1915 In a new edition of *Three Essays on the Theory of Sexuality*, Freud adds a section outlining his theory of **psychosexual development**.

1920s The psychoanalytic world is **divided on issues of child development** between Anna Freud's conservative approach and Melanie Klein's "revolutionary" one.

1930s Lev Vygotsky's sociocultural theory of learning emphasizes the **importance of the community** in learning and development.

1936 Jean Piaget suggests that cognitive processes develop in **a series of well-defined stages** through childhood.

1946 Kenneth and Mamie Clark found the Northside Center for Child Development in Harlem, New York, where they examine the formation of **racial bias**.

1950 Eric Erikson publishes *Childhood and Society*, which includes an exposition of the eight stages of **psychosocial development**.

1957 Noam Chomsky challenges traditional theories of **language learning** in *Syntactic Structures*.

1958-60 **John Bowlby** publishes a series of articles rejecting psychoanalytic and behavioral theories of attachment.

In the early part of the 20th century, two main approaches in psychology examined the psychological development of humans from childhood to adulthood: the psychoanalytic theory of Freud gave an account of psychosexual development in children, and behaviorism explained the mechanics of the learning process. However, the study of development itself—the psychological, emotional, and perceptual changes that occur during a lifetime—did not evolve until the 1930s, when Jean Piaget overturned conventional thinking with the idea that a child is not just a "miniature adult" gaining knowledge as his or her body matures, but at the same time is also going through radical psychological changes.

Piaget raised some fundamental questions: whether we acquire knowledge gradually or in distinct stages; whether certain abilities are innate or learned; and how the environment affects development. His cognitive development theory suggested that a child's growth into adulthood is divided into several developmental stages, and within each stage the child learns by doing rather than instruction. Piaget's ideas set the stage for the new field of developmental psychology and shaped the curricula of schools up to the present day.

Other developmental theories soon emerged. Although broadly agreeing with Piaget's findings, Lev Vygotsky argued that it was necessary for a child to have adult guidance at various stages in his learning, and also stressed the importance of a child's social and cultural environment. Erik Erikson also built on Piaget's ideas, identifying eight stages of psychosocial development, including the "identity crisis" of adolescence; while Lawrence Kohlberg came up with six stages of moral development in his studies.

With the "cognitive revolution" that followed World War II, psychologists such as Albert Bandura looked at the issue of development again, this time in the light of cognitive models of information processing. Bandura retained elements of both Piaget's stages of development and Vygotsky's social constructivism in his social learning theory. Cognitive psychology also brought new ideas about learning, especially the acquisition of

1959 Harry Harlow carries out experiments on monkeys proving that **contact comfort** is more important than the provision of food in forming attachments.

1961 Albert Bandura performs the **Bobo Doll experiments** into observational learning (modeling).

1970 Mary Ainsworth explores types of attachment in her **Strange Situation** studies.

1971 Lawrence Kohlberg identifies **six stages of moral growth** in *Stages of Moral Development*.

1973 A school opens in Neuville-du-Bosc, France, which follows the educational theories of **Françoise Dolto**.

1974 Eleanor E. Maccoby conducts a study into **gender differences** in *The Psychology of Sex Differences*.

1991 **Jerome Bruner** explores the way the developing mind structures its sense of reality in *The Narrative Construction of Reality*.

1995 Simon Baron-Cohen publishes *Mindblindness*, exploring the implications of **growing up with autism**.

language, and Noam Chomsky's suggestion that this is an innate capability once more opened the nature versus nurture debate.

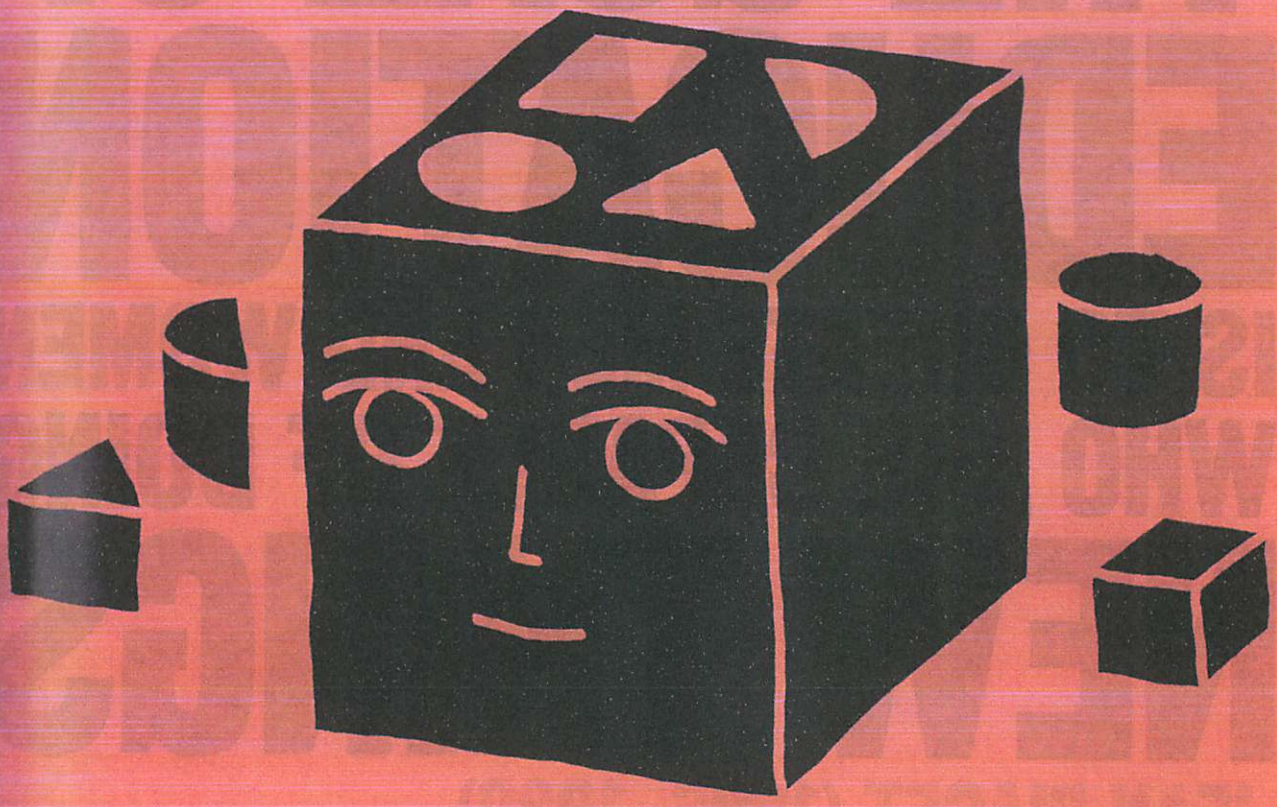
Attachment theory

While much developmental psychology concerned itself with the process of learning, a growing area of interest arose from the research carried out by the British psychoanalyst and psychiatrist John Bowlby. His study of children who had been separated from their families during World War II led to the formulation of attachment theory, which deals with the way we build and maintain relationships with family and friends, placing a special importance on the attachments made by infants to the people who care for them; Bowlby saw this as a natural impulse for survival. The basic ideas of attachment theory were reinforced by experiments carried out by psychologist Harry Harlow in the US, who showed the effects of isolation and maternal separation on infants. His experiments demonstrated that to build healthy cognitive and social development, infants needed companionship and care. Later research by Mary Ainsworth built on these findings, adding the concept of a "secure base" from which an infant can explore the world. Bruno Bettelheim developed his own, more controversial, theories of childhood development from the basis of attachment theory, rejecting the importance of the traditional family after his study of children brought up communally in kibbutzim. In the 1960s, social issues such as the civil rights movement and feminism were influencing thought in both social psychology and developmental psychology. How our prejudices are acquired, and at what stage of development, became an area of interest for the African-Americans Kenneth and Mamie Clark, who based their work on studies of child development in Harlem, New York; while Eleanor Maccoby examined the differences in development between the sexes—the first of many similar explorations in the new field of gender studies.

Developmental psychology is currently exploring the causes and treatment of autism and learning difficulties. And, with a growing aging population, psychology is also looking into issues that confront us as we enter old age. ■

THE GOAL OF EDUCATION IS TO CREATE MEN AND WOMEN WHO ARE CAPABLE OF DOING NEW THINGS

JEAN PIAGET (1896–1980)



IN CONTEXT

APPROACH
Genetic epistemology

BEFORE
1693 English philosopher John Locke's *Some Thoughts Concerning Education* suggests a child's mind is a tabula rasa, or blank slate.

1780s German philosopher Immanuel Kant introduces the concept of the schema and suggests that morality develops independently of authority figures through interaction with peers.

AFTER
1907 Italian educator Dr. Maria Montessori opens the first Montessori school, which encourages independence and respect for natural developmental stages.

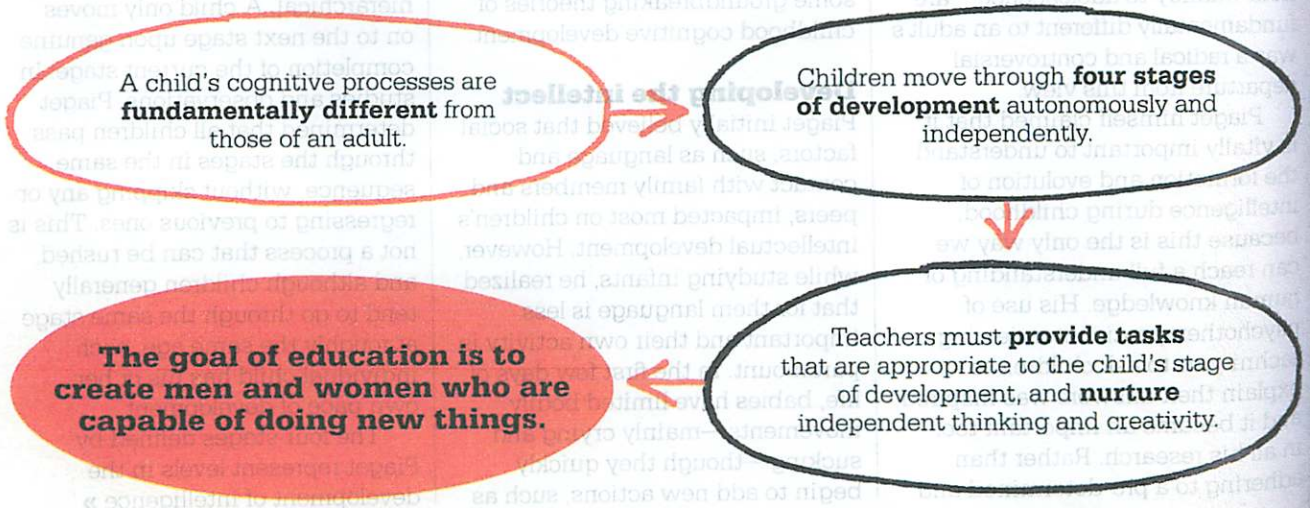
1970s–80s Many Western education systems incorporate a more child-centered approach to learning.

Somewhere between his roots as a precocious young biologist and his later fascination with epistemology, Jean Piaget carved out his own niche in a discipline that he called genetic epistemology, the study of how intelligence changes as children grow. Piaget was not interested in comparing levels of intelligence between children of different ages (quantitative cognitive change); his interests lay in the natural development of mental skills over time (qualitative cognitive change). Quantitative studies make possible numerical comparisons, but Piaget wanted to explore differences in the types, experience, and qualities of children's learning, which required "qualitative" research. Breaking away from the prevalent behaviorist model, which had linked child development entirely with environmental factors, Piaget decided to explore the innate, or inborn, capacities that he believed guide children's progression through a series of age-defined developmental stages.

Piaget believed that children are active and autonomous learners, using their senses to interact with the world around them as they move through the developmental stages. He also believed that it is of primary importance to nurture and guide children on this journey, giving them the freedom to experiment and explore on their own, in a very individual, trial-and-error manner. The task of a good teacher is, therefore, simply to support children on their journey through these stages, constantly encouraging their creativity and imagination, because "the goal of education is to create men and women who are capable of doing new things."

Learning is active

One theme that pervades Piaget's theory of intellectual development is the concept of learning as an active personal process. From infancy through childhood, he says, learning arises from a child's natural desire to sense, explore, move, and then master. For this reason Piaget had many misgivings about the notion of standardized testing, in which children undergo preformatted tests that have "correct" answers to provide quantitative measures of intelligence. While working on



See also: Alfred Binet 50–53 ▪ Jerome Bruner 164–65 ▪ Lev Vygotsky 270 ▪ Erik Erikson 272–73 ▪ Françoise Dolto 279 ▪ Lawrence Kohlberg 292–93 ▪ Jerome Kagan 339

standardizing intelligence tests for Alfred Binet in the early 1920s, he became interested less in a child's ability to produce correct answers than in what those answers actually were. Their explanations revealed that children's assumptions about how the world works are very different to those of adults, leading Piaget to believe that children not only think differently to adults, but also that children of different ages have different methods of thinking.

