Piaget's Theory of Intellectual Development

The Years 2 through 11

The Semiotic Function and Piaget's Early Work

HERBERT P. GINSBURG

SYLVIA OPPER

The Years 2 through 11:

The Semiotic Function and Piaget's Early Work

Herbert P. Ginsburg and Sylvia Opper

From *Piaget's Theory of Intellectual Development* by Herbert P. Ginsburg and Sylvia Opper

Table of Contents

The Years 2 through 11:
The Semiotic Function and Piaget's Early Work

The present chapter covers two broad topics. The first to be considered is the development of cognitive processes in the child of approximately 2 to 4 years. At this time some very important advances occur in the child's thought. One such advance is the onset of the semiotic function. We will concentrate on the young child's use of mental symbols and words, and on symbolic play. The second topic to be considered is the development of certain characteristics of thought in the child from 4 to 11 years. We shall review Piaget's early work on this topic and cover such matters as egocentrism, communication, and moral judgment.

THE SEMIOTIC FUNCTION

The sensorimotor period involves a rapid and remarkable development of behavioral schemes. The newborn entered the world with only a limited repertory of automatic behavior patterns provided by heredity. Yet after a period of only about two years, the infant can interact quite effectively with the immediate world of things and of people. He possesses schemes enabling him to manipulate objects and use them as means for the attainment of his goals. The infant also experiments with things to achieve a practical understanding of their properties. But all of these abilities, ad-though useful, are nevertheless concrete, that is, limited to immediately present objects. For example, while the infant may be able to use a stick to bring an object within reach, he cannot conceive of relationships between objects that are not within his immediate scope of vision. The infant is able to act only on things which are perceived directly. Toward the end of the second year, the child begins to develop novel *cognitive*, or mental, processes.

One important aspect of cognitive development is the appearance of the *semiotic Junction.* This refers to the fact that from 2 to 4 years the child begins to develop the ability to make something—a mental symbol, a word, or an object—stand for or represent something else which is not present. For example, the child can use a mental "picture" of a bicycle, or the word "bicycle," or a small schematic toy to stand for the real bicycle when it is not in immediate view. The ability to represent in this way makes it

possible for the child to operate on new levels. At this stage the child is not restricted to acting on things in the immediate environment because the semiotic function allows the evocation of the past. For example, his mental symbol of the bicycle permits the recollection of previous experience with this toy.

The semiotic function manifests itself in several ways. During the period from 2 to 4 years the child begins to employ mental symbols, to engage in symbolic play, and to use words. Let us review each of these activities in turn.

Mental Symbols

One example of the use of mental symbols involves deferred imitation. Let us recall the example of the temper tantrum:

> At 1;4(3) [Jacqueline] had a visit from a little boy of 1;6, whom she used to see from time to time, and who, in the course of the afternoon, got into a terrible temper. He screamed as he tried to get out of a playpen and pushed it backward, stamping his feet. J. stood watching him in amazement, never having witnessed such a scene before. The next day, she herself screamed in her playpen and tried to move it, stamping her foot lightly several times in succession. (*Play, Dreams, and Imitation, PDI*, p. 63)

The important feature of the observation is that Jacqueline's imitation was deferred: it occurred some time after she had originally seen the boy throwing the tantrum. Her behavior therefore did not simply copy an immediately observable model. If she could not see the tantrum, on what was her behavior based? How can we explain delayed imitation? One interpretation is that when Piaget observed her, Jacqueline happened to throw a tantrum for the first time, quite independently of anything the boy had done. But the explanation is quite implausible, because her behavior was so much like that of the boy. Consequently, we are forced to postulate a more complicated explanation that involves mental symbolism. The reasoning is as follows. We know that in throwing the tantrum Jacqueline did not simply copy an immediately present model. Nevertheless, her behavior was clearly similar to the boy's. Consequently, we assume that Jacqueline must have formed a mental symbol of the tantrum and then based her behavior on this symbol. In other words, Jacqueline must have had available a mental event which stood for or represented the boy's real action. The ability to symbolize in this way allowed her to copy the boy's behavior at a later time.

What is the nature of mental symbols? It is difficult to answer this question since we have no

method which permits a direct "look" at the child's thought. One possibility, however, is that the child's mental symbols are, at least in part, comprised of visual images. Perhaps Jacqueline "pictured" the tantrum to herself. While visual imagery does indeed occur (and may or may not have been used by Jacqueline), Piaget reminds us that mental symbols may take other forms as well. Although sometimes a person may use visual imagery, he may at other times represent objects by their sounds, or even by an abbreviated form of their movements. Piaget also proposes that the inpidual may not even be conscious of these mental symbols. A child may display imitative behavior without realizing that it is based on the actions of another person. Surely, after Freud's work, it should come as no surprise that many of our thought processes are unconscious.

We have seen, then, that the mental symbol may or may not be conscious and may or may not involve visual imagery. Does the mental symbol involve language? Was Jacqueline able to imitate the tantrum because she carried in her head the *words,* "He is lifting his arms, he is shouting," and so on? Although this sort of interpretation—a verbal mediation approach—has its adherents, Piaget rejects it. He cites two major reasons. First, certain experiments with animals show that chimpanzees, for instance, have mental symbols which of course could not be based on language. If nonverbal symbolism is possible in animals, then why not in the human too? Second, observation of the child shows that behavior like deferred imitation occurs while language skills are still very primitive. It is quite unlikely that Jacqueline was at that time capable of a reasonably full verbal description of the boy's temper tantrum. Yet, her imitation was quite accurate. Since a mental symbol based on the child's crude language could not have provided a basis for such accurate imitation, the linguistic explanation must be ruled out. Thus, to explain Jacqueline's deferred imitation, we must postulate her use of mental symbols. These symbols probably do not involve language to a significant degree, but we cannot confidently specify their exact nature.

A second example of mental symbolism can be seen in the child's reaction to hidden objects. If you will recall, in stage 6 of the sensorimotor period, the child could reconstruct a series of invisible displacements of an object. In an observation described in Chapter 2, Piaget hid a small pencil in his hand and then placed the hand consecutively under a beret, under a handkerchief, and finally under a jacket where he left the pencil. Jacqueline did not look for the pencil in her father's hand, which was the last place she had seen it, and which is where the younger child searches; instead, she immediately

reached under the jacket and found the pencil.

How can we explain Jacqueline's behavior? It was not random, since she acted in essentially the same way on many occasions. Piaget assumes that Jacqueline formed a mental symbol of the pencil. When Piaget covered the pencil in his hand, Jacqueline believed in its continued existence. When the hand was placed under a succession of objects, the use of the mental symbol enabled her to follow mentally the invisible displacements. The availability of a mental symbol is thus necessary for a mature object concept.

Thus far, we have seen two kinds of behavior—deferred imitation and search—which may be interpreted as demonstrating the existence of mental symbolism in the child. We may now explore the development of mental symbols.

The Formation of Mental Symbols

How does the child form mental symbols? There seem to be at least two possible answers to this difficult question. One explanation is that the ability to symbolize is an entirely new function which suddenly makes its appearance when the child is about 2 years of age. Another possibility is that symbolism has precursors in the sensorimotor period. Emphasizing continuity in intellectual development, Piaget adopts the second alternative. He postulates that the semiotic function is derived from imitation. Consider the following observation from the sensorimotor period:

> At 1;3(8) J. [Jacqueline] was playing with a clown with long feet and happened to catch the feet in the low neck of her dress. She had difficulty in getting them out, but as soon as she had done so, she tried to put them back in the same position. … As she did not succeed, she put her hand in front of her, bent her forefinger at a right angle to reproduce the shape of the clown's feet, described exactly the same trajectory as the clown and thus succeeded in putting her finger into the neck of her dress. She looked at the motionless finger for a moment, then pulled at her dress, without of course being able to see what she was doing. Then, satisfied, she removed her finger and went on to something else. (*PDI*, p. 65)

Here we have a case of imitation put to the service of understanding an unusual phenomenon. In the course of playing with a familiar toy, Jacqueline discovered that the clown did something unexpected and initially unexplainable. Its feet caught her dress in a way that had not occurred before. Jacqueline immediately tried to understand the cause of the unexpected event. Her method of doing so was through imitative action: she formed her finger into the shape of the clown's foot, placed the finger in her dress, and then pulled to see what would happen. She discovered that the finger got caught and therefore

prevented free movement of her arm. In this way she came to understand that the shape of the clown's foot similarly restricted its removal. Another way of looking at the observation is to say that it involves a special kind of imitation: Jacqueline used her own body to represent or stand for the clown's movements. Her actions symbolized those of the clown. This is not an isolated observation; Piaget finds that the child often imitates things. For example, he noted that Lucienne, upon observing that her father's bicycle could be made to move back and forth, performed the same motions herself. She swayed to and fro at about the speed of the bicycle.

Piaget argues that such imitation of things is the sensorimotor *forerunner* of mental symbolism. The infant's swaying back and forth is the behavioral equivalent of the older child's mental symbol of the bicycle. In other words, for the infant the action of swaying signifies a bicycle, whereas for the older child a mental symbol performs the same function. Toward the end of the sensorimotor period, the child's imitation "goes underground," figuratively speaking. Instead of imitating things on the level of overt behavior, the older child does so internally. For instance, in place of actually swaying back and forth, the older child might imitate the bicycle by making very slight and almost imperceptible movements of his muscles. Or, instead of forming the finger in the shape of the clown's foot, the older child might tense his finger muscles so slightly that an observer would not notice. Moreover, this internal imitation is no mere oddity. The child's internal and almost undetectable movements *constitute* the mental symbol. The child's muscles perform an abbreviated imitation of swaying, and these bodily sensations symbolize for him the bicycle. When the child's finger tenses ever so slightly, this internal imitation, which is not necessarily a visual image, signifies the clown.

We have seen, then, that the sensorimotor child represents things by acting like them. The older child, on the other hand, performs such imitation internally, and these abbreviated body movements constitute the mental symbol. Eventually the child becomes so proficient at interned imitation that the movements are extremely abbreviated and, therefore, almost impossible to detect.

Several interesting points can be made concerning the formation of the mental symbol. First, Piaget's theory gives us additional insight into the nature of the child's mental symbols. We said earlier that they might involve a visual component and that they probably do not consist of linguistic features. Now we know that mental symbols initially involve the child's actions in an important way. The mental

symbol of the bicycle consists not only of a visual image, but it also may involve bodily sensations corresponding to the bicycle's movements.

Second, in referring to the symbol as consisting of internal imitation, Piaget uses the term imitation in a very broad sense to account for visual imagery. Consider this hypothetical example. When a person sees a table, his perception accommodates to it. His eyes must follow the table's outline, detect its color, focus to localize the table in space, and so on. In these ways, the person establishes a number of relationships concerning the table (space, color, etc.) which together form his perception of it. In other words, the environment does not simply impose on him the perception of the table. Instead, the perception is derived from his own activity—from a series of intricate movements of his eyes and from complex activity in the brain and nervous system. Visual perception is an activity, just as the child's swaying is an activity. Next we see the role of imitation. At a later time when the table is no longer present, the person may repeat in an abbreviated form the movements involved in his initial perception of the table. That is, his eyes may again move as they did when they traced the table's contour, adjusted to its distance, and so on. This internal and abbreviated imitation of the perceptual activity *constitutes* the visual image of the table. Since an image of an object is seldom as rich or as detailed as the original perception, the image merely represents or symbolizes the actual object. In brief, the mental symbol may involve visual imagery, and the latter may be considered the internal imitation of the originally perceived object.

