chi-square
    - Non-nested: Akaike Information Criterion, Bayesian Information Criterion
6. Research Design

Cross Sectional Designs

Overview
- Assess groups of individuals who differ in age and studied at the same point in time.
- Thus you are able to examine for differences on differences in developmental processes across age
  - Making age the IV, or alternatively, a moderator of the relationship between two variables

Advantages
- Can obtain LARGE amounts of data
- Results are obtained quickly compared and less costly in terms of time and commitment

Weakness
- Not able to examine developmental change within individual
- In addition cohort effects can play a critical role
  - Cross-sectional designs do not allow for examination of cohort effects
    - Thus, differences in age maybe an artifact of a specific cohort as opposed to a developmental trend
  - Example
    - Early cross-sectional studies found an inverse relationship between age and intelligence.
    - Given that high school is a relatively novel society requirement, not to mention the recent trend for college education, it is easy to see why there may differences in intelligence that based on the limitations of that cohorts historical time period

Longitudinal Designs

Overview
- Data collected from the same subject at different time points
  - describes a pattern of change and the magnitude and directions of a causal relationship

Designing
- 3 types of LD-retrospective, prospective and combined retro/prospec
  - Retrospective:
    - Can be invalid due to factors such as faulty memory, retrospective bias or destruction of old records;
    - Can confuse causal factors and outcomes
  - Prospective:
    - Research can choose which measures to use.
    - BUT costly, researcher ages at same time as subject, key results may be delayed

- Types of sample: general population, high-risk, case controlled samples
- Duration of studies:
  - Developmental nature of what is investigated and cost determine duration of study (longer study = high selective attrition-people stop participation).
  - Results may be delayed in long studies, so generalizability may be skewed.
- Frequency of assessment and interval between them:
  - Follow up data: expected speed of developmental changes determines frequency of FU
Strengths of longitudinal designs

- Studies processes of continuity and discontinuity, frequency and seriousness, persistence, specialization and escalation
- Convincing to explain which correlates/predictors have causal relationships.
- Predicts later outcomes from earlier factors
- Establishes developmental sequence and pathways
- Studies effects of critical periods and life events over course of development
- Studies effects of prevention and treatment
- Studies intergenerational transmission of psychopathology
- Things that can alter developmental trajectory, non-normative age-graded, social graded, non-normative factors can lead to redirected developmental trajectories.

Weaknesses of longitudinal designs

- Problems regarding reliability and validity: data collected from limited sources
  - Solution: study should collect info from multiple informants,
- Aging, period, cohort effects: confounding aging and period effects,
  - SOLUTION: multiple cohort, more costly though
- Data analysis: level of measurement, distribution of data, missing variables cause issues of data analysis as they reduce validity/reliability.
  - SOLUTION: factor, cluster analysis, developmental pathways, to analyze longitudinal data use
- Selective Attrition
  - Participants may drop out due to a systemic reason
  - Creates a nonrepresentative sample

Sequential Design

Overview

- Combines the best features of cross-sectional and longitudinal studies by selecting participants of different ages and following each of these cohorts over time.
- Illustration
  
  | 2002 – | 6-yr old | 8-yr old | 10-year old |
  | 2000 – | 8-yr old | 10-yr old | 12-year old |
  | 2008   | 2010     | 2012      |

Strengths

- Allows for the capacity to determine whether there are any cohort effects influencing our results within two time points
  - i.e. Comparing 8 yr old data from the 2000 cohort collected in 08 can be compared to 8 yr old data from the 2002 cohort collected in 2010
- Allows the capacity to examine both
  - Cross-sectional capacity to examine difference between 6 & 8 year olds in 2008, 8 & 10 in 2010, and 10 & 12 in 2012
  - Longitudinal capacity to examine consistent and change over time for the 2002 and 200 cohort
- If age trends found to be similar across both comparisons provide greater evidence for true developmental change.
- Allows for examining a large time age range in a shorter time
  - Example above for example was able to look at a six year range (from 6 to 12 year olds) within a 4 year span.
    - Saving yourself two years had this study been done in a standard longitudinal format
Can still run into many problems found in traditional longitudinal designs
  - Problems regarding reliability and validity: data collected from limited sources
  - Data analysis: level of measurement, distribution of data
  - Selective Attrition

In addition, while it may be less costly and less time consuming than a longitudinal design
  - It still requires a great deal of funding and management

A Relational Perspective to Research Design

Lerner and Overton (2008) proposed the concept of mindless methodologism when referring to researchers that allow the preference for one or another research design to dictate or constrain the questions one asks about the substance of human development.
  - Thus theory should be the basis for selecting the methods used in developmental research.

As proposed by Lerner and Schwartz, researchers should follow 3 steps
  - Develop a theoretical conception of the substantive phenomenon/process one is studying
  - Then allow THAT theoretical conception to guide methodology selection
    - ‘What design will elucidate the theoretical issues I am addressing?’
  - Finally, match the design that is selected with statistical procedures that will best exploit the data

Three Areas guiding research design
  - Study design refers to the specific longitudinal approach adopted, as well as the problematics of how time will be conceptualized and spaced.
  - Methodology refers to specific issues within the design selected, such as the measures chosen to assess the study constructs, the mode of assessment, and procedures to ensure participant retention.
  - Statistical analysis refers to the analytic methods used to summarize and interpret the data generated in the study.