The evolving mind

Since the 17th century, the idea that a child is effectively a miniature adult had held sway. Empiricist philosophers of the time had suggested that a child's brain works exactly like an adult's, but has fewer associations. Another group of thinkers, the psychological nativists, claimed that certain concepts—such as the ideas of time, space, and number—are innate, or "hard-wired" into the brain, so babies are born with an ability to make use of them. Piaget's suggestion that children's mental processes—from infancy to adolescence—are fundamentally different to an adult's was a radical and controversial departure from this view.

Piaget himself claimed that it is vitally important to understand the formation and evolution of intelligence during childhood, because this is the only way we can reach a full understanding of human knowledge. His use of psychotherapeutic interviewing techniques to ask children to explain their answers was inspired, and it became an important tool in all his research. Rather than adhering to a pre-determined and impersonal list of questions, this flexible method allowed the child's answers to determine the subsequent question. By following the child's line of thought, Piaget believed he could better understand the processes underlying it. His rejection of a notion of quantitative or measurable intelligence led to some groundbreaking theories of childhood cognitive development.

> Education, for most people, means trying to lead the child to resemble the typical adult of his society.
> **Jean Piaget**

Children are not mini adults who simply do not yet know as much as adults; rather, they see the world differently and interact with it in a wholly distinct way.

Developing the intellect

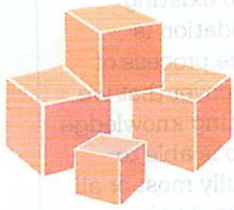
Piaget initially believed that social factors, such as language and contact with family members and peers, impacted most on children's intellectual development. However, while studying infants, he realized that for them language is less important and their own activity is paramount. In the first few days of life, babies have limited bodily movements—mainly crying and sucking—though they quickly begin to add new actions, such as reaching for a toy. So Piaget concluded that action, rather than social interaction, is the source of thought at this stage.

This discovery formed part of his theory that every child passes through various stages of cognitive development, and that these stages are different in quality and are hierarchical. A child only moves on to the next stage upon genuine completion of the current stage. In studies and observations, Piaget determined that all children pass through the stages in the same sequence, without skipping any or regressing to previous ones. This is not a process that can be rushed, and although children generally tend to go through the same stage at roughly the same age, each individual child has his or her own pace of development.

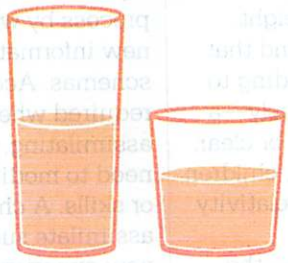
The four stages defined by Piaget represent levels in the development of intelligence »

The Four Stages of Development

1 At the **sensorimotor** stage, babies learn about the world through touch and their other senses.



2 Children begin to arrange objects logically during the **pre-operational** stage.



3 During the **concrete operational** stage, children learn that quantities can take different forms.

4 Verbal reasoning and hypothetical thinking develop in the **formal operational** stage.

and, as such, they provide a list of the "schemas" that children make use of at that particular moment in their development. A schema is a representation in the mind of a set of ideas, perceptions, and actions that provide a mental structure to help us organize our past experiences, and prepare us for future experiences. During infancy and early childhood, a schema can be as simple as "things I can eat." However, as children grow, their schemas become more complex, offering an understanding of what constitutes "a kitchen," a "best friend," or "democratic government." Intelligent behavior, according to Piaget, is comprised of a growing collection of schemas.

> Knowledge...is a system of transformations that become progressively adequate.
> **Jean Piaget**

Four stages of development

Piaget's first stage is called the sensorimotor stage, and this spans the first two years of a child's life. During this period, infants learn about the world primarily through their senses (sensori-) and through physical action or movement (motor). Children at this stage are egocentric, able to see the world only from their own viewpoint. At the beginning of this stage, infants practice reflexes without understanding or intention; later they can extend and coordinate reflexes with objects. Then they begin to coordinate their senses in a way that anticipates events; for example, they can imagine objects that are not present and find hidden ones. They begin to experiment and set goals in their use of objects, and think about a problem before acting. These developments mark the completion of the first stage.

As the child moves toward the development of self-awareness, they now have the tools of representational thought and can begin to develop and use internal images, symbols, and language. This constitutes the second, or pre-operational, stage when a child is primarily interested in how things look or appear. They will demonstrate skills such as arranging objects in a logical order (according to height, for example), or comparing two objects (such as blocks) through shared attributes, focusing on one perceptual quality (such as size or color) at a time. From years two to four, the child thinks in absolute terms (such as "big" or "biggest"); from four to seven, they begin to use relative terms (such as "bigger" or "heavier"). The ability to think logically is still limited and children remain egocentric, unable to see things from another's perspective.

The third stage is the concrete operational stage, and this is when a child becomes capable of performing logical operations, but only in the presence of actual (concrete) objects. The child now begins to grasp the concept of conservation, understanding that the quantity of an object remains the same despite physical changes in its arrangement. They realize

that if you pour liquid from a short, wide glass into a tall, thin one, the amount of liquid remains the same despite the difference in height. Children can also understand that objects can be sorted according to many qualities simultaneously—a marble can be large, green, or clear. A little less egocentric now, children begin to incorporate more relativity into their viewpoints.

During the fourth stage—the formal operational stage—children begin to manipulate ideas (rather than simply objects) and are able to reason purely on the basis of verbal statements. They no longer need to refer to concrete objects, and can follow an argument. They start to think hypothetically, and this new capacity for imagination, and their ability to discuss abstract ideas, reveals that they have now become less egocentric.

Reaching equilibrium

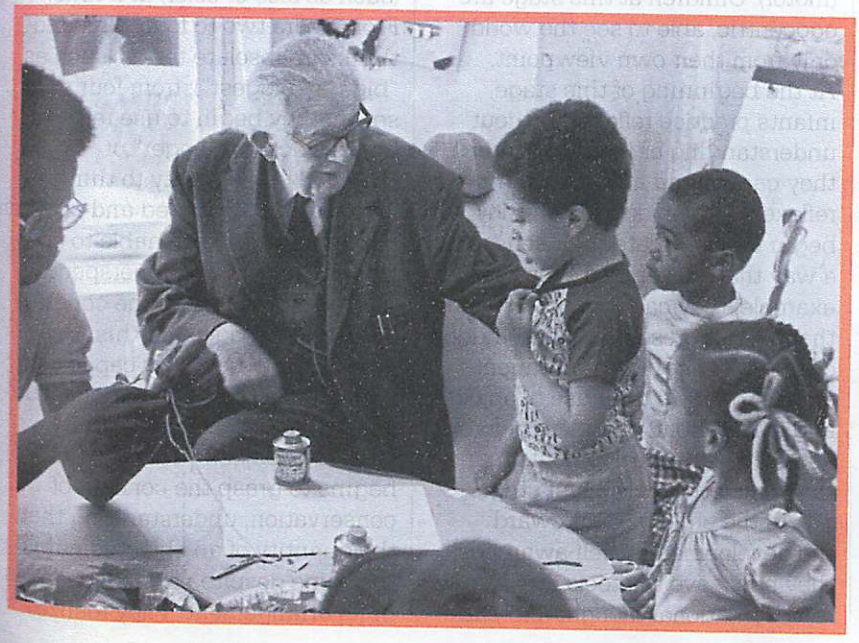
In addition to defining the four stages, Piaget identified several fundamental facets of the developmental process that were required through each of the stages; assimilation, accommodation, and equilibrium. Assimilation is the process by which we incorporate new information into existing schemas. Accommodation is required when, in the process of assimilating, we discover that we need to modify existing knowledge or skills. A child who is able to assimilate successfully most or all new experiences is said to be in a state of equilibrium. However, if the existing schemas are inadequate for coping with new situations successfully, then the child is in a state of cognitive disequilibrium, and the schemas need to develop in order to accommodate the necessary information. Essentially, this is the process of adaptation, one of the most basic forms of learning.

Impact on education

Piaget's work inspired the transformation of the education systems of Europe and the US during the 1970s and 80s, bringing about a more child-centered approach to teaching, in theory and in practice. Rather than trying to teach a child to think and behave like an adult, educators were encouraged to view their work as an opportunity to engage children in novel and individual modes of thinking. Piaget believed that education should inspire people to create, invent, and innovate, and actively discourage them from conforming or following established guidelines at the expense of imagination. If the natural process of learning—from infancy onward—is individual, active, and exploratory, then so too should be a system of education that guides children's formal intellectual development.

Another vitally important aspect of a child-centered education is an awareness of the concept of "readiness," which involves setting limits on learning based on the child's stage of development. One of Piaget's most enduring contributions to the field of education, particularly with »

> Intelligence is what you use when you don't know what to do.
> **Jean Piaget**



Educators should not insist on a particular way of doing or understanding something, Piaget (pictured left) asserted, but nurture children's natural learning processes.

Children at this Montessori school bring Piaget's ideas to life. They are encouraged to build their own learning with hands-on activities and plenty of discussion with their peers.

regards to mathematics and science, is the acknowledgement that teachers need to be aware of and honor an individual child's capacity to deal with a novel experience or to take on fresh information. The tasks that a teacher sets should reflect, and also be adapted as precisely as possible to, the individual student's cognitive level and capabilities.

Piaget believed that children learn from being active rather than from passive observation, and teachers must adapt to this. Interaction between students is of primary significance in the classroom, and having established that one of the best ways to secure knowledge is to teach it to somebody else, it follows that if children are allowed to discuss topics actively among themselves (rather than listening passively to lessons), they are more likely to deepen and consolidate their existing knowledge.

Moral education

As with intellectual development, Piaget believed that children also develop morally in stages and, for the most part, autonomously. Real moral growth is not the product of adult instruction, but is based on a child's own observations of the world. Piaget viewed peer interaction as absolutely crucial for the moral development of children. Peers, not parents or other authority figures, are seen as being vital to moral growth, providing a key source for understanding concepts such as reciprocity, equality, and justice. Consequently, Piaget keenly promoted peer interaction within the classroom as an integral part of the learning experience.

> Children have real understanding only of that which they invent themselves.
> **Jean Piaget**

The role of the teacher in Piaget's child-centered classroom is, therefore, almost one of a mentor and an enabler rather than that of a standard instructor. Teachers need to assess carefully each student's current level of cognitive development and then set tasks that are intrinsically motivating. Interestingly, teachers must also create cognitive disequilibrium in their students in order to help them advance to the next stage of

Jean Piaget

Born in Neuchâtel, Switzerland, Jean Piaget grew up with an insatiable interest in the natural world, and at the age of 11 he wrote his first scientific paper. He studied natural sciences and earned a PhD from the University of Neuchâtel at the age of 22. His interest moved to psychoanalysis and he developed his theories of genetic epistemology in France. In 1921, he became the director of the Jean-Jacques Rousseau Institute in Geneva. He married Valentine Châtenay and they had three children, who were the subjects of many of Piaget's observations about cognitive development. In 1955, he created the International Centre for Genetic Epistemology and was its director until his death in 1980. He was awarded prizes and honorary degrees worldwide.

Key works

1932 *The Moral Judgment of the Child*
1951 *The Psychology of Intelligence*
1952 *The Origins of Intelligence in Children*
1962 *The Psychology of the Child*

development, thereby providing genuine learning opportunities. They should focus on the process of learning, rather than on the achievement of end results, by encouraging their students to ask more questions, experiment, and explore, even if that means making some mistakes along the way. Above all, they must engender a collaborative space where students teach and learn from each other.

Criticisms of Piaget's work

Despite his popularity and the broad influence of his work in the fields of developmental psychology, education, morality, evolution, philosophy, and even artificial intelligence, Piaget's ideas were not accepted without scrutiny and criticism. As with all highly influential theories, years of exploration and research have brought to light its problems and weaknesses. Piaget's notion of egocentrism, for instance, has been called into question. Studies by the US psychologist Susan Gelman in 1979 demonstrated that four-year-olds were able to adjust their explanation of something in order to clarify it for a blindfolded person, and would use simpler forms of speech when talking to younger children, which is inconsistent with Piaget's description of an egocentric child who has no awareness of the needs of others.

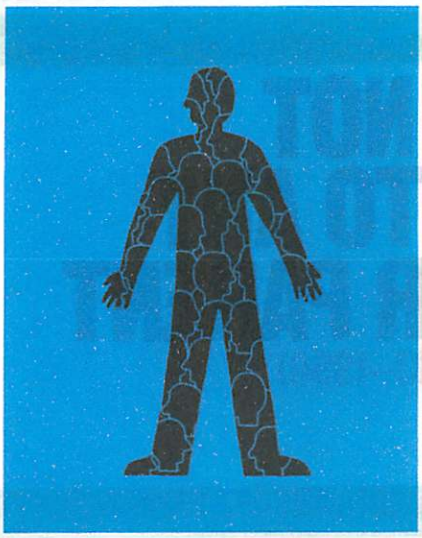
Piaget's portrayal of children as primarily independent and autonomous in their construction of knowledge and their understanding of the physical world also met with some resistance, as it seemed to ignore the important contribution that other people make to a child's cognitive development. Pioneering psychologist Lev Vygotsky's work focused on proving that knowledge and thought are essentially social in nature, and disproving Piaget's assumption that a child was not really a part of the social whole. His theory suggests human development exists on three levels: the cultural and the interpersonal as well as the individual, and his main concern was with the first two levels. His "zone of proximal development" theory—which states that children require the help of adults or older children to complete some tasks—served as a response to Piaget.

