What Children Know about Mental Experiences

John H. Flavell and Beverley M. Hartman

If developmental psychologists were asked to nominate the most exciting, cutting-edge research area in the field's recent history, many would vote for the area popularly known as *theory-of-mind development,* the childhood acquisition of everyday, common-sense knowledge and beliefs about the mental world. What does the theory of mind include, and what do we use it for?

As adults, we know that our minds incorporate mental states such as percepts, thoughts, beliefs, knowledge, attitudes, desires, intentions, feelings, and emotions. We routinely use these mental concepts to predict and explain our own and other people's actions; thus, we use our knowledge about the mind as an informal theory of behavior. For example, it is natural to infer that Mary and John went into the ice cream store because they *like* ice cream, *wanted* some, *believed* they would find some there, and would *feel* good if they got some. We simply could not make any sense of ourselves and other human beings without such inferences. We would see one another as purposeless and insensate physical objects whose movements are unpredictable, possibly even frightening.

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A good brief review of this area was presented in a previous issue of this journal by Lillard and Curenton (1999). For more extensive surveys see, for example, Flavell and Miller (1998) and Wellman and Gelman (1998).

There is now a great deal of evidence that children have acquired the basics of this theory by the end of the preschool period. In the most famous research example, an experimenter shows a five-year-old a box with pictures of candy on it and asks what it contains. "Candy," the child answers. The experimenter then reveals that the box actually has pencils in it. Next, the experimenter asks the child what another child who has not yet seen inside the box would think it contained. The five-year-old is likely to say "candy," just as an adult would.

However, if the experimenter presents this same false-belief task to a three-year-old, the result is usually quite different. The younger child also initially expects the box to contain candy, yet unlike the older child, the three-year-old is likely to say that another child will think that pencils are in the box.

Although the meaning of this striking developmental difference is still the subject of debate in the field, a common interpretation is that preschoolers have not yet acquired a mental representational conception of the mind—that is, they do not yet understand that people think and act in accordance with how they represent the world mentally rather than how the world actually is. In contrast, by the age of five most children have acquired at least some understanding of beliefs and therefore can recognize that a person could have false beliefs as well as true ones.

Mental experiences

A rough distinction can be made between more or less enduring, disposition-like mental states, such as beliefs and attitudes, and here-and-now occurring, conscious mental experiences, such as a sudden thought, memory, percept, or feeling. The *Young Children* article by Lillard and Curenton

John H. Flavell, PhD, is emeritus professor of psychology at Stanford University in California. For his research in cognitive development, he has received numerous honors and awards, including three honorary degrees and election to the National Academy of Sciences.

Beverley M. Hartman, MA, is a lecturer in psychology and a head teacher at Bing Nursery School, Stanford University. She is a member of NAEYC with wide experience in preschool education.

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(1999) provides a summary of developmental research on disposition-like mental states. In contrast, the present article summarizes research on what children know about mental experiences.

Most of the research evidence on children's knowledge about mental experiences comes from our laboratory and those of Wellman, Woolley, and Estes (see References). This research shows that children have acquired some elementary knowledge about mental experiences by the end of the preschool period (Flavell, Green, & Flavell 1995a). They know that only humans and other animates can think. They know that thinking is an internal, mental activity and consequently realize that a mental image of a dog, unlike a real dog, is internal, private, and intangible (Estes, Wellman, & Woolley 1989). They know that one thinks *about* things—present or absent, real or imaginary. Thus they know that thinking is some sort of internal, mental activity people engage in that can have as its content either real or imaginary objects or events.

More surprising, they also can distinguish thinking from other psychological activities, such as seeing and talking, that often accompany thinking and that therefore could be confused with it.

The two coauthors demonstrate a classic experiment in which one experimenter—in this case, John Flavell—turns to a blank wall and the other investigator—here Bev Hartman—asks the young participant, "How about his mind right now? Is he having some thoughts and ideas right now, or is his mind empty of thoughts and ideas?"

However, other commonplace and seemingly obvious intuitions about mental experiences tend to be acquired later, during the post-preschool years (Flavell, Green, & Flavell 1995a; Flavell & Miller 1998).