Third, Piaget introduces a technical vocabulary for dealing with representations. As Figure 1 shows, the *semiotic* or *representational function* involves signifiers—mental events, words, or things which stand for something else—and the signified, to be described shortly. Signifiers signify or represent something to the inpidual. One type of signifier is the *symbol,* which may be *personal* and *idiosyncratic,* and resembles the thing it stands for. For one child, a toy may symbolize the bicycle; for another child, the visual image (resembling the bicycle's appearance) may suffice. Consequently, one person's symbol may not transmit to another person any information at all about the action or object that is represented. *Abbreviated movements,* as in swaying like a bicycle, seem to be the developmental forerunners of symbolism. Symbols may be *mental* or *concrete.* Concrete symbols, which we shall review shortly, may involve using one object (e.g., a handkerchief) to stand for another (e.g., a blanket). Mental symbols take several forms. We have already seen that one type of symbol is the *visual image;* other types include

auditory images. The symbol involves a predominance of *accommodation.* This is so because the symbol consists of internal imitation, and imitation involves modifying one's behavior to fit that of a model, or in broader terms, to meet the demands imposed by the social or physical environment. Another type of signifier is the *sign,* which typically refers to a *word* used in conventional language. (The sign could also refer to other conventions like mathematical notation, football diagrams, etc.) A *word* is social, not personal, and is arbitrarily related to the thing it stands for. "Bicycle," for example, is not an idiosyncratic term: most of us agree that "bicycle' ' stands for the same object, and therefore use of the term transmits considerable information. Also, the word "bicycle" bears no resemblance to the real thing; if our linguistic community so decreed, we could legitimately substitute "elephant" for "bicycle." In summary, signifiers involve various types of symbols and signs.

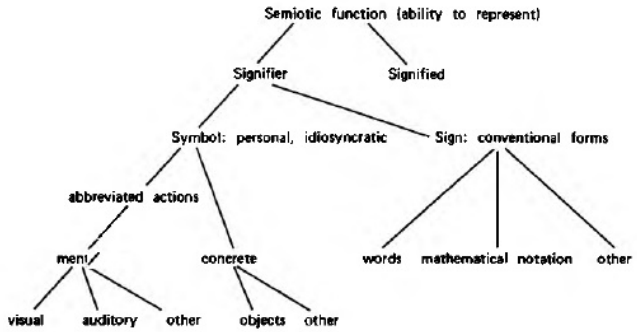

FIGURE 1
Schematic outline of the semiotic function.

The complexity of Piaget's terminology should not obscure the fact that the ability to form mental representations is an achievement of great magnitude. In the sensorimotor period this capacity was lacking. If you will recall, the only signifiers were concrete attributes of things. For example, the mother's voice or footsteps signified to the infant that she would soon arrive. However, this primitive signifier, or "index," was linked to the infant's actually hearing the voice or footsteps. He had no mental representation for these events; therefore, the signifier had meaning for the infant only when the events actually occurred. By contrast, the older child can use mental representations to stand for absent events or things. Things no longer need to be present for the child to act on them. In this sense, the ability to

represent eventually liberates the child from the immediate present. He can imagine things that are both spatially and temporally separate from himself. It may therefore be said that the use of mental representations permits the child to transcend the constraints of space and time.

Meaning

Having reviewed Piaget's theory of the formation of mental symbols, we shall now deal with the process by which they acquire meaning. Let us consider an apparently simple question: To what does the child's mental symbol, like swaying back and forth, refer? We may pose the same question with regard to the word: What does "bicycle" designate? Our first response to this question is to say that both the mental symbol and the word obviously refer to the real bicycle. But according to Piaget, the matter is more complicated than that. The "signified" (what the symbol or word stands for, or its meaning) is not the real object, but rather the child's understanding or intellectual construction of the real object. To put it differently, symbols or words do not refer to things, but instead stand for one's knowledge of things. Suppose one child uses the word "bicycle." For him, a bicycle has two wheels, a seat, and handlebars. A bicycle is something that goes delightfully fast, and, also, it is one kind of vehicle. For another child, however, the signified may be somewhat different. This child agrees that a bicycle has two wheels, a seat, and handlebars, but having often fallen from bicycles, he therefore feels that they are frightening and dangerous. Further, he has no conception of the bicycle as a vehicle. Note that for both these children the word "bicycle" evokes some common meaning: two wheels, handlebars, and so on. Both children can therefore easily identify what a bicycle is and what it is not. In this "denotative" sense, the word does refer to the real object. But the children also disagree as to the word's meaning; for one, a bicycle is delightful and for the other it is frightening. Also, for one child it is a member of the class of bicycles which in turn is included in the larger class of vehicles. The other child, on the other hand, employs no such class hierarchy. In Piaget's terms, each child has assimilated the word "bicycle" into a different set of schemes (the signified or the meaning). Therefore, the word "bicycle," or the children's personal mental symbols for it, does not refer to the real thing but to their understanding of it.

To summarize, internal imitation (accommodation) provides the child with symbols. The child then endows these symbols and words too with meaning, assimilating them into his mental schemes. Therefore, what the symbol or word refers to (the signified) is always personal, if not idiosyncratic,

although in the case of words there is a sufficient amount of common signification for communication among inpiduals to occur.

Symbolic Play

A further example of an activity implying use of the symbolic function is symbolic play. Here is an observation.

> [At 1 ;3(12) Jacqueline] . . . saw a cloth whose fringed edges vaguely recalled those of her pillow; she seized it, held a fold of it in her right hand, sucked the thumb of the same hand and lay down on her side, laughing hard. She kept her eyes open, but blinked from time to time as if she were alluding to closed eyes. (*PDI*, p. 96)

The observation involves several interesting features. First, Jacqueline acted toward the cloth in roughly the same way as she behaved toward a pillow. She put her head on it, sucked her thumb, and so on. Second, Jacqueline's behavior revealed a certain playfulness; that is, she laughed at what she was doing. Apparently, she thought her actions were quite funny.

One simple interpretation of this behavior is that the child merely confused the cloth with the pillow. But this explanation is not very plausible because it fails to explain why the child laughed. After all, Jacqueline did not ordinarily giggle upon going to bed.

Piaget interprets the behavior as a case of the playful use of concrete (not mental) symbols. It is clear from Jacqueline's laughter and from her attitude of pretense that she knew perfectly well that the cloth was not really a pillow. Her playfulness indicates that she realized that the cloth was a substitute for another thing. In other words, the cloth was a symbol or signifier, and what it signified was the pillow. The cloth, of course, was a concrete object and not a mental symbol.

How did this assignment of meaning to the cloth come about? Piaget's interpretation is that meaning is achieved in terms of assimilation. While in the past Jacqueline had performed the actions of lying down, closing the eyes, and so on only in connection with the pillow, she now extends these schemes to an object which she knows is not a pillow. We can therefore say that Jacqueline assimilated the cloth into schemes previously applied only to the pillow. It is the process of assimilation to schemes (the signified), then, which provides the meaning for the symbol. Moreover, Jacqueline is aware of the

make-believe character of her acts. Her playfulness should not make us underestimate the seriousness and importance of her accomplishment: she has achieved a primitive comprehension of the nature of symbols. Indeed, we often find that the child's "play" involves significant intellectual activity.

It is interesting to note that Piaget feels that symbolic games play an important role in the child's emotional life as well. The child from 2 to 4 years is in a very vulnerable stage of development in the sense that he is beginning to acquire a new set of ways of dealing with the world around him. The child also finds that he must conform to a set of social rules, not the least of which is language. The child must accept the fact that words stand for things without any apparent justification. His capacity for self-expression via language is extremely limited and rudimentary and the words available frequently are inadequate to express needs and feelings. The child must obey commands whose purpose he cannot understand. The child's natural spontaneity is being compressed into the social mold of his culture, and he is generally powerless to resist.

These feelings of inadequacy lead to frustration for the child and, subsequently, to conflict with surrounding persons. Symbolic play, which forms a large part of the child's activity in this stage, is an appropriate means of providing an adjustment to reality. With this form of interaction the child can assimilate the external world almost directly into his own desires and needs with scarcely any accommodation. He can therefore shape reality to his own requirements. Furthermore, in symbolic play, the child can act out the conflictual situations of real life in such a way as to ensure a successful conclusion in which he comes out the winner, and not, as is sometimes the case in real life, the loser. In brief, symbolic play serves a necessary cathartic purpose and is essential for the child's emotional stability and adjustment to reality. Indeed, symbolic play often serves as the basis for psychotherapy with young children.

Language

We have now seen two different manifestations of the semiotic function: the use of mental symbols and symbolic play. We will turn now to a third aspect of the semiotic function and see how the child uses language and gives it meaning.

In the sixth stage of sensorimotor development, the child's first use of words is not representational in the sense of referring to absent objects. Instead it is intimately related to his ongoing actions. Consider this example concerning Laurent:

> at 1;5(19) "*no more*" meant going away, then throwing something on the ground, and was then used for something that was overturned (without disappearing). He thus said "*no more*" to his blocks. Later "*no more*" merely meant that something was at a distance from him (outside his field of prehension), and then it referred to the game of holding out an object for someone to throw back to him. At 1;6(23) he even said "*no more*" when he wanted something someone was holding. Finally, at 1;7 "*no more*" became synonymous with "begin again." (PDI, p. 218)

Note that Laurent did not use *"no more"* in a representational way. He did not make the words stand for an absent thing or event as in the sentence, "There is no more water in the garden." Instead, Laurent's use of "no more" was concrete in two senses. First, he employed the words in connection with objects that were immediately present like the overturned blocks. Second, the words were used to express his immediate desires, as when he wanted something a person was holding. In addition to being tied to concrete things or actions, the child's first words are very unstable. The phrase "no more" was used to refer to going away, to something overturned, to something at a distance, and so on. The meaning of words is not constant for a young child. In fact, for him, words have little socially agreed upon meaning; instead, they are quite personal, and in this respect they resemble idiosyncratic mental symbols.

The next step in the development of language involves the use of words in a representational way. At about 2 years of age, the child gradually begins to use words to stand for absent things or events. For example, at 1; 11(11) after returning from a trip, Jacqueline told her father about it. She said, "Robert cry, duck swim in lake, gone away" (*PDI*, p. 222). These events had occurred some time previously, and Jacqueline was able to remember them. Moreover, she was capable of using words to stand for past events. Thus, through a gradual evolution, words are no longer used by the child to refer solely to ongoing actions, desires, or immediately present events.

Now that words have generally assumed a representational character and refer to absent things, we may ask whether the child uses them in the same way as the adult. For example, we saw that Jacqueline used the words "duck swim in lake" to refer to events in the past. Despite the fact that the words are representational, does the child give them the same meaning that an adult does? Another way

of putting the question is to ask whether the child's *concept* of duck, or the meaning assigned to the word "duck," is the same as the adult's. The mere fact that the child uses the word does not necessarily imply that he gives it what we consider its ordinary meaning. Here are some observations which may clarify the issue:

> at 2;7(12), seeing L. [Lucienne] in a new bathing suit, with a cap, J. [Jacqueline] asked: *"What's the baby's name?"* Her mother explained that it was a bathing costume, but J. pointed to L. herself and said: *"But what's the name of that?"* (indicating L's face) and repeated the question several times. But as soon as L. had her dress on again, J. exclaimed very seriously: *"It's Lucienne again, "* as if her sister had changed her identity in changing her clothes. *(PDI,* p. 224)

The observation shows that Jacqueline's concept of her sister, and the use of the word "Lucienne," are quite different from the adult's. Jacqueline's thinking attributes little inpiduality to her sister. There is not one Lucienne who is the same person regardless of superficial changes; instead, as a result of wearing different clothing, the real Lucienne is seen as two different little girls. The child at this age fails to recognize that a person Or thing remains the same, or conserves its identity, when it undergoes minor variations in appearance.

In addition to perceiving insufficient inpiduality, the child also shows other unusual uses of words. Once Jacqueline was in the garden and walked on the landlord's flowers. She remarked *"Me spoil Uncle Alfred's garden" (PDI*, p. 224). She had had earlier contact with her uncle's garden, and in the present case used the phrase "Uncle Alfred's garden" to refer to the landlord's. In other words, she used one phrase to refer to two different things. All gardens are "Uncle Alfred's garden." In the case of her sister, Jacqueline saw the same inpidual under different guises as different inpiduals; in the present instance she saw different "inpiduals" (gardens) as the same "inpidual." Clearly, in neither case did Jacqueline's use of words correspond to an adult's. The concepts or meanings evoked by "Lucienne" or "Uncle Alfred's garden" were quite primitive. In a sense, the child's early words resemble *symbols*—they are personal and idiosyncratic.

