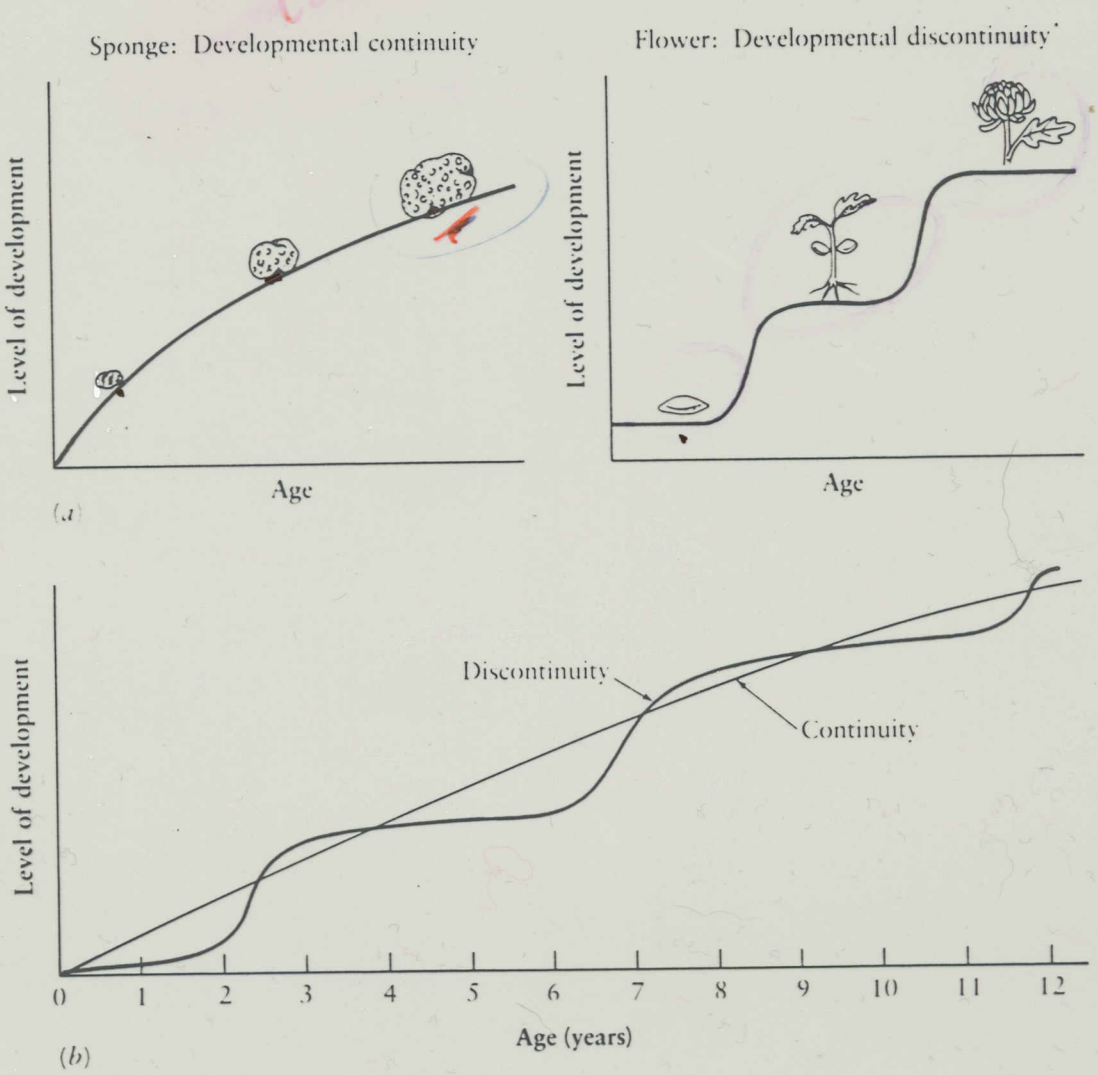

FIGURE 1.2 *(a) The contrasting courses of development of sponges and flowers provide idealized examples of continuous and discontinuous development. (b) According to the continuity view, development is a process of gradual growth, whereas according to the discontinuity view it is a series of stagelike transformations. Human beings appear to exhibit a mixture of the two types of development.*

ing middle childhood (approximately ages 6 to 12), for example, are closely linked to new forms of social interaction that appear at the same time. who specializes in studying the development of children's thinking, makes a similar argument: "Children's thinking," he writes, "is continually changing, and

