

Continuity-Discontinuity Issue In Developmental Psychology

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Introduction

Developmental psychology is the scientific study of how people change and remain consistent across the lifespan. It examines physical growth, cognition, language, emotion, personality, social relationships, identity, and behavior from infancy through old age. Although early developmental research focused primarily on children, contemporary developmental psychology recognizes that meaningful development continues throughout adulthood.

One of the discipline's oldest and most important debates concerns continuity and discontinuity. The continuity-discontinuity issue asks whether development occurs through gradual, cumulative changes or through distinct stages involving qualitative transformations. A continuous account compares development to a steadily growing tree: later abilities emerge gradually from earlier experiences and capacities. A discontinuous account compares development to the life cycle of a butterfly: the organism passes through recognizable stages in which its structure and functioning become qualitatively different.

The issue is more complicated than choosing between smooth growth and sudden change. A person may develop continuously in one area but discontinuously in another. Vocabulary may increase gradually, while puberty produces relatively rapid physical changes. An individual's aggressive behavior may decline, yet the underlying difficulty with emotional regulation may continue in a different form. Development can therefore display continuity and discontinuity at the same time, depending on what is measured and how it is defined.

Modern research suggests that neither strict continuity nor strict discontinuity provides a complete explanation of human development. Development usually emerges from continuing interactions among biological maturation, prior experiences, relationships, cultural expectations, learning opportunities, and major life events. Apparent stages may arise from numerous gradual changes that combine to produce a visible transition. Conversely, gradual development may be interrupted or redirected by illness, trauma, migration, education, parenthood, or other turning points.

This essay explains continuous and discontinuous models of development, reviews examples from cognitive, emotional, language, motor, and personality development, and evaluates the limitations of treating the two positions as opposites. It argues that the most appropriate solution is an integrated developmental-systems approach that studies patterns of continuity and change at multiple levels over time.

Meaning of Continuity in Development

Continuity refers to development that occurs gradually through the accumulation of small changes. In a continuous model, later abilities are constructed from earlier abilities rather than appearing as entirely new structures. Development may be slow or rapid at different moments, but it does not require a person to enter a sharply separated stage.

Physical growth provides a simple illustration. A child generally becomes taller through countless small biological changes rather than suddenly acquiring an adult height. Vocabulary development offers another example. Children gradually hear, understand, and produce more words. Their knowledge builds through repeated exposure, communication, memory, and practice.

Continuous development is often quantitative. Quantitative change involves an increase or decrease in the amount, frequency, speed, or complexity of an existing characteristic. A child may remember more items, solve mathematical problems more quickly, control attention for longer periods, or use increasingly complex sentences. The underlying ability remains recognizable even though its level changes.

Learning theories have traditionally emphasized continuity. From a behavioral perspective, development reflects accumulated learning through conditioning, reinforcement, imitation, and environmental experience. A child who receives encouragement for sharing may gradually perform more cooperative behavior. A student who repeatedly practices writing may become more fluent as successful strategies are strengthened.

Information-processing approaches also commonly describe cognitive development as continuous. Improvements in attention, processing speed, working memory, knowledge, and strategy use can gradually make children more capable problem solvers. What appears to be a new intellectual capacity may result from several smaller improvements working together.

A continuous approach highlights the importance of early experiences because small differences can accumulate. For example, children who receive frequent opportunities for conversation may acquire stronger language skills. Those skills can then make reading instruction easier, which may support later academic achievement. The later outcome is not caused by one isolated early event. Instead, development unfolds through a chain of mutually reinforcing experiences.

This principle is consistent with the concept of developmental cascades. Developmental cascades occur when functioning in one area influences other areas over time. Strong self-regulation may support classroom behavior, which improves learning opportunities and strengthens academic confidence. In contrast, early attention difficulties may contribute to school problems, conflict with adults, and declining motivation. These pathways can be positive or negative, and they demonstrate how gradual processes may have increasingly visible consequences (Masten & Cicchetti, 2010).

Meaning of Discontinuity in Development

Discontinuity refers to development involving qualitative changes. A qualitative change occurs when a person begins to think, behave, or understand the world in a substantially different way. Stage theories propose that development is organized into distinct periods, each characterized by a particular structure, task, conflict, or form of functioning.

Jean Piaget's theory of cognitive development is one of the best-known discontinuous models. Piaget proposed that children progress through the sensorimotor, preoperational, concrete operational, and formal operational stages. Each stage represents a different organization of thought rather than simply an increase in knowledge.

For example, a young child may fail a conservation task because the child focuses on the height of liquid in a container and does not coordinate height with width. A child who develops concrete operational reasoning can understand that the quantity remains unchanged even when its appearance changes. In Piaget's account, this development represents a reorganization of thinking rather than the simple addition of facts.