Reasoning

During the years 2 to 4, the child shows three different kinds of reasoning. In one type, the child is faced with a simple situation which has been experienced before. The child then "reasons" about the

situation very concretely in terms of what had occurred in the past. For example, at 2;4(16) Jacqueline called her father who did not answer. She concluded from this: *"Daddy didn't hear. " At* about the same time Jacqueline saw her father getting hot water and reasoned: *"Daddy's getting hot water, so he's going to shave" {PDI,* p. 231). In both cases, Jacqueline had had previous experience with her father in similar situations. Her "reasoning" about them was limited merely to simple memory of what had occurred in these situations in the past. Piaget feels that this type of reasoning is simply an application of previous experience to a current situation and is not to be confused with the genuinely deductive reasoning of the mature person.

In a second kind of reasoning, the child's desires distort thinking. For example, at 2; 10(8) Jacqueline wanted to eat oranges. Her parents explained that this was impossible because the oranges were still green and not yet ripe. Jacqueline "seemed to accept this, but a moment later, as she was drinking her chamomile tea, she said: *'Chamomile isn't green, it's yellow already . . . Give me some oranges!"'* (*PDI,* p. 231). Apparently Jacqueline, having a strong desire for oranges, reasoned that if the tea were yellow then the oranges must be yellow too, and therefore she could have them to eat. At this stage, the child attempts to reason to achieve some goal, but thought distorts reality in accordance with desire. This is similar to Freud's notion of wish fulfillment. (As will be evident shortly, the tea observation is also an example of transduction.)

A third type of reasoning is what Piaget calls "transductive." In logic a distinction is sometimes made between deduction and induction. Deduction is usually characterized as a process of reasoning from the general to the particular. For instance, if we assume that all men have hearts of gold, and if we are then shown a particular man, we deduce that he has a heart of gold. Induction is usually considered a method for reasoning from the particular to the general to establish general principles from examination of particular cases. For instance, if we have met a large number of men all of whom have hearts of gold, we might conclude that all men have hearts of gold. According to Piaget, the young child's reasoning lies in between induction and deduction. The child does not go from the general to the particular (deduction), or from the particular to the general (induction), but rather from the particular to the particular without touching on the general. Transductive reasoning sees a relationship between two or more concrete (particular) items when there is none. For example, on an afternoon when Lucienne did not take a nap, she said: *"I haven't had my nap so it isn't afternoon*" (*PDI*, p. 232). In this case,

Lucienne's thought proceeded from the nap (one particular) to the afternoon (the second particular) and concluded that the afternoon depended on the nap, when of course the relationship was of a different type.

Summary and Conclusions

In the period from 2 to 4 years the child achieves the capacity to form mental representations which stand for absent things or events. To deal with things, the child no longer requires that they be immediately present; instead, the child is able to create a mental substitute for the real thing. This ability frees the child from the immediate here and now. Instead of having to manipulate things, he works with their substitutes. The child forms mental symbols through imitation. The child looks at things, handles them, and acts like them, and in these ways incorporates a great deal of information about them. These actions of the child lay the foundation for mental symbolism. In fact, imitation may be considered to bridge the gap between sensorimotor and later intelligence. During the sensorimotor period the infant develops abilities in imitative behavior. When the child is proficient at imitation at a later age, he begins to imitate internally, and thereby forms the mental symbol. In Piaget's terminology mental symbols are *signifiers.* The symbol is personal and resembles what it refers to. For example, Lucienne swayed back and forth to represent a bicycle. Once mental symbols are formed, the child gives them meaning through the process of assimilation. He assimilates them into the schemes which are already available. Therefore, what the symbol refers to (the signified) is always personal and intimately related to the child's experience. A good example of the relation between the symbol and its meaning is the child's playful use of symbols. In a make-believe fashion, the child makes some things (symbols) stand for others. The child playfully assimilates some objects into schemes appropriate for others. Another type of signifier is the sign or word which is also used to refer to something else. The word, however, usually does not resemble its referent, but has a conventionally agreed-upon meaning to facilitate communication.

During this period the child uses words in several ways. After a preliminary stage in which words are closely related to ongoing actions and desires, the child uses language to refer to absent things and events. The child, however, does not use words in the same way that an adult does; the meaning assigned to words, or the concept associated with them, is still quite primitive. The child's concepts are in fact only *pre-concepts:* they are sometimes too general and sometimes too specific. The child also shows

signs of an initial reasoning. Sometimes it is successful, but only when it does not go far beyond mere memory for past events. At other times the reasoning may be faulty. This is either due to the tendency for wishes to distort thought or to the transductive nature of the child's thought: he reasons from the particular to the particular.

These, then, are the beginnings of symbolic activity in the young child. His initial efforts are imperfect, and from the adult point of view involve many "errors." A long evolution is necessary before the child can achieve maturity in thought; logical thinking does not emerge fully formed in the child of 2 years.

Piaget argues that language plays a limited but not negligible role in the formation of the child's thought. Clearly, language does not fully shape the child's mental activities. Despite his new ability at language, the child often thinks nonverbally. He forms mental symbols which are based on imitation of things and not on their names. Language does, however, make a contribution. For example, when an adult uses a word which refers to a *class* of things, the child is given a glimpse at one facet of adult reasoning. An adult's language forces the child, to some degree, to consider the world from a new perspective. Nevertheless, it is probably fair to say that the child's thought depends less on his language than the child's language does on his thought. As we saw earlier, the child interprets words in terms of his own personal system of meanings, and the child's meaning is not necessarily the same as the adult's. Although the culture provides the child with language, the latter does not immediately socialize the child's thought. In other words, language does not completely impose on the child the culturally desirable ways of thinking. Instead, the child distorts the language to fit his own mental structure. The child achieves mature thought only after a long process of development in which the role of language is but one contributing factor.

THE CHILD FROM 4 TO 11 YEARS (PIAGET'S EARLY WORK)

We have now reviewed the infant's accomplishments in the sensorimotor period (0-2 years) and the child's acquisition of the semiotic function (2-4 years). It is hard to emphasize sufficiently the magnitude of these achievements. In the space of only a few years, the child has transformed himself from an organism almost totally dependent on reflex and other hereditary equipment to a person

capable of symbolic thought. During the years to follow (after the age of 4), neither sensorimotor nor symbolic activities disappear. The child older than 4 years continues to develop sensorimotor schemes applicable to a wide range of objects, to improve skills in language, and to acquire mental representations for increasingly large portions of the surrounding world. But at the same time the child's development extends into a number of new areas.

The present section offers an account of intellectual growth in the child from about 4 to 11 years. Recall that Piaget's first five books cover this age span and present preliminary and tentative conceptualizations. Later works offer more elaborate and mature theorizing on the same age range. We will describe here Piaget's early views on the child from 4 to 11 years; Chapter 4 reviews the later work. As we shall see, Piaget's early work, although preliminary, is still quite fascinating and, according to some criteria, rates among his finest accomplishments.

The Use of Language

Piaget's early work begins with a consideration of children's use of language. At the outset he poses a fundamental question: What is the function of the child's language? Our first response is probably that the purpose of language is communication. The child, like the adult, most likely uses language to express thoughts to others, and to transmit information. But a little reflection should suffice to convince us that even in the adult, language is not entirely communicative. When alone, adults often talk to themselves on a mental level. Occasionally, they even speak aloud when no one else is present. Therefore, our initial hypothesis about the communicative nature of language is not always true.

If this is so, then several questions immediately arise. How much of language—particularly children's language—is communicative and how much is not? What is the non-communicative variety like? And when it is not communicative, what purpose does children's language serve? To answer these and other questions, Piaget carried out a series of investigations. He began by observing two 6-year-old boys for about a month in their class at school. The children, who were from the poorer sections of Geneva, attended a progressive class. The students could draw or make what they liked, could work inpidually at "games" of mathematics and reading, had the freedom to talk or play together, and could go without permission from one room to another. As the two boys pursued their activities, Piaget and

another observer took down in full detail the children's speech as well as the context in which it occurred. Piaget attempted to avoid interfering with the children's activities and tried not to influence their behavior in any way. The intention, of course, was to obtain a full record of the child's use of language in his natural school environment. If you will recall, Piaget used such naturalistic observation in his studies of infancy and the period from 2 to 4 years. Several of the advantages and disadvantages of this method have already been discussed in Chapter 2. One question that was not considered is whether or not Piaget is correct in assuming that the children's behavior is not affected by the presence of an observer. Do children act and speak differently when watched by an adult? Unfortunately, there is little empirical evidence on this issue. At the moment we can only use our informal experience in similar situations to hazard a guess that after a short period of time young children generally learn to ignore adult observers and seem to behave quite naturally.

After recording the two children's speech, Piaget attempted to categorize each sentence spoken by each child. He discovered several varieties of both communicative and non-communicative language. Non-communicative or "egocentric" speech may be pided into three types. One type is *repetition,* which involves the child's mimicking something she has just heard; for example, "Jac says to Ez: *'Look, Ez, your pants are showing. '* Pie, who is in another part of the room [and was one of the two children Piaget observed], immediately repeats: *'Look, my pants are showing, and my shirt too. (Language and Thought, LT,* p. 35). The statement clearly involved copying another's speech since Pie was in fact quite properly dressed. Thus Pie's utterance was a clear case of repetition and did not serve a communicative function. Very often too the child is not aware that he is merely repeating what another person has said, but believes that his statement is an original one. According to Piaget's records, repetition made up about 1 or 2 percent of the total number of statements.

A second kind of egocentric speech is the *inpidual monologue.* This type occurs when the child is alone and yet talks aloud, often at great length. For example, "Lev sits down at his table alone: 7 *want to do that drawing there ... I want to draw something, I do. I shall need a big piece of paper to do that'" (LT,* p. 37). Since no one else was present apart from the observer, who by this time presumably no longer disturbed the child, Lev's statement clearly did not involve communication. In the case of Pie, monologue constituted 5 percent of his speech, and for Lev the figure was 15 percent.

Perhaps the most interesting kind of egocentric speech is the *collective* monologue. This occurs when two or more children are together and one of them speaks a soliloquy to which the others do not listen. The speaker may intend to interest the others in his remarks and may in fact believe that the others are listening. But the egocentric nature of the monologue prevents the others from understanding him even if they wanted to. Despite the fact that the speaker is in a group, his statements are not communicative; he is merely talking to himself aloud. For example, when sitting with some other children and apparently playing with toys or drawing, Lev said, *"I say, I've got a gun to kill him with. I say, I am the captain on horseback. I say, I've got a horse and a gun as well"* (*LT*" p. 41). Note that Lev's continual use of the phrase "I say" seems to indicate that he wanted the others to listen to him and that he intended to transmit information. But at the same time, Lev's statement is unclear: we do not know whom he intended to kill with the gun, who was the captain on horseback, and so on. Moreover, Lev's remarks were unrelated to anyone else's and did not succeed in making the other children listen. In fact, each child, although apparently working with and speaking to the others, offered soliloquies like Lev's. There was no "give and take" among members of the group or any continuity in the discussion; each child spoke about what interested him at the moment, and this involved mostly his own activities. The collective monologue is therefore neither truly social nor communicative as it is merely the simultaneous occurrence of at least two monologues. According to Piaget's calculations, the collective monologue involved 23 percent of Lev's speech and 30 percent of Pie's. Egocentric speech as a whole— repetition, monologue, and collective monologue—represents 39 percent of Lev's and 37 percent of Pie's total number of sentences.

