01 - 2.1 Jean Piaget and Cognitive Development

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Contributions of the Psychosocial Sciences 2.1 Jean Piaget and Cognitive Development Jean Piaget (1896–1980) is considered one of the greatest thinkers of the 20th century. His contributions to the understanding of cognitive development had paradigmatic influence in developmental psychology and had major implications for interventions with children, both educational and clinical. Piaget was born in Neuchatel, Switzerland, where he studied at the university and received a doctorate in biology at the age of 22 (Fig. 2.1-1). Interested in psychology, he studied and carried out research at several centers, including the Sorbonne in Paris, and he worked with Eugen Bleuler at the Burghöltzli Psychiatric Hospital. FIGURE 2.1-1 Jean Piaget (1896–1980). (Reprinted from the Jean Piaget Society, Temple University, Philadelphia, PA, with permission.)

Piaget created a broad theoretical system for the development of cognitive abilities; in this sense, his work was similar to that of Sigmund Freud, but Piaget emphasized the ways that children think and acquire knowledge. Widely renowned as a child (or developmental) psychologist, Piaget referred to himself primarily as a genetic epistemologist; he defined genetic epistemology as the study of the development of abstract thought on the basis of a biological or innate substrate. That self-designation reveals that Piaget's central project was more than the articulation of a developmental child psychology, as this term is generally understood; it was an account of the progressive development of human knowledge. COGNITIVE DEVELOPMENT STAGES According to Piaget, the following four major stages lead to the capacity for adult thought (Table 2.1-1): (1) sensorimotor, (2) preoperational thought, (3) concrete operations, and (4) formal operations. Each stage is a prerequisite for the following one, but the rate at which different children move through different stages varies with their native endowment and environmental circumstances. Table 2.1-1 Stages of Intellectual Development Postulated by Piaget Sensorimotor Stage (Birth to 2 Years) Piaget used the term sensorimotor to describe the first stage: Infants begin to learn through sensory observation, and they gain control of their motor functions through activity, exploration, and manipulation of the environment. Piaget divided this stage into six substages, listed in Table 2.1-2. Table 2.1-2 Piaget's Sensorimotor Period of Cognitive Development

From the outset, biology and experience blend to produce learned behavior. For example, infants are born with a sucking reflex, but a type of learning occurs when infants discover the location of the nipple and alter the shape of their mouths. A stimulus is received, and a response results, accompanied by a sense of awareness that is the first schema, or elementary concept. As infants become more mobile, one schema is built on another, and new and more complex schemata are developed. Infants' spatial, visual, and tactile worlds expand during this period; children interact actively with the environment and use previously learned behavior patterns. For example, having learned to use a rattle, infants shake a new toy as they did the rattle they had already learned to use. Infants also use the rattle in new ways. The critical achievement of this period is the development of object permanence or the schema of the permanent object. This phrase relates to a child's ability to understand that objects have an existence independent of the child's involvement with them. Infants learn to differentiate themselves from the world and are able to maintain a mental image of an object, even when it is not present and visible. When an object is dropped in front of infants, they look down to the ground to search for the object; that is, they behave for the first time as though the object has a reality outside themselves. At about 18 months, infants begin to develop mental symbols and to use words, a process known as symbolization. Infants are able to create a visual image of a ball or a mental symbol of the word ball to stand for, or signify, the real object. Such mental representations allow children to operate on new conceptual levels. The attainment of object permanence marks the transition from the sensorimotor stage to the