Stage theories have made important contributions because they draw attention to meaningful transformations. Infants do not merely possess less adult thought. Their understanding, communication, and dependence on sensory and motor activity differ from those of older children. Similarly, adolescence involves more than becoming physically larger. Puberty, changing social expectations, identity exploration, and increasingly complex reasoning alter the young person's experience.

Sigmund Freud's psychosexual theory also described development as a sequence of stages: oral, anal, phallic, latency, and genital. Freud argued that psychological energy becomes focused on different bodily areas and conflicts during development. Although many specific claims in Freud's theory lack strong modern empirical support, his work helped establish the idea that early experiences can influence later personality.

Erik Erikson extended stage thinking across the lifespan through his psychosocial theory. He proposed that individuals encounter different psychosocial conflicts, including trust versus mistrust in infancy, identity versus role confusion in adolescence, and integrity versus despair in later adulthood. Erikson's theory is significant because it presents adulthood and aging as developmental periods rather than treating development as complete at the end of childhood.

Discontinuous development may also occur when new biological capacities emerge. Puberty produces hormonal and physical changes that affect emotion, social relationships, self-image, and behavior. The transition to independent walking changes how an infant explores the environment and interacts with caregivers. These developments may appear sudden even though they depend on gradual preparation.

Continuity Is Not the Same as Stability

A major source of confusion is the assumption that continuity and stability mean the same thing. In contemporary developmental research, these concepts can refer to different patterns.

Continuity may describe whether the average level of a characteristic changes over time. Stability often describes whether individuals maintain approximately the same relative position compared with others. A characteristic can change substantially in its average level while remaining stable in relative ranking.

Consider a group of children whose vocabulary is measured at ages three and six. Every child is likely to know considerably more words at age six. Vocabulary therefore changes in absolute level. However, children who had relatively large vocabularies at age three may still have relatively large vocabularies compared with their peers at age six. The group shows change and stability simultaneously.

Bornstein et al. (2017) explain that group-level continuity or discontinuity and individual-order stability or instability provide different information about development. Their analysis shows why researchers must specify whether they are examining average change, individual trajectories, or relative differences among people.

This distinction also prevents deterministic conclusions. An early characteristic may predict a later outcome without determining it. A child who is more anxious than peers may remain relatively anxious, but the level and expression of that anxiety can change through supportive relationships, treatment, new environments, and growing coping skills.

Homotypic and Heterotypic Continuity

Developmental psychologists also distinguish between homotypic and heterotypic continuity. Homotypic continuity occurs when the same or a closely similar behavior remains present over time. For instance, persistent physical aggression in childhood and adolescence may represent homotypic continuity.

Heterotypic continuity occurs when an underlying function, tendency, or difficulty remains similar but is expressed through different behaviors at different ages. A young child's distress may appear as crying and clinging, whereas an adolescent's related insecurity may appear as withdrawal, reassurance seeking, or intense fear of rejection. The form of the behavior changes, but its psychological function may continue.

This distinction is especially important in developmental psychopathology. A behavior appropriate for one age may be unusual at another. Temper tantrums are relatively common in early childhood, but

similar emotional dysregulation may appear as verbal aggression, impulsive risk-taking, or relationship conflict during adolescence.

Petersen (2024) argues that researchers should not infer continuity merely because one broad syndrome predicts another. They must examine individual behaviors, determine the functions those behaviors serve, and investigate the cognitive and biological mechanisms involved. The same behavior can serve different purposes, while different behaviors can perform a similar function.

For example, two children may both avoid school. One may be attempting to escape academic failure, while the other fears separation from a parent. The behavior is identical, but its function differs. Treating both cases as the same developmental pattern would overlook the mechanisms that explain them.

Evidence for Continuous and Discontinuous Cognitive Development

Piaget's theory encouraged researchers to view children as active thinkers who construct knowledge. However, later research has challenged the claim that all children move through broad cognitive stages in a uniform and abrupt manner.

Children may demonstrate advanced reasoning in a familiar task but perform less successfully when language, memory, or instructions make another task difficult. Their performance can depend on experience, culture, motivation, and how a problem is presented. Developmental abilities may therefore appear at different times across tasks rather than emerging together as one complete stage.

Contemporary examinations of Piaget's legacy acknowledge the importance of stage theory but also emphasize that cognitive transitions may be less uniform than strict stage models suggest. The boundaries between stages can be "fuzzy," with children displaying mixed or transitional forms of thinking (Winstanley, 2022).