The remainder of the children's speech is communicative or "socialized." In this case the child takes into consideration the point of view of the listener and attempts to transmit information to him. For example, he tells another child certain simple facts, for example, how to operate a toy. Or he criticizes another child, or asks him questions, or in other ways interacts with him. While serving a communicative function, such speech nevertheless shows certain deficiencies. Young children do not attempt to explain events to one another, and they do not speak in terms of the causes of events. Also, young children do not try to give proof or logical justification for what they have proposed. One reason is that they do not consider the possibility that the listener may have a contrary opinion.

After establishing these facts in the case of Lev and Pie, Piaget then went on to study a larger group

of twenty children varying in age from 4 to 7 years. Again, the method was naturalistic and involved the recording of the children's spontaneous remarks. In general, the findings replicated the data on Lev and Pie. A significant proportion of speech was egocentric, and this proportion was especially large in the speech of the youngest children, at about age 4.

These, then, are the results of Piaget's naturalistic observations. There seems to be a decline in egocentrism and an increase in communication as the child gets older. The child's language, especially in the early portion of the years from 4 to 5 or 6 years, does not entirely serve the function of communication. Often, the child does not assume the point of view of the listener; he talks of himself, to himself, and by himself.

How can we explain the non-communicative nature of the child's speech? What purposes does it serve? Piaget offers a number of interesting hypotheses which he regarded as tentative, and not conclusive. First, consider verbal repetition, where the child simply mimics what others say or repeats phrases of his own. Piaget's interpretation is that repetition is "simply the joy of repeating for its own sake . . . the pleasure of using words ... for the sake of playing with them" (*LT*" p. 35). You will no doubt observe that this explanation is another version of the principle of functional assimilation—the tendency to repeat schemes and to exercise them. In the present case the child mimics both his own words and those of others, just as earlier in the sensorimotor period he repeated patterns of behavior. Consequently, repetition is not motivated by the desire to communicate, but by the need to exercise verbal schemes.

But repetition comprises only a small portion of the child's speech. Let us now turn to the inpidual monologue which involves a substantial proportion of the total number of statements. To explain the monologue, Piaget offers two hypotheses which are not mutually exclusive. One hypothesis is that the inpidual monologue serves the purpose of wish fulfillment. When the child's actions are not successful in producing an intended result, he uses words to achieve his goal. If, for example, he would like to move a box but cannot because it is too heavy, the child might *tell* the box to move, thus using words to bring about what his activities cannot accomplish. The child's language, therefore, is in part a kind of fantasy, a word magic. A second explanation of inpidual monologue is that words and actions, for the child, are not yet fully differentiated. When beginning to learn language, the 2- or 3-year-old child often calls an immediately present object by its name or uses a word to describe ongoing actions. Consequently, in his

initial experience with language, the thing (or action) and the word for it are simultaneously present, and the two are seen as a whole. The word is in a sense part of the thing, and vice versa. It takes a long time for the child to disassociate fully the word from its referent; he must learn that the word bears a totally arbitrary relation to that to which it refers and that the word is not a part of it. Even in the period under discussion (4 to 7 years), the child has not fully grasped the relation between word and thing. Consequently, when he acts—plays with toys, draws, and so on—he tends to say the words associated with his behavior. Thus, the monologue is in a sense a part of the child's action and is not designed for the purpose of communication.

In the case of the collective monologue, similar explanations can be employed. Sometimes the child in a group merely repeats what another says because of functional assimilation; sometimes his remarks are magically intended to produce results which he otherwise cannot achieve; and, finally, his utterances often merely accompany activities in which he is engaged.

All three types of speech—repetition, inpidual monologue, and collective monologue—may be characterized as *egocentric*. Piaget does not use the term in the sense of selfish or self-serving. The young child is characterized as egocentric not because of conceit or because of an attempt to satisfy desires at the expense of other people, but because he is centered about himself (or his own ego in the general sense) and fails to take into account the other's point of view. When delivering a monologue in a group, the desires of the egocentric child do not necessarily clash with those of other children; rather he is insensitive to what the others need to hear. To communicate, one must consider what information the listener does and does not have and what he is and is not interested in, and this the young child does not do.

One may criticize the naturalistic study of the child's language in several ways. Perhaps Piaget found the use of non-communicative language to be extensive only because of the liberal atmosphere of the school where the emphasis was on inpidual rather than group activity. If you will recall, the children were allowed to do what they liked, and the situation was so devised that the children learned from inpidual play. Under these circumstances, it might be the case that the children felt no real need for communication, and consequently they did not display these abilities.

We may, however, cite as evidence against this argument an experiment by Piaget on verbal communication. Briefly, the task involved an experimenter's giving some information to one child (the speaker) who was then supposed to transmit it to another child (the listener). Piaget made clear to the speaker that the task was to communicate. These instructions presumably oriented the child toward the goal of communication rather than that of play. Therefore, the experiment might give insight into the child's ability to transmit information when he felt the need to do so. The experiment was also used to obtain information about the listener's ability to understand the speaker. Even if the speaker were communicative, did the listener comprehend what was said? However, since the methods used to assess the listener's understanding were rather poor, we will not concentrate on this aspect of the study.

Let us now describe the experiment in greater detail. In one portion, pairs of children were used as subjects. There were thirty children at ages 7 to 8 years and twenty at ages 6 to 7 years. The experimenter sent one of the pair out of the room and told the other a story. This child, to be referred to as the speaker, was instructed to listen carefully since he would have to tell the same story to the other child, whom we will call the listener. Then the experimenter read a story, repeated the difficult parts, and tried to make the speaker attend carefully. Several different stories, varying from six to nine sentences in length, were used, although at any one time the speaker was required to tell only one story to the listener. Next, the listener was brought into the room, and the speaker told him the story.

The experimenter took down everything that was said and, in addition, questioned both the speaker and the listener to determine the degree to which they understood. After the experiment with stories, the same pairs of children were used to investigate communication concerning mechanical objects. This time, the examiner explained to the speaker how a faucet or a syringe works. Diagrams were used to make the matter clear, and the speaker was permitted to make use of the diagram in explaining the mechanical process to the listener. Again, the experimenter recorded everything that the speaker said.

While the experiment yielded many results, we shall focus on the verbalizations of the speaker. Did children in the experiment succeed in producing communicative speech, and if not, what was their language like? In general, the experiment on communication replicated the results of Piaget's earlier naturalistic observations; that is, in both cases a substantial proportion of speech was non-communicative

or egocentric. For example, the experiment on communication showed that young children often use pronouns and demonstrative adjectives—such as *he, she, it, that, this*—without indicating clearly to what they are referring. In the midst of an explanation of the faucet, the speaker might say "If you move it with that other thing, then it will go." This child fails to consider that the listener might not know what "it" and "that other thing" designate. This tendency is carried so far that often the speaker completely fails to name the objects involved in a mechanical explanation. The child is also poor at expressing the order of events. One child explaining how a faucet works began by telling how the water falls into the basin, and only later did he bother to say how the water goes through the pipe. Or, in telling a story, the child might begin with the end and end with the beginning.

A young child may also express causal relations poorly, and seldom connect the cause with its effect. For example, in telling a story in which a fairy turned certain children into swans, one child said, *"There was a fairy, a wicked fairy. They turned themselves into swans" (LT,* pp. 126-27). Note how the child did not express the central causal relation; it was the fairy who caused the children to become swans. The child merely mentioned the two events without indicating their connection. The second sentence also illustrates the tendency to use pronouns without describing their referents. To whom does "they" refer?

Often the child may also omit large parts of the explanation or story. Even though he understands and remembers these portions (as shown by Piaget's later questioning), the child may fail to mention them. In effect he assumes that the listener already knows parts of the story or explanation. Omissions of this kind clearly reveal a lack of sensitivity to the needs of the listener.

Another aspect of egocentric speech is manifested in the observation that the child's story or explanation does not form a coherent and integrated whole. The account is fragmentary; it is merely composed of a large number of specific and unrelated items which are juxtaposed one upon the other. For example, here is one child's account of how a faucet works:

> The handle is turned on and then the water runs, the little pipe is open and the water runs. There, there is no water running, there the handle is turned off, and then there is no water running, and here the water is running. There, there is no water running, and here there is water running. (*LT*; p. 130)

Clearly this explanation involves a mere collection of inpidual statements which are not integrated into a reasonable whole. One aspect of such juxtaposition is a tendency already described: the inability to

state caused relations.

In summary, the preceding five properties of the young child's speech—the faulty use of pronouns and demonstrative adjectives, the incorrect ordering of events, the poor expression of causality, the tendency to omit important features, and finally, juxtaposition—all are concrete manifestations of the child's egocentrism—the inability to take into consideration the other person's point of view. With development these egocentric manifestations decrease and speech becomes more communicative. The speaker becomes aware of the views of others and adapts his speech accordingly.

Piaget's experiment on verbal communication also studies the understanding of the listener. Although the methodology was questionable, severed of Piaget's impressions are of interest. The results showed that, in general, the listener does not understand the speaker very well. Part of the listener's inability to understand is clearly due to the speaker's faulty presentation. Few people could comprehend the explanation of the faucet just described. But Piaget feels that part of the listener's difficulty is due to his own patterns of thought and not to the speaker's egocentric speech. Even when the speaker is relatively clear, the listener distorts his utterances in several ways. One, the listener almost always thinks that he understands what the speaker says, even when it is very obscure. The listener very seldom asks questions to clarify a point or to obtain additional information. The listener feels confident that he has understood when in fact he has not. Two, the speaker's remarks evoke in the listener a kind of free association. In Piaget's terms, the listener assimilates the remarks into his own schemes which often bear little relation to what the speaker is attempting to communicate. For example, after listening to the story in which the bad fairy turned several children into swans, one 6-year-old child distorted the account in important ways. Instead of saying that the children were turned into swans, he maintained that they were dressed in white clothes. Then he elaborated on this proposition until the end of the story was no longer recognizable. He transformed one part of the story and, giving free rein to his imagination, went on from there to construct a new tale of his own. In brief, while the speaker fails to take account of the needs of the listener, the listener also distorts what he hears, elaborates on it, and is satisfied that he has understood, whereas, in actual fact he has not.

It is easy to see that Piaget's experiment on communication is deficient in several ways. Piaget does not make clear the methods used to assess either the speaker's or the listener's understanding of the story

or explanation. The measurement of comprehension is a difficult and delicate matter that requires more attention than Piaget has given to it. Piaget also may not have fully eliminated the possibility that faulty memory, and not egocentrism, may sometimes underlie the speaker's lack of ability to communicate. Perhaps the young child is not able to tell a lengthy story simply because of the failure to remember large parts of it. Despite Piaget's attempts to control for the memory factor by questioning, it is not altogether clear to what extent he was successful.

Another factor to be considered is that Piaget's subjects were poor children. Is it not possible that lower-class children have different verbal abilities from middle-class children? If so, Piaget is too quick to generalize his findings to children in general. While these and other criticisms may be raised and seem to have validity, one must remember that Piaget's first studies were intended as exploratory. Their aim was to uncover interesting issues for investigation, to propose preliminary hypotheses, and not to reach firm conclusions. Piaget's studies on communication seem to have fulfilled his original goals. His research raises interesting questions. For example, is it true that the young child cannot express cause-and-effect relations, or that the listener so extensively distorts what the speaker says? Despite its deficiencies, Piaget's research is of great historical significance: it was one of the first attempts in child psychology to deed with the crucial issue of the functions of human language.

Thus far we have seen that the young child from about 4 to 7 years displays a significant amount of egocentric speech and that the older child after about 7 years is increasingly proficient at verbal communication. Why does egocentric speech decrease as the child gets older? Piaget proposes an interesting hypothesis to explain the waning of egocentrism. When the child is young, particularly in infancy, adults take great pains to understand his thoughts and desires. The mother must know which toy the infant wants or what bothers him and is not able to rely exclusively on words to understand him. Consequently, the young child does not need to communicate clearly; even if his speech is unclear, adults will make every effort to understand. As the child grows older, however, he is thrown more and more into the company of older children who are not as solicitous as adults. Other children do not try so hard to penetrate the obscurities of his language. Moreover, they argue with him; they challenge what he says and force the child to defend himself. It is under social pressures of these kinds that the child is gradually forced to adopt better modes of communication. In the attempt to express himself and to justify his arguments, the child eventually learns to take into account the other's point of view. Not to do so is to be

misunderstood and to lose the argument. In this way, then, does egocentrism diminish.