preoperational stage of development. Stage of Preoperational Thought (2 to 7 Years) During the stage of preoperational thought, children use symbols and language more extensively than in the sensorimotor stage. Thinking and reasoning are intuitive; children learn without the use of reasoning. They are unable to think logically or deductively, and their concepts are primitive; they can name objects but not classes of objects. Preoperational thought is midway between socialized adult thought and the completely autistic Freudian unconscious. Events are not linked by logic. Early in this stage, if children drop a glass that then breaks, they have no sense of cause and effect. They believe that the glass was ready to break, not that they broke the glass. Children in this stage also cannot grasp the sameness of an object in different circumstances: The same doll in a carriage, a crib, or a chair is perceived to be three different objects. During this time, things are represented in terms of their function. For example, a child defines a bike as "to ride" and a hole as "to dig." In this stage, children begin to use language and drawings in more elaborate ways. From one-word utterances, two-word phrases develop, made up of either a noun and a verb or a noun and an objective. A child may say, "Bobby eat," or "Bobby up." Children in the preoperational stage cannot deal with moral dilemmas, although they have a sense of what is good and bad. For example, when asked, "Who is more guilty, the person who breaks one dish on purpose or the person who breaks 10 dishes by accident?" a young child usually answers that the person who breaks 10 dishes by accident is more guilty because more dishes are broken. Children in this stage have a sense of immanent justice, the belief that punishment for bad deeds is inevitable. Children in this developmental stage are egocentric: They see themselves as the center of the universe; they have a limited point of view; and they are unable to take the role of another person. Children are unable to modify their behavior for someone else; for example, children are not being negativistic when they do not listen to a command to be quiet because their brother has to study. Instead, egocentric thinking prevents an understanding of their brother's point of view. During this stage, children also use a type of magical thinking, called phenomenalistic causality, in which

events that occur together are thought to cause one another (e.g., thunder causes lightning, and bad thoughts cause accidents). In addition, children use animistic thinking, which is the tendency to endow physical events and objects with lifelike psychological attributes, such as feelings and intentions. Semiotic Function. The semiotic function emerges during the preoperational period. With this new ability, children can represent something—such as an object, an event, or a conceptual scheme—with a signifier, which serves a representative function (e.g., language, mental image, symbolic gesture). That is, children use a symbol or sign to stand for something else. Drawing is a semiotic function initially done as a playful exercise but eventually signifying something else in the real world.

Stage of Concrete Operations (7 to 11 Years) The stage of concrete operations is so named because in this period children operate and act on the concrete, real, and perceivable world of objects and events. Egocentric thought is replaced by operational thought, which involves dealing with a wide array of information outside the child. Therefore, children can now see things from someone else's perspective. Children in this stage begin to use limited logical thought processes and can serialize, order, and group things into classes on the basis of common characteristics. Syllogistic reasoning, in which a logical conclusion is formed from two premises, appears during this stage; for example, all horses are mammals (premise); all mammals are warm blooded (premise); therefore, all horses are warm blooded (conclusion). Children are able to reason and to follow rules and regulations. They can regulate themselves, and they begin to develop a moral sense and a code of values. Children who become overly invested in rules may show obsessive-compulsive behavior; children who resist a code of values often seem willful and reactive. The most desirable developmental outcome in this stage is that a child attains a healthy respect for rules and understands that there are legitimate exceptions to rules. Conservation is the ability to recognize that, although the shape of objects may change, the objects still maintain or conserve other characteristics that enable them to be recognized as the same. For example, if a ball of clay is rolled into a long, thin sausage shape, children recognize that each form contains the same amount of clay. An inability to conserve (which is characteristic of the preoperational stage) is observed when a child declares that there is more clay in the sausage-shaped piece because it is longer. Reversibility is the capacity to understand the relation between things, to realize that one thing can turn into another and back again—for example, ice and water. The most important sign that children are still in the preoperational stage is that they have not achieved conservation or reversibility. The ability of children to understand concepts of quantity is one of Piaget's most important cognitive developmental theories. Measures of quantity include measures of substance, length, number, liquids, and area (Fig. 2.1-2).