A child may conserve number before weight, use logical reasoning in one context but not another, or alternate between advanced and less advanced strategies. Such variability does not mean that development is random. It indicates that new forms of reasoning may emerge gradually, compete with older strategies, and become more consistent through experience.

Thus, cognitive development can look discontinuous at the level of observable performance while relying on continuous underlying changes in memory, attention, knowledge, language, and strategy selection.

Critical and Sensitive Periods

The original claim that age five is the single critical period for language acquisition is too absolute. Developmental science usually distinguishes between critical and sensitive periods.

A critical period is a limited developmental window during which a particular experience must occur for an ability to develop normally. After the period closes, acquisition may become extremely difficult or impossible. A sensitive period is a time when the developing person is especially responsive to certain experiences, although learning can still occur later.

Research supports age-related constraints on language learning, but language does not have one simple deadline at age five. Different language abilities may follow different developmental timelines. Speech perception, pronunciation, vocabulary, grammar, and literacy are not identical processes.

Hartshorne et al. (2018) analyzed data from approximately two-thirds of a million English speakers. They found that the capacity to learn grammar remained relatively strong through childhood and declined substantially around late adolescence. However, people who began later had less time to achieve native-like performance before learning capacity declined. The study therefore supported a defined age-related period while locating its ending later than many earlier accounts had assumed.

Children in bilingual homes often acquire two languages successfully because they receive meaningful, repeated exposure during development. Nevertheless, adults can also learn additional languages and reach high levels of competence. Age affects learning, but so do instruction, motivation, immersion, educational opportunity, similarity between languages, frequency of use, and social identity.

Sensitive periods demonstrate why the continuity-discontinuity debate cannot be solved through a simple choice. The gradual maturation of neural systems may create a period of unusually rapid learning, followed by a more noticeable decline in plasticity. A seemingly discontinuous boundary can therefore emerge from continuous biological and experiential processes.

Motor Development and Dynamic Systems

Motor development was once described mainly as the unfolding of a biological timetable. From that perspective, infants sit, crawl, stand, and walk when the nervous system reaches the required level of maturity.

Dynamic systems theory offers a broader explanation. It proposes that new behaviors emerge through interactions among the brain, body, motivation, task, and environment. Walking does not appear because one isolated “walking program” turns on. It emerges when muscle strength, balance, body proportions, perception, practice, motivation, and environmental support become coordinated.

A small change in one part of the system can produce a visible transition. An infant may attempt to stand repeatedly without success. A slight improvement in balance or strength can then make independent standing possible. The final transition may appear sudden, although it results from numerous gradual changes.

Dynamic systems research has influenced the study of motor and cognitive development by showing how stable patterns and rapid transitions can both arise from interacting components. It rejects the assumption that development must be either predetermined stages or uninterrupted linear growth (Spencer et al., 2011).

This approach also explains developmental variability. Children may reach the same outcome through different pathways. One infant crawls before walking, another moves by bottom shuffling, and a third proceeds almost directly from supported standing to independent steps. The outcome is similar, but the developmental routes differ.

Personality, Temperament, and Life Events

The continuity-discontinuity issue also applies to personality. Temperamental differences appear early in life. Some infants are more active, cautious, sociable, or emotionally reactive than others. These differences can show moderate stability, but they do not fix adult personality permanently.

The expression of temperament changes with age. A highly active toddler may become an adult who enjoys demanding work and physical recreation. A cautious child may become a careful planner rather than a socially fearful adult. The underlying tendency may remain recognizable while its behavioral form changes.

Relationships and social expectations also influence personality development. A shy child who receives patient support may gradually develop confidence. The same child in a humiliating or hostile environment may become more withdrawn. Development results from transactions between personal characteristics and environmental responses.

Major life events can redirect established patterns. Bereavement, trauma, migration, marriage, parenthood, illness, unemployment, education, and supportive relationships may change a person's priorities or behavior. Such changes can appear discontinuous, but their effects depend on previous development, available resources, interpretation of the event, and the surrounding social context.

Trauma does not produce the same outcome in every person. Some individuals develop lasting psychological problems, others recover over time, and some report positive changes in meaning or relationships. Therefore, discontinuity after a life event cannot be understood without considering the individual's earlier trajectory and present environment.

Why the Either-Or Debate Is Inadequate

The strongest conclusion is not that the truth merely lies halfway between continuity and discontinuity. Instead, the two patterns describe different aspects and levels of development.

A behavior may change gradually in frequency but discontinuously in function. An underlying mechanism may remain continuous while its outward expression changes. Alternatively, the same behavior may continue while the psychological process causing it changes.

Development can also be nonlinear. Nonlinear change means that equal amounts of time do not produce equal amounts of development. A child may show little observable progress for several months and then improve rapidly. Progress may involve advances, temporary regressions, and periods of stability.