Another area of exploration has been the assumed universality of the developmental stages identified by Piaget. Although he had no compelling evidence to support this assumption at the time, more recent cross-cultural investigations concerning the sensorimotor stage (including one study conducted by Pierre Dasen in 1994) indicated that the sub-stages suggested by Piaget are indeed universal, though environmental and cultural factors seem to affect the rate at which these stages are reached, and how quickly they are then completed.

Piaget's work unquestionably paved the way for many new areas of enquiry into the nature of child development and human cognitive development. He created the context in which a vast body of research took shape in the 20th and 21st centuries, and fundamentally changed the nature of education in the Western world. ■

Australian Aboriginal children aged between eight and 14, and living in remote parts of central Australia, were found by Pierre Dasen to progress through the stages identified by Piaget.

> The deep structures, the basic cognitive processes, are indeed universal.
> **Pierre Dasen**



WE BECOME OURSELVES THROUGH OTHERS

LEV VYGOTSKY (1896–1934)

IN CONTEXT

APPROACH
Social constructivism

BEFORE
1860s Francis Galton sparks debate about whether nature (innate ability) or nurture (upbringing) has the most influence on personality.

AFTER
1952 Jean Piaget argues that the ability to absorb and process information develops through interaction between children's innate talents and their environment.

1966 Jerome Bruner suggests that any subject can be taught effectively to a child at any stage of development.

1990 American educational psychologist Robert Slavin designs his Student Teams Achievement Divisions (STAD) to promote more collaborative learning, and downgrade competitive, winner–loser approaches to education.

For Russian psychologist Lev Vygotsky, the skills needed to reason, understand, and remember all stem from a child's experiences with parents, teachers, and peers. Vygotsky saw human development as taking place on three levels—cultural, interpersonal, and individual. He focused on the cultural and interpersonal levels, believing that our most formative experiences are social; "we become ourselves through others."

> All higher psychological functions are internalized relationships of the social kind.
> **Lev Vygotsky**

Vygotsky believed that children absorb the accumulated wisdom, values, and technical knowledge of previous generations through interactions with their caregivers, and use these "tools" to learn how to conduct themselves effectively in the world. But it is only through social interaction that children can experience and internalize these cultural tools. Even our ability to think and reason on an individual level stems from social activities in the course of our development that foster our innate cognitive abilities.

Vygotsky's theories influenced approaches to both learning and teaching. He believed that teachers should play an instructive role, constantly guiding and nurturing their pupils in order to improve their attention span, concentration, and learning skills, and so build up their competence. This idea had a marked effect on education, particularly in the late 20th century, stimulating a shift from child-centered to curriculum-centered teaching, and to a greater use of collaborative learning. ■

See also: Francis Galton 28–29 ▪ Jerome Bruner 164–65 ▪ Jean Piaget 262–69

A CHILD IS NOT BEHOLDEN TO ANY PARTICULAR PARENT

BRUNO BETTELHEIM (1903–1990)

IN CONTEXT

APPROACH
Parenting systems

BEFORE
1945 American psychoanalyst René Spitz reports on the disastrous effects of bringing up children in institutions.

1951 John Bowlby concludes that an infant requires an intimate and continuous relationship with his mother.

1958 US anthropologist Melford Spiro writes *Children of the Kibbutz*, insinuating that Western child-rearing methods, with the focus on the mother as the main carer, work best in all cultures.

AFTER
1973 American psychiatrists Charles M. Johnston and Robert Deisher argue that communal child-rearing provides advantages that few nuclear families offer.

While running a center where disturbed children were raised successfully by professional carers, Bruno Bettelheim began to question the common assumption that the best upbringing involved a close mother–child relationship. He wondered if the Western world might have something to learn from communal child-rearing systems, such as the one used on an Israeli kibbutz.

In 1964, Bettelheim spent seven weeks on a kibbutz, where children were cared for in special houses, away from their family home. In his 1967 book *The Children of the Dream*, he stated that "a kibbutz child is not beholden to any particular parent," and although he observed that this led to fewer one-to-one relationships, it did encourage many less intimate friendships and an active social life.

Successful adults

Before his study, Bettelheim had predicted that a kibbutz might produce mediocre adults who had little cultural impact on society. Instead, he found that kibbutzniks often become accomplished adults. In fact, the children Bettelheim studied were tracked down in the 1990s by a journalist, who discovered that a high percentage were now successful professionals.

Kibbutz children, Bettelheim found, often develop closer bonds with each other than with adults. This ability to relate well to their peers may explain their professional success as adults.

Bettelheim concluded that the kibbutz's communal approach was a huge success. By publishing his findings, he hoped to improve childcare systems in the US. ■

See also: Virginia Satir 146–47 ▪ John Bowlby 274–77

ANYTHING THAT GROWS HAS A GROUND PLAN

ERIK ERIKSON (1902–1994)

IN CONTEXT

APPROACH
Psychosocial development

BEFORE
1905 Sigmund Freud develops his theory of psychosexual development, claiming there are five stages through which a child progresses toward sexual maturity.

1930s Jean Piaget proposes a stage-based theory of cognitive development.

AFTER
1980 Building on Erikson's work, American psychologist James Marcia explores identity formation in adolescence.

1996 In her bestselling book *New Passages*, American writer Gail Sheehy notes that adults are prolonging their adolescence into their 30s, pushing back all of Erikson's stages of adulthood by approximately ten years.

Erik Erikson understood human development in terms of the epigenetic principle, which states that every organism is born with a certain purpose and its successful development results in the fulfillment of this purpose. In Erikson's own words, "anything that grows has a ground plan, and out of this the parts arise." He proposed that the human personality unfolds and evolves in eight predetermined stages. According to Erikson, this growth involves the constant interaction between heredity and environmental influences.

The eight stages

The first stage, which takes place during a baby's first year, is "trust versus mistrust." If the infant's needs are badly or inconsistently met, feelings of mistrust develop that can recur in later relationships. The second stage, "autonomy versus shame and doubt," takes place from 18 months to 2 years. This is when the child learns to explore, but also for the first time must deal with feelings of shame and doubt as a result of small failures or parental reprimands. Healthy willpower develops as a result of learning to negotiate both success and failure.

Stage three, from three to six years, presents the crisis of "initiative versus guilt." This is when children learn to act creatively and playfully, but also with purpose. As they interact with others they discover that their actions can adversely affect someone else. Severe punishments at this stage can inflict paralyzing feelings of guilt.

From 6 to 12, children focus on education and learning social skills. This fourth stage is known as "industry versus inferiority," and it provides a feeling of competence, although an over-emphasis on work can lead children mistakenly to equate self-worth with productivity.

> "Hope is both the earliest and the most indispensable virtue inherent in the state of being alive."
> **Erik Erikson**

See also: G. Stanley Hall 46–47 ▪ Sigmund Freud 92–99 ▪ Kurt Lewin 218–23 ▪ Jean Piaget 262–69 ▪ Lawrence Kohlberg 292–93

Anything that grows has a ground plan, and out of this the parts arise.

The human personality develops through eight **distinct and predetermined stages** between birth and death.

By **negotiating each stage successfully**, we develop as mentally healthy individuals.

Failure at any stage results in a **mental deficiency** (such as lack of trust or an overwhelming sense of guilt) that stays with us throughout life.

From here we enter adolescence and the fifth stage of "ego-identity versus role confusion." This is when we develop a coherent sense of who we are, through consideration of our past, present, and future. When successfully negotiated, this stage ensures a unified sense of self, but problems here can lead to an "identity crisis"—a term coined by Erikson.

During the sixth stage of "intimacy versus isolation," between the ages of 18 and 30, we build close relationships and experience love. The penultimate stage, "generativity versus stagnation," from 35 to 60, sees us working on behalf of future generations, or contributing to society through cultural activities or social activism.

The final stage, "ego-integrity versus despair," starts at the age of around 60. It occurs when people reflect on their lives, becoming either satisfied and at peace with their old age, or despairing over physical disintegration and the reality of death. Successful negotiation of this stage results in the attainment of wisdom. ■

Erikson said that in our older years we achieve a sense of completeness and "personal wholeness" in direct proportion to the degree to which we successfully negotiated earlier stages.

Erik Erikson

Erik Erikson was born in Frankfurt, Germany, as the result of an extramarital affair. He was given the surname of his mother's husband, never knew his biological father, and his mother married again when he was three years old. Unsurprisingly, Erikson always struggled with identity issues. He was encouraged to study medicine, but rebelled and studied art, touring Italy in his youth as a "wandering artist." He then suffered what he called an "aggravated identity crisis" and went to Vienna, where he taught art in a school run on psychoanalytic principles. Embracing these fully, he then trained as a psychoanalyst under Anna Freud. In 1933, he married Joan Serson and they emigrated to Boston, where he became the first child psychoanalyst in the city. He later taught at Harvard, Yale, and Berkeley. He changed his surname to the self-chosen "Erikson" when he became an American citizen in 1933.

Key works

1950 *Childhood and Society*
1964 *Insight and Responsibility*
1968 *Identity: Youth and Crisis*

EARLY EMOTIONAL BONDS ARE AN INTEGRAL PART OF HUMAN NATURE

JOHN BOWLBY (1907–1990)

IN CONTEXT

APPROACH
Attachment theory

BEFORE
1926 Sigmund Freud presents the psychoanalytic theory of "cupboard love," suggesting that infants become attached to caregivers because they fulfil physiological needs.

1935 Konrad Lorenz's research shows that non-humans form strong bonds with the first moving object they encounter.

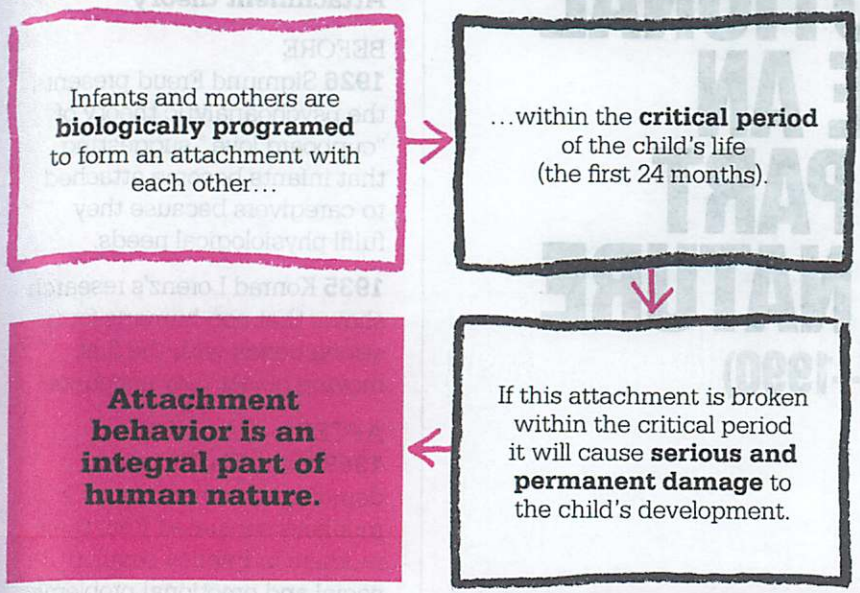
AFTER
1959 Harry Harlow's work demonstrates that macaque monkeys separated from their mothers in infancy develop social and emotional problems.

1978 Michael Rutter shows that children can become strongly attached to a variety of attachment figures (such as fathers, siblings, peers, and inanimate objects).

In the 1950s, the prevailing theory on how infants form attachments was based on the psychoanalytical concept of "cupboard love." This suggested that babies form bonds with people who fulfil their physiological needs, such as feeding. At the same time, the animal studies of Konrad Lorenz suggested that animals simply bond with the first moving object they encounter, which is usually the mother.

It was against this background that John Bowlby took a distinctly evolutionary perspective on early attachment. He argued that because newborn infants are completely helpless, they are genetically

See also: Konrad Lorenz 77 ▪ Sigmund Freud 92–99 ▪ Melanie Klein 108–109 ▪ Anna Freud 111 ▪ Kurt Lewin 218–23 ▪ Lev Vygotsky 270 ▪ Bruno Bettelheim 271 ▪ Harry Harlow 278 ▪ Mary Ainsworth 280–81 ▪ Michael Rutter 339



programed to form an attachment with their mothers in order to ensure their survival. Mothers, he believed, are also genetically programmed to bond with their babies, feeling the need to keep them in close proximity. Any conditions that threaten to separate mother and child activate instinctive attachment behaviors and feelings of insecurity and fear.

These ideas formed the basis of Bowlby's theory, which developed to explain the lifelong significance of the mother–infant bond as well as the psychological difficulties that children suffer if this bond is damaged or entirely broken.