FIGURE 2.1-2 Some simple tests for conservation, with approximate ages of attainment. When the sense of conservation is achieved, the child answers that B contains the same quantity as A. (Modified from Lefrancois GR. Of Children: An Introduction to Child Development. Wadsworth: Belmont, CA; 1973:305, with permission.) The 7- to 11-year-old child must organize and order occurrences in the real world. Dealing with the future and its possibilities occurs in the formal operational stage. Stage of Formal Operations (11 through the End of Adolescence) The stage of formal operations is so named because young persons' thinking operates in a formal, highly logical, systematic, and symbolic manner. This stage is characterized by the ability to think abstractly, to reason deductively, and to define concepts, and also by the emergence of skills for dealing with permutations and combinations; young persons can grasp the concept of probabilities. Adolescents

attempt to deal with all possible relations and hypotheses to explain data and events during this stage. Language use is

complex; it follows formal rules of logic and is grammatically correct. Abstract thinking is shown by adolescents' interest in a variety of issues—philosophy, religion, ethics, and politics. Hypotheticodeductive Thinking. Hypotheticodeductive thinking, the highest organization of cognition, enables persons to make a hypothesis or proposition and to test it against reality. Deductive reasoning moves from the general to the particular and is a more complicated process than inductive reasoning, which moves from the particular to the general. Because young persons can reflect on their own and other persons' thinking, they are susceptible to self-conscious behavior. As adolescents attempt to master new cognitive tasks, they may return to egocentric thought, but on a higher level than in the past. For example, adolescents may think that they can accomplish everything or can change events by thought alone. Not all adolescents enter the stage of formal operations at the same time or to the same degree. Depending on individual capacity and intervening experience, some may not reach the stage of formal operational thought at all and may remain in the concrete operational mode throughout life. PSYCHIATRIC APPLICATIONS Piaget's theories have many psychiatric implications. Hospitalized children who are in the sensorimotor stage have not achieved object permanence and, therefore, have separation anxiety. They do best if their mothers are allowed to stay with them overnight. Children at the preoperational stage, who are unable to deal with concepts and abstractions, benefit more from role-playing proposed medical procedures and situations than by having them verbally described in detail. For example, a child who is to receive intravenous therapy is helped by acting out the procedure with a toy intravenous set and dolls. Because children at the preoperational stage do not understand cause and effect, they may interpret physical illness as punishment for bad thoughts or deeds; and because they have not yet mastered the capacity to conserve and do not understand the concept of reversibility (which normally occurs during the concrete operational stage), they cannot understand that a broken bone mends or that blood lost in an accident is replaced. Adolescents' thinking, during the stage of formal operations, may appear overly abstract when it is, in fact, a normal developmental stage. Adolescent turmoil may not herald a psychotic process but may well result from a normal adolescent's coming to grips with newly acquired abilities to deal with the unlimited possibilities of the surrounding world. Adults under stress may regress cognitively as well as emotionally. Their thinking can become preoperational, egocentric, and sometimes animistic. Implications for Psychotherapy

Piaget was not an applied psychologist and did not develop the implications of his cognitive model for psychotherapeutic intervention. Nevertheless, his work formed one of the foundations of the cognitive revolution in psychology. One aspect of this revolution was an increasing emphasis on the cognitive components of the therapeutic endeavor. In contrast to classical psychodynamic therapy, which focused primarily on drives and affects, and in contrast to behavior therapy, which focused on overt actions, cognitive approaches to therapy focused on thoughts, including automatic assumptions, beliefs, plans, and intentions. By including "theory theory" and "script theory" we can see additional applications to psychotherapy. Cognitive development theory has influenced psychotherapeutic approaches in multiple ways. Some therapists have taken developmental notions from Piaget's work and developed intervention techniques. Others have developed cognitive models of treatment independent of Piaget but with heavy reliance on the role of cognition. Others have included Piaget's concepts in a broader set of constructs to undergird

