

Chapter 4: Jean Piaget



The teacher-organizer should know not only his own science but also be well versed in the details of the development of the child's or adolescent's mind.

Jean Piaget

Biography

Jean Piaget was born in Neuchâtel, Switzerland, in 1896. He was a budding scientist at an early age, publishing a scholarly paper at the age of eleven. Throughout his long career he added over sixty books and hundreds of articles to his accomplishments. Although Piaget is frequently referred to as a psychologist, he was really an *epistemologist* (someone who studies the nature and beginning of knowledge). It is this piece of his work that has made Piaget a major contributor to the knowledge base of educational psychology. While others asked *what* children know or *when* they know it, Piaget asked *how* children arrive at what they know.

Like many of us, Piaget hadn't planned on a career of working with children. He received a doctorate in biology but never worked in that field. Instead, he turned to psychology. In 1919 Piaget traveled to Paris to study

and took a job at the Alfred Binet Laboratory School. His job was to standardize the French version of a British intelligence test. While doing this work, Piaget began to notice similarities in the wrong answers children gave to questions at certain ages, and he began to wonder what thought processes they were using. This became the research question that would drive his life's work. He continued to pursue his interest in children and their thought processes until his death in 1980.

Piaget's work has been a primary influence in American preschool programs for the past thirty years. The volumes of Piaget's work provide an in-depth view of how children create knowledge. Unfortunately, much of his work is difficult to read and can be intimidating to busy teachers. In addition, Piaget's work has been criticized in recent years for limitations that have been challenged by current research. Specifically, many teachers think he focused too much on thought processes and not enough on children's feelings and social relationships with teachers and peers. Many also believe his use of unfamiliar terminology confuses the reader. In addition, because much of his observation was done on his own three children, critics say the work is not scientific research.

Nonetheless, Piaget's stages of cognitive development have created our overall view of how children think in their early years, just as Erikson's stages of emotional and social development have helped us understand how children develop emotionally. Teachers can accept that while some of Piaget's theories are not as true of young children as we once thought, his basic concepts still help us plan curriculum to challenge young children's minds. To dismiss his work because of

its flaws would be a mistake. The most sensible words I've read about Piaget's contributions came from Elizabeth Jones, who says:

People in all times and places invent explanations for what happens to them, and all explanations have predictive power; they enable us to say, "See, I told you." In our culture we call our explanations science and pretend they're real, not invented. But scientific explanations change, just as myths and superstitions do, because even in physics, and certainly in psychology, they provide only partial explanations of the way things really happen. Learn them, use them, but don't take them too seriously. Nothing happens because Piaget says it does. Piaget says it does because it happens, and he was an unusually thoughtful observer and generalizer. All of us can grow in our ability to do the same." (Teaching Adults, Washington, DC: National Association for the Education of Young Children, 1986).

Piaget's Theory

While others of his time argued that learning is either *intrinsic* (coming from the child) or *extrinsic* (imposed by the environment, or taught by adults), Piaget thought that neither position explains learning by itself, but that the child's interactions with his environment are what create learning. He claimed that children *construct* their own knowledge by giving meaning to the people, places, and things in their world. He was fond of the expression "construction is superior to instruction" (Joanne Hendrick, *The Whole Child*, Englewood Cliffs, NJ: Merrill, 1992). By this he meant that children learn best when

they are actually doing the work themselves and creating their own understanding of what's going on, instead of being given explanations by adults. He was a student of Montessori's work and built on her idea that meaningful work was important to children's cognitive development. Like Montessori, Piaget believed children needed every possible opportunity to do things for themselves. For example, children might be interested in how things grow. If a teacher reads them a finely illustrated book on how things grow, this instruction will increase the child's knowledge base. But if the child has the opportunity to actually plant a garden at school, the process of digging, watering, observing, and actually experiencing growing things will help the child to construct a knowledge of growing things that he cannot ever achieve merely by looking at pictures.

Like Dewey, Piaget believed that children learn only when their curiosity is not fully satisfied. He thought that children's curiosity actually drives their learning. According to Piaget, the best strategy for preschool curriculum is to keep children curious, make them wonder, and offer them real problem-solving challenges, rather than giving them information. Many adults still hold the notion that a teacher is someone who shares information. Using Piaget's theory about children's learning requires changing the image of *teacher* into someone who nurtures inquiry and supports the child's own search for answers.