The following are some of these later-developing intuitions, together with a few illustrative studies attesting to their development. Each intuition is described by the heading of the section discussing it.

They know that thinking is an internal, mental activity and consequently realize that a mental image of a dog, unlike a real dog, is internal, private, and intangible.

When they are awake, people experience a more or less continuous, essentially unstoppable flow of conscious mental content (William James's [1890] famous stream of consciousness), even when receiving no significant perceptual input and engaged in no cognitive task.

Several studies reveal that young children tend to be surprisingly unaware of this fundamental intuition about the way our minds work. In one study (Flavell, Green, & Flavell 1993), for example, three-year-olds, four-year-olds, six- and seven-year-olds, and adults were first given some pretraining on the meaning of "having some thoughts and ideas" (while awake) versus not having any (while sound asleep and not dreaming). Next, as the participants were interviewed one by one, one experimenter sat quietly in a chair facing a blank wall, "just waiting" (see photo). The other experimenter then asked the participant: "How about his mind right now? Is he having some thoughts and ideas right now, or is his mind empty of thoughts and ideas?" Empty and non-empty thought bubbles, previously used in the pretraining, were employed to illustrate each option. The percentages of participants saying that the first experimenter was having some thoughts and ideas while waiting were 15, 35, 80, and 95 percent, from the youngest to oldest group.

Other research (Flavell, Green & Flavell 1995a) has shown that preschoolers may not assume that something is "going on in a person's mind" or that the person's mind is "doing something" even when that person is engaged in activities such as listening, talking, or reading—activities adults would regard as necessarily involving mental activity.

Another investigation assessed awareness of the virtually unstoppable nature of the stream of consciousness (Flavell, Green, & Flavell 1998). In this study, five-year-olds, nine-year-olds, thirteen-year-olds, and adults were asked whether a depicted child could go for three days without thinking or wondering about anything—if he or she tried really hard. The percentages of participants claiming that the child could not do this were 50, 90, 90, and 100 percent, from the youngest to oldest group. One five-year-old said: "Three days—that's a *long* time! Maybe *two* days?" (Such are the rewards of doing research with preschoolers!) In their justifications for their denials, almost one-third of the 13-year-olds and more than half of the adults seemed to be expressing the view that it is the very nature of the mind to be spontaneously active, and therefore one cannot inhibit this activity for long.

Attention is selective and limited.

In a series of studies, four-year-olds revealed a curious limitation in their understanding of how thought

or attention is deployed. In one of the studies that illustrates this development (Flavell, Green, & Flavell 1995b), four-, six-, and eight-year-olds were tested for their understanding that a person who is mentally focused on one thing will be devoting little or no simultaneous attention or thought to another, totally irrelevant thing. For example, they were asked whether an experimenter, busy trying to recognize the people in a group photograph, was also paying attention to or thinking about the photograph's drab frame. Whereas most of the six- and eight-year-olds demonstrated an understanding that task-oriented thought and attention require selective focus, most of the four-year-olds showed no such understanding—that is, these younger children happily asserted that the experimenter was mentally focused on the frame as well as the photograph.

These and other results suggest that four-year-olds may implicitly conceive of the mind as more analogous to a lamp than a flashlight—that is, they may believe that the mind is capable of radiating attention or thought in many directions at once, rather than in only one direction at a time.

When they are deeply asleep and not dreaming, people do not have conscious mental experiences, although they may respond to some stimuli at a subconscious level.

One study (Flavell et al. 1999) assessed the willingness of five-year-olds, eight-year-olds, and adults to attribute conscious thought to a videotaped individual said to be deeply asleep and not dreaming. The participants saw someone mischievously touch the sleeper's nose with a feather. This caused the sleeper to stir slightly but not to wake up (this last point was strongly emphasized by the experimenter). The participants were then asked if, while being touched, the sleeper was thinking to himself, "Hey, I think someone is tickling my nose right now!" (the most conscious-sounding thought we could think of!).