Clinical Method

Piaget's early work was in part concerned with the contents of the child's thought. He attempted to discover the spontaneous ideas of the child at different stages of his development. What is the child's conception of the nature of dreams, or what is his explanation of the fact that boats float on water? The study of content is particularly difficult, because as we have seen in the previous section, young children have great difficulty in communicating their thoughts. It is therefore crucial for the investigator of content to employ sensitive and accurate methods. Piaget has devoted careful consideration to the choice of a proper method. He has rejected the testing approach, assigned a limited role to naturalistic investigation, and adopted the clinical procedure. Let us consider each of these decisions in turn.

The essential feature of the testing method is a series of questions which are posed in the same way to all who take the test. If we are investigating the origin of the sun, for instance, we might ask all children, "Where did the sun come from?" It is important that the question be put in precisely the same way to all children. In fact, the reading of the question (the intonation, stress, and so on) should be as consistent as possible. If a child does not seem to understand, the examiner may repeat the question. But this is usually the maximum of flexibility permitted: the examiner may not rephrase the question or otherwise alter it. The purpose of a standardized administration is to guarantee that all subjects are faced with the same problems. Then if 4-year-olds generally give one type of answer and 8-year-olds another, the examiner may reasonably conclude that there is a real difference between the age groups. If, on the other hand, the form of the questioning varied across age groups, the examiner would not know whether the difference in answers is genuinely related to age or is due simply to the difference in questions. While the testing method has important psychological uses, Piaget feels that it is not suitable for his task—the discovery of content (or the discovery of structure, a problem to which Piaget also applies the clinical method).

The testing method has the disadvantage of inflexibility. If a child gives an interesting response, the examiner cannot pursue it. If a child misunderstands the question, the examiner cannot clarify it. If the child's answer suggests an additional topic for investigation, the examiner must leave the matter

unexplored. In addition, the test procedure may be suggestive. If the child is asked, "Where did the sun come from?" the question implies that the sun did have an origin, and this idea may not have occurred to the child before. Consequently, his answer may not reveal the contents of his spontaneous thought, but may be merely a hastily considered response to a question encountered for the first time. And, finally, the test method does not usually allow the examiner to establish the stability of the child's response. If a child is asked what the sum of 2 and 2 is, and says "4," his answer may be tentative or firm. If he is unsure, further questioning may induce the child to change his mind. If his belief is firm, nothing will sway him. In the testing procedure the child gives an answer and that is the end of it: a tentative "4" is as good as a sure one. For these reasons, then, Piaget rejects the testing approach.

Another method for the investigation of spontaneous content is the naturalistic procedure as used in Piaget's study of infancy or language. In a sense, this is an ideal method. Suppose we observe that a child spontaneously asks the question: "Who made the sun?" The statement gives a clear insight into the content of his thought. It is immediately obvious that he believes that some agent, perhaps a person or perhaps God, intervened to create the sun, and that it did not evolve naturally. Surely this spontaneous question is far more valuable than a response to a standardized question.

The naturalistic method, however, is subject to a number of drawbacks. One may observe a child for a very long time before he will say anything of interest. Suppose we are interested in the child's conception of the origin of the sun; it is extremely unlikely that he will ask the relevant question while being observed. Consequently, the naturalistic method, despite its clear utility, cannot be used as the chief instrument of research. At best, naturalistic observation can serve only a subsidiary role in two ways. It can suggest questions for intensive clinical examination. If, for example, we hear a child ask, "Who made the sun?" then we can interview a large number of children to test the generality of the assumption underlying his question. Second, the naturalistic observation can serve as a check on the results of clinical questioning. If interviewing suggests that children believe that clouds are alive, then patient, naturalistic observation may furnish data to support or refute this hypothesis.

Piaget feels that the clinical method avoids the deficiencies of the testing and naturalistic procedures, and in addition offers a number of attractive features. The clinical method is hard to describe since it is so flexible and provides a general framework for questioning the child rather than a set or

standardized form. This account is therefore intended only as an outline of the clinical method. The basic aim of the method is to follow the child's thought without deforming it by suggestions or by imposing the adult's views on the child. One important feature is that the experimenter tries to adopt the language of the child and keep the level of questions accessible to the child. Terms which are beyond his reach are avoided and replaced as much as possible by those which the child has spontaneously emitted. The examiner usually begins by asking a nondirective question. Instead of saying, "Who made the sun?" or "How did the sun evolve?" the examiner might ask, "How did the sun come about?" If the child does not understand, the examiner is free to rephrase the question by asking, for example, "How did the sun get there?" After the child answers, the experimenter forms an hypothesis concerning the nature of the child's beliefs. For example, if the child first answered, "It was put there," the examiner might guess that the child believes that a person created the sun. Subsequent questions are used to test this hypothesis. The examiner might then ask: "Can you tell me how it was put there?" If the child says, "God put it there," then the examiner might follow up aspects of this response. Does the child really believe in pine intervention, or is this just a superficial mimicry of what he has been taught in Sunday school? To answer this question, the examiner may challenge the child's belief to see how firmly he holds to it. Or the examiner may wonder whether the child means to say that the sun already existed before God "put it there" or that God created it too. Further questions must be asked to decide between the two alternatives. Of course, if the examiner's hypothesis is not confirmed, he must allow the child's answers to lead him to the correct interpretation. It is easy to see that no two clinical examiners, even if they are testing the same child, will pursue the same line of questioning. It is also clear that clinical questioning is very delicate and subject to several kinds of errors. The examiner may talk too much and thereby suggest answers to the child. Or the examiner may not talk enough and fail to pose the questions necessary for determining the child's meaning. Piaget feels that at least a year of daily practice is necessary before the examiner can achieve proficiency at clinical questioning.

We may raise a number of criticisms of the clinical method. How do we know that Piaget is a good clinical examiner? His books give only portions of selected clinical interviews. It is possible that the published interviews are exceptional—from the point of view of method and support for Piaget's theory—and that the unpublished protocols are poorly done. Perhaps in the latter case the examiner suggested answers to the child, asked the wrong questions, and so on. Also, we may wonder whether Piaget's

diagnoses—the judgments derived from the interview—are reliable. That is, would other persons agree with the interpretations, or are Piaget's diagnoses quite idiosyncratic? It is also true that since the clinical interviews are unstandardized, it is very difficult for independent investigators to test Piaget's work. If another psychologist attempted to repeat Piaget's research and obtained different results, the Piagetian criticism could always be that he failed to use the clinical method properly. Another criticism that is raised is that Piaget usually commits a large number of methodological sins unrelated to the clinical method. For example, he does not usually report the number of subjects seen in an investigation, or their exact ages, or their social backgrounds. In describing the results he presents only fragments of interviews and fails to give a statistical summary of the children's reactions. To summarize, the clinical method is deficient. Perhaps the chief objection is that it requires us to take a lot on faith: that Piaget conducts the interview without suggestion, that he interprets the results properly, and so on. As we well know, scientists prefer to take as little on faith as possible.

The deficiencies in Piaget's research are real. Yet we must be careful not to exaggerate them; we must evaluate the clinical method in the overall context of Piaget's work. Piaget felt that the early portion of his research was essentially exploratory. His goal was to open up new areas for investigation and to propose preliminary hypotheses for further examination. The early work was not intended to prove a theory or to present definitive views on intelligence, and Piaget felt that methods should be as flexible as possible at the preliminary stages of research. It seemed premature to him to introduce rigorous procedures when almost nothing was known about the subject matter, and when it was by no means clear what the proper methods should be. If Piaget had attempted to establish every point with the maximum of certainty, then he probably would not have advanced beyond the study of children's verbal communication (one of his first research topics). Once the pioneering research has been done, then it is always possible to check the results by more standardized methods and revise the tentative hypotheses.

The Content of Thought

Piaget's early investigations of content are extensive. His two books on the subject are *The Child's Conception of the World (CCW)* and *The Child's Conception of Physical Causality (CCPC)*. They cover a large number of topics which include the child's beliefs concerning dreams, meteorology, the origin of trees, the nature of shadows, the explanation of the steam engine, and so on. To illustrate this work we shall

describe only one topic: the origins of the sun and moon.

According to Piaget's findings there are three stages in the child's concept of the sun and moon. The stages occur in sequence somewhere between about 3 and 12 years. Piaget does not attempt to specify precise age norms because there are large variations in responses. Here is an example of a stage 1 protocol, a 6-year-old's beliefs:

> How did the sun begin?—*It was when life began.* —Has there always been a sun?—*No.*—How did it begin?—*Because it knew that life had begun.*—What is it made of?—*Of fire.* —But how?—*Because there was fire up there.* —Where did the fire come from?—*From the sky.*—How was the fire made in the sky?—*It was lighted with a match.* —Where did it come from, this match?—*God threw it away. . . .* How did the moon begin?—*Because we began to be alive.*—What did that do?—*It made the moon get bigger.* —Is the moon alive?—*No . . . Yes.* — Why?—*Because we are alive.* (*CCW* p. 258-59)

The protocol illustrates three kinds of beliefs common to children in the first stage of development. The first belief is *animism.* The child believes that the sun and moon are alive in the same sense that people are alive; that is, the sun is credited with *knowing* that life had begun. The second belief is *artificialism.* The child asserts that the sun resulted from the actions of an outside agent. It was not a natural process that formed the sun, but an act of intervention on the part of God. The third belief illustrated by the protocol contains the idea of *participation.* The child perceives some continuing connection, or some participation, between human activities and those of things. His belief is that the moon began because people began to be alive. Note that this explanation is not artificialism, since the child does not assert that people created the moon. His conception is vague, and he merely assumes a dim relation between people and the planets; he believes that there is some sort of influence or participation between them.

The second stage of the child's concept of the sun and moon is transitionary. The child continues to believe in artificialism and animism, but less blatantly than before. The following excerpt involves an 8-year-old child:

> How did the sun begin?—*It was a big cloud that made it.*—Where did the cloud come from?—*From the smoke.* —And where did the smoke come from?—*From houses. . . .*—How did the clouds make the sun shine?—*It's a light which makes it shine.* —What light?—*A big light, it is someone in Heaven who has set fire to it.* (CCW, p. 274)

Note that at the beginning of the protocol the child invoked only natural phenomena to explain the

sun's origin. The sun was formed by clouds which in turn derived from smoke. However, when asked where the smoke came from, the child proposed an artificialist explanation. The smoke came from houses and, by implication, from fires which people created. Artificialism is even more apparent in the second part of the protocol where the child maintains that someone in Heaven has created a light that makes the sun shine.

In the third stage, the child gives up notions of artificialism, animism, and participation. While his explanations are often crude and incorrect, he attributes the sun's formation to natural processes in which human or pine agents have no role. Sometimes, of course, the child's accounts are based on what he has been told in school. Yet sometimes they are not, and even then the child proposes explanations invoking physical processes of the planet's origins.