Piaget also stressed the importance of play as an important avenue for learning. As children engage in symbolic play (making a cake out of sand, using a garden hose to be a firefighter) they make sense of the

objects and activities that surround them. As they imitate what goes on around them, they begin to understand how things work and what things are for. Initially this is a process of trial and error. However, with time and repetition they use new information to increase their understanding of the world around them.

Piaget believed that children all pass through the same stages when developing their thinking skills. The age at which children accomplish these stages of development can vary. Because of this variation, charts outlining Piaget's stages may also differ slightly. Parents and teachers should always remember that individual children have their own rates of development. Differences in development stretch over a broad continuum. For example, many books cite ten to thirteen months as a typical age range for first steps. Yet some children walk as early as eight months and others as late as eighteen months.

Many teachers and other adults wonder if there are things that prevent growth or if there are ways to hurry development along. Piaget believed that children's intellectual growth is based partly on physical development. He also believed that it is affected by children's interactions with the environment. He did not believe that teachers can "teach" young children to understand a concept. He was certain that children build their own understanding of the world by the things they do.

According to Piaget, children's cognitive development passes through the stages shown in the chart on page 64. What follows is a basic discussion of Piaget's first two stages in children's journey to build knowledge, since these are the stages that most concern teachers in early care and education settings.

| Piaget's Stages of Cognitive Development | | |
|--|----------------------|---|
| Age | Stage | Behaviors |
| Birth – 18 Months | Sensorimotor | Learn through senses Learn through reflexes Manipulate materials |
| 18 Months – 6 Years | Preoperational | Form ideas based on their perceptions Can only focus on one variable at a time Overgeneralize based on limited experience |
| 6 Years – 12 Years | Concrete Operational | Form ideas based on reasoning Limit thinking to objects and familiar events |
| 12 Years and Older | Formal Operational | Think conceptually Think hypothetically |

Jean Piaget. *The Child and Reality*. New York: Penguin Books, 1976.

The Sensorimotor Stage

Piaget believed that in the beginning, babies' reactions to the world are purely *reflexive* (without thought). He said that intelligence began when the reactions became purposeful. For example, when we watch an infant lying below a crib gym, we notice that initially he shows a startled response if his hand or foot hits a bell or rattle, but that over time he hits the bell on purpose. This first stage of cognitive development Piaget called the *sensorimotor* stage. During this time the baby relies on his senses and physical activity to learn about the world.

Toward the end of this first stage, Piaget says, *object permanence* occurs. *Object permanence* means that the

baby has come to realize that something exists even when he can't see it. This is a very important development for children. Before achieving this milestone, a baby only thinks about what is in his view at the time. For example, if we carefully watch babies we see that before eight or nine months they drop things from the high chair tray without making a fuss. This is because for a young baby if things are out of sight they are literally out of mind. From the baby's point of view, they no longer exist. Then suddenly, at eight or nine or ten months, when that spoon drops from the tray the baby leans over pointing and fussing and wanting it back. Often parents and providers are surprised and dismayed when they pick it up and hand it to a smiling baby who tosses it right back down again. This is not the beginning of premeditated attempts to drive adults crazy. This is the first burst of the joy of learning! This is object permanence.

This is also the age at which we see *separation anxiety* in children. They cry when their parents leave them at child care or when their primary caregiver is not present. Now the baby understands that when his parent or provider is not in sight, that person is somewhere else. The caregiver hasn't just ceased to exist. So the baby makes attempts to bring that important "other" back into view—by crying.

To support cognitive development in children under two, Piaget's theory tells teachers to

- keep babies safe but interested
- respond reassuringly to separation anxiety

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Keep Babies Safe but Interested

Since motor development is a significant learning task of the sensorimotor stage, one of the most important supports to cognitive development that infant/toddler teachers can establish is a safe and interesting environment. Babies need to push, pull, and manipulate objects. They need to crawl, climb, and pull up to standing positions without being physically at risk. An infant environment

with multilevel furnishing and climbing opportunities allows babies the spaces they need to experiment with spatial relationships and learn through their bodies.