Mothers only

One of the most controversial aspects of Bowlby's theory is that infants always attach to a female, never a male. This female figure may not be the natural mother, but she certainly represents a mother-figure. The term he gave for this tendency to attach to a female is "monotropy," and he emphasized that, although an infant may have more than one attachment figure, his attachment to a mother-figure is simply different from and more significant than any other attachment he will form throughout his life. Both the infant and his mother behave in ways that secure this attachment. An infant, for instance, engages in sucking, cuddling, looking, smiling, and crying in order to shape and control his caregiver's behavior, and a caregiver would be sensitive and responsive to the infant's needs. In this way the two behavioral systems—attachment and caregiving—help to shape one another and create a lifelong bond.

Bowlby believes that this bond is so deeply formative that if it fails to take place, or breaks down within the first few years of life, the child will go on to suffer serious negative consequences in later life. He also argues that there is a critical period during which a mother and infant should develop a secure attachment: it should take place during the first year, or at the very least before the child is two years old. Bowlby thought that any attempts at mothering beyond the age of three would be useless, and the child would be on course to suffer the effects of maternal deprivation.

Maternal deprivation

In 1950, Bowlby was commissioned by the World Health Organization to study children who had suffered maternal deprivation during World War II due to evacuation or being made homeless. He was also asked to investigate the effects of being raised in residential nurseries and other large institutions (such as orphanages). The result of this early work was Bowlby's 1951 report, *Maternal Care and Mental Health*, in which he observed that children deprived of maternal care for prolonged periods of time during early childhood suffered some degree of intellectual, social, or emotional retardation later in life.

Five years later Bowlby began a second study, this time investigating children who had spent five months to two years in a tuberculosis »

> "Mother love in infancy is as important for mental health as are vitamins and proteins for physical health."
> **John Bowlby**

Bowlby predicted that child evacuees would suffer long-term attachment problems as a result of enforced separation from their mothers; later studies found this to be the case.

sanatorium (which offered no substitute mothering) when they had been less than four years old. The children—aged seven to 13 by the time of the study—were rougher in play, showed less initiative and more over-excitement, and were less competitive than those with a more traditional upbringing.

In extreme cases, Bowlby found that maternal deprivation could even result in "affectionless psychopathy," a clinical condition in which people are unable to care deeply for others and so do not form meaningful interpersonal relationships. Those who suffer from it display a higher incidence of juvenile delinquency and antisocial behavior without any sign of remorse, since they are unable to experience feelings of guilt. In Bowlby's 1944 study of juvenile thieves, he found that many of the young criminals had been separated from their mothers for a period of more than six months before they were five years old, and of these, 14 had developed the condition of affectionless psychopathy.

> "Attachment behavior is held to characterize human beings from the cradle to the grave."
> **John Bowlby**

The reason why this primary, secure attachment is so important, Bowlby says, is that it is essential for the development of an inner working model or framework that the child uses to understand himself, others, and the world. This inner working model guides a person's thoughts, feelings, and expectations in all of his personal relationships, even into adulthood. Because the primary attachment serves as a prototype for all future relationships, the quality of the attachment will determine whether or not a child grows to trust others, view himself as valuable, and feel confident in society. These working models are resistant to change; once formed, they determine how people behave and the kind of bond they will form with their own children.

The father's role

Bowlby's attachment theory has been criticized for exaggerating the importance of the mother–child relationship and undervaluing the father's contribution. Bowlby sees the father as having no direct emotional significance for the infant, contributing only indirectly by supporting the mother financially and emotionally. The evolutionary basis of Bowlby's theory suggests that women are naturally inclined to be parents, with inborn maternal instincts that guide them through the process of child-rearing, whereas men are more naturally suited for being providers.

However, British psychologist Rudolph Schaffer—who worked under Bowlby at the Tavistock Clinic in London—found that there is considerable cultural variation in the extent to which fathers are involved in childcare. Increasing numbers of fathers are taking on the role of principal parent, which suggests that parenting roles are a consequence of social convention rather than biology.

Bowlby's view implies that men will inevitably be inferior parents, but research by Schaffer and the American psychologist Ross Parke suggests that men are equally capable of providing warmth and sensitivity to their infants. They also found that a child's developmental outcome is not determined by the parent's gender, but rather by the strength and

> Direct observations of men in their fathering role has shown them to be as capable of as much warmth and sensitivity as women.
> **H. Rudolph Schaffer**

quality of the bond that is forged. In a further study, Schaffer and psychologist Peggy Emerson found that infants and young children display a wide range of attachment behaviors toward many people besides their mothers, and that multiple attachments may actually be the rule rather than the exception.

These later findings were especially important for working women, because the implication of Bowlby's theories was that women should not work once they become mothers; they should stay with the child, fulfilling the role of essential primary caregiver. For decades after Bowlby's theory was posited, generations of working women were saddled with guilt, but many studies since then have questioned this aspect of Bowlby's theory. For instance, in the 1970s psychologists Thomas Weisner and Ronald Gallimore showed that mothers are the exclusive caregivers in only a very small percentage of human societies, and it is not uncommon for groups of people (including relatives and friends) to share responsibility for raising children. Schaffer also points to evidence suggesting that children of mothers who are happy in their work develop more successfully than children whose mothers are frustrated from staying at home.

Groundbreaking work

Despite the many criticisms and revisions that it has provoked, Bowlby's work remains the most comprehensive and influential account of human attachment to date, and led to the groundbreaking experiments of Harry Harlow and Mary Ainsworth. Psychologists have used Bowlby's basic premise to delve more deeply into childhood attachment patterns, and to develop theories of adult attachment by exploring how the bond between parent and child can influence the future bond between spouses and romantic partners. Bowlby's theories have also had many beneficial effects on various aspects of child-rearing, such as the improvement of institutional care and the growing preference for fostering as an alternative. ■

Bowlby claimed that day care centers are not suitable for the care of infants, because maternal deprivation leads to juvenile deliquency; this created a real dilemma for working mothers.

John Bowlby

John Bowlby was the fourth of six children born to a London-based, upper-middle-class family. He was raised primarily by nannies and sent to boarding school at the age of seven. These experiences made him particularly sympathetic to the attachment difficulties faced by young children. He studied psychology at Trinity College, Cambridge, then spent some time teaching delinquent children. He later earned a medical degree and qualified as a psychoanalyst.

During World War II, Bowlby served in the Royal Army Medical Corps and in 1938 married Ursula Longstaff, with whom he had four children. After the war he became director of the Tavistock Clinic, where he remained until retirement. In 1950 he carried out a major study for the World Health Organization. He died at his summer home on the Island of Skye in Scotland, aged 83.

Key works

1951 *Maternal Care and Mental Health (WHO Report)*
1959 *Separation Anxiety*
1969, 1973, 1980 *Attachment and Loss* (three volumes)

CONTACT COMFORT IS OVERWHELMINGLY IMPORTANT

HARRY HARLOW (1905–1981)

IN CONTEXT

APPROACH
Attachment theory

BEFORE
1926 Sigmund Freud's psychoanalytic theory of "cupboard love" suggests that an infant becomes attached to a caregiver because that person is a source of food.

1935 Konrad Lorenz states nonhumans form strong bonds with the first moving object they meet—often the mother.

1951 John Bowlby argues that human mothers and infants are genetically programmed to form a uniquely strong bond.

AFTER
1964 UK psychologists Rudolf Schaffer and Peggy Emerson show that infants are attached to people who do not perform feeding and caretaking duties.

1978 Michael Rutter shows that children bond with a variety of attachment figures, including inanimate objects.

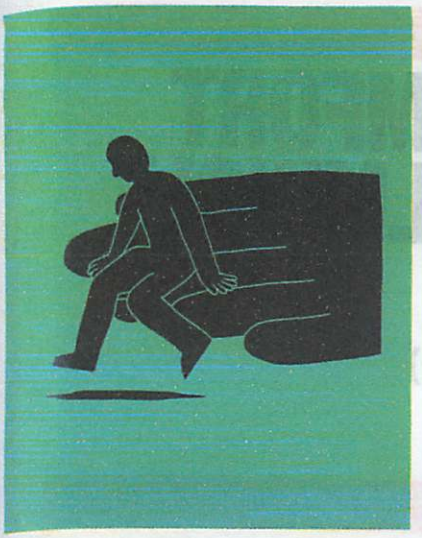
Many psychologists have suggested that an infant becomes attached to its caregiver simply because that person fulfils its need for food. John Bowlby challenged this "cupboard love" idea theoretically, but Harry Harlow set out to prove it.

Harlow took infant macaque monkeys from their mothers, placing them in cages with surrogate "mothers"—one made of wire with a feeding bottle attached; the other made of soft, cuddly, terry cloth, but with no bottle. If the "cupboard love" theory was correct, the baby monkeys would remain with the mother that provided food. But in fact, they spent most of their time with the cloth mother, using her as a secure base, and clinging to her for safety when frightening objects were placed in the cage. Later tests, in which the cloth mother was also able to rock and provide food, showed this attachment was even stronger. Harlow, therefore, suggested that the main function of nursing might even be to ensure body contact with the mother.

Infant macaque monkeys in Harlow's experiment formed a strong attachment to their cuddly, cloth, surrogate "mother," despite her inability to provide any nourishment.

Harlow's work was enormously important, because contemporary advice from psychologists and doctors had warned parents against rocking or picking up a crying child. The results of his experiments were so conclusive that they changed the approach to parenting in the Western world. ■

See also: Konrad Lorenz 77 ▪ Sigmund Freud 92–99 ▪ Abraham Maslow 138–39 ▪ John Bowlby 274–77 ▪ Mary Ainsworth 280–81 ▪ Michael Rutter 339



WE PREPARE CHILDREN FOR A LIFE ABOUT WHOSE COURSE WE KNOW NOTHING

FRANCOISE DOLTO (1908–1988)

IN CONTEXT

APPROACH
Psychoanalysis

BEFORE
1924 Sigmund Freud theorizes about the castration anxiety children face, which Dolto says is a factor in our unconscious image of our own bodies.

1969 Jacques Lacan investigates "otherness," which becomes central to Dolto's work focusing on the distinctiveness of individuals.

AFTER
1973 A school based on Dolto's theories opens in La Neuville-du-Bosc, France, emphasizing well-being and non-compulsory activities.

1978 La Maison Verte, a daycare center based on Dolto's ideas, opens in Paris, with the aim of helping parents and children to minimize the adverse effects of separation.

Following her own difficult childhood, French physician and psychoanalyst Françoise Dolto decided that her work should help children discover and release their desires, believing that this release would prevent neuroses. She felt that some of the illnesses commonly manifested by children were, in reality, reflections of a lack of connection between parents and their offspring. Adults, she observed, often seemed unable to understand children, in spite of once being children themselves.

Unique perspective

Dolto believed that every child possesses a unique perspective, which traditional education seeks to stifle. She condemned any system of morality or education that seeks to control children through obedience or imitation, and was dissatisfied with the techniques being used, both at school and at home, to anticipate a child's future when that future is fundamentally unknowable. Children, she stated, are different from the adults who teach them, simply because they must have had experiences that the older generation could never have had when they were that age.

For Dolto, the goal of education was to allow each child the freedom to explore his individual inclination. The adult, she believed, should serve as a role model, offering an example rather than attempting to impart a method. The educator's role, Dolto declared, was to teach children how to lead themselves. ■

> "It is too late to make a difference with adults; the work has to be done with children."
> **Françoise Dolto**

See also: Sigmund Freud 92–99 ▪ Alfred Adler 100–01 ▪ Jacques Lacan 122–23 ▪ Daniel Lagache 336–37

A SENSITIVE MOTHER CREATES A SECURE ATTACHMENT

MARY AINSWORTH (1913–1999)

In the early 1950s, Mary Ainsworth, working closely with attachment theorist John Bowlby, developed a particular interest in the relationship between mothers and infants. In 1969, she experimented with a procedure that became known as the "Strange Situation," which studied how babies balance their needs for attachment and exploration under varying levels of stress. In each experiment, Ainsworth placed a mother and her one-year-old baby in a room with toys for the baby to play with, and watched their

When an infant is **separated from his mother** he displays one of three different kinds of attachment.

If he shows no signs of distress and a stranger is able to comfort him, the attachment is **anxious-avoidant.**

If he shows intense signs of distress but resists contact with her on her return, the attachment is **anxious-resistant.**

If he is distressed, but upon her return uses her as a secure base from which to explore, there is a secure attachment.

IN CONTEXT

APPROACH
Attachment theory

BEFORE
1950s John Bowlby emphasizes the significance of the mother-child bond.

1959 Harry Harlow's research with infant macaque monkeys demonstrates that they use an attachment figure as a secure base from which to explore their environment.

AFTER
1980 American psychologist Brian E. Vaughn shows that the attachment figure may change, according to variations in a family's circumstances.

1990 American psychologist Mary Main identifies a fourth attachment type in young children—"disorganized"—to describe an infant who is fearful of both the environment and the attachment figure.

See also: Sigmund Freud 92–99 ▪ John Bowlby 274–77 ▪ Harry Harlow 278 ▪ Jerome Kagan 339 ▪ Michael Rutter 339

> Attachment behavior is strongly activated under circumstances when the attachment figure is inaccessible.
> **Mary Ainsworth**

interactions both before and after the introduction of a stranger to the room. The "situation" included periods when the mother left the baby alone with the stranger, then returned to the room.