Theory should be consulted first during the design phase of a study;
  - although theory must also guide analytic decisions,
  - advanced analyses cannot compensate for problems in the study design.
7. Qualitative versus Quantitative

Overview

- Mixing qualitative and quantitative research in developmental science
  - The world can be represented in both numbers (quantitative) and words (qualitative)
  - Keep in mind that there is quantitative/qualitative data AND quantitative/qualitative data analysis
    - These four can be combined in a number of ways
  - Combination of words and numbers brings us closer to the complexity of developmental change
    - Provides divergent as well as convergent data
    - Divergent data can spur further inquiry and refinement of theory rather than just disconfirming information
    - Also makes a study more believable to broader audiences because they represent the world more broadly
  - Use of quantitative/qualitative or both methods should be determined by the research question

- From a DST
  - Continuity at one level of analysis may be coupled with discontinuity at another level;
  - Quantitative continuity or discontinuity may be coupled with qualitative continuity or discontinuity within and across levels;
  - And continuity or discontinuity can exist with regard to both the processes involved in developmental change and in the features, depictions, or outcomes

A Relational Metatheory Perspective

- As highlighted by Overton at any given level of analysis, there is quantitative and qualitative change.
  - When change is considered both in terms of life forms and physical systems,
    - Transformational change is identified with what has been called the “arrow of time,”
    - And variational change is identified with the notion of the “cycles of time” (Overton, 1994).

- In the past, theories have taken two solutions that fall under the same split-metatheoretical perspective.
  - In the first they have privileged variational change while marginalizing transformational change by claiming that it is mere description (e.g. Skinner & Bandura).
  - On the other end, some theories have placed transformational change as the bedrock reality and marginalized the significance of variation (at times seen as nothing more than irrelevant white noise).

- A third solution exists built on a relational metatheory sees both transformational and variational as coequal
  - Transformational systems producing variation and variation transforming the system.

Healing the Divide

Benefits of Incorporating Qual/Quant Methodologies

- Capturing Data
  - If investigator believes that all individuals do not perceive, interpret, and understand similar life phenomenon in same way,
    - Then it becomes imperative to draw upon qualitative techs to gain understanding about cultural and individual differences in significance and meaning of behaviors and events.
  - The use of qualitative work allows for unexpected responses and expands the scope of research beyond preexisting theoretical frameworks (Briggs, 1989).
Investigators can then build upon qualitative derived data to create instruments to quantify significant aspects of dev and/or improve limitations of quantitative measures

- Estimating and understanding developmental change at multiple time scales
  - Developmental change need methods that quantify data (structured tasks, time diaries) and methods that aim to understand qualitative (observations and interviews)
  - Given a Dynamic Systems Approach
    - Development emerges through complex and dynamic interactions across multiple levels of the system that may lead in variation change or in structural-organization change.
    - In addition, variational change at one level of analysis may create transformational change at an another
      - And the reverse, transformational change at one level may lead to variational

- Examining reciprocal relationships between contextual and individual level factors
  - Mixed methods give a richer picture of reciprocity by uncovering details about the processes by which individuals select their own environments
  - Contributions of quantitative and qualitative methods are different and shed different light on causality,
  - so combining them gives the most robust, comprehensive understanding of causality
    - Quantitative: estimating the direction and magnitude of causal influence on development
    - Qualitative: uncovering mechanisms of cause and effect (process analysis)
  - In addition, qualitative can find influences, factors, etc. overlooked by only quantitative

Relational Data Analysis

- Relational Data Analysis (RDA), a multidimensional, multi-phasic framework for unifying data analytic strategies across dimensions of analysis (quantitative/qualitative, causal/structural, etc.) and phases of analyses (conceptual, theoretical, and research analyses).
  - RDA attempts to overcome the splits (Overton, 2006, Kurtines et al., 2008) by viewing quantitative variational change and qualitative transformational change as two sides of same coin
- Lerner & Overton (2008) argue that the Miami’s Youth Development Project and RDA’s approach to relational developmental science avoids “mindless methodologism”
  - Theory and methods operate in a relationally-integrated way
- The RDA Circle
  - Components
    - Conceptual Analysis: emergence of new categories or variables
    - Theoretical Analysis: theory construction to explain relationships among variables and create new hypothesis
    - Research Analysis: Hypothesis Testing
  - Facilitates switching back and forth between poles of the splits (qualitative →quantitative →qualitative; structural → causal → structural . . ., etc.) based on findings obtained at any phase of analysis (conceptual, theoretical, research) or level of analysis (theory or data).
  - Forward and/or backward movement through each of the remaining phases of the cycle allows a similar possibility of altering the direction of the circle or transforming it into a spiral. The cycle ends when
    - (a) the null findings resulting from the hypothesis tested answer the research question or questions that initiated the cycle, or
    - (b) the confirmatory findings resulting from the hypothesis tested answer the research question or questions. Alternatively,
For work with qualitative data, the RDA approach implies grounded theory
  - Emerging out of a field research tradition rather than a laboratory research tradition,
    - Grounded theory evolved in response to the need to identify, analyze, and evaluate hypotheses concerning the subjective meaning and significance of participants’ narrative
  - In this frame, grounded theory is used to construct theory from data or, if relevant theories exist, to modify these theories as new data is gathered.
- Using a relational approach, RDA
  - Extends the scope of research to include properties and categories that were not defined prior to the research being conducted (Eichas, 2010).
  - Allows for patterns of differential positive qualitative (structural organizational) change in the subjective meaning and significance of participant life course experiences
  - Provides the opportunity to identify the positive and problematic quantitative (dimensional) changes that predict, underlie, and/or accompany structural organizational change (Eichas, 2010).
III. SPECIALTY