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According to Piaget, babies also need interesting things to touch and explore. A variety of cause-and-effect toys (toys that

make noise when pushed, pulled, or shaken) such as busy boxes, crib gyms, and shape sorters is essential. Babies also need to have experiences with softer materials such as nontoxic playdough, cornstarch-and-water, water, and sand. Mirrors and artwork at babies' eye level, and board and cloth books that children can reach, provide even more interesting possibilities.

Babies' cognitive development is also stimulated by adults who talk with them and tell them what will be happening, and who delight in their accomplishments. Comfortable places for adults working in infant/toddler programs help them focus on the children and invite them to sit at the babies' level to provide another essential kind of interaction.

Respond Reassuringly to Separation Anxiety

When children are beginning to experience object permanence and thus separation anxiety, it is important to

make as few changes in their lives as possible. With a little experience the baby will begin to see that when people he loves go away, they always return. But during the transition time it's a good idea to keep schedules routine. For example, this is not a good time to make new child care arrangements. Providers who understand this stage can help parents see why their babies are suddenly more upset than usual when they say good-bye. They can reassure parents that this stage too will pass if they can just give it a little time.

The challenges of separation anxiety have implications not only for how children are handled in the program, but for enrollment policy as well. For example, Gini was the director of a center I supervised. She told me about holding an intake interview with parents who were considering moving their child from another provider into her center. She listened sympathetically as parents described tearful separations every morning from their ten-month-old baby. The parents were certain that their child must not like his current child care arrangements but couldn't tell them that because he wasn't yet talking. Gini talked with them about separation problems and encouraged them to wait another month or two before making any changes. She suggested that the baby would probably pass through this stage and be fine. The parents thanked her and left. A week later she heard at a directors' meeting that the baby had been taken out of his current situation and enrolled at another nearby center. She was disappointed, because she knew that the baby would now suffer even greater separation anxiety that probably could have been avoided if the other center's policies had supported children's developmental needs, and if the family had chosen to wait a bit.

Providers can also support parents at this stage of development by welcoming them to call at any time to

see how their child is doing, and by acknowledging how hard it is for parents to walk away when their child is screaming. If parents are anxious, their babies will share that anxiety, which makes everything worse. Everything teachers can do to reassure parents during this stage of infant development will support the growth of the babies in their care. Some programs don't even wait for parents to call, but initiate the exchange because they understand how stressful it is for parents to be away from their babies. Sometimes parents get locked into a guilt reaction when their infant screams at separation in the morning. A quick call to say the baby's doing fine and share a story about their morning often makes the day easier for parents. When parents are supported in these ways, they are more apt to be able to maintain consistent schedules for their babies, which will help the babies get through separation anxiety more quickly and successfully.

During the earliest months of life, caring for parents is a big part of supporting children's development. New parents are under stress in American culture. Some mothers have anxiety because they are forced to return to work before they are ready to leave their babies. Some mothers wish they could stay at home but can't afford to. Others are eager to return to work but feel guilty and conflicted about doing so. Piaget's concept of object permanence and the separation anxiety that often accompanies it is not something most young parents know about. When teachers help parents understand their children's development, they are helping parents support that development.

Preoperational Stage

According to Piaget, after the sensorimotor stage, children's cognitive development enters the preoperational

stage, which extends from the second year of life through age seven or eight. The preoperational stage is when children's thinking differs most from adult thought patterns. Piaget said that during the preoperational stage, children are *egocentric* (think of everything only as it relates to them), can focus on only one characteristic of a thing or a person at a time (for example, take words at their exact meaning), gather information from what they experience rather than from what they are told, and overgeneralize from their experience.

Egocentrism means seeing the world from only one's own point of view. When observing preschoolers, adults frequently hear conversations like this one:

Teacher: I've brought in many beautiful things for our blue display. We have blue paint at the easel and I've put "Rhapsody in Blue" in the CD player since we are having Blue Day!

Child 1: My mom's car is blue.

Child 2: My mom's car is broke.

Child 3: My TV is broke.

Teacher to child 1: Your mom's car is blue?

Child 1: I saw "Rug Rats" on TV.