Moral Judgment and Behavior

Piaget's early work covered a wide range of topics including verbal communication, concepts of physical causality, and moral judgment and behavior. This last topic will be considered now. Piaget begins his study of moral behavior and judgment with a detailed consideration of children's games of marbles. He describes how children conceive of the game and follow its rules. At first glance it may seem quite unusual to study morality by means of the apparently trivial game of marbles. Our intuitive definition of morality probably relates to such matters as lying and stealing, and not to mere games. But according to Piaget the essential aspect of morality is the tendency to accept and follow a system of rules which usually regulate interpersonal behavior. Our society has gradually developed norms which control how an inpidual treats others, behaves toward property, and so on, and these regulations, supplemented by the inpidual's own conceptions, constitute the moral system. On closer inspection it would seem as if the rules governing the game of marbles fulfill all the defining conditions of a moral system. The rules control how inpiduals behave toward one another in terms of the actions which comprise the game, they determine inpidual and property rights, and they are a cultural product which has been passed down from generation to generation. The game of marbles also has a unique advantage from the point of view of child psychology. The rules have been developed largely by children, and the game is played almost exclusively by children. Therefore, the child's conception of the game and his playing of it reflect the workings of his own mind and is subject to little adult influence. Unlike rules

dealing with lying or stealing, the game of marbles is the child's creation, not the adult's. If we question the child about the game, his answers do not simply parrot the teachings of adults, but give a genuine indication of his own thought. But is not the game just play, something that is not at all taken seriously, and that therefore bears no relation to morality, which is a grave matter? We may answer this criticism by pointing out that the child does take the game seriously. While a game has its "fun" aspects, if one observes children playing, one realizes that they are deeply engrossed in their activities, consider the other players' actions of some importance, and are not entirely disinterested in the outcomes. Is the adult who "plays" the stock market very different?

To study children's behavior in the game of marbles, Piaget first acquired a thorough knowledge of the rules of the game. Then he asked about twenty boys, ranging from 4 to 12 or 13 years of age, to show him how to play. (In Switzerland the game of marbles is played exclusively by boys.) In the course of his game with the child, Piaget tried to appear as ignorant as possible about the rules so that the child would feel that he had to explain them. In this way Piaget was able to determine both whether the child understood the rules, and, if so, whether he followed them. Sometimes Piaget observed pairs of children, particularly younger ones, play the game without him. Piaget also questioned the child about the nature of the rules. He was interested, for example, in whether the child believed that the rules might be changed and in the child's conception of the origin of rules.

Let us consider the practice of rules, or moral behavior. From about ages 4 to 7 years, an *egocentric* stage occurs where children do not know or follow the rules, but they insist that they do. As an example of this stage, let us examine the following:

Piaget separately examined two boys who were in the same class at school, who lived in the same house and often played marbles with one another. The first boy described and played by a set of rules which was highly unusual and idiosyncratic. The second boy did not understand the first boy's rules and moreover proposed an unusual system of his own. Thus, each of the boys, who often played "together," in fact followed his own system of rules which bore little relation to the other child's. There was little notion of "winning," in the adult sense, and little genuine competition between the two players. For the young child, "winning" means "having a good time," and it was, therefore, quite possible for all players to win in this particular game. Each child was merely playing an inpidual game and did not really need the other.

At the same time, the children believed that they were playing like other children and that they knew and followed the rules quite well.

The behavior at marbles is similar to the speech of children of the same age and is, therefore, called egocentric. In both cases the child is centered about himself and fails to take into account another person's point of view. In the game of marbles the young child plays for himself and not with someone else. He has his own set of rules and is relatively uninfluenced by what the other does. In the case of speech, the child talks by himself and not with someone else. He speaks for his own purposes, and his monologue is relatively unaffected by the other's comments. Egocentrism is therefore a tendency common to both speech and moral behavior.

The next stage, that of *incipient cooperation,* lasts from about 7 to 10 or 11 years. The game begins to acquire a genuinely social character, and the child has a much firmer grasp of the rules. While his knowledge of the game is not perfect, he has mastered the basic rules and attempts to learn the rest. The child of this stage both cooperates and competes with his partner. There is cooperation in the sense that the child agrees with his partner on a common set of rules which are then followed. (Cooperation does not mean here that the two or more children assist each other to attain a common goal.) There is competition in the sense that each child tries to win for himself, while at the same time he adheres to the mutually agreed-upon framework. Nevertheless, play is not yet fully mature. Since the child has not yet mastered all of the rules, the game does not proceed smoothly, and there are difficulties and conflicts. Again, there is a parallel between play and speech. In both instances, the child of about 7 years of age begins to take into account an external point of view. In marbles he allows a set of rules to govern his behavior, and he interacts with the partner. In speech he tries to anticipate what the listener needs to know, and he accepts linguistic conventions which facilitate real interaction.

The final stage of moral behavior is that of *genuine cooperation* which begins at about 11 or 12 years of age. Now the child acquires a thorough mastery of the rules. As before, he agrees with the others on the way to play the game, and it is within this common framework that he tries to win. In addition, however, the older child shows a kind of legalistic fascination with the rules. He enjoys settling differences of opinion concerning the rules, inventing new rules, and elaborating on them. He even tries to anticipate all the possible contingencies that may arise.

Piaget tells a delightful anecdote about the legalistic tendencies of this stage. He observed a group of boys aged 10 and 11 who were preparing to have a snowball fight. Before getting on with it, they devoted a considerable amount of time to piding themselves into teams, electing officers, devising an elaborate set of rules to regulate the throwing of snowballs, and deciding on a system of punishments for transgressors. Before they had actually settled on all these legalistic aspects of the game, it was time to return home, and no snowball game had been played. Yet, all the players seemed content with their afternoon.

We may summarize by stating, then, that there are three major stages of the practice of rules: *egocentrism,* where each child does not know the rules or how to apply them but thinks he does; *incipient cooperation,* where mastery of the rules has improved and children begin to share them to compete; and finally, the stage of *genuine cooperation,* where children know the rules well and enjoy elaborating upon them.

After establishing the child's knowledge and practice of rules, Piaget went on to question the child about their inviolability. He asked the child whether the rules might be changed, whether they always existed in their present form, and how they originated. In determining the child's conception of the rules, Piaget of course used the clinical method (as he did in establishing knowledge of the rules). He found that there are two major stages in notions concerning the inviolability of rules. The first stage, which is in turn pided into two parts, lasts from about 4 or 5 years to about 9 or 10 years. Thus it overlaps the first two stages of the practice of rules (egocentrism and incipient cooperation). In the first part of the first stage, which we shall call the *absolutistic* stage, the child believes that some authority originated the rules of marbles and that no one ever played the game before that authority played it. Moreover, the authority conveys on the rules a sacred, unchangeable character: they are absolute and cannot be altered. Here is part of a protocol of a 5-year-old illustrating some of these beliefs:

> How did you get to know the rules?—*When I was quite little my brother showed me. My Daddy showed my brother.* —And how did your daddy know?— *My Daddy just knew. No one told him. . . .*—Tell me who was born first, your daddy or your granddad?—*My Daddy was born before my granddad.* —Who invented the game of marbles?—*My Daddy did. (Moral Judgment,* MJ, p. 55)

We see that the child believes that the rules emerged, fully formed, from his father, who is so prestigious that he was born before his own father.

While believing in the sanctity of rules, the young child from about 4 to 6 years in the first part of stage 1 is also willing to accept changes in the rules. He agrees to place the marbles in a circle, whereas a square is the usual convention. This seems paradoxical: the child thinks that the rules are sacred but easily consents to their modification. Piaget feels that the child's acceptance of changes is only apparent. He has such a poor grasp of what the rules are that he believes the changes to be merely alternative and quite legitimate versions of the rules. In other words, the child consents to alterations only because he does not know that they really are alterations.

In the latter part of the first stage (from about 6 to 10 years), the child's knowledge of the rules increases, and he is consequently able to recognize a real change in the rules when it is proposed. Now he refuses to accept these alterations and asserts that the rules are immutable. For example, Piaget asked one boy of 6 years to invent a new game, and he refused, saying "I've never invented games." Then, after Piaget suggested a new game of marbles to him, the boy played it for a time. But when asked, "Could this game ever become a fair game?" the boy responded "No, because it's not the same [as the usual game of marbles]" (MJ, P-60).

If you will recall, many of the children who are in stage 1 of the conception of rules are simultaneously in stage 1 of the practice of rules (egocentrism). This means that at the same time that the child believes the rules to be sacred and immutable, he also does not know them too well and does not follow them. Again we seem to be faced with a paradox: how can he place so much faith in the same rules that he consistently breaks? To understand this apparent contradiction, we must consider the child's acquisition of rules. Usually he learns them from an older child whom he considers similar to adults, and whom he therefore imbues with the same respect and authority that he gives to adults. In Piaget's terms, there is a relationship of *constraint* or *unilateral respect* between older and younger children; the former's authority is unconditionally accepted so that the younger child assigns to the rules the same authority that he considers the older child to have. Since the adult and the older child are considered infallible, so are the rules which they propagate. In addition, the young child is egocentric. As we saw in the case of language, he cannot take the point of view of others. Since he is wrapped up in his own concerns, he cannot understand the value of rules which protect the interests of others. It is not so much that he is selfish; rather he does not perceive the legitimate needs that other persons have. Since this is so, he does not understand the purpose of rules. For him they are merely external things which cannot be

changed.

We can say, then, that the young child imbues rules with absolute respect since they derive from a prestigious person and that he sees the rules as external objects which cannot be changed because his egocentrism prevents him from understanding the purpose of rules.

Piaget then notes that all of the factors mentioned—the relation of unilateral respect, egocentrism, the conception of the rules as authoritative and external—prevent the young child from participation in the formation of rules. Since the young child cannot assume the older child's point of view, how can he cooperate in developing fair rules? Because the young child does not participate in making the rules, they remain quite external to him. The rules are not really his; they are a kind of foreign body imposed on him. It should come as no surprise that they do not effectively transform his behavior. In other words, because the child has not cooperated in devising the rules, he does not understand them and, therefore, is not able to follow them.

In the second stage of the conception of rules, beginning at about 10 or 11 years, the child believes that the rules can be changed, that they originated through human invention, and that they are maintained only by mutual consent among equals. Consequently, the child will agree to a modification of the game so long as all of the other players agree, and so long as the change is a fair one. Since he himself participates as an equal in the invention of new rules, he feels obligated to follow them and does so.

To explain the shift from the absolutistic morality of the younger child to the flexibility of the older child, Piaget proposes a social learning theory. He begins by noting that as the child in Western society grows older, he becomes progressively free of parental and other adult supervision. During the first five years or so of life, the child is very closely tied to his parents. After that point he goes to school, spends an increasing amount of time with peers, and generally assumes greater responsibility for his own life. As these events take place, the child gradually learns to make decisions for himself and does not necessarily accept as authoritative the views of other persons who are now considered his equals. In other words, the child escapes from the attitude of unilateral respect toward elders and begins to adopt a position of mutual respect. As a result of this development he does not unquestioningly accept rules as binding and immutable. Because he now sees himself as the equal of others, he desires to assist in the formation and

modification of the moral code.

Another and related factor influencing the decline of the absolutistic concept of rules is the child's increasing contact with pergent points of view. As the child widens his sphere of contacts beyond the immediate family, he discovers that there are perse and conflicting opinions and customs. He finds that not everyone accepts the views promulgated by his parents. This conflict between what he has been taught and what other people believe forces the child to reassess his own position and to resolve the differences in opinion. In attempting to do so, the child reasons about rules and comes to the conclusion that they must, to some extent, be arbitrary and, therefore, changeable.

To summarize, as he grows older the child evolves from a position of submission to adults to one of equality. He also is confronted with beliefs contradictory to those he has been taught. Both these experiences influence the child to see rules as having a human, and hence fallible, origin, and to agree to participate in their formation and alteration. Since the child now has a hand in the formation of rules, they no longer exist as a foreign entity imposed on his conscience; they no longer exist as a code which may be unquestionably respected, occasionally obeyed, and seldom understood. The child now chooses to follow rules which are his own or at least freely agreed upon.

Piaget goes on to examine the development of judgments concerning explicitly moral situations. To study this he told children stories which posed a moral dilemma and asked them to resolve it. For example, if a child stole some apples, what would his punishment be? In this way Piaget attempted to discover the child's conception of justice, punishment, lying, and similar matters. To illustrate these investigations, we will focus on the conception of goodness and naughtiness.