Ainsworth found that the most important information about mother-child bonding was gleaned not from the baby's reaction to the mother leaving the room, but rather from the infant's reaction to her return. She suggested that a baby's reactions upon reunion with his mother indicate three distinct patterns, or types, of attachment.

Attachment types

Around 70 percent of the babies in Ainsworth's studies were "securely attached." These infants used their mothers "as a secure base from which to explore." They were distressed when she left the room, but played happily, even in the presence of a stranger, as long as the mother was on hand if needed.

The babies who appeared to be indifferent to their mothers, and were hardly affected when she left the room, Ainsworth classified as "anxious-avoidant." They were as easily comforted by the stranger as by the mother. About 15 percent of the infants fell into this group.

A further 15 percent, described as "anxious-resistant," were wary of the stranger, even with the mother present. They became intensely distressed when the mother left the room, but were also angry and resistant to contact on her return.

Mothers in non-Western cultures often keep their infants close to them at all times. Customs such as these can affect the incidence of different attachment types in a community.

Ainsworth claimed that a mother's sensitivity largely determines the type of attachment. A sensitive mother, she stated, understands her child's needs and responds appropriately to them, creating a secure attachment.

Criticism

Critics of Ainsworth's work have suggested that attachment types are not always permanent, and that babies do not fit neatly into a single type. Cultural differences have also been noted. A 1990 study in Japan uncovered an unusually high percentage of anxious-resistant infants, which may have been due to Japanese babies being less used to separation from their mothers than US infants. However, the Strange Situation is considered to be one of the most important studies in attachment research, and is still widely replicated today. ■

Mary Ainsworth

Mary Ainsworth was born in Glendale, Ohio, USA, moving to Canada at the age of five. She gained her doctorate in psychology from the University of Toronto in 1939, and taught there briefly before joining the Canadian Women's Army Corps in 1942. After World War II, she returned to the University of Toronto, marrying graduate student Leonard Ainsworth in 1950 and moving to London, where Mary worked with John Bowlby at the Tavistock Clinic.

In 1954, the couple moved to Uganda, where Leonard had accepted a post, and Mary took the opportunity to study mother-child bonding in tribal society. On returning to the US in 1956, she continued her academic career, eventually becoming a professor at the University of Virginia in 1975.

Key works

1967 *Infancy in Uganda*
1971 *Infant Obedience and Maternal Behavior*
1978 *Patterns of Attachment*

WHO TEACHES A CHILD TO HATE AND FEAR A MEMBER OF ANOTHER RACE?

KENNETH CLARK (1914–2005)

IN CONTEXT

APPROACH
Race attitudes

BEFORE
1929 German-born writer and social worker Bruno Lasker publishes *Race Attitudes in Children*, setting up methods for the psychological study of children's views on race.

Early 1930s Canadian psychologist Otto Klineberg works with lawyers fighting for equal salaries for black public-school teachers.

AFTER
1954 The US Supreme Court rules that racial segregation in schools is unconstitutional, in the *Brown v. Board of Education of Topeka* hearings.

1978 Elliot Aronson devises the "jigsaw method" of teaching—where mixed-race groups of students work interdependently—to help reduce racial prejudice in integrated classrooms.

During the late 1930s, Kenneth Clark and his wife, Mamie Phipps Clark, studied the psychological effects of segregation on African-American schoolchildren, particularly on their self-image. They designed a "doll test" that would indicate children's awareness of racial differences and their underlying attitudes about race. Working with children between the ages of three and seven, they used four dolls, each identical in appearance except for the color of their skin, which ranged from shades of white to dark brown. The children showed an undeniable awareness of race by correctly identifying the dolls on the basis of their skin color, as well as identifying themselves in racial terms by choosing the doll that looked most like them.

In order to explore the children's attitudes about race, the Clarks asked each of them to point out the doll they liked best or most wanted to play with; the doll that had a nice color; and the doll that looked bad. Distressingly, black children showed a clear preference for the white dolls and a rejection of the black dolls, which can be interpreted as indirect self-rejection. Convinced that this reflected the children's tendency to absorb racial prejudices that exist in society and then to turn this hatred inward, the Clarks asked a very important question: "Who teaches a child to hate and fear a member of another race?"

Clark's doll experiments of the late 1930s and early 1940s showed that black children in segregated schools often preferred white dolls, a sign that they had absorbed prevailing prejudices.

Passing on prejudice

The Clarks sought to understand the influences shaping prejudice in America, and decided that as children learn to evaluate racial differences, according to the standards of society, they are

See also: Elliot Aronson 244–45 ▪ Muzafer Sherif 337

By the age of three, children are **racially aware** and already forming **prejudices**.

In 1930s America, white and even black children showed a preference for whiteness and a **rejection of blackness**.

Who teaches a child to hate and fear a member of another race?

Segregation and social influences from parents, teachers, playmates, and the media lead to children internalizing racist attitudes.

required to identify with a specific group, and each racial group has an implied status within a hierarchy. That young black children preferred the white doll showed they were aware American society preferred white people, and had internalized this. Children as young as three had expressed similar attitudes to those of adults in their community.

> Segregation is a way in which society tells a group of human beings that they are inferior.
> **Kenneth Clark**

The Clarks concluded that these attitudes are determined by a mix of influences, including parents, teachers, friends, television, films, and comics. Although it is very rare for parents to deliberately teach their children to hate other racial groups, many subtly and unconsciously pass on dominant social attitudes. Some white parents, for example, may discourage their children from playing with their black peers, implicitly teaching them to fear and avoid black children.

Clark's 1950 summary of his research insisted that segregation was damaging the personalities of white and black children alike. His expert testimony in court cases tied into the 1954 *Brown v. Board of Education of Topeka* case, which determined that racial segregation was unconstitutional in public schools, contributed directly to desegregated schooling and to the Civil Rights Movement in America. ■

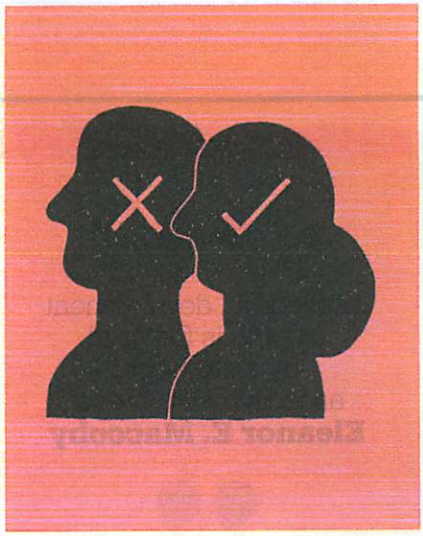
Kenneth Clark

Kenneth Clark was born in the Panama Canal Zone, but moved to Harlem, New York, when he was five. After his mother refused to accept a ruling that her son would be limited to trade or vocational schooling, Clark was enrolled in high school. He went on to earn a master's degree in psychology from Howard University, Washington DC, where he met his wife. The pair carried out research together, becoming the first African-American man and woman to receive a PhD in psychology from Columbia University in New York City. They also founded child development and youth opportunity centers in Harlem.

Clark was also the first African-American to hold a permanent professorship at the City University of New York, and to serve as the president of the American Psychological Association.

Key works

1947 *Racial Identification and Preference in Negro Children*
1955 *Prejudice and Your Child*
1965 *Dark Ghetto*
1974 *Pathos of Power*



GIRLS GET BETTER GRADES THAN BOYS

ELEANOR E. MACCOBY (1917–)

There is no significant difference in the overall **intellectual aptitude** of boys and girls.

But because girls tend to put in a greater effort at school, and have greater interest and better work habits…

…girls get better grades than boys.

IN CONTEXT

APPROACH
Feminist psychology

BEFORE
Early 20th century First research into sex differences by female psychologists.

1970s Studies of the sexes tend to emphasize differences between men and women.

AFTER
1980s Studies suggest structural differences between the male and female brain.

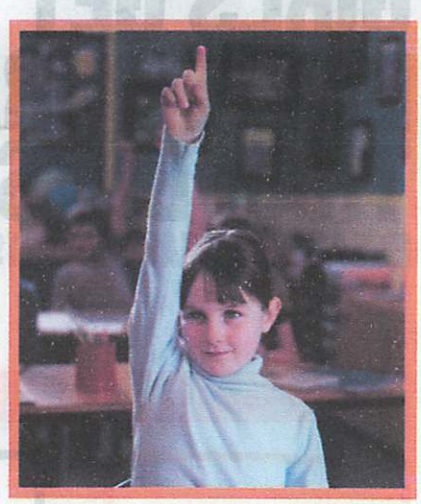
1993 Anne Fausto-Sterling claims biological graduations exist between "male" and "female," such that we can identify five different sexes along the spectrum.

2003 Simon Baron-Cohen argues that the female brain is predominantly hard-wired for empathy, and the male brain for understanding systems.

The emergence of feminist psychologists during the 1970s revived an interest in the study of sex differences, which had waned during the rise of behaviorism. Feminist concerns became increasingly important to US psychologist Eleanor Maccoby. Frustrated by the tendency of psychological literature to report on research findings that emphasized the differences between men and women rather than the similarities, Maccoby, with student Carol Jacklin, reviewed more than 1,600 studies of gender differences. They published their findings in *The Psychology of Sex Differences* (1974) with the aim of showing that what most consider essential differences between the sexes are in fact myths, and that many gender stereotypes are untrue. Although some findings had shown boys to be more aggressive and more adept at mathematics and spatial reasoning than girls, and girls to have superior verbal abilities, subsequent studies revealed that these differences are either negligible or are more complex than they initially appear.

One difference that was consistent and undeniable was that "girls get better grades than boys" in school. Maccoby found this particularly interesting, especially considering that girls did not obtain higher aptitude test scores when all of the subject matter areas were reviewed.

See also: Janet Taylor Spence 236 ▪ Simon Baron-Cohen 298–99



Girls show greater responsiveness to teacher's expectations and are more willing to work, according to Maccoby's research, which makes them more likely to do better at school than boys.

Furthermore, previous research into achievement motivation seemed to suggest that boys should outperform their female peers. Males were arguably more oriented toward achievement for its own sake than girls, showing greater task involvement, and more exploratory behavior; females were primarily interested in achievement relating to interpersonal relationships—exerting effort to please others, and demonstrating low self-confidence with respect to many tasks.

Challenging stereotypes

Maccoby systemically argued against these assumptions, pointing to the fact that girls are higher academic achievers than boys, show greater interest in school-related skills from an early age, and are less likely to drop out before completing high school.

> Intellectual development in girls is fostered by their being assertive and active.
> **Eleanor E. Maccoby**

Maccoby concluded that their better grades clearly reflect some combination of greater effort, greater interest, and better work habits than their male peers. Whatever discrepancy exists between boys and girls in terms of achievement motivation does not reflect school-related motivation. This motivation could prove significant throughout girls' lives, as performance at school is also relevant to job performance.

The ongoing debate over inherent sex differences is tied up with general political questions about how society should be organized, and the roles that men and women are "naturally" equipped to fill. By pointing out that psychological literature tends to publish results indicating sex differences, while ignoring those indicating equality, Maccoby has fought against the assignment of men and women to stereotypical professions. ■

Eleanor E. Maccoby

Born in Tacoma, Washington, Eleanor Maccoby (née Emmons) earned a bachelor's degree from the University of Washington and an MA and PhD in experimental psychology from the University of Michigan. In the 1940s, she worked for the Department of Agriculture, and then at Harvard University, supervising research on child-rearing practices. Perceiving that gender bias was holding her back, she moved to Stanford University, where she became the first woman to serve as Chair of the Psychology Department. Maccoby went on to receive a Lifetime Achievement Award from the American Psychology Foundation and The American Psychological Association introduced an award in her name. Maccoby's work to debunk stereotypes is considered fundamental to understanding children's socialization and gender differences.

Key works

1966 *The Development of Sex Differences*
1974 *The Psychology of Sex Differences*
1996 *Adolescents after Divorce*

MOST HUMAN BEHAVIOR IS LEARNED THROUGH MODELING

ALBERT BANDURA (1925–)

IN CONTEXT

APPROACH
Social learning theory

BEFORE
1938 B.F. Skinner proposes the behaviorist notion of operant conditioning, which explores positive and negative reinforcements in learning.

1939 US psychologist John Dollard argues that aggression is always a consequence of frustration, and that frustration always leads to aggression.

AFTER
1966 American pychologist Leonard Berkowitz claims environmental cues, such as those associated with aggressive behavior, must be present for aggression to follow anger.

1977 US psychologist Robert A. Baron suggests that Bandura's experiment implies that violence in the media contributes to violence in society.

In the 1940s and 1950s, learning was understood primarily in behaviorist terms, with B.F. Skinner's theory of operant conditioning—in which learning is wholly determined by rewards and punishments—dominating the field. From this context emerged Albert Bandura's interest in studying childhood aggression—an area he felt was too complex to explain in terms of operant conditioning—as a learned behavior.