More than half of the children attributed a conscious, verbalized thought of this kind to the videotaped sleeper, whereas no adult participant ever did. The adults also showed a much better understanding of levels of consciousness. While denying the conscious thought, some said the sleeper would "sort of feel" the touch. They often justified this conclusion by saying that the feeling was at a subconscious rather than a conscious level.

Four-year-olds may believe that the mind is capable of radiating attention or thought in many directions at once, rather than in only one direction at a time.

Mental experiences may cause other mental experiences.

Knowing that thoughts or memories can cause emotions is an example of this type of understanding. Of course, people may suddenly feel sad (or experience some other emotion) because of something sad that just happened to them. They may also suddenly experience a sad feeling merely because they perceive something that triggers a thought or memory of some past event. A third possibility is that an emotion-causing thought or memory may just happen to come to mind, without there being any external reminder.

Even very young children are attuned to the first possibility, in which present sad events are construed as triggering present sad feelings directly. Research by Lagattuta, Wellman, and Flavell (1997) and Lagattuta and Wellman (2001) has shown that by age five or earlier, children can also understand the second possibility. Flavell, Flavell, and Green (2001) have recently found that a sensitivity to the third possibility—spontaneous ideation alone triggering feelings—develops still later.

In one study, for example, five-year-olds, seven-year-olds, and adults were told a story of a girl lying in bed at night in total darkness (no external cues) who suddenly starts to feel happy. The participants were asked to explain her sudden change of feeling. The percentages of participants who suggested that she must have thought of something happy were 15, 70, and 100 percent, from youngest to oldest. The percentages were similar for the suggestion that if such a child wanted to feel happy, she could perhaps do so by thinking of something happy. We speculate that becoming more aware of how one mental content can trigger another may help children become more aware of the stream of consciousness, much of which seems to consist of one thought triggering another, related one, with that one then cueing a third, and so on down the stream.

Suggested Resources

Lillard and Curenton (1999) offer a brief and highly readable overview of the theory-of-mind development area. An article by Flavell (2000) also provides a short, easy-to-read summary. Several children's books are cited in the text here that may be of use in fostering young children's understanding of mental experiences.

Mental experiences vary considerably in the degree to which they are controllable by the experiencer.

Flavell, Green, and Flavell (1998) tested five-year-olds, nine-year-olds, thirteen-year-olds, and adults for their understanding that people have limited control over their

mental activities and experiences. The experimenter told the participants about a child who, while awaiting a shot in the doctor's office, sees an injection needle. It was emphasized that this child does not want to think about getting a shot and is trying very hard not to do so. Participants were then asked whether or not the child would think about getting a shot while looking at the shot needle and to justify their answers.

Only the 13-year-olds and the adults appeared to understand clearly that there are severe limits to people's ability to control their own mental activity. They believed that the character in the story would think about getting a shot despite a strong wish not to. In their justifications most of them pointed out that, under the circumstances described in the story, this mental event would happen automatically and involuntarily; it would not be subject to an individual's control. Similarly, recent research by Woolley and Boerger (2002) shows that belief in the controllability of dreams also decreases with age.

The mental experiences of different people will seldom if ever be identical, even in response to the very same inputs.

Eisbach (2001) hypothesized that most adults would have the intuition that the flow of thoughts that goes on in one person's mind would almost certainly be different from the flow in another person's mind, even when the two people receive the same thought-triggering stimulus. For example, even if two people both see the same object and construe it as being the same thing, their ensuing trains of thought will almost surely be nonidentical.

All of Eisbach's adult participants seemed to share this intuition, but most of the five-year-olds attributed the same thought trains to the two people. However, like the adults, the five-year-olds readily attributed different trains of thought to two individuals who received different inputs. Eisbach speculated that children first recognize that differences in thought occur in response to different inputs and only later recognize that they also occur even in response to the very same inputs.

A father asked his preschooler, "What are you thinking about?" The answer: "Nothing, I never think. I just walk and I just talk!"

In summary, the research suggests that although preschoolers possess some important basic knowledge about mental experiences, there is still much more for them to acquire. They will discover that attention is selective and limited. They will also learn that conscious mental experiences

- occur one after another more or less continuously in conscious individuals but not in unconscious, nondreaming ones;
- can be triggered by other mental experiences;
- vary in controllability; and
- tend to differ from individual to individual even when initiated by the same input.