These children are typical of this developmental stage. This is the egocentrism Piaget refers to. The children are not connecting with each other's stories; rather, each child's words trigger other children's thoughts about their own situations. Another familiar example of egocentrism in young children is the child who wants to buy a stuffed toy as a gift for a parent or grandparent. Because this would please the child, she believes her grandfather will also love it!

The preoperational stage is when children's thinking differs most from adult thought patterns.

Piaget believed that in the preoperational stage, children form ideas from their direct experiences in life. This is why telling them is less effective than finding a way to help them think their own way through a problem. For example, if a child sees birds fly away when the dog barks, she may decide that barking dogs are the

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cause of birds' flight. Even though this is not an accurate idea, the child will be perfectly comfortable with her own reasoning despite any attempt to tell her otherwise. It is only when she has gathered more experience on her own (seeing birds take flight when no dog is around) that she will change her view and adapt it to her new information. Piaget called this *accommodation*, the process of adapting one's

understanding on the basis of new information.

Accommodation returns the child to a more comfortable balanced state that Piaget calls *equilibrium*.

Because preoperational children tend to believe what they see, they do not yet have a firm grasp of qualities belonging to the objects in their world. For example, they confuse "heavy" with "large." Due to inexperience, most young children would initially be surprised that a beach ball is lighter than a baseball. Unable to separate height from age, preoperational children will insist that the tallest person is the oldest. Piaget did a classic experiment to demonstrate this kind of thinking in children. He put two sets of coins on a table in two lines. Both sets had the same small number of coins, but the coins in one line were spread farther apart. When asked which line had more coins in it, preoperational children

always said the line in which the coins were spread farther apart had more. They held to this belief even when the coins from the two lines were matched up to show that for each coin from the long line, there was a coin from the short line.

Because children at this stage are dependent on their own experience, they tend to make incorrect generalizations. They base their general belief about something on a single experience, which may cause a false conclusion. One example is the girl above who believed that a dog's barking made birds fly because she had seen birds flying when dogs barked.

Another instance is the child in a Virginia child care center whose parents told the teachers that he yelled and screamed on the weekend when they attempted to take him for a haircut. "He was hysterical and kept saying it would hurt too much!" the frustrated mother told the teacher. The teacher, who knew a great deal about young children and a little bit about Piaget, slowly explained to the mom that from her son's perspective there was good reason to be afraid of a haircut. By the age of three or four most youngsters have had enough experience with "boo-boos" to know that a *cut* on your knee or your finger can hurt quite a bit and sometimes even make you bleed. They know that at preschool, when they make soup, the teachers are very careful to show them how to chop the vegetables so they don't get *cut*. They know that Grandma doesn't let them use her good scissors because they might get *cut*. And then the grownups say they're taking you to get your hair *cut*! The child was overgeneralizing from his limited experience, and when his mother saw the situation from his perspective, his behavior suddenly made more sense to her.

Preoperational children also tend to focus on one attribute of an object or person at a time. It is hard for them to think of their mother as their grandma's daughter, for instance. This single-focus thinking is revealed in children's conversations, if adults know how to listen for it. For example, a Head Start teacher tells the story of a little girl in her class whose mom has had a new baby. The teacher shows the children pictures of babies in books. The children discuss how wrinkly and funny-looking babies are when they are born. The teacher tells the children that she heard one boy tell his mother that she should iron the baby. None of the children laugh at this or show any alarm. No one says, "Oh, that is awful. That would hurt the baby."

Instead, Heather says, "My big sister irons her hair to get the curls out."

Joshua says, "That's not what it's for. You do it to get the lines off your clothes."

Clearly, the children do not make the connection that an iron might be a good tool to use on clothes or curly hair but not on babies. These children are not cruel or limited, but they are incapable of holding several qualities of an object or situation in their minds simultaneously. They are focusing on one aspect of the baby (the baby has wrinkles), and one aspect of the iron (the iron is used to get wrinkles out). The children do not naturally consider at the same time that the iron is hot, hot enough to hurt, and that a baby has skin like theirs that could be burned.