1. Future Research in Identity Development

Identity and Dynamic Systems

Overview

- There is a burgeon need for a more dynamic perspective on identity development (Koepke & Denissen, 2012) that highlights the emergence of new structural and functional properties as the consequence of multiple interactions among various developmental processes (Gestsdottir & Lerner, 2007).
- These levels range from the biological level, through the psychological level and the social relational level, to the sociocultural and biochemical levels, as well as the built environment (Bronfenbrenner, 1977; Szapocznik & Coatsworth, 1999).

Personal Identity and Dynamic Process

- Erikson’s (1950) work was in large part abstract and not based on operationalized and empirically testable methods (Schwartz, Zamboanga, Luyckx, Meca, Ritchie, in press).
  - Towards this end, Marcia (1966) operationalizing the emergence of a sense of identity into two distinct processes – exploration and commitment.
  - Marcia went one step further and created a typology of identity by crossing both
- As a consequence, the field has focused on cross-sectional methodologies and portrayed development in a linear fashion (Forclosed -> Diffused -> Moratorium -> Achieved)
  - as opposed to the dynamic process originally proposed by Erikson (1950).
- Recently, two distinct models have emerged out of the identity literature that have expanded on Marcia’s original status paradigm to provide a more dynamic model of identity development (Schwartz, Zamboanga, Luyckx, Meca, Ritchie, in press).
  - The dual cycle model (Lucykx et al., 2006; 2008)
    - Highlights two distinct stages
      - The first stage encompasses Marcia’s traditional dimensions – exploration in breadth and commitment making.
      - The second stage expands on this model by including an exploration in depth dimension, where by previous commitments are evaluated for ‘goodness of fit’.
        - If deemed adequate, then the individual comes to identify with these commitments (identification of commitments).
        - If the individual does not, then he or she can reject these commitments and engage in a new round of exploration in breadth.
    - Thus identity work is not static and categorically tied to a typology, instead it is iterative and fluid.
  - The Three Factor Model
    - Proposed three distinct processes underlying the formation of a sense of self.
    - Postulate that adolescents begin the identity process with a basic identity (unconsolidated though) and thus already come with commitments.
    - As the identity processes begins,
      - adolescents reevaluate these commitments which launches them to an in-depth exploration
      - and an eventual commitment or rejection of past commitments.
- Despite the differences between the two models, both portray identity work as a dynamic iterative process that is ongoing and extends across multiple domains of identity.
Identity Domains and Dynamic Systems

- Identity has been conceptualized as a very broad construct.
  - Recently, Vignoles, Schwartz, and Luyckx (2010) defined four broad categories or identity domains
    - Personal Identity
    - Collective Identity
      - Ethnic
      - Gender
      - Religious
      - Etc.
    - Relational Identity
    - And Social Identity
  - While separate work has been done in each of these domains, the future of identity literature should seek to consolidate, while at the same time recognizing their individual differences.
    - Towards this end, the field should first seek to examine the generalizability of identity processes (e.g. identity model’s) across these domains and then further seek to examine identity development across each domain
      - Moreover, and consistent with a DST, future research should take both personal centered approaches to examine individual differences in the relative importance of any given domain at any given time in any giving context.
      - as well as evaluate from a variable centered approach the relationship between identity processes within each domain (Personal Commitment/Exploration, Ethnic Identity Exploration/commitment, etc) and across domains (i.e. Personal Commitment -> Ethnic Exploration)
  - Moreover, following the lead of the Dual Cycle and the Three Factor Model has been created to show the fluid motion of personal identity development.
    - The literature regarding these additional domains, has yet to develop more fluid and dynamic models.
    - For example, as stated by Broderick and Blewitt (2010),
      - theories focusing on racial and sexual-orientation development which fall under the broader collective identity development,
      - have mapped themselves onto Marcia’s operationalization of the identity processes.

Identity within an Embedded System

- Finally the above future research directions has largely painted a picture of identity development focused as an individual processes.
- Erikson’s Psychosocial Theory postulated that development, and more so the development of an ego identity, occurs at the intersection between the individual and the society/culture.
  - From this perspective the individual cannot be separated from the environment
  - And there go, the developing identity occurs within an embedded context.
- While the identity literature has recognized this,
  - For example multiple identity theorist have highlighted that identity occurs as a result of an identity conflict (individual is faced with new information that is not consistent with current identity) or deficit (individual does not have a sufficient sense of self and identity to deal with a situation).
- More research is required to focus on the environmental affordances that provide the individual with needed assets for the development of a sense of self and identity.
- With regards to research that has looked at identity at the level of the Family,
  - Most research has focused on a one-way interaction or concurrent associations between numerous variables of parental involvement and the development of a consolidated sense of self and identity,
  - Future research should seek to paint a more dynamic approach that views identity development as an emergent property of transactions between individuals and their environments.
As a starting point, Koepke and Denissen (2012) have emphasized that the incorporation of the parent <-> child as the most basic level of analysis.