new developmental approaches to psychotherapy. First, some psychotherapists applied Piagetian notions directly to child interventions. Susan Harter, for example, discussed techniques for helping young children become aware of divergent or contradictory emotions and to integrate these complex emotions within a more abstract or higher class of emotions. One of Harter's techniques is to ask the young child to make a drawing that shows different and conflicting feelings in one person. This technique represents an application of the concrete operation of class inclusion to the realm of the emotions. Harter's work applied Piagetian findings to the common therapeutic problem of helping children to recognize, tolerate, and integrate mixed or ambivalent affects within stable object relations. As such, it drew on cognitive theory and psychodynamic theory. Similar techniques are important in work with children who have been exposed to trauma or to sexual abuse. It is an essential component of such work to assist them in labeling, differentiating, and accepting the full range of emotions stemming from these experiences. Second, other psychotherapists developed treatment models that, although not directly dependent on Piagetian psychology, emphasized core ideas quite similar to those Piaget discovered in his naturalistic observations of cognitive development. These models are even more closely aligned with recent developments in "theory theory." Aaron Beck, for example, developed an entire school of cognitive therapy that focuses on the role of cognitions in causing or maintaining psychopathology. Cognitive therapy has been shown to be an effective treatment for problems as diverse as depression, anxiety disorders, and substance abuse. A core idea in cognitive therapy is that the patient has developed certain core beliefs, aspects of the self-schema, and conditional probability beliefs as a result of developmental experiences, and these contribute to emotional or behavioral problems. For example, depressed persons may have the core belief "I am unlovable." Addicted persons may have the belief "Unless I drink I cannot feel happy." In cognitive therapy, the person can be assisted to identify the negative automatic thoughts and underlying

dysfunctional attitudes or beliefs that contribute to emotional distress or addictive behavior. The key therapeutic process after identification of the maladaptive thoughts is to help the patient view these thoughts more objectively, not take them in an unquestioning manner as veridical. Here, cognitive therapy emphasizes evidence, consistent both with Piagetian theory and "theory theory." The patient is assisted to seek out evidence to test negative thinking; active involvement, rather than passive listening, is required. What the cognitive therapist accomplishes through such techniques as Socratic questioning and asking if there are other ways to look at the same event is similar to what the talented teacher does in guiding children to more adequate, more intelligent understanding of operational tasks. The notion of equilibration is relevant in both instances. By helping the individual see that previous cognitive structures are in some ways inadequate, the therapist or teacher disturbs the old cognitive structure, and the patient or student experiences a disruption that leads to the search for more-adequate structures. The compensation for external disturbance is what Piaget termed equilibration. New structures can be constructed only through a process of accommodation, enabling the subject to assimilate a wider array of data, a new perspective, or more complex information. Because it requires thinking about thinking, cognitive therapy seems to require formal operational thinking, although this has not been empirically tested. At the least, it requires the ability to recognize and articulate affects, to recognize and label events that give rise to affects, and to translate into a thought the mediating process that occurs rapidly between the event and the affect. Cognitive–behavioral models of psychotherapy include cognitive techniques and more behavioral, interactive techniques, such as increasing pleasant activities and improving communication and problemsolving skills. It is possible that the less-cognitive, more-behavioral techniques, although requiring a lower level of cognitive development,

can also lead to garnering of evidence and modification of specific expectancies, attributions, and self-schemata. Because “script theory” or narrative approaches to cognition in psychotherapy are empirically based, generated by repetitive experiences rather than by reflective abstraction, and domain specific, they may have even more general application to psychotherapy than classic Piagetian theories or “theory theory.” For example, in dialectical behavior therapy, patients provide a “chain analysis” of events, feelings, thoughts, situational stimuli, and interpersonal factors that led up to a negative or selfdamaging behavior. This narrative provides guidance to the patient and the therapist about where and how to intervene to prevent subsequent similar behavior. Developmentally Based Psychotherapy Developmentally based psychotherapy, developed by Stanley Greenspan, M.D., integrates cognitive, affective, drive, and relationship-based approaches with new understanding of the stages of human development. The clinician first determines the level of the patient’s ego or personality development and the presence or absence of

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