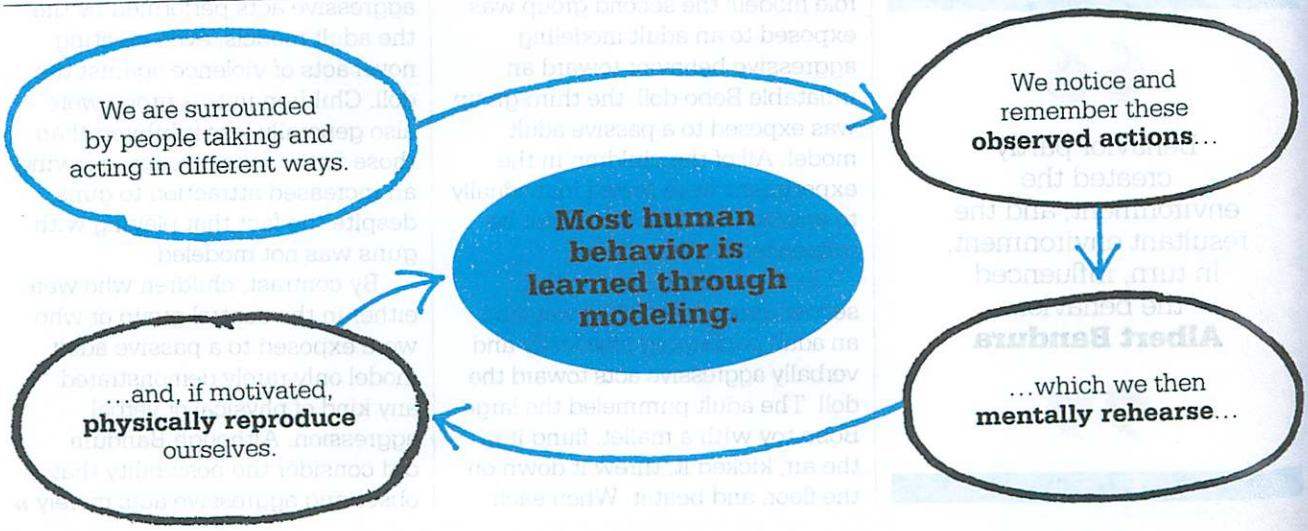
Bandura's hypothesis was that children learn aggression through observing and imitating the violent acts of adults—particularly family members. He believed that the key to the problem lies at the intersection of Skinner's operant conditioning and Freud's psychoanalytic theory of identification, which explores how people assimilate the characteristics of others into their own personalities. Bandura's work culminated in his famous Bobo doll experiment, and his hugely influential 1977 treatise *Social Learning Theory*.

Social learning theory

Bandura's belief that people learn not through reinforcement (rewards and punishments), but through observing others, is at the heart of social learning theory. This theory suggests that learning is achieved by mentally rehearsing and then imitating the observed actions of other people, who serve as models of appropriate or acceptable behavior. Bandura argued that "most human behavior is learned through modeling."

Bandura noted four conditions that are necessary for a person to successfully model the behavior of another: attention, retention, reproduction, and motivation. Learning requires that the learner is paying attention to the behavior in the first place, that he remembers what he saw or heard, that he is actually able to physically reproduce the behavior, and that he has a good motive or reason to reproduce it, such as the expectation of reward.

Although the concept of reward is part of his social learning theory, Bandura's move away from behaviorism is evident in his radical, anti-behaviorist ideas about the relationship between a person's environment and his or her behavior. According to behaviorism, environmental circumstances entirely determine



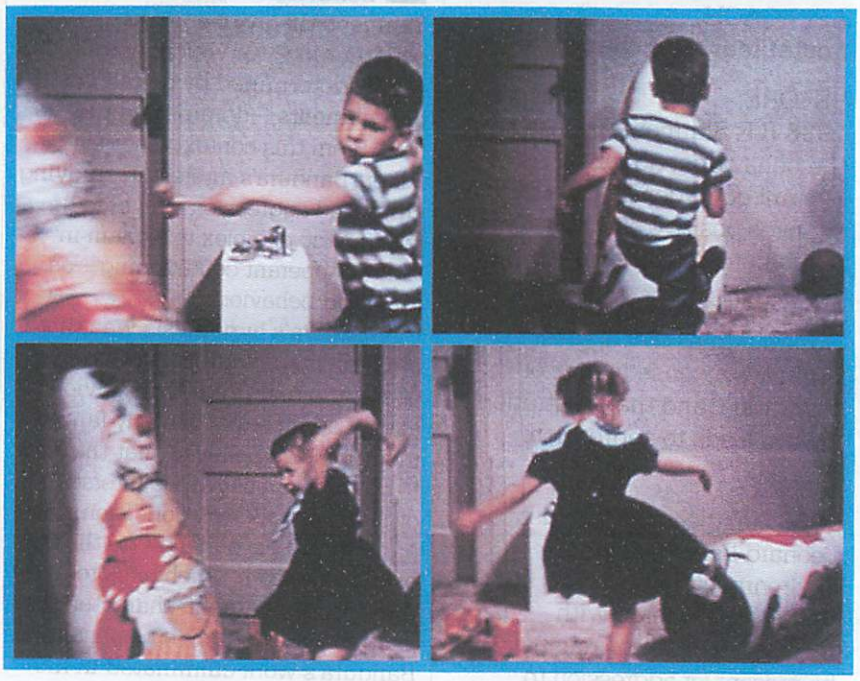
See also: Konrad Lorenz 77 ▪ B.F. Skinner 78–85 ▪ Sigmund Freud 92–99 ▪ Lev Vygotsky 270

behavior, but Bandura believes in "reciprocal determinism"—the idea that a person influences the environment just as the environment influences him. Bandura conceived of personality as an interaction between three different components: the environment, behavior, and psychological processes (the ability to use language and entertain images in the mind). All of these components are relevant to the study of childhood aggression, which, Bandura argued, was learned by watching and modeling adults.

Bobo doll experiment

Bandura's social learning point of view was the basis for his 1961 Bobo doll experiment on childhood aggression, which sought to explain how aggressive behavior develops, what provokes people to carry out aggressive acts, and what determines whether they will continue to behave aggressively. By proving that a child will imitate the behavior of an adult role model, the experiment showed the power of examples of aggression in society.

> Behavior partly created the environment, and the resultant environment, in turn, influenced the behavior.
> **Albert Bandura**



Children attack the Bobo doll in Bandura's 1961 experiment on aggressive behavior. In some cases, subjects devised new ways to attack the doll by using other toys in the room.

For the experiment, 36 boys and 36 girls, all between the ages of three and six, were recruited from a local nursery school. They were divided up into three groups of 24, each comprising 12 boys and 12 girls. The first group was the control group (which did not see any adult role model); the second group was exposed to an adult modeling aggressive behavior toward an inflatable Bobo doll; the third group was exposed to a passive adult model. All of the children in the experiment were tested individually to ensure that they would not be influenced by their peers.

In the experiments on the second group, each child watched an adult performing physically and verbally aggressive acts toward the doll. The adult pummeled the large Bobo toy with a mallet, flung it in the air, kicked it, threw it down on the floor, and beat it. When each child was later left alone in a room of toys that included a Bobo doll, he or she imitated a good deal of the aggressive acts performed by the the adult models, even creating novel acts of violence against the doll. Children in this group were also generally less inhibited than those in the other groups, showing an increased attraction to guns despite the fact that playing with guns was not modeled.

By contrast, children who were either in the control group or who were exposed to a passive adult model only rarely demonstrated any kind of physical or verbal aggression. Although Bandura did consider the possibility that observing aggressive acts merely »

Violence in computer games, and in the media generally, has been cited as a potential source of behavior modeling, although this view has not been strongly supported by studies.

weakened any inhibitions that the children may have already had about behaving violently, the fact that they often imitated the exact behavior they had just seen suggests that observational learning was taking place.

Violence in the media

Bandura's research has raised many important questions surrounding the prevalence of violence in the media. If a stranger performing aggressive acts can be a model of aggression for children, you might argue that television programs could also be considered a source of behavior modeling. Modern films and television shows include graphic violence, which is often expressed as an acceptable (or at least expected) form of behavior, which children who are regularly exposed to the media may feel inclined to imitate. This idea has been hotly debated. Many studies indicate that violent films and television shows do not increase a child's tendencies toward violence. Some studies even indicate that exposure to violence can actually decrease the amount of aggression in children. This theory—known as the Catharsis effect—suggests that an individual may be able to relate to a violent on-screen character and release negative feelings, thereby becoming less aggressive personally than prior to the viewing.

> “Exposure to aggressive modeling is hardly cathartic.”
> **Albert Bandura**

Other psychologists regard television as a form of education, and believe that, as characters often serve as role models for children, they should be positive models in order to help decrease the general level of violence prevalent in society.

Although Bandura himself does not believe in the Catharsis effect of viewing aggressive behavior, he was careful to note that there was a distinction between learning and performance. Children, he thought, could certainly learn aggressive behavior from viewing it, but knowledge of violent acts would not necessarily result in committing these acts themselves. He warned against assuming a more direct and causal relationship between violence in the media and real-world aggression.

Social learning theorists accept that cognition has a part to play in modeling, and that cognitive factors mediate the process between viewing violence and actually imitating it. For instance, the perception and interpretation of TV violence, and how realistic the program is, are both important intervening variables. Bandura also considers that environmental experiences are another influence in the social learning of aggression in children. Unsurprisingly, people living in neighborhoods with high crime rates are more likely to commit acts of violence than those living in low-crime areas.

Gender development

The social learning theory underlying Bandura's research on childhood aggression has important implications for our understanding of the development of gender identity. According to the gender development theory, one reason why boys and girls tend to exhibit differences in their behavior is that they are treated differently by their parents (as well as other significant adults and

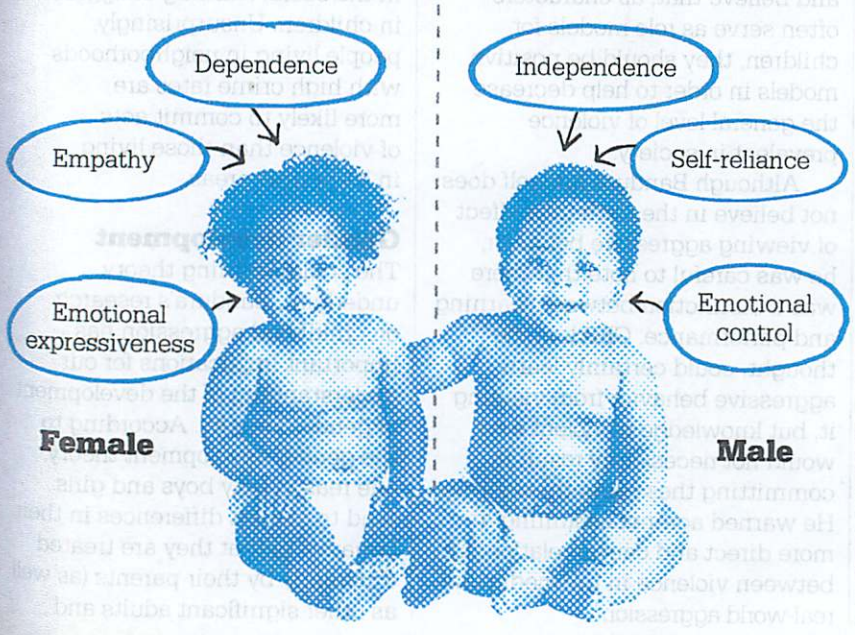
peers). It has been shown that people unwittingly tailor their behavior toward children from birth to match their own gender-role expectations; this encourages children to behave according to what are considered gender norms.

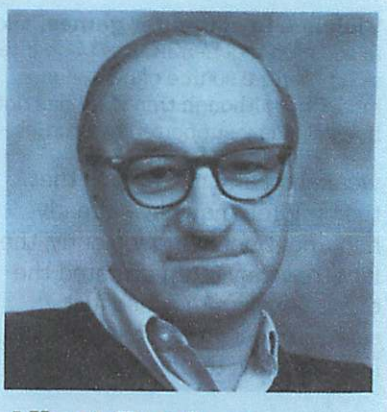
According to Bandura's findings, children also learn how to behave through reinforcement and observation learning. By imitating the behavior of others, children are highly likely to receive positive reinforcement for the type of behavior that is considered most appropriate to their sex. They will also be either directly or subtly discouraged from behaving in ways that are not sex-appropriate.

Although there has been some criticism of Bandura's work (often centered on whether his idea is truly a theory of cognitive development), his findings and theories are still cited and debated half a century later, reflecting the breadth and scope of his influence. His groundbreaking contributions span many of the fields of psychology, including social cognitive theory, personality theory, and even therapeutic practices. His ideas also serve as a bridge between preceding behaviorist learning theories and subsequent cognitive learning theories.

Bandura's focus on processes such as attention, memory, and motivation marked a departure from studying only observable and measurable variables (the sole concern of behaviorists) and looked instead to the mental realm—the mind—for information about how people learn. For these reasons, Bandura is considered by many of his peers to be one of the most distinguised and influential psychologists of all time. ■

Behavior seen as sex-appropriate in children, such as independence (in boys) or empathy (in girls), is often positively reinforced by adults' expectations, as well as by children's imitation of adults and peers.