Preschoolers' limited introspective abilities

There is considerable research evidence, then, that most preschoolers do not possess intuitions about the mental experiences just described. To acquire these intuitions one may need to pay attention to one's own mental experiences, and evidence suggests that preschoolers have quite limited introspective abilities (Flavell, Green, & Flavell 1993, 1995a, 2000; Flavell et al. 1997; Kipp & Pope 1997).

For example, five-year-olds, who at an experimenter's instigation clearly had just been thinking silently about which room in their house they keep their toothbrush in, often denied that they had just been thinking. Moreover, those that did say they had been thinking often did not mention either a toothbrush or a bathroom when asked what they had been thinking about. Seven- and eight-year-olds proved to be much more skilled than five-year-olds at this and other introspection tasks. Consistent with these results, other research (Flavell et al. 1997) has shown that preschoolers are largely unaware of their own ongoing inner speech—the mental process that Vygotsky (1962) made famous.

Preschoolers' relative insensitivity to their own ongoing mental activity is sometimes evident in their everyday interactions. An extremely bright child of four and a half was looking very pensive, so his father asked, "What are you thinking about?" The answer: "Nothing, I never think. I just walk and I just talk!"

How parents and teachers can help foster young children's knowledge about mental experiences

Sensitivity to one's own and other people's mental experiences is useful both in school and in life at large. In school, children need to learn to pay attention to their ongoing mental activity: noting how they arrived at problem solutions so they can evaluate the quality of those solutions (critical thinking skills); planning, guiding, and monitoring various intellectual activities; and so on.

Metacognition—knowledge and control of one's own cognition—has long been recognized as important for academic achievement, and it involves attending to ongoing mental experiences. And in life at large, metacognition is adaptive in numerous situations as children try to gauge their own and other people's thoughts, feelings, goals, and so on, for example, attending to what they and their friends might be thinking and feeling when playing with one another. New research

Stream of consciousness, inner speech, and introspection

Explain and model stream of consciousness, inner speech, and introspection. Talk aloud your own stream of consciousness, explaining that what the children hear are the inner thoughts (ideas, memories, feelings, desires, and so on) you are experiencing right then. Close your eyes and look pensive for a few seconds, then report what you had just been thinking. Encourage children to do the same. Explain that sometimes we deliberately try to think about things in order to achieve some goal (directed thinking), but that more often thoughts just come into our heads, without our trying to do anything (undirected thinking). We experience some sort of mental content—a perception, a thought, an image, a memory, a feeling—even when we don't look particularly attentive or thoughtful.

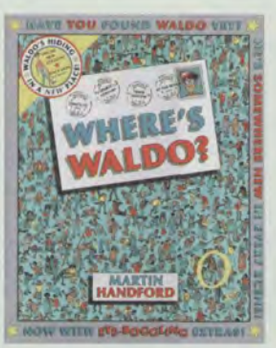
Be alert to situations in which children might be more easily brought to notice their own thinking. For example, they might occasionally be made aware of the thinking they do when recalling past events, anticipating future ones, or looking at books. Model your own conscious process; pause and take a *think-break* (similar to an intermission or commercial break) and share your stream of consciousness. Invite the children to take think-breaks and share their thoughts. Many settings lend themselves to this type of interaction, including home, school, a shopping excursion, a walk around the block. Embed these experiences in routines at play, story, meal, or travel times.

Introduce external cues as a useful, beginning approach to awareness of thought. Young children might tap their forehead to indicate the process. Other initial prompts, such as a thinking cap or wand (akin to the talking stick used by storytellers), clarify the act of awareness and thinking for young children. For example, use a puppet with a thinking cap to explore the range of the character's possible thoughts. Look skyward or adopt Rodin's *The Thinker* pose to help convey the idea of thinking.

Tell children about *inner speech* (talking to oneself silently). Explain that we often think in words. Model and give them practice in talking to themselves, at first out loud, then in a whisper, and then silently. Talk about visual imagery as another kind of thinking and invite the children to try to picture various objects and events in their minds; Estes, Wellman, and Woolley (1989) have shown that even three-year-olds are able to do this with a bit of practice. Explain that we can often identify what we have been thinking just by remembering our thoughts; and that, when memory fails, we may be able to guess at previous thoughts by recalling what we were doing at the time.