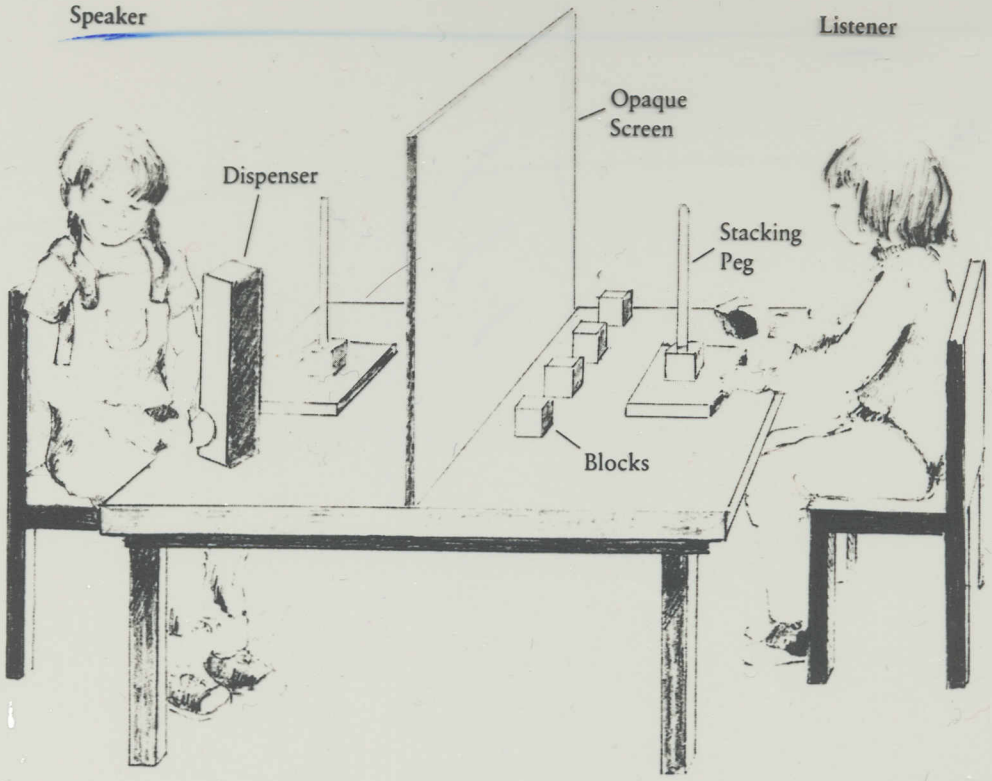

FIGURE 10.2 *The task keeping in mind what some else needs to be told in orde communicate with that per effectively often defeats schoolers. In the drawing ab the children must describe blocks they have, being carefu mention their distinguishing tures, in order to stack them the same order. (From Kraus Glucksberg, 1969.)*

Pick up this Block And put it here.
which Block? This one!!

Evidently, these preoperational children are not able to imagine what information another person with a different point of view might need.

Distinguishing Appearance from Reality

Another distinctive feature of preschool thought is a tendency to focus attention on what is perceptually most striking, that is, on surface appearances. This makes it difficult for the preschooler to distinguish between the way things seem to be and the way they are (Flavell, 1985). An example of the appearance–reality distinction is the changed appearance of a straight stick when it is partially submerged in water: the stick looks bent, but adults know it is not (see Figure 10.5). Preschoolers, however, may believe the stick has actually changed. Likewise, because they have difficulty with the appearance–reality distinction, 2½-year-olds may become frightened at Halloween time when an older child puts on a mask, as if the mask had actually changed the child into a witch c dragon.

Rheta De Vries (1969) took advantage of small ch dren's confusion over the reality behind masks study the development of the appearance–reality tinction. In separate experimental sessions, each ch was introduced to Maynard, an unusually well-haved black cat. At the start of the experiment, e child was told, "I want to show you my pet. Do y know what it is?" All of the children were able to that Maynard was a cat. Then they were encouraged play with Maynard for a short while, after which Vries hid Maynard's front half behind a screen wh she strapped a realistic mask of a ferocious dog or his head (see Figure 10.3*a*). The children were asked keep their eyes on the cat's tail while the mask was p on so that they would be certain that she was n switching one animal for another. As she removed t screen, De Vries told each child, "Now this anima going to look quite different. Look, it has a face lik dog."

De Vries went on to ask a set of questions desig

hints from the environment. This limitation of preschoolers' attention was demonstrated by Elaine Vurpillot (1968), who recorded the eye movements of children aged 3 to 10 while they examined pairs of line drawings of houses such as those shown in Figure 10.9. On some trials, children were shown identical houses, on some the houses differed in one or more ways. Children were asked to say whether or not the houses were identical.

Vurpillot found that all of the children responded correctly when the houses were identical, but that the preschoolers were likely to make mistakes when the houses differed, especially if they differed only in one way. Her recordings of eye movements pinpointed the difficulty. The preschoolers scanned several windows in haphazard order, rather than making a systematic comparison. The older children scanned the windows row by row or column by column until they had checked almost all of them, sometimes scanning back again to check themselves. Preschoolers thus seem to have only limited ability to select relevant details.

A variety of research has identified other limitations in the amount of information that preschoolers take in and their subsequent ability to store and manipulate it. For example, Chi and Klahr (1975) found that 5-year-olds could immediately perceive no more than three objects flashed briefly on a screen, while adults could take in six or seven objects at a glance. With respect to short-term memory, Case and Khanna (1981), among many others, have demonstrated age-related increases in the ability to hold several items of information in mind at one time. Thus older children and adults can work through various steps in complex problems without losing track of what they are doing, while young children cannot. Finally, older children and adults have generally accumulated more knowledge and developed more effective strategies for dealing with various problems than have preschoolers. This information is available in long-term memory storage and can be applied to new problems as they arise, leading to competent performance (Chi & Koeske, 1983; Siegler, 1986).

This view of preschoolers' information-processing limitations suggests that when children are interested in a task, when information is presented slowly, and when children have good background knowledge, their cognitive performance should be enhanced. These are precisely the circumstances arranged by experimenters whose preschool subjects have demonstrated competence on the Piagetian tasks reviewed earlier in this chapter. Information-processing psychologists are thus encouraged to believe that by shifting the focus from global stages to local circumstances, their approach may represent a genuine improvement on Piaget.

We will discuss the information-processing approach in more detail in our discussion of middle

FIGURE 10.9 *Stimuli used by Vurpillot to assess visual search. Preschoolers fail to scan systematically, which often leads them to claim that the top pair of houses are identical. (From Vurpillot, 1968.)*