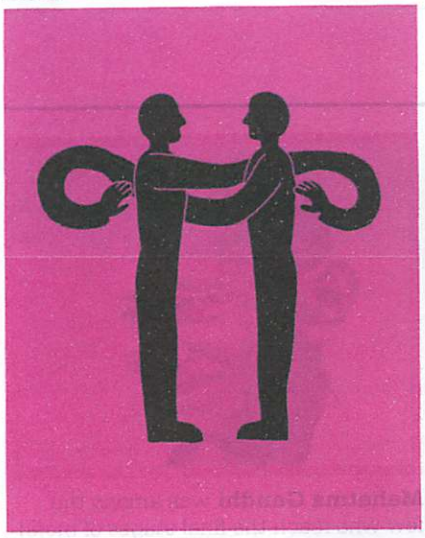
Albert Bandura

Albert Bandura was born to Polish parents in the small town of Mundare in Alberta, Canada. He graduated from the University of British Columbia, moving on to take his master's degree and doctorate at the University of Iowa, where his interest in learning theory developed. In 1953, he took up a teaching post at Stanford University, California, where he is a professor emeritus.

One of the world's most eminent and influencial psychologists, Bandura has received numerous awards, including the Thorndike Award for Distinguished Contributions of Psychology to Education (1999), and a Lifetime Achievement Award from the Association for the Advancement of Behavior Therapy (2001). He also has more than 16 honorary degrees, and in 1974 was elected president of the American Psychological Association.

Key works

1973 *Aggression: A Social Learning Analysis*
1977 *Social Learning Theory*
1986 *Social Foundations of Thought and Action: A Social Cognitive Theory*



MORALITY DEVELOPS IN SIX STAGES

LAWRENCE KOHLBERG (1927–1987)

IN CONTEXT

APPROACH
Moral development

BEFORE
1923 Sigmund Freud offers a psychoanalytic account of moral development.

1932 Jean Piaget argues that morality develops from two types of reasoning: one that is subject to the rules of others, and another that is subject only to a person's own rules.

AFTER
1977 American educational psychologist William Damon suggests that young children are able to take the needs of others into account, earlier than Kohlberg claims they are.

1982 American psychologist Nancy Eisenberg argues that in order to understand children's moral development, we must examine their reasoning when faced with conflict between their own needs and those of others.

Lawrence Kohlberg believed that morality develops gradually throughout childhood and adolescence. In 1956, he began a study involving 72 boys between the ages of 10 and 16. He presented the boys with moral dilemmas that required them to choose between two alternatives, neither of which could be considered completely acceptable, and noted their responses. One example was whether it was right or wrong for a man with no money to steal drugs that his sick wife desperately needed. Kohlberg followed up on 58 of the boys, testing them every three years over the course of 20 years, to

Morality develops in six stages throughout childhood, adolescence, and adulthood.

↓

In the **two preconventional stages**, moral behavior is determined by the concepts of punishment, reward, and reciprocity.

↓

In the **two conventional stages**, moral behavior is consistent with doing what others believe to be right, upholding laws, and maintaining social order.

↓

In the **two postconventional stages**, the individual is the ultimate judge of moral behavior, based on his own conscience and universal moral principles rather than social norms.

See also: Sigmund Freud 92–99 ▪ Jean Piaget 262–69 ▪ Albert Bandura 286–91

> Moral thought may be considered partially to generate its own data as it goes along.
> **Lawrence Kohlberg**

observe how their moral inclinations changed with age. Based on the answers given by his subjects, Kohlberg identified six stages of moral development, which spanned three levels of moral reasoning: preconventional, conventional, and postconventional.

Building moral reasoning

The preconventional level of moral reasoning, which develops during our first nine years of life, considers rules as fixed and absolute. In the first of its two stages (the stage of obedience and punishment), we determine whether actions are right or wrong by whether or not they lead to a punishment. In the second stage (the stage of individualism and exchange), right and wrong are determined by what brings rewards. The desires and needs of others are important, but only in a reciprocal sense—"You scratch my back and I'll scratch yours." Morality at this level is governed by consequence.

The second level of moral reasoning starts in adolescence, and continues into early adulthood. It sees us starting to consider the intention behind behavior, rather than just the consequences. Its first stage, often called the "good boy–nice girl" stage, is when we begin classifying moral behavior as to whether it will help or please. Being seen as good becomes the goal. In the second stage (the law and order stage), we start to equate "being good" with respecting authority and obeying the law, believing that this protects and sustains society.

Mahatma Gandhi was among the few who reach the final stages of moral development described by Kohlberg. Throughout his adult life, he felt a duty to disregard unjust and oppresive laws.

The third level of moral development is when we move beyond simple conformity, but Kohlberg suggested that only around 10–15 percent of us ever reach this level. In its first stage (the social contract and individual rights stage), we still respect authority, but there is a growing recognition that individual rights can supersede laws that are destructive or restrictive. We come to realize that human life is more sacred than just following rules. The sixth and final stage (the stage of universal ethical principles) is when our own conscience becomes the ultimate judge, and we commit ourselves to equal rights and respect for all. We may even resort to civil disobedience in the name of universal principles, such as justice.

Kohlberg's six-stage theory was considered radical, because it stated that morality is not imposed on children (as psychoanalysts said), nor is it about avoiding bad feelings (as the behaviorists had thought). Kohlberg believed children developed a moral code and awareness of respect, empathy, and love through interaction with others. ■

Lawrence Kohlberg

The youngest of four children, Lawrence Kohlberg was born in Bronxville, New York. After completing high school at the end of World War II, he became a sailor, and helped smuggle Jewish refugees into Palestine.

In 1948, Kohlberg enrolled at the University of Chicago, where he completed his bachelor's degree in just one year, and went on to research and teach, gaining a doctorate in 1958. He also taught at Yale University, and finally Harvard.

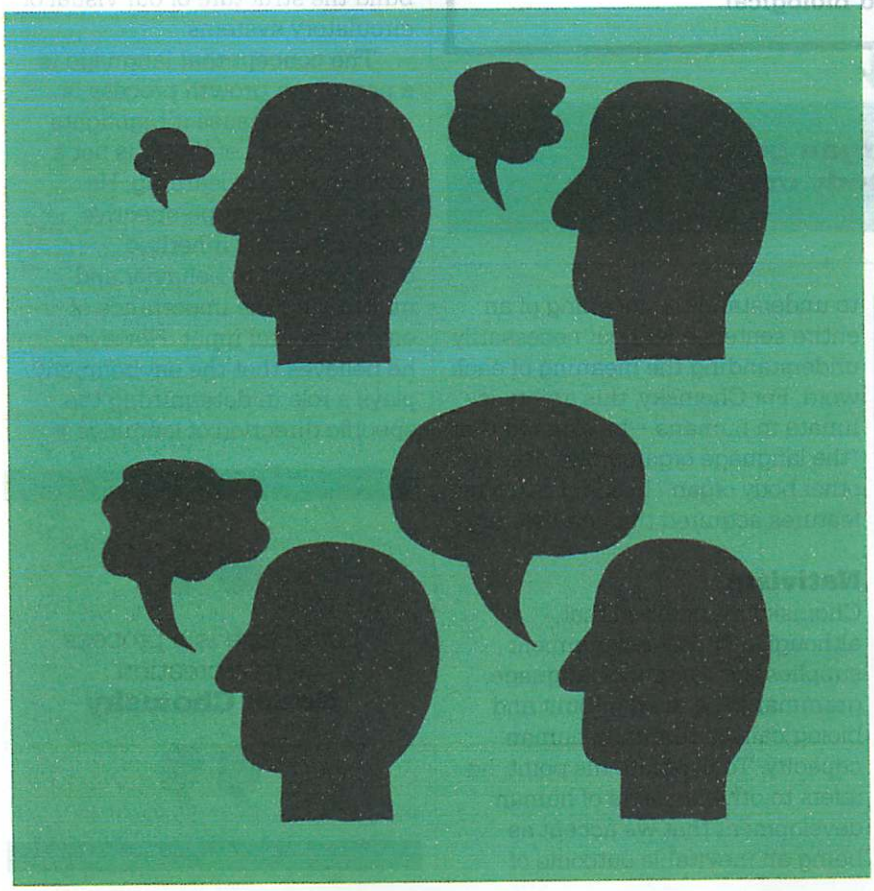
While in Belize in 1971, Kohlberg contracted a parasitic infection that left him battling with persistent pain and depression. On January 19, 1987, after asking to leave a treatment session, he committed suicide, reportedly by walking into the icy waters of the Atlantic Ocean.

Key works

1969 *Stage and Sequence*
1976 *Moral Stages and Moralization*
1981 *The Philosophy of Moral Development*

THE LANGUAGE ORGAN GROWS LIKE ANY OTHER BODY ORGAN

NOAM CHOMSKY (1928–)



IN CONTEXT

APPROACH
Nativism

BEFORE
1958 B.F. Skinner uses operant conditioning to explain language development, arguing that children learn words and phrases through reinforcement.

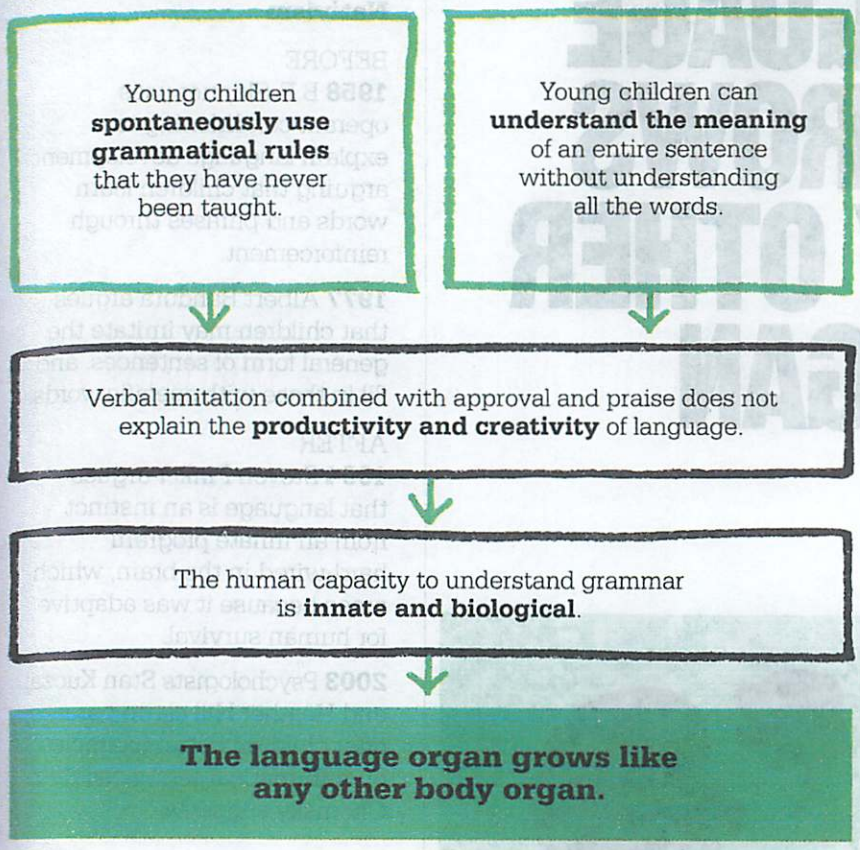
1977 Albert Bandura argues that children may imitate the general form of sentences, and fill in these with specific words.

AFTER
1994 Steven Pinker argues that language is an instinct from an innate program hard-wired in the brain, which arose because it was adaptive for human survival.

2003 Psychologists Stan Kuczaj and Heather Hill claim parents offer children better examples of grammatical sentences than Chomsky suggests.

In the middle of the 20th century, learning theory as explained by B.F. Skinner and Albert Bandura dominated psychologists' conception of language development. These behaviorists believed that language—like all other human faculties—was a direct result of environmental input and learning, developed through the reinforcement and reward techniques at the heart of operant conditioning. Skinner noted that when children imitate verbal sounds, and form correct words, they receive immediate reinforcement and approval from their parents, which motivates

See also: B.F. Skinner 78–85 ▪ Jerome Bruner 164–65 ▪ Steven Pinker 211 ▪ Jean Piaget 262–69 ▪ Albert Bandura 286–91



them to continue learning new words and phrases. Bandura broadened the concept of imitation, noting that children imitated not only specific words and sounds, but also the general form and structure of sentences, as though filling in templates with specific words.

Linguist Noam Chomsky, however, did not believe that operant conditioning adequately explained the productivity, creativity, and innovation of language. It also seemed insufficient to explain children's spontaneous use of grammatical rules that they have neither heard nor learned, as well as their ability to understand the meaning of an entire sentence without necessarily understanding the meaning of each word. For Chomsky, this ability is innate in humans—he claimed that "the language organ grows like any other body organ," likening it to other features acquired through heredity.