Piaget presented his subjects with a series of stories of two types. In one story, the central character performed an act which unintentionally resulted in considerable damage; in the other, he caused a negligible amount of damage as a result of a deliberately improper act. The subject's task was to decide who was good and who was naughty.

Here is an example of the first type:

> A little boy who was called Augustus once noticed that his father's inkpot was empty. One day that his father was away he thought of filling the inkpot so as to help his father, and so that he should find it full when he came

home. But while he was opening the inkbottle he made a big blot on the table cloth. (*MJ*, p. 122)

The corresponding story involving negligible damage is as follows:

There was a little boy called Julian. His father had gone out and Julian thought it would be fun to play with his father's inkpot. First he played with the pen, and then he made a little blot on the tablecloth. (*MJ*, p. 122)

After telling each pair of stories, Piaget asked whether the two children were equally guilty, or which of the two was the naughtier and why. He used the clinical method to probe the child's responses. The results were that until the age of 10, children give two kinds of answers. One of the answers maintains that the character's guilt is determined by the nature of his motives. The boy who wanted to help his father but caused a great deal of damage is less guilty than the boy who engaged in an improper act which resulted in negligible damage. Piaget calls this a "subjective" conception of responsibility since the child takes into account the motives (the subjective state) of the character in the story. The second type of judgment found in this stage (and found, moreover, in many of the same children who sometimes give a subjective answer) is less mature. This answer maintains that the character's guilt is determined not by his motives, but by the sheer amount of damage he has caused. The boy who wanted to help his father is nevertheless guilty because he made a large stain, whereas the boy playing with the pen is not guilty since his stain was so small. Consider this protocol, from a girl of 7 years:

Which is the most naughty?—*The one who made the big blot.*—Why?—*Because it was big.* —Why did he make a big blot?— *To be helpful.* —And why did the other one make a little blot?—*Because he was always touching things. He made a little blot.* —Then which of them is the naughtiest?— *The one who made a big blot.* (MJ, p. 126)

It is evident from the protocol that the child was perfectly aware of each character's intentions, and yet ignored them. What determines guilt is not intention but quantity of damage. Piaget characterizes such a response as a case of *moral realism.* The judgment is "realistic" in the sense that the criterion of guilt is not subjective (the intention) but material or "real" (the amount of damage). The child considers only the facts of damage, not the subjective state of motive. Also, the child's judgment observes the letter and not the spirit of the law. The rule (in this case, "Thou shalt not spill ink") is an absolute, so that any action which conforms to it is good, and any which does not is bad.

Piaget finds that the young child's moral realism is pervasive. Consider the definition of a lie. One 6-year-old gave a typical response in saying: "It's when you say naughty words" *(MJ*, p. 141). He went on

to agree that "fool" is a lie because it is a word you should not say. We see then that the child's definition is "realistic": a lie is a bad thing and does not at all refer to the intention to deceive. A second example concerns young children's comparison of the magnitude of lies. To study this sort of judgment Piaget read the children two stories. In one story a boy was frightened by a dog and told his mother that the dog was "as big as a cow." In a second story a boy deliberately deceived his mother about his school grades. Young children often maintained that the story about the dog was a greater lie than the story about the grades. The reason was that seeing a dog the size of a cow was a less probable event than getting good grades. In the case of the dog there is a much greater discrepancy between actual facts (the real size of the dog) and the lie (the dog being as large as a cow) than in the case of grades, where the lie (a good grade) seems almost as likely as the fact (a bad grade). In other words, seeing a dog as large as a cow is far less likely to occur than having good grades and, therefore, appears to be a bigger lie. Intention to deceive is irrelevant, and the important criterion has to do with the probability of occurrence of the events. Thus the young child's judgment of lies is as "realistic" as his decision concerning goodness and naughtiness. It focuses on the external or material aspect of the question and fails to take into account the intentional or subjective aspect.

Why does a significant proportion of the young child's responses involve moral realism? Part of the reason is probably that parents are sometimes "realistic" themselves. Some adults punish the child more for breaking fifteen cups unintentionally than for purposely destroying one cup. But this is not the whole story. Parents punish a statement intended to deceive (a real lie) more than a mere exaggeration (for example, the dog as big as a cow). The child, however, thinks that the exaggeration is naughtier than the intention to deceive, so it seems that the child's judgment does not simply reflect the punishments which he has actually received from adults. It is apparent, then, that two additional factors are involved. One factor is the relation of unilateral respect. Since the parent is respected, so are his rules. If the parent forbids the breaking of cups, then the act of doing so is bad regardless of intention. Another factor is the child's egocentric patterns of thought. Since he cannot assume points of view different from his own, he cannot see the other's need for truth, and consequently, he is not aware of the fact that his "lies," in which he himself often appears to believe, are deceiving the listener. Unilateral respect and egocentrism, then, contribute to moral realism just as they do to the concept of rules as inviolable and sacred.

The child gradually abandons moral realism in favor of a more "subjective" approach. In judgments

of goodness and naughtiness he focuses on motivation, not extent of damage. In judgments of lying he considers the intention to deceive, not just the likelihood that the event could have occurred. As was the case in the conception of rules, the child's progress is due largely to his new independence from the family, to his increased interaction with others, to his contact with pergent views, and to similar factors.

We may make severed comments concerning moral behavior and judgment. First, Piaget emphasizes that the various stages overlap, that the same child may be in both stages simultaneously depending upon the content of a particular situation, and that primitive forms of moral judgment are often characteristic of adults as well as children. Neither the stages nor the course of their development are clear-cut, and Piaget does not wish to give an impression of orderliness where little is to be found. Second, Piaget's social learning theory—that primitive moral judgment derives in fact from unilateral respect and mature conceptions from cooperation and similar factors—is speculative because there is no direct evidence linking adult constraint with moral realism. Nevertheless, the theory points in interesting directions. The effect of the social environment on intellectual processes has hardly been considered. Undoubtedly the theory will require clarification and elaboration, particularly with regard to the reciprocal effect which seems to exist between cooperation and the diminution of egocentrism. Does the child take the other's point of view mainly because the two persons interact, or do they interact mainly because they can each take the other's point of view? Or, as seems more plausible, could it be that there is a complex relationship between cooperation and the passing of egocentrism?

A third comment is that Piaget's theory, like Freud's, is somewhat pessimistic. According to Freud it is inevitable for both social and biological reasons that the child will experience an Oedipal conflict, which will result in the adoption of a harsh and authoritarian superego or conscience. For Piaget, too, it seems inevitable that the young child will display egocentric thought and that he will stand in a relation of unilateral respect to the adult. Egocentrism defines certain properties of thought observed in young children which appear to be unavoidable and which must be overcome before the child can reach a more mature level of cognitive functioning. Unilateral respect is inevitable too; even if the parent tries, he cannot create a total atmosphere of mutual respect. The parent must arbitrarily impose upon the child some regulations because the child cannot understand their complex rationale. Since egocentrism and unilateral respect are inevitable, so is their product, moral realism.

A fourth comment is that Piaget has not yet fully demonstrated that the moral judgments elicited by his questioning on stories correspond to moral judgments in "real life." Piaget's arguments may be convincing— for example, that children take the game of marbles seriously—but no amount of argument can resolve the issue. What is required is naturalistic study. We need to see whether moral realism, for example, is indeed found in children's moral judgments in the natural situation.

A fifth comment concerning moral behavior and judgment is that Piaget's work has certainly fulfilled its original purpose: to stimulate further experimentation and theorizing. Moral judgment has been a popular topic for research, and in the main, independent investigators' findings have been consonant with those of Piaget.[1]

Reasoning

Piaget's early work touched upon the child's reasoning, too. The research again was preliminary, and as we shall see in Chapter 4, he later intensively elaborated upon the same topics. At this point we will consider several types of reasoning: syncretism, juxtaposition, and ordinal and part-whole relations.

In one of his studies Piaget presented thirty-five 9-year-old boys and girls with a series of proverbs and a collection of explanatory sentences. The child's task was to connect each proverb with the proper explanatory sentence. For example, one proverb is, "Drunken once will get drunk again." The sentence which expressed the same idea is, "It is difficult to break old habits," and not, "Some people are continually drunk." Piaget also questioned each child concerning the reasons for his choice.

One 8-year-old child said that the sentence corresponding to "When the cat's away the mice can play" is "Some people get very excited but never do anything." When Piaget asked his justification, he responded:

> Because the words are about the same. . . . It means that some people get very excited, but afterwards they do nothing, they are too tired. There are some people who get excited. It's like when cats run after hens or chicks. They come and rest in the shade and go to sleep. There are lots of people who run about a great deal, who get too excited. Then afterwards they are worn out and go to bed. (*LT*, p. 149)

The child's process of reasoning is certainly very confused. One way we may characterize it is in terms of *syncretism,* a tendency to connect a series of separate ideas into one confused whole. In the

present case the child tries to tie together an absent cat with excited people. The child assigns to disparate things a similarity which is almost unfathomable to the adult. How does the tendency toward syncretism work? According to Piaget, when the child reads the proverb he constructs an interpretation of it. This interpretation may be only loosely related to the real meaning of the proverb because the child, in effect, free associates when he hears the words.

In the case of the subject whose protocol was just described, subsequent questioning revealed that he interpreted the proverb as meaning "The cat runs after the mice." The child then searched among the alternative sentences to find the one corresponding to the proverb. His interpretation or understanding guided this process, so that he viewed the sentences in terms of his interpretation of the original proverb. In Piaget's terminology, the child assimilates the sentences into the scheme which originally contributed toward his understanding. The subject cited thus perceived a similarity between his understanding of, "The cat runs after the mice," and the sentence, "People get excited." Then, after the child has interpreted a proverb and seen a relation between the interpretation and a sentence, he says that the sentence and the proverb have the same meaning. By means of an intermediary—the scheme which enabled him to understand in the first place—he has conglomerated two apparently disparate items. In a sense, syncretism is a case of assimilation gone wild. The child does not accommodate to the real meaning of the proverb; rather, he assimilates it into his own scheme, and then he goes on in the same way to assimilate the sentence into this scheme too.

Now we will consider the phenomenon of *juxtaposition.* If you will recall, in his study of verbal communication Piaget found that young children seldom express causal relations. In describing some mechanical device, the child merely says that *a* and *b* occurred; he does not say that *a* caused *b.* Instead of being related one to the other, the two events are merely juxtaposed, that is, placed one after the other. To investigate this matter more directly, Piaget performed an experiment on forty children from about 6 to 10 years of age. He gave each child an incomplete sentence ending with the word "because," and asked him to complete it. For example, he might ask, "Water gets hot because . . .". If the child answered, "the fire was turned on," then Piaget might continue by asking, "And the fire was turned on because . . .".In this way, he attempted to determine if children could use the notion of causality when they are almost directly asked to do so. The responses to the sentences and to clinical questioning revealed a frequent inability to express causal relations. Here are some examples:[2]

> the man fell from his bicycle, because he *broke his arm*. ... I had a bath, because *afterwards I was clean*. . . . I've lost my pen because *I'm not writing*. . . . He fell off his bike, because *he fell and then he hurt himself*. (*Judgment and Reasoning, JR*, pp. 17-18)

At least two explanations of the child's responses are possible. According to one explanation, the child's answers express sophisticated relationships. The sentence "I had a bath, because *afterwards I was clean*" means "We can tell that I had a bath because afterwards I was clean" or "My cleanliness implies that I had taken a bath." A second interpretation of the same sentence is that the child has a poor understanding of causality: he reverses cause and effect and merely juxtaposes one event after the other. Which explanation is correct? A number of factors seem to support the second interpretation, juxtaposition. In his natural speech the child seldom uses the word "because" or other similar words to express relations, causal or otherwise, between events. Also, some of the answers to Piaget's test do not reveal sophisticated relationships of the type proposed by the first hypothesis. An example is, "He fell off his bike, because *he fell and then he hurt himself*." This statement does not directly connect falling with injury; the two events are merely juxtaposed. The more accurate interpretation of the child's responses seems to be that they reveal a failure to perceive causality (let alone more sophisticated relations) and indicate a tendency merely to place events one after the other without specifying the relations among them.