Specifically, future research should include parent’s sense of self and identity and the interaction the reciprocal interaction between adolescent/parent identity alongside subjective evaluation adolescent/parent relationship/parenting and multiple psychosocial indicators.

Dynamic Example

- Normative exploration in risky behaviours may be dealt with more harshly by a strict, highly controlling parent, more so if this parent has a negative sense of self and identity.
  - And is attempting to develop their own identity vicariously
- This negative interaction between adolescent/parent may reciprocate into more propensity to engage in risky behaviours.
  - feeding the adolescents sense of identity down a potentially negative life trajectory as they internalize these problem behaviours into their identity.
- Engagement in risky behaviours, as punishment, to be forced to engage in a community service for a church. As the adolescent works within this environment,
  - if it is one that is structured by a positive role model, with a strong & positive sense of self and identity across personal and religious domains that provides meaning and purpose in life:
    - For example, purpose to shape the lives of troubled youth through gospel
  - And if the adolescent is met with the opportunity to develop a sense of autonomy and capacity for mastery experience (aka PYD)
  - The adolescent, who lacked a religious identity (under collective domain) may seek to become closer to religion and the religious community.
    - Increasing his tendency towards prosocial behaviour through the church, and causing the adolescent to evaluate his/her current commitments within other domains (e.g. personal domain – engagement in risky behaviour).
- This positive interaction may, feed into multiple domains of identity and facilitate a transformational change in the organization of the system,
  - changing the adolescents life course from a negative to positive life trajectory by creating a sense of purpose, a consolidated sense of self and identity
- In turn, this change may improve the interactions between the adolescent and his/her parent.

Identity and Culture

Cross-Ethnic Diversity and Comparisons

- From Marcia’s original research until the beginning of the 21st century,
  - vast majority of studies in identity status and related areas of personal identity used overwhelmingly White samples (Sneed, Schwartz, & Cross, 2006).
- A number of writers (e.g., Oyserman & Destin, 2010; Phillips & Pittman, 2003; Yoder, 2000) have enumerated the challenges faced by immigrants and by members of minority groups,
- These challenges introduce a number of additional issues that immigrant and minority individuals are often confronted with when developing a sense of identity.
  - At the very least, individuals from outside the cultural majority group in a given country or region generally must make sense of their membership in an ethnic minority group as well as in the larger society where they live (Phinney & Ong, 2007).
  - This sense of oneself as a member of a minority group is known as ethnic identity and represents an additional domain in which identity work must be conducted (Schwartz, 2005).
- Additionally, in many cases, membership in an ethnic minority group may result in certain identity commitments becoming more difficult to implement (e.g. education attainment due to low SES)
- It is important to note that the terms “immigrants” and “minority group members” are sometimes, but not always, synonymous with one another.
Whereas the personal identity literature has only recently begun to include large numbers of ethnic minority participants (e.g., Schwartz, Côte, & Arnett, 2005; Schwartz et al., 2009), issues of ethnic diversity are becoming increasingly important in many Western countries. Current projections indicate that ethnic minorities will make up one half of the United States population by 2050 (Cohn & Passel, 2008).

Ethnic diversity, and its implications for personal identity development, are likely to become more, rather than less, important.

Cross-Cultural Comparisons.

For most of the identity status model’s lifespan, personal identity research was dominated by North American studies.

Most of the original identity researchers were based either in the United States or in Canada,

Arnett (2008) has referred to this problem as the “neglected 95%” and has called for an increase in the representation of young people from other parts of the world in psychological research.

In the last 15 years or so, personal identity research has begun to take hold in Europe – predominantly in Belgium, and Germany

With the increased prominence of the Internet a small number of cross-cultural studies comparing European and United States samples have appeared since 1995

Conclusions from this growing body of work suggest that the structure of identity development is similar across countries, but that identity processes (i.e., forms of exploration and commitment) are endorsed to different extents between and among countries.

These findings have generally been explained in terms of differing developmental contexts across countries,

including differences in societal expectations for adolescents and emerging adults,

differences in the timing of young people’s departure from the parental home,

and differences in the timing of and processes underlying assumption of adult roles

A small number of personal identity studies have been conducted in East Asia – and these studies have indicated that the structure of personal identity is not equivalent between American and East Asian young people.

Specifically, although commitment making may serve similar functions in East Asian and Western cultural contexts, the factor structure of exploration subscales did not fit the data well – suggesting that identity exploration may not represent the mechanism through which identity is developed in East Asian countries.

Identity exploration involves an agentic, self-directed process that may not be consistent with the largely collectivist and group-oriented focus in many East Asian cultural contexts.

Specifically, there is evidence that the “self” is regarded as equivalent to a self-contained person in the United States, but is regarded as including important others in East Asia

Moreover, the cross-ethnic and cross-national work conducted thus far has used an “etic” approach where models developed in one cultural context are imported into other contexts.

Even if the measures can be shown to operate equivalently across cultures, such a finding does not rule out the possibility that there may be additional and/or unique identity processes at work within specific cultural-historical contexts.
2. Developmental Intervention Science (DIS)

Applied Developmental Science

Overview

- As the 20th century ended, developmental science emerged in the human sciences as a result of its integration/application of a life-span/interdisciplinary orientation to basic and applied issues.
  - From this perspective, the term applied develop mental science (ADS) emerged in reference to scholarship that seeks to advance the integration of developmental research with actions, policies & programs that promote positive development across the life span (Lerner et al., 2000).
    - policy and program endeavors Do Not constitute secondary work, or derivative applications, conducted after basic research evidence has been compiled.
- From an ADSP perspective.
  - positive individual development and family functioning is an interactive product of biology and the physical and social environments that continuously evolve and change over time.
  - it is critical to understanding normative & atypical processes as they emerge within different developmental periods across the lifespan and across diverse physical and cultural settings.
  - And both descriptive and explanatory knowledge about changes within human systems are required to not only address a full spectrum of applied concerns, but is also influenced by the outcome of these community activities (Lerner et al., 2000).