Nativism

Chomsky maintained that, although a child's environment supplies the content of language, grammar itself is an in-built and biologically determined human capacity. To illustrate his point, he refers to other aspects of human development that we accept as being an inevitable outcome of heredity. The onset of puberty, for instance, is an aspect of human growth that is like the "growth" of the language organ. We assume unquestioningly that it is a genetically determined milestone, and though the specific details of its onset depend on several variable environmental influences, the fundamental process is the same across the human species. We take for granted that this is a result of basic biological programming. Language growth, Chomsky emphasizes, is another genetically programmed inevitability of human development, on a par with the processes that determine that we have arms instead of wings, or that build the structure of our visual or circulatory systems.

The concept that language is a part of our growth process is important because it highlights Chomsky's belief that it is not a consequence of learning. He adopts a nativist perspective, focusing on the inherited contributions to behavior and minimizing the importance of environmental input. However, he believes that the environment plays a role in determining the specific direction of language »

> “Language is a process of free creation.”
> **Noam Chomsky**

growth, insofar as an individual's language organ develops according to early experiences. For instance, because Chomsky grew up in Philadelphia, Pennsylvania, he absorbed knowledge of that particular English dialect and his language organ's structure was tailored accordingly. The same process occurs for everyone, whether they have grown up in Paris, Tokyo, or London.

Universal grammar

But where is the proof that language acquisition is inborn rather than learned? According to Chomsky, the most convincing evidence for this claim is that there are aspects of grammar that are so intuitive and self-evident that they need never be discussed or learned in order to be understood (they are therefore part of our biological inheritance). For instance, there are certain constructions in the English language that permit the dropping of pronouns, and others that do not. The difference between the two is subtle, yet even by the age of six, native English-speaking children will use the constructions flawlessly. This implies that certain aspects of grammar are understood without requiring any instruction, and that the knowledge is therefore innate. This is the only way to explain how people have such a rich grammatical understanding and how children can use language so creatively by the age of six.

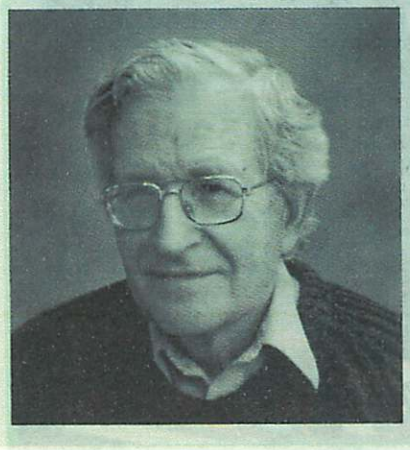
Chomsky claims that "universal grammar" is found worldwide, with modifications according to people's native languages. It is a predefined mechanism that acts as the basis for the acquisition of any language. He argues that this is demonstrated by the way that all children are equally able to learn any language to which they are exposed. He says that a common set of linguistic features is built into the language organ through heredity, and it includes elements of grammar, meaning, and speech. It is what makes it possible for us to speak and learn human languages, and may make it impossible for us to learn any language that violates these principles.

Language device

Chomsky proposes a name for our innate language organ: the Language Acquisition Device (LAD). He bases his claim for its existence on three things: the fact that children are born with the capacity to formulate and understand all kinds of sentences despite never having heard or learned them; that every human language appears to have certain universal elements; and that some grammatical principles are acquired by individuals regardless of their culture or intelligence. There is other supporting evidence as well, including the fact that the human vocal organs, breathing

> We are designed to learn languages based upon a common set of principles, which we may call universal grammar.
> **Noam Chomsky**

Noam Chomsky



Linguist, philosopher, cognitive scientist, and social activist Noam Chomsky was born in Pennsylvania to Jewish parents. He studied philosophy and linguistics at the University of Pennsylvania, where he earned his bachelor's, master's, and doctoral degrees. Chomsky joined the Massachusetts Institute of Technology in 1955, becoming an Institute Professor in 1976.

Chomsky is widely known as one of the fathers of modern linguistics, but he is also a political dissident and anarchist. His criticisms of US foreign policy have made him a highly controversial figure. He has won several honorary degrees as well as being a recipient of the Distinguished Scientific Contribution Award, the Dorothy Eldridge Peacemaker Award, and the Orwell Award. He was married to linguist Carol Schatz for 59 years until her death in 2008.

Key works

1957 *Syntactic Structures*
1965 *Cartesian Linguistics*
1968 *Language and Mind*

Deaf children communicate using a "gestural language," which has the same characteristics as spoken language, suggesting that knowledge of grammar and syntax is innate.

apparatus, auditory system, and brain are all specialized for spoken communication. Chomsky argues that, in light of the frequency with which children are exposed to the ungrammatical and incomplete speech uttered by their parents and other adults, only some kind of LAD can explain the fact that children seem to possess knowledge of grammatical rules. Finally, studies of deaf children provide further evidence for an LAD, revealing the untutored emergence of a "gestural language" that shares the basic principles of spoken language.

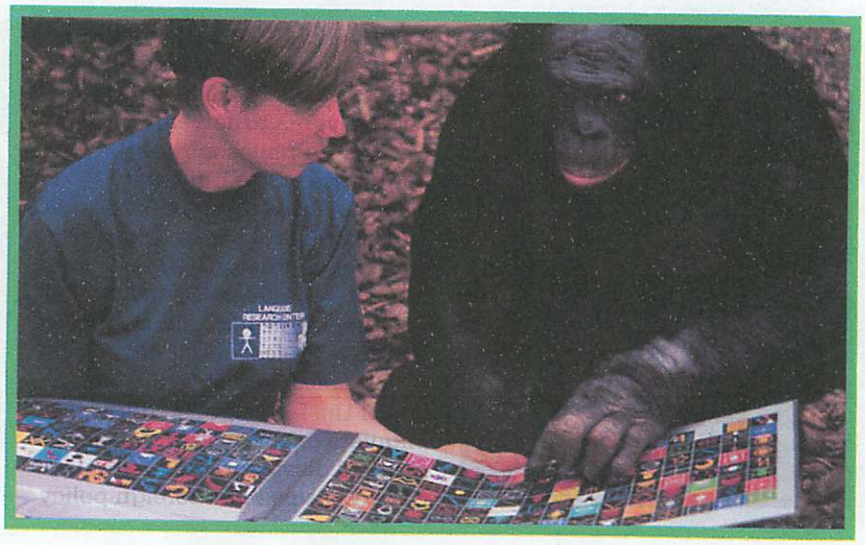
Evaluation

Cognitive scientist Steven Pinker agrees that language is an instinct stemming from an innate program that is hard-wired in the human brain, but says that it arose through evolution and was therefore adaptive, helping our ancestors to survive. Chomsky disagrees with Pinker about how language evolved, arguing that language represents a distinct mental module that is unique to human beings and completely independent of general cognitive ability.

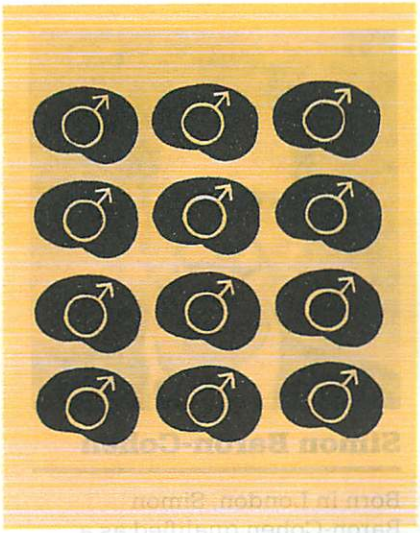
Linguist Jean Aitchison is also in agreement with Chomsky's claim that children are hard-wired with knowledge of linguistic rules, but her view is that children have built-in problem-solving abilities that enable them to process linguistic data (and other forms of data). Chomsky maintains, however, that human beings' innate language ability exists independently of other abilities, and because the mind is constructed of mental organs similar to those of the body, language can easily be isolated from other mental faculties.

Criticism also comes from Robin Chapman, an expert in communicative disorders, who argues that the study of language development should also be understood within the context of children's social interactions. She notes that language structure is acquired piecemeal over several years, and that there are wide variations in how rapidly children acquire it, suggesting that social environment could also be a factor. There is also some degree of doubt surrounding Chomsky's assumption that language is unique to human beings. Data from studies with chimpanzees and gorillas has suggested that the difference between ape and human language is quantitative rather than qualitative, which raises questions about how species-specific language really is.

Chomsky's work has been highly influential across linguistics, psychology, philosophy, and even mathematics. Although the idea that children are predisposed to learn language is widely accepted, his claim that children have an innate knowledge of language that is not deeply influenced by their parents is highly controversial. He has been widely considered the most extreme nativist in the history of psychology, and although a biological source for language development is widely thought to be nearer the truth than one involving operant conditioning, it is still unlikely to offer the complete picture. Chomsky's work has led to the emergence of more integrated views, which will no doubt lead to new research and understanding. ■



Studies of how chimpanzees communicate with each other shows that their language is complex, although it appears to have less content and variation than human language.



AUTISM IS AN EXTREME FORM OF THE MALE BRAIN

SIMON BARON-COHEN (1958–)

IN CONTEXT

APPROACH
Theory of mind

BEFORE
1943 American psychiatrist Leo Kanner identifies autism, suggesting it is the result of cold, unemotional parenting.

1944 Austrian pediatrician Hans Asperger describes autism as "an extreme variant of male intelligence."

1979 British psychiatrists Lorna Wing and Judith Gould discover that there is a wide spectrum of autistic disorders.

AFTER
1989 German-born psychologist Uta Frith states that autistic individuals tend to notice detail, rather than the broader aspects of situations.

1997 UK psychologist Peter Mitchell argues Baron-Cohen's "theory of mind" fails to explain the exceptional memory and ability in specific areas that some autistic people possess.

Autism is a disorder that affects the brain's normal development of social and communication skills. Autistic children often react to the world around them in a way that seems bizarre to others. They may have poor communication skills, and social interaction with autistic children tends to be challenging, partly because many of them fail to speak, and partly because many show little interest in others. The majority of autistic children are male, and most remain impaired throughout adulthood. Various explanations for autism have been offered. One of the most recent and influential theories is Simon Baron-Cohen's "theory of mind" hypothesis, which, when supported by his observations about sex differences in the brain, suggests that "autism is an extreme form of the male brain."

> "The person with the extreme female brain would be 'system-blind.'"
> **Simon Baron-Cohen**

Brain types

In 2003, Baron-Cohen developed the empathizing–systematizing theory of "female" and "male" brains, which assigns a particular "brain type" to every person, regardless of gender, depending on ability to empathize or systematize. His research suggests that the female brain is largely hard-wired for empathy, with females usually showing more sympathy for others, and greater sensitivity to facial expressions and non-verbal communication. The male brain, by contrast, appears to be geared toward understanding and building systems; it is mostly interested in how things work, as well as their structure, and organization. It is therefore often better at tasks requiring decoding skills, such as map reading.

This does not mean, however, that there is a neat gender split. Baron-Cohen's experiments showed that around 17 percent of men appear to have an "empathizing brain," and 17 percent of women

See also: Roger W. Sperry 337–38 ▪ Heinz Heckhausen 338–39 ▪ Michael Rutter 339

The **male brain** is predominantly hard-wired for understanding and building systems.

The **female brain** is predominantly hard-wired for empathy.

Autistic people are obsessed with understanding and **working with systems**, but do not have the **"tools" for empathy**.

Autism is an extreme form of the male brain.

have a "systematizing brain," while many people have a "balanced" brain of equal abilities.

Theory of mind

Baron-Cohen believes that autistic people lack a "theory of mind"—the ability to interpret others' emotions and actions successfully—and so are unable to assess another's state of mind or intentions. Also, they often have obsessive interests that are centered on some form of system, such as an intense preoccupation with light switches. They focus on tiny details in the system, working out the underlying rules that govern it, or home in on a specific topic, learning everything about it with great accuracy. This mix of little or no empathy and an obsession with systems, along with the higher rate of autism in males, led Baron-Cohen to conclude that autistic people have an extreme "male" brain.

Autism is one of the most severe psychiatric disorders in children, and Baron-Cohen's ideas have helped to deepen understanding of the condition, raising awareness and making treatment more effective. ■

Autistic children sometimes show remarkable aptitude in certain areas, especially those that demand acute observation of fine detail, such as mathematics, drawing, and painting.

Simon Baron-Cohen

Born in London, Simon Baron-Cohen qualified as a clinical psychologist at London University's Institute of Psychiatry, and took his PhD at University College, London.

In 1995, he became a fellow in experimental psychology at Trinity College, Cambridge, and is currently the university's Professor of Developmental Psychopathology and director of its Autism Research Centre, where his work involves investigating ways of treating autism, as well as research into possible causes.

His many accolades include the President's Award and Spearman Medal from the British Psychological Society, plus the Boyd McCandless Award from the American Psychological Association.

From 2009 to 2011, Baron-Cohen served as vice-president of the International Society of Autism Research, and is also vice-president of the National Autistic Society (UK).

Key works

1993 *Autism: The Facts*
1995 *Mindblindness*
1999 *Teaching Children with Autism to Mind-Read*
2003 *The Essential Difference*