Introduce inner speech through familiar songs or finger plays. Songs such as "The Eency Weency Spider" can be recited aloud, then in a whisper, and eventually silently. Mouthing the words and performing the corresponding actions indicate the voice, albeit silent. This process can help young children identify their inner voice and in time notice their spontaneous inner speech. Most children would enjoy this activity, and it can be called upon when waiting in line at a store or in a doctor's waiting room.

Consider using thought bubbles to illustrate points about mental experiences. Thought bubbles can be understood by children even as young as three with a little instruction (Flavell, Green, & Flavell 1993; Wellman, Hollander, & Schult 1996). Voice-overs on video presentations also can communicate the idea of inner verbal thought: the person on the video is clearly not talking aloud (no lip movements), yet his or her verbalized thoughts are audible. Pause an ordinary video and use the freeze-frame as a think-break to reflect on the character's thought process. When reading stories, encourage children to guess at the characters' ongoing thoughts and feelings. More generally, incorporate more discussion about feelings, thoughts, and other mental experiences into children's everyday activities at school, at home, and within their community.



Attention, awareness, and controllability

Show children that we are conscious of only part of what is available to be perceived at any one moment. Use explanation, demonstration, and modeling. *Attention* is selective and limited—more like a flashlight than a lamp, as pointed out earlier. To make this point in a dramatic way, show children the illustrations in a *Where's Waldo?* book. Waldo is right there in front of our eyes, but he's in a large crowd of people and hard to find. As a less dramatic example, explain to the children that they will certainly see the edges of the book pages while searching for Waldo, but they will probably not pay any attention to them because they are focusing on the page's contents.

Hidden pictures of the sort often found on restaurant placemats, in comics, or in books are another way to dem-

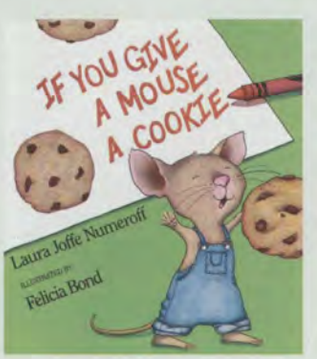
about Mental Experiences

onstrate to children how to find the images inserted in drawings. The game I Spy with My Little Eye can be played in many settings. Encourage parents to play a getting-ready-for-bed game of What Can We See with the Flashlight? first with the lights off, then on.

Help give young children an initial understanding of *awareness* and *consciousness.* Use sleep and waking states as familiar illustrations. Awake, we have conscious mental experiences of various kinds—conscious percepts, thoughts, feelings, and so on; when asleep and not dreaming, we do not have conscious mental experiences. *Caps for Sale,* by Esphyr Slobodkina, invites children to consider awareness through awake and sleep states. Discuss the sleeping peddler and ask, Can he see the monkeys when asleep? Does he hear them? Does the peddler feel it when the monkeys take the caps during his nap? Have the children act out *Caps for Sale;* encourage them to take another character's persona and perspective. Use a puppet to explore the condition of consciousness when sleeping and awake.

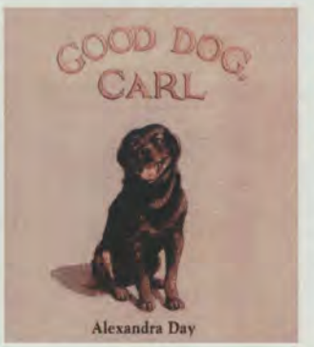
Help children discover how hard or easy it is to *control* various kinds of mental experiences. For example, we can usually decide to look or not look at something, imagine or not imagine something—and then just do that. On the other hand, it can be harder to refrain from thinking about some things—things we are worried about or events we are looking forward to. It's impossible to think about nothing at all for very long (that unstoppable flow of consciousness). Yet we can often direct and control our thoughts to some extent, and doing so often benefits us. In addition to the obvious case of problem solving, we can sometimes give ourselves an injection of happy feelings just by deliberately thinking about a joyous event.