The teacher, aware that she has overestimated the children's understanding, can ask questions which make them think a little more about irons. "Is the iron hot that you use on clothes?" she might ask. "How would you feel

if you put it next to your skin? Does a baby have skin? How do you think it would feel to the baby's skin?" The children would quickly work out for themselves that an iron is not a good way to get rid of a newborn's wrinkly skin! They know that irons are for getting wrinkles out, but without help, they can't make the distinction between wrinkled clothes and a baby's wrinkled skin. Piaget's theory tells us that it will be more effective to ask questions that help a child think through the problem on his own than to tell him flat out, "An iron would hurt the baby." If he constructs that knowledge for himself by puzzling through the teacher's questions, he is more apt to take it in than if the teacher gives it to him.

This characteristic of only seeing one aspect of a thing at a time also plays out in the way children this age take adults very literally (take their words at their exact meaning). For example, Betty cared for her three-and-a-half-year-old niece for a weekend. She invited Alison to help her with dinner preparations. At home Alison's mother served her hot dogs on a roll with ketchup already on it. When Betty asked her niece to get the ketchup, Alison asked, "Should I put it on our hot dogs?" Betty, busy in the kitchen, responded, "No, just put it on the table." Betty was surprised when Alison squirted ketchup right onto the dining room table (just as she'd been told to do!).

Teachers wanting to support the cognitive development of preoperational children in their care can

- provide large blocks of time for uninterrupted free play

It is largely the influence of Piaget, building on Montessori's work, that encourages uninterrupted periods of play in early childhood classrooms. When children are interested and involved, they need teachers who respect this absorption with their work.

- provide many real-world experiences for children throughout the year
- plan open-ended activities and ask open-ended questions

Provide Large Blocks of Free Play Time

It is largely the influence of Piaget, building on Montessori's work, that encourages uninterrupted periods of play in early childhood classrooms. When children are interested and involved, they need teachers who respect this absorption with their work. Giving a child a little more time while others clean up for snack can be a way of saying, "I see that you are very involved with your work and that is important." Sometimes it isn't necessary to completely clean up the room. Children need places where their ongoing work and projects can be left until they are ready to finish them. In times past children often had abundant opportunities for this kind of ongoing work in their neighborhoods and backyards. It is now our responsibility to meet these needs for sustained projects and "works in progress" in our child care classrooms.

It isn't necessary to pull a whole group of children together for a group time because three or four are having trouble finding an appropriate focus for their energy. When children are allowed large blocks of time for sustained interest in their play and work, that usually gives the teachers more time to work one-on-one with those who need it.

Many teachers are finding that times like snack and story time work much better when they are done in several shifts of small groups rather than groups of ten or twelve, with some of the children unable to focus on the task at hand. Organizing to do small group work,

simultaneously, while others enjoy extended free play time, is how some teachers are making opportunities for more project work for those who are really engaged.

Time outdoors is another gift that teachers can share with children. It is easy to say that the time outside should be as rich and meaningful for children as the time spent in the classroom, but this is not often the case. Many teachers are afraid to let children stay outside on a beautiful day because they fear it will be perceived as "doing nothing." When children have opportunities to spend time with nature they will learn about the world they live in. Talking with each other and with parents about the importance of taking time to learn is a good place to start.

Provide Real World Experiences

Like Montessori, Piaget has helped teachers of young children to see how important it is for children to experience whatever we want them to learn about. Looking at pictures of cows does not give a child the experience of cow—its size, smell, and sound, its function in our lives. Visiting a dairy farm, smelling the barnyard and the haymow, watching machines milk the cows, and seeing the milk loaded into a truck gives children a completely different understanding of cows. Similarly, reading about "things that go" is not a substitute for riding on the subway, in a taxi, or on a train. Providing real-life experiences doesn't have to mean going on field trips. It can be as simple as cooking with children, bringing animals

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into the classroom, or studying the birds in your area as Kathy's class did in the chapter on Dewey.

It is possible anywhere to find real-life projects for children even if child care program resources are not what they could be. In rural New Hampshire, a team of Head Start teachers on a very limited budget did a project with children on building. They visited a lumbering site and watched trees cut and processed. They went to a construction area where a neighbor was having a house built, and then they realized they knew very little about the building their school occupied. The custodian became very involved. Children viewed the plumbing and electrical systems in the school. They did tracings of brick surfaces, floors, and other areas. The play that went on in woodworking and blocks showed a much deeper understanding of many construction principles than one usually views in a preschool room. This is what construction of knowledge is all about for young children.