Components of ADS

- The applied aspect of ADS scholarship reflects its direct implication for what individuals, families, practitioners, and policymakers do.
- The developmental aspect emphasizes a focus on systematic and successive changes within human systems that occur across the life span.
  - stresses the importance of understanding normative and atypical processes as they emerge within different developmental periods and across diverse physical and cultural settings.
- The science aspect stresses the need to utilize a range of research methods to collect reliable and objective information in a systematic manner to test the validity of theory and application.

Philosophical Assumptions

- ADS thus takes on
  1. contextual philosophy of science (Pepper, 1942);
  2. emphases placed on application that characterized the early scientific history of developmental psychology (Cairns, 1998; Sears, 1975);
  3. developmental theories focused on the dynamics of organism-context relations (Lerner, 1998);
  4. the life-span view of human development (Baltes, 1987);
  5. and (5) the bioecological approach to human development

Positive Youth Development

- Emerged in response to a complex set of interrelated contextual changes, with transformations in the conceptual foundations of both developmental and intervention science being particularly relevant.
  - As Lerner (2005) noted, with respect to developmental science, the PYD movement was the result of the emergence of ADS.
  - accompanied by a shift away from the view adolescence as a period of “stress and storm” and youth as both dangerous and endangered or as “problems to be managed” (Arnett, 2000).
- The PYD perspective has arisen out of
  - comparative psychology and evolutionary biology has documented the potential for systematic change—for plasticity—in the course of development.
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- life-span developmental psychology, bioecological developmental psychology, and life-course sociology demonstrated the possibility of optimizing individual and group change by altering bidirectional relations between individuals and their ecologies
- psychology which emerged in the early 1960s as a critique of the disease/medical model, and which stressed primary prevention rather than secondary and tertiary prevention.
- And finally, from youth-workers who shared their positive outlook regarding the potential of youth,
  - a perspective that has been gained through experiences with youth overcoming the odds, being resilient in the face of challenges, and taking initiative to enact change

- PYD, in integrating the above models,
  - stresses the relative plasticity of human development and
  - argue that this potential for systematic change in behavior exists as a consequence of mutually influential relationships between the developing person and his or her biology, psychological characteristics, family, community, culture, physical and designed ecology, and historical niche.

**Conceptual Convergence between Intervention and Prevention Science**

- There has been a broad recognition of the need for integrating treatment, prevention, and developmental intervention science
  - With regards to intervention and prevention
    - Intervention science has highlighted the emergence of prevention science as a logical extension of treatment science and its emphasis on positive adjustment and optimal functioning.
  - In addition, within prevention science literature,
    - The convergence between developmental and prevention approaches was recognized in a major review of the literature (Catalano et al., 2002)
      - Both PYD and prevention perspectives recognize the need to target person ↔ context relations, such as family relationships, bonding to school, etc.
      - efforts have been made to broaden the criteria by which prevention intervention outcomes are evaluated (beyond reducing risk factors).
  - Lastly, with respect to intervention science and developmental approaches
    - As a whole, there has been a recognition that intervention science needs to do more than “treat” problem behaviors (i.e., symptoms) or “prevent” negative outcomes and that developmental science needs to do more than generate complex descriptive models
      - Overton (1996) refers to as model of what changes and how it changes (Lerner, 2005), and evolving intervention science models of what to change and how to change it (Holmbeck, 2002; K. R. Weisz & Hawley, 2002).
      - It is out of this shared focus on understanding the mechanisms of intervention fields can be unified to focus on positive progressive developmental change
        - in ways that complement the major foundational contribution of developmental psychopathology to prevention science and problem/risk reduction.
  - These efforts have resulted in the inclusion of more general indices of positive adjustment and optimal functioning to include emerging views of psychological health and resilience

- Thus, the conceptual convergence between promoting positive development and preventing/treating risky or problem behavior includes a shared emphasis on developmental regulation and the interplay between individuals and the contexts in which they function.

- The fusion of these literatures to have the potential to bring together
  - (a) a more empowering model knowledge development for research involvement in the community,
  - (b) a nuanced and contextualized notion of youth and their development; and
  - (c) methodologies that richly reflect rather than reduce the experiences of young people whose development we seek to promote
Overview

• Informed by the changes in both the above literatures, a new perspective has also emerged:
  o DIS is specifically committed to the use of both descriptive and explanatory knowledge about
    changes within human systems that occur across the lifespan in the development, implementation,
    and evaluation of evidence-based multidisciplinary lifespan intervention strategies (Kurtines et al., 2008).