The time scale of observation also affects conclusions. A researcher observing language development every day may see small continuous changes. A researcher comparing a child at ages two and six may see a dramatic qualitative transformation. Both observations can be correct.

Measurement can create false discontinuities. A test designed for toddlers may not be appropriate for adolescents, forcing researchers to use different measures at different ages. Changes in scores may then reflect the instruments rather than actual development. Conversely, using the same task across ages may hide change because the task has different meanings for younger and older participants.

Bornstein et al. (2017) conclude that consistency and change are “equally central in development.” A complete account must explain what remains stable, what changes, how rapidly it changes, and why the pattern differs among people and contexts.

An Integrated Solution to the Issue

A useful solution is to replace the either-or question with a series of more precise questions. Researchers should ask what is continuous, what is discontinuous, at which level, over what period, for which individuals, and under which conditions.

First, development should be examined across multiple levels. Biological processes, cognition, emotion, behavior, relationships, social institutions, and culture influence one another. Puberty is biological, but its psychological meaning depends partly on family attitudes, peer relationships, gender expectations, education, and culture.

Second, researchers should distinguish behavioral form from behavioral function. A behavior that looks different across ages may serve the same purpose. Conversely, the same behavior may arise from different motives. This approach can improve both explanation and intervention.

Third, longitudinal research should follow the same individuals over meaningful periods. Cross-sectional research compares different age groups, but age differences can reflect historical, cultural, or generational influences. Longitudinal studies are better suited to identifying individual trajectories, although they require considerable time and resources.

Fourth, researchers should measure both average developmental change and individual differences. A group average may suggest smooth growth even when some children improve rapidly, others remain stable, and others decline. Person-centered analyses can reveal different pathways hidden within the average.

Fifth, theories should allow for sensitive periods without assuming rigid universal deadlines. Developmental timing matters, but people retain varying degrees of plasticity throughout life. Earlier intervention may be more efficient in some domains, yet meaningful change can still occur in adolescence and adulthood.

Sixth, researchers should investigate mechanisms rather than relying only on prediction. An early behavior predicting a later outcome does not explain why the relationship exists. Family stress, neurological development, learning history, peer responses, or educational opportunities may account for the association.

Finally, development should be understood as probabilistic rather than predetermined. Early experiences influence later outcomes, but they rarely dictate one inevitable future. Protective relationships, treatment, education, and changing environments can redirect developmental pathways.

Practical Importance of the Debate

The continuity-discontinuity issue has practical consequences for education, parenting, mental-health care, and social policy.

Teachers who assume rigid stages may underestimate a child who has not reached an expected milestone at the typical age. Teachers who assume only continuous development may overlook genuine qualitative transitions that require different forms of instruction. Effective education considers developmental readiness while recognizing individual variation.

In clinical psychology, a developmental approach prevents professionals from treating adult behavior as separate from earlier experience. It also prevents them from assuming that early risk guarantees later disorder. Intervention can interrupt negative cascades and promote new developmental pathways.

Parents may benefit from understanding that milestones represent general patterns rather than exact deadlines. Comparison with typical development can help identify concerns, but children do not all

develop at the same speed or through identical routes.

Public policies should also reflect both continuity and plasticity. Early-childhood support is important because early differences can accumulate, but investment should not end after the first years of life. Adolescents, adults, and older people remain capable of learning, adaptation, and psychological change.

Conclusion

The continuity-discontinuity issue remains a central debate in [developmental psychology](#) because human development contains both consistency and transformation. Continuous models emphasize gradual growth, accumulated learning, and connections between early and later functioning. Discontinuous models emphasize qualitative transitions, stages, sensitive periods, and reorganizations of thought or behavior.

Evidence does not support a universal model in which every aspect of development proceeds through abrupt and sharply separated stages. Nor does it support the claim that all development is smooth, linear, and uniform. Cognitive skills may develop gradually but produce stage-like performances. Biological maturation may create rapid transitions, while environmental experiences influence their timing and meaning. The same psychological function may continue through different behaviors, and similar behaviors may emerge from different causes.

The most defensible solution is an integrated developmental-systems perspective. This approach examines biological, psychological, social, and cultural processes together. It distinguishes continuity from stability, behavior from function, and prediction from explanation. It also recognizes nonlinear change, individual pathways, developmental cascades, and continuing plasticity.

Human beings are neither entirely fixed by their early lives nor continually remade without connection to the past. Earlier development provides the foundation on which later experience operates, but that foundation can be strengthened, altered, or redirected. Understanding development therefore requires attention to both the person someone has been and the person that individual may still become.

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