Plan Open-Ended Activities, Ask Open-Ended Questions

Open-ended activities do not have a predetermined result or product. For example, when a teacher plans a science experiment to which she already knows the answer, the experiment is not open-ended. However, when children plant seeds and chart the days until the shoot breaks through the earth, and then measure the seedling every day and keep a graph of how it grows, the project is open-ended. Neither the adult nor the child knows what the result will be.

Similarly, open-ended questions do not have a predetermined answer. "What color is your shirt?" is a closed question: there is (probably) only one right answer, and

the teacher knows what it is. "How do you think that works?" is an open-ended question: the teacher is asking the child for his reasoning and doesn't already know the answer.

Open-ended activities and questions support children's cognitive development because they ask children to think. Instead of putting children in the position of being right or wrong, they put them in the position of inquiry, of finding out what the possibilities are, or how fast the bean sprout grows. They help children look at several aspects of the same thing, as the teacher's questions about the hot iron and the baby's skin helped those children think about the consequences of ironing a baby. They help children accommodate new information. For example, take the child who thinks that a dog's barking makes the birds fly. Over time, an adult who knew that she had formed this idea about the world could help her adjust it by noticing dogs barking and birds flying, and asking careful open-ended questions such as, "I heard that dog bark behind the house, and look, those birds are sitting on the fence. Why do you suppose that is?" or "Look, there's a group of ducks taking off from the pond. Did you hear any dogs barking? Why do you suppose those ducks took flight?"

Concrete Operations and Formal Operations

The last two stages in Piaget's theory refer to school-age children and teenagers. Since the focus of this book is on the early childhood years, the discussion of these stages will be very brief. It is helpful to all parents and teachers to know a little bit about these final stages. For more information, see the suggested reading list at the end of the chapter.

When children enter Piaget's stage of *concrete operations* at about age seven, many changes in their thought patterns are visible. At this age (usually from about seven through eleven or twelve) children possess the characteristic of *reversibility*, which allows them to reverse the direction of their thought. For example, a child at this stage can retrace her steps on the schoolyard looking for a forgotten lunch box. Children no longer count on their fingers, because they are beginning to be able to think abstractly. They begin to notice differences in classes of objects. For instance, at four every dog is a "doggie," but at eight or nine there are differences between a collie and a poodle. The concrete-operational child can hold several qualities in mind, knowing that a boat is large, red, *and* a sailboat. She knows and really understands that her mother is also the daughter of her grandmother. With this new flexibility of thought, children can add, subtract, and multiply "in their heads."

The final stage Piaget outlined is *formal operations*. This stage begins between ages eleven and sixteen and is marked by the ability to think logically and in hypothetical terms. According to Piaget, once this stage is reached, young people can wrestle with such questions as "Is it wrong to steal food for your starving children?" or "If a tree falls in the forest and no one is there to hear it, does it make a sound?"

Discussion Questions

1. One of the nine-month-old babies in your infant program has always transitioned easily in the morning. You can tell from several clues that he has recently achieved object permanence. He begins to fuss and cry at separation from his

parents in the morning, and they are alarmed at what they see as evidence that he is no longer happy in your program. You are convinced that his recent "clinginess" is related to his development. How can you explain this to the baby's parents?

2. Kevin is a four year old in your preschool class. He is very interested in building. He wants to spend all of his time in the block area. Kevin's mom worries that he plays too much. She has asked you to teach him math and language skills. Drawing on Piaget's work, how can you respond in a supportive way to this parent?

3. On a trip to the children's museum with your class of three year olds, a parent volunteer approaches you with one of the children in hand and says, "I just caught this one shoplifting!" How do you handle this situation? What do you say to the parent? What do you say to the child? How do you talk to the museum staff? How can Piaget's theories help explain what has happened?

Suggestions for Further Reading

- Forman, George E. 1983. *The child's construction of knowledge: Piaget for teaching*. Washington, DC: National Association for the Education of Young Children.
- Furth, H. G., and Harry Wachs. 1975. *Thinking goes to school: Piaget's theory in practice*. New York: Oxford University Press.
- Singer, D. G., and Tracey Revenson. 1978. *A Piaget primer: How a child thinks*. New York: New American Library.