• The key concepts a Developmental Intervention Science approach draws on include:
  o Community supported interventions that meet youth and community needs
  o Developing affordable and sustainable interventions in “real world” settings
  o Targets risky and problem behaviors while promoting positive self-development
  o Research that aims to promote both short and long term life course changes

• Building on applied developmental science (Lerner, 2005),
  o DIS is specifically committed to the use of both descriptive and explanatory knowledge about
    changes within human systems that occur across the lifespan

• However, the emerging DIS literature extends applied developmental science by developing links with
  efficacious and effective treatment and prevention intervention models and approaches.

• The aim of DIS is to advance the evolution of sustainable broadband developmental intervention
  strategies targeting specific positive developmental outcomes intended to complement the wide array of
  well-established treatment and prevention intervention strategies

• By drawing on advances in treatment and prevention science, DIS has begun to generate theory-
  informed empirically supported developmental intervention strategies specifically targeting positive
  developmental outcomes.

Developmental Structural Organizational Change

• A basic premise of DIS is that interventions that promote “broadband” change in “core” positive
  psychosocial developmental domains such as a person’s basic sense of self and identity foster positive
  change in the structural organization of the developmental system
  o Which may manifest as multidirectional positive change across domains of development,
    including problem domains (Eichas et al., 2010).

• Extending ADS, DIS views change as a necessary, inevitable feature across levels of analysis
  o Developmental change has two basic characteristics – it is systematic and successive.
    ▪ Systematic change rather than random, chaotic, disorganized or dispersive change.
    ▪ Successive change when change that occurs at a later point in time is influenced by
      change that occurs earlier in time.
  o The concept of development implies systematic and successive change in the hierarchy, structure,
    or organization of the ordered subsystems that make up a specific developmental system.
    ▪ More specifically, change lies in the relations that exist among the multiple levels of
      organization that constitute the substance of human
      • These levels range from the inner biological level, through the individual or
        psychological level and the proximal social relational level
      • to the sociocultural level
      • and the natural and designed physical ecologies of human development
  o These levels are structurally and functionally integrated, thus requiring a systems view of the
    levels involved in human development
    ▪ The change component of these units derives from the ideas that all of the biological,
      psychological, and social and physical ecological levels of organization involved in
      human development are embedded in history,
      ▪ that no level of organization functions as a consequence of its own isolated activity
  o The concept of developmental change has been extended and refined to include the concept of
    developmental change as progressive change, or systematic, successive change over time in the
    organization of an organism that serves an adaptive function
Structural organizational change emerges as the result of adaptive developmental regulation through the dynamic process of individuals acting on their contexts and contexts acting upon individuals.

- The individual’s contributions to developmental regulation are referred to as self-regulation, which can be either organismic or intentional.
  - Unlike organismic self-regulations that are primarily physiological,
  - intentional self-regulation refers specifically to goal-directed actions that can be actively selected and controlled by the person to transform situations.
    - “contextualized actions that are actively aimed toward harmonizing demand and resources in the context with personal goals to attain better functioning and to enhance self-development” (Gestsdottir & Lerner, 2008, p. 204).

- Contextual contributions to developmental regulation of the person ↔ context relationship may also be intentionally directed.
  - An intervention process is a specific type of person ↔ context (structural-interactive) exchange intended to have an effect on a specific outcome process.

- During adolescence, newly emergent cognitive and communicative capacities transform the individual’s contributions to developmental regulation,
  - in part because their emergence also brings the challenge (and responsibility) of forming an integrated and coherent sense of identity (Kurtines et al., 2008).
  - A child’s self-regulations are primarily observed in terms of attention and inhibition,
    - whereas an adolescent’s self-regulations involve increased intentions to promote his or her own development in a way that is consistent with his or her identity.
  - More developmentally advanced intentional self-regulations involved in the development of individuals as active producers of, or contributors to, their own development
    - and in doing so, the formation of an increasingly integrated—and therefore an increasingly complex, coherent, and cohesive—sense of identity.
Clinic Based/Efficacy Research

- The main goal of efficacy research is to discover whether an intervention “works.”
  - With an efficacy approach, an experimental study is conducted to estimate the maximum treatment benefit possible on a primary outcome measure.
- The emphasis in an efficacy trial is on internal validity, which allows for a causal link to be established between the intervention and the primary outcome.
  - It is therefore typically conducted under ideal, highly controlled circumstances in clinical research settings.
  - Efficacy research usually involves a carefully chosen sample (where participants are compensated for their time and effort), and highly trained (and closely supervised specialists) using standardized, manual-based treatment protocols.
- This type of research is typically best suited for short-term designs (e.g., random clinical trials).
  - Clinic based research necessarily provides good control over confounding variables, and therefore reliable inference of causation (high internal validity).
- The tacit assumption in any lab based research is that the efficacy of the interventions developed therein will be comparable to the effectiveness of treatment conducted in “real” practice.
  - Despite their methodological strengths, efficacy research is limited in its ability to estimate or predict the effects of an intervention outside of the clinical setting.
  - Results have proven difficult to transport into practice because the utility and validity of the resulting interventions, when applied in real-world settings, is unclear.

Community Based/Outreach Research

- In contrast to theory-driven clinic or lab-based efficacy research, outreach research uses a bottom-up rather than a top-down approach to developing intervention strategies (Kurtines & Silverman, 1999).
- Outreach research emerges out of and remains in community settings because it is rooted in the specific needs of that particular setting.
  - Effectiveness is built into intervention strategies as they are implemented and evaluated in real-world community settings with respect to their capacity to do so from the beginning.
    - No need to address issues of transportability, dissemination, and implementation,
- Another distinct advantage of a community-supported outreach research program is that this long-term commitment also creates the potential for addressing long-term, research-related knowledge development goals for the field.
  - Because of its long-term community commitment, an important advantage of outreach research is its use of both short-term designs (i.e., randomized clinical trials or quasi-experimental) and long-term designs (i.e., multistage longitudinal and comparative) in evaluating long-term, community-supported outreach programs for both internal and external validity.