Juxtaposition can also be seen in another and different context, namely, the child's drawing. In depicting a bicycle, for instance, the child draws many of the parts but does not synthesize them into a proper whole. He may draw the chain but not connect it to the wheel; he may draw the seat but not attach it to the frame. We see that the child considers only isolated events and ignores the relations between them.

Since syncretism and juxtaposition seem to be opposites, their simultaneous existence in the young child poses a paradox. How can the same child both ignore the parts in favor of the whole (syncretism) and ignore the whole in favor of the parts (juxtaposition)? Piaget attempts to resolve the paradox by arguing that both juxtaposition and syncretism are expressions of a common mode of thought—the inability to think about severed aspects of a situation simultaneously. Juxtaposition involves failing to see any relation among the parts of a whole, and the result is that they are seen as discrete and unrelated to each other. The child is thus unable to think simultaneously about the parts as separate things *and* about

the relations which unite them. Similarly, in the use of syncretism, the child perceives a whole or the common relationships, but fails to recognize the differences within the whole. He also has focused on one aspect of the situation at the expense of the other. In other words, since the child cannot focus simultaneously both on the differences among things and on their common relationships, he is apt to see either a succession of unrelated events (juxtaposition) or a conglomerated whole (syncretism). Both types of distortions result from the same deficiency in thought.

In yet another investigation Piaget studied relational thinking. He presented a number of children with this problem: "Edith is fairer (or has fairer hair) than Suzanne; Edith is darker than Lili. Which is the darkest, Edith, Suzanne, or Lili?" *(JR.,* p. 87). The problem in effect involves what Piaget was later to call *ordinal relationships.* Suppose we know that *b* is a smellier number than *c* and that *b* is a larger number than *a.* Which is the largest number? The answer, of course, is *c.* If we substitute Lili for *a,* Edith for *b,* and Suzanne for *c,* and "has lighter hair than" for "is a smaller number than," then we have the same problem in the two cases: both deal with the understanding of relations of ordering, whether these be in terms of lightness of color, size of number, and so on. Both problems present the child with partial information concerning the ordering (e.g., that $b < c$ and $b > a$) and ask him to deduce the entire ordering (that $a < b < c$). Piaget found that children even as old as 13 years found the problem to be very difficult. For example, a 9-year-old said: "You can't tell, because it says that Edith is the fairest and the darkest" *(JR,* p. 88). Piaget again explains their difficulty in terms of an inability to consider severed aspects of a situation simultaneously. It is because the child cannot at the same time focus on $b < c$ and $b > a$ that he fails to deduce $a < b < c$ or that Suzanne is the darkest of the lot.

Another investigation yielded remarkably similar results. The study dealt explicitly with the relations of the part to the whole. The aim was to discover whether the child believed that the part was *included in* the whole. The questions were phrased in terms of the relations between cities (the parts) and countries (the whole). Here is an example:

> Stu (7;8) says that "*Geneva is in Switzerland*" and that "*Switzerland is bigger* [than Geneva], "But Genevans are not Swiss. "Then where must you come from to be Swiss?"—"*From Switzerland.*" We draw a circle representing Switzerland, and ask Stu to put the cantons in their places. . . . Stu inscribes within the circle three or four smaller ones—Geneva, Vaud, etc., but he still maintains that Genevans are not Swiss people. The Swiss are the inhabitants of the big circle. (*JR*, p. 123)

Note that at the outset the child seems to maintain that the city is part of a larger whole *("Geneva is in Switzerland").* But when he is questioned about the matter, he denies that Genevans are Swiss or that the part is in fact included in the whole. The child again sees part and whole separately: they are unrelated entities.

We see in summarizing that Piaget's studies of reasoning find that the child has a tendency to group together various different events into a loose and confused whole (syncretism), that he sometimes fails to see the relations among separate events (juxtaposition), that he fails to understand ordinal relations, and that he cannot deal with the relations between a part and the whole of which it is a member. All these types of reasoning reveal a common deficiency: an inability to think simultaneously about several aspects of a situation.

Piaget makes an extremely interesting general comment about his investigations. He postulates that his findings, since they are the results of questioning children, hold true on the "plane of verbal thought" but not on the "plane of action." That is, while children may fail a problem when its solution requires verbal expression, they may be quite able to deal with the same dilemma on a practical, behavioral level. While the child first solves problems on the plane of action, he then must relearn his solutions on the plane of verbal thought. In a sense, action is more advanced than verbal thought (for the child from 7 to 11 years); the latter lags behind the former. Piaget terms the lag a *vertical décalage.* The verticality refers to an ascending age scale: what the child learns at age 7 on the plane of action, he must restructure at age 11 on the plane of verbal thought. "Décalage" refers to the gap or lag.

GENERAL SUMMARY AND CONCLUSIONS

Piaget's early work is greatly varied. The first studies deal with the child's use of language. Naturalistic observation reveals that children younger than the age of 7 years often fail to use speech as a vehicle for transmitting information to one another, and instead frequently repeat another's remarks or engage in inpidual or collective monologues. An experiment confirms these findings: when young children are given the explicit task of conveying information to another child, they fail to communicate. They do not consider the informational needs of the listener. Moreover, the listener distorts what the speaker says by giving it idiosyncratic interpretations.

In other investigations Piaget uses the clinical method. He rejects the testing approach because of its rigidity and rejects the naturalistic approach because of its failure to yield a sufficient amount of relevant information. The clinical approach, he feels, is more flexible and, therefore, is especially well suited to the exploratory aims of initial stages of research. He uses the clinical method to investigate the child's conception of the world, and finds that the child exhibits several primitive thought patterns. *Animism* is the tendency to consider natural events to be alive in the same sense as human beings are. *Artificialism* is the tendency to believe that some agent—human or pine—created natural events. *Participation* is the vague idea that human actions and natural processes interact and are related.

A further study, again using the clinical method in part, deals with moral judgment and behavior. Children below the age of 7 years fail to follow the rules of a game while at the same time believe that the rules are sacred and inviolable. Older children display both a greater tendency to follow the rules and to believe that they can be changed. In explicitly moral situations, young children believe that guilt and moral responsibility are determined not by intention but by the amount of damage produced. These "realistic" moral tendencies are seen in the case of lying as well, and decline with age.

In studies of reasoning, Piaget finds that the young child's thought is characterized by *syncretism,* the tendency to group together into a confused whole several apparently unrelated things or events, and by *juxtaposition,* the failure to see the real connections among several things or events, and the failure to understand either part-whole or ordinal relations. All these tendencies reflect a common pattern of thought: the inability to consider several aspects of a situation simultaneously.

Piaget employs a social learning theory to explain the child's development particularly in the areas of language and moral judgment. He postulates, for example, that the child's primitive moral judgment is the result of egocentric thought tendencies and the relation of unilateral respect toward the adult. The child's moral judgment becomes more mature when he adopts a position of mutual respect toward adults and comes into contact with new social institutions and points of view.

There are several comments we may make concerning Piaget's early research. First, what are the relations among the various findings? The young child is egocentric in communication, has an absolutistic concept of rules, is realistic in his moral judgment, and in his reasoning displays syncretism

and juxtaposition. These varied terms at first may seem to refer to different and unrelated phenomena. One might think that moral realism and syncretism, for instance, refer to different patterns of thought, and that there is no commonality between them. But Piaget feels that such a view is mistaken: there is indeed a strong similarity among many of the young child's reactions to the problems posed by the various investigations.

The common pattern underlying these apparently perse reactions is the inability to deal with several aspects of a situation simultaneously. This is due to the egocentric nature of the child's thought or the incapacity to shift attention from one to another aspect of a situation. In the case of speech, the young child cannot consider *both* the other's point of view and his own at once, and therefore centers solely on his own point of view. In the case of rules, the young child fails to consider both his own interests and the needs of others. Consequently, he often breaks the rules. He sees the origin of rules from a limited perspective, too. Emanating from a person whom he regards as prestigious, they must likewise be prestigious. The child fails to consider both the parent's prestige and his reasons for devising the rules. In the case of moral judgment, the child cannot consider both degree of damage and intention, and he bases his judgment entirely on the former. As far as reasoning is concerned, we have already seen how both syncretism and juxtaposition are expressions of a single tendency, namely, that of focusing on a limited aspect of the problem. The same may be said of the understanding of ordinal and part-whole relations. In the former, the child considers only certain parts of relations but not others; in the latter, he focuses on the part but not the whole, or vice versa.

As the child grows older and comes into contact with opposing points of view and varied social institutions, his thought goes through a process of decentration. In speech, he considers both what he wants to express and the listener's needs. In games, he considers the other's interests as well as his own and is, therefore, willing to follow and modify the rules. In moral judgment, he considers both the outcomes of a person's behavior and its intent. And in reasoning, he tries to consider the complexities of problems—both the differences and similarities among the same set of events. Thus, the child decenters his thought just as in the sensorimotor period the infant decentered his behavior. The newborn *acts* as if the world is centered about himself and must learn to behave in more adaptive ways. Similarly, the young child *thinks* from a limited perspective and must widen it. Both infant and young child must decenter—the former, his action and the latter, his thought.

In addition to characterizing the young child's thought in terms of centration, Piaget occasionally described it in Freudian terms. Freud described several primitive mental operations usually found in certain kinds of mental illness and in the deepest layers of the normal person's unconscious. Freud felt that this type of thinking, called "autistic thought," displays certain regularities. For instance, it shows a tendency to fuse disparate things into one image. Thus, in a dream we may perceive a character who is a "condensation" of two distinct persons. In his early work Piaget proposed that the thought of the child is intermediate between autistic and adult thinking. For example, the child's syncretism is similar to, but more mature than, the tendency toward condensation. While at the beginning of his career Piaget borrowed a few ideas from psychoanalysis, he was never a disciple of Freud but always an independent investigator. As time went on, his limited dependence on Freud diminished further with the result that Piaget's later work is totally devoid of Freudian concepts.

Piaget not only abandoned Freudian ideas, but became dissatisfied with the clinical method as administered at that time. He came to feel that it relied too heavily on language. The child thinks in nonverbal ways too, and the exclusively verbal clinical method was not always effective in tapping these thought processes. Consequently, he turned to somewhat different methods which we will describe in the next chapter.

Despite their methodological deficiencies, Piaget's early investigations may be considered among the most interesting of his achievements. The major part of the early studies dealt with *socially and practically relevant* phenomena: the child's ability to communicate information, to follow rules, and to make moral judgments. All these matters are obviously important for the child's practical success in the world and for his interactions with others.

By contrast, Piaget's later work deals, as we shall see, with more abstract phenomena: the child's understanding of number or classification. These have less obvious relevance to the child's ordinary activities. Probably, his ability to understand the cardinality of number makes less of a difference to his daily life than his ability to communicate to other children. Also, in his early books, Piaget showed a strong interest in the role of social factors in development. Later research, as we shall see, convinced Piaget that other factors of equal importance were involved. With time his interests have tended to focus on these factors rather than on the social environment.

Finally, we may note that the explanatory concepts which evolved from Piaget's early work are vague. They are stated in ordinary language and are often not entirely clear. Much confusion, for example, has arisen over the concept of egocentrism. But as we have stated repeatedly, Piaget fully recognized that his early concepts were only preliminary and tentative, not final and conclusive. He hoped that his early work would stimulate research by others, and that he himself could clarify his concepts at a later time. The first of his expectations has been fulfilled: there has been much research on moral judgment, for example. We will see in the next chapter how Piaget elaborated and even formalized some of his early and tentative notions, including ordinal and part-whole relations.

Notes

1 For a review of this literature, see T. Lickona, ed., *Moral Development and Behavior* (New York: Holt, Rinehart and Winston, 1976).

2 The sentence to be completed is in roman type, and the child's answer is in italic.