Try changing a story formula to explore the controllability of thinking. Read *Tear-Water Tea,* by Arnold Lobel, and explore the experience of thinking sad thoughts. The children can add to the list of sad thoughts that would enable Owl to cry more. Then create a new version of the story—*Sweet-Water Tea*—and substitute happy thoughts for sad ones. Write a happy list and reflect on the ideas the children come up with.

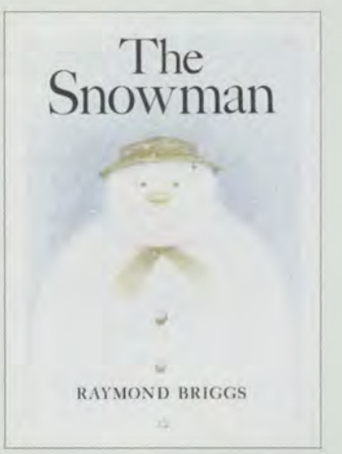


Individual differences in mental experiences

Explain and demonstrate how we may respond to the same event differently on different occasions, depending on our mood, recent experiences, or other factors. After children have acquired a little facility with introspection, ask a group of them to look at a scene (a photograph, an illustration, or a video event), think about it silently for a brief period, and then share their thoughts aloud with the group. Call attention to the fact that, although all of us may see the same scene, our trains of thought will differ from person to person.



Provide other examples of how our mental experiences depend both on the nature of the individual and on the nature of the situation. Wordless books such as *The Snowman,* by Raymond Briggs, and *Good Dog, Carl,* by Alexandra Day, invite the reader to guess at the mental experiences of the characters. Encourage children to explore the characters' perspectives and help them become aware that their interpretations can differ from those of other children.



Good children's literature is a useful avenue to foster knowledge about mental experiences. Classic author A.A. Milne refers to the thinking process in many of his stories and poems. Laura Joffe Numeroff focuses on train of thought in her books, such as *If You Give a Mouse a Cookie,* in which one item triggers thinking about another. These stories delight children and we can use their templates to guide children in creating their own stories.

Provide repeated opportunities for children to hear stories that rely on their ability to imagine. Storytelling relies on the listener to create internal images of the characters and places described in the story. Ask questions that help children describe the setting, characters, and events. Encourage them to distinguish what the characters say from what they think. Eventually children will develop skill in telling their own stories.

Incorporate more discussion about feelings, thoughts, and other mental experiences into children's everyday activities at school, at home, and within their community.

evidence suggests that children with better skills in this area enjoy more successful social relationships than those less knowledgeable (Repacholi & Slaughter 2003). Finally, in addition to these academic and social uses, such knowledge may help children with the fundamental developmental task we all have: discovering what we and other human beings are like, inside.

Providing some head start for such skills during the preschool years might therefore be worth trying. A recent longitudinal study by Ruffman, Slade, and Crowe (2002) showed that mothers' tendency to talk about mental states when describing pictures to their three-year-olds was positively correlated with the same children's theory-of-mind understanding at age four. Our experience has been that preschoolers are often intrigued by questions about their mental states. The mind is an inherently interesting topic, even for young children.

We suggest that teachers and families might try supportive activities of the sort described below in "Helping Young Children Begin to Learn about Mental Experiences." Introduce them to young children gradually and only occasionally in the context of book reading or other interactions. They obviously should not be considered either necessary or sufficient for children's development in this area. However, they might sensitize children to an important domain of knowledge and action, one that young children seldom attend to but are probably developmentally ready to begin learning about.

Summary

Research indicates that although preschool children possess some understanding of thinking and other mental experiences, they have much more to acquire in this important area of cognitive development. In subsequent years they will learn that attention is selective and limited and that conscious experiences succeed one another in a virtually continuous stream of consciousness when people are awake. Children will also discover that one mental experience can trigger another, that mental experiences vary in how easy it is for a person to control them, and that different people are likely to have different mental experiences even when they perceive the very same stimulus. This article suggests some ways that teachers and parents might occasionally and gently support these developing understandings.

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