Integrating Both Traditions

- Miami Youth Development Program, a community-supported positive youth development intervention
  - draws on a “developmental intervention science outreach research approach,” that attempts to integrate both of the approaches described above.
- The Miami YDP views outreach research as an approach to be employed in ways that are contingently and contextually complementary to efficacy research.
- A view of efficacy and outreach research as complementary suggests that a researcher’s choice of intervention development strategy (e.g., efficacy research or outreach research or mixed efficacy/outreach research) is (or should be) contingent upon factors relevant to the research issue in question, that is,
  - type of problem (narrowband vs. broadband),
  - type of intervention (treatment, prevention, positive development),
Internal/External Validity in Relation to Efficacy/Effectiveness

Internal Validity
• Methodological aspects need to be controlled to ensure internal validity.
• Examples:
  o Internal validity can be increased by using control procedures, such as exclusion criteria (to rule out comorbidity), and by gathering a large sample.
  o A large sample decreases the chance of expectancy effects or inaccuracy of results due to subjects’ variability in the degree of interest in or amount of effort and commitment to the study.
  o Internal validity can be increased by reducing the time between pre- and post-tests, because time and maturation of subjects can mask the effects of an intervention.
  o However, decreased time between pre- and post-tests can also increase the possibility of test-retest confounds. In this case, it would be beneficial to use highly correlated but slightly different measures.
  o Experimenter bias can decrease internal validity but can be managed by using double-blind procedures or by using the least number of experimenters as possible, as well as through the use of effective training measures for experimenters.

External Validity
• Methodological Aspects that should not be as rigidly applied to ensure external validity:
  o Sample should be culturally diverse
  o Experiment should not be tightly controlled, so that it can approximate real world settings
• There are questions as to whether lab studies generalize to clinics where most therapy occurs.
  o Although research shows beneficial effects of therapy in labs, most clinic studies have not shown significant effects
• Efficacy of child therapy appears positive from review of meta-analysis
• However, most studies included in the meta-analysis involved children, interventions, and treatment conditions that were relatively unrepresentative of conventional clinical practice. For instance, most youngsters were not seriously clinically disturbed
• Samples were selected for homogeneity (with most participants displaying similar focal problems)
• Therapy addressed the focal problems primarily or exclusively
• Therapists were trained immediately before the therapy in the specific techniques to use
• Therapy was often manualized
• By contrast, in most clinics:
  o Clients are seriously disturbed (they were referred to the clinic)
  o Youngsters are heterogeneous (different problems, many disorders, etc)
  o Therapy is directed at not one focal problem, but several different focal problems
  o Therapy cannot be limited to a set of techniques
  o Treatment manuals are not common
• In clinical settings, it is almost impossible to have a control group (not ethical)
  o To address this, we can compare treated individuals to those that drop out prior to treatment
    • They may be different (completers versus drop outs), but this study says they are not…
  o Wait-list control
4. Risk, Protective Factors, and Resilience

Dynamical Systems Models

- Many variables operating on different levels of analysis affect developmental processes & outcomes
  - within-person: biology, genetics, neural structure, cognitions, behaviors,
  - outside-person: interpersonal, social, cultural, and historical
- Isolated variable cannot explain behavioral change in one direction over time
  - a change in any one of these variables can produce a change in another (Thelen & Smith, 1998)
  - there is not one particular pathway to a given endpoint
- Thus variability is embraced
  - outcomes are influenced by “multiple contributors”, both internal and external to the individual (Cicchetti and Rogosch, 1996)
- Example of contributors: risk factors & protective factors

Overview

- Risk and Protective factors can interact with each other over time to create a number of different outcomes….so
  - “outcomes are a function of the multiple, mutual, and continuous interactions of all the levels of the developing systems, from molecular to cultural”.
  - Also “the nested processes that may unfold over many time scales from milliseconds to years” (Thelen & Smith, 1998)
- Risk & protective factors put broadly are conditions, characteristics or states that either increase or buffer against the probability of an undesired outcome – defined by their function (Schaffer, 2006)
  - risk & protective factors = moderating variables
- Dynamically interact (at many levels) influencing the course of an individual’s development & developmental outcome

Risk Factors

- Increase probability of psychopathology/negative outcome
  - Examples: maltreatment, exposure to violence, poor relationship with, poor self-esteem, poor social competence (Kim & Cicchetti, 2004)

Protective Factors

- reduce probability of psychopathology/negative outcome
- facilitates ability to resist stressful life events, risks, hazards
- promotes adaptation and competence
  - Examples: resilience (Masten, 2004) positive adaptation in context of adversity (Bolgers et al 1998)
  - social support and peer relations

Resilience:

- Exhibition of competence in SPITE of adversity has been conceptualized as resiliency by a number of researchers
- Extent to which individuals who possess the genetic risk for maladaptation and psychopathology are not affected (Luthar, Cicchetti, Becker, 2000)


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- of particular interest to multifinality – understanding how some individuals who come from disadvantaged backgrounds have successful developmental outcomes may provide effective suggestions for intervention
  - speaks to diversity that exists in outcomes

Importance in Developmental Science

- It is important to understand risk and protective factors in the context of development, as their effects on an individual may change over time - importance of timing of risk factors and interactions of factors
- protective factors, resource factors, vulnerability factors and risk factors can interact with each other over time to create a number of different outcomes (Cicchetti & Rogosch, 1996)
- Risk and protective factors can interact dynamically at multiple levels of analysis
  - To develop a thorough and comprehensive understanding of adaptive and maladaptive functioning,
    - it is essential that scientists increasingly incorporate a multiple-levels-of-analysis perspective into their research (Cicchetti & Dawson, 2002).
  - Such multiple-levels-of-analysis investigations may reveal the genetic elements that are probabilistically associated with maladaptive developmental outcomes and psychopathology,
    - and, alternatively, those genes that may serve a protective function for individuals experiencing significant adversity (Cicchetti & Blender, 2004).
  - Future research should examine multigene–environment interactions.
  - Moreover, environmental variables must be precisely defined and clearly specified to permit investigators to discover ways in which genes may moderate environmental experiences, or vice versa (Cicchetti & Blender, 2004).

5. Empowerment Theory

A multi-level construct of analysis.

Overview

- Empowerment is a multi-level open construct of the process by which
Psychological empowerment

- Psychological empowerment refers to an individual's ability
  - to make personal life decisions (Schulz, Israel, Zimmerman, & Checkoway, 1995),
  - employ a proactive approach to life,
  - perception of personal control, and
  - a critical understanding of the sociopolitical environment (Zimmerman, 1990; 1995).
- Psychological empowerment is not simply an individually-oriented conception that neglects contextual factors and solely focuses on intrapsychic variables such as motivation to control, locus of control, and self-efficacy (Zimmerman, 1990).
  - Instead, psychological empowerment is the understanding of “how what goes on inside one's head interacts with what goes on in one's environment to enhance or inhibit one's mastery and control over the factors that affect one's life” (Zimmerman, 1990 p. 174) and thus requires a contextual analysis to be fully understood (Zimmerman, 1990; 1995).
- While an individual may not have any real power in a political sense, within a contextual framework, it is still possible to be considered empowered so long as the individual has an understanding of what choices can be made given different situations (Zimmerman, 1990).
  - Being empowered is the knowledge that individuals can choose whether to fight or retreat, to be dependent or independent, and to organize or wait (Zimmerman, 1990).

Measuring Empowerment Outcomes

Overview

- Empowering processes are a series of experiences that provide individuals, organizations, and communities with the opportunity to examine the relationship between their goals and a sense of how to achieve them (Cornell Empowerment Group, 1989; Mechanic, 1991; Zimmerman, 1990).
- Empowering processes include the opportunity to develop skills, to learn about resource development and management and to work with others towards a common goal (Zimmerman, 1995).
- While empowering processes are the means by which people, organizations, and communities become empowered,
  - empowerment outcomes are the consequences of those processes and defined by the "specific measurement operations that may be used to study the effects of interventions designed to empower participants" (Zimmerman, 1995).
- Empowerment outcomes vary across levels of analysis; however, three components have been found to be consistently an outcome of the empowerment process.

Components of Psychological Empowerment Outcomes

- The intrapersonal component.
  - The Intrapersonal component (Zimmerman, 1995) refers to the individuals’ concept and self-perception of their capacity to influence social and political systems that are important to them.
  - This component is inclusive of domain-specific perceived control (Paulhus, 1983), self-efficacy, motivation to exert control, and perceived competence.
- The interactional component.
The interactional component encompasses the transaction between the individual(s) and environments that engage in successful mastery over social or political systems.

- Included within this category is knowledge over resources needed to achieve goals, understanding causal agents (Sue & Zane, 1980), a critical awareness of one's environment (Freire, 1973; Kieffer, 1984), and the development of decision-making and problem-solving skills necessary to actively engage one's environment.

- The behavioral component.
  - The behavioral component of PE refers to the actions that individuals take to exercise their influence on their environment.

### Setting Specific Examples of Psychological Empowerment

- Psychological empowerment
  - varies across people in its manifestation of different perceptions, skills, and behaviors across people (Rappaport, 1984)
  - requires different beliefs, competencies, and actions in order to master different settings, and
  - changes across time (Zimmerman, 1995).
- Zimmerman (1995) provided examples of psychological empowerment across levels of analysis as well as the contextually appropriate empowerment outcomes.
- For example, in a mutual help group much like the intervention groups in the CLP, members would not be concerned with sociopolitical control but rather
  - personal control (intrapersonal component).
  - problem-solving and coping skills (interactional component),
  - as well as taking on leadership roles, reaching out to other members of the group, and getting involved in the community (behavioral).
Appendix

Key Articles

- Lickliter and Honeycutt (2003)
- Overton (2006)
- Erikson (1963)
- Elder (1998)
- Bronfenbrenner (1986)
- Shields & Bhatia
- Gould
- Spencer et al. 2006
- Oishi & Graham (2010)
- Oyama, Griffiths, and Gray (2001)
- Lerner (2000)
- Lerner (2002)
- Kurtines et al. (2008)
- Zimmerman (1995)
- Luyckx et al. 2006
- Lerner & Schwartz (2008)