

ZERO TO THREE

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Barbara Hadley

The Guy Who Went Up The Steep Nicken: *The Emergence of Story Telling During the First Three Years*

Susan Engel

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My 2 1/2 year old son, Sam, eagerly begins to tell a story he has heard and told several times before. He tells it to one of his brothers, who already knows the story. "When I was a born baby? (voice goes up as if asking a question) lake was carrying me down the stairs and he, and he, he . . . (he turns to me) Mom, you tell the rest." At 2 1/2 Sam is already a budding raconteur, eager to share experiences from his past.

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Editor's Note

This issue of *Zero to Three* explores the development of memory and creativity in very young children. Contributors show us how infants' and toddlers' enchantment with the world around them, their developing cognitive capacities, and their need to cope with pain and suffering lead them to creative expression. How this happens depends on infants' and toddlers' specific experiences with their caregivers. In the earliest years of life, children begin to participate in some of the most quintessential of human activities—mastering the symbols of their culture, creating and telling stories, and using movement, music, drawing materials, and any other available vehicle for creative expression. Young children first express themselves in the moment, and then use symbolic expression to transcend time and space.

Psychologists Susan Engel, Judy DeLoache, Katherine Nelson, and Lois Barclay Murphy and their colleagues, and psychoanalyst Barbara Young are clearly people who are very much in tune with young children's hearts and minds. Their experimental research and clinical observations are systematic, meticulous, and yet playful—a continuation, perhaps, of discoveries that began in their own earliest years. Their ways of looking and listening are creative, whether they are using eyes and ears or tape recorders and cameras. And, happily for us, each of our contributors is an artist as well as a scientist. Their stories, their photographs, and even their experimental designs inform, delight, and inspire us to work so that the young children in our care can experience the joy and the power of creation, and to live, ourselves, as creatively as we can.

Emily Fenichel, Editor

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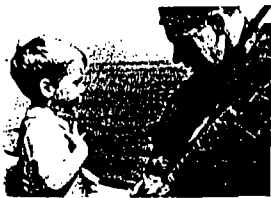
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The Guy Who Went Up The
Steep Nicken
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In this case he is sharing an anecdote that has been told to him by others in the family, an event he couldn't possibly remember. As he has heard me tell it many times, at 2 weeks of age, his nine-year-old brother was carrying him down the stairs and slipped and fell all the way down. I watched from a distance, horrified, as they disappeared behind the staircase wall and bumped their way down. I ran over to them at the bottom of the stairs, where Jake sat holding his baby brother, sobbing and saying to me, "It's alright, he's okay, I didn't let him go, he's fine."

One can imagine the different feelings and thoughts this dramatic story engenders in each family member. What is so fascinating is that Sam, at age 2 1/2, already knows it is a powerful story and wants to tell it again. He no doubt finds it more interesting than other stories he might have heard, because he is a central character in it. And though he cannot yet tell the whole story on his own, he begins in proper narrative form "... When I was a born baby ...," setting the scene in time and identifying the central character.

Story telling is perhaps the most powerful way that human beings organize experience. Some have argued that narrative thinking is the optimum form of thinking for learning and expressing what we know about ourselves and about other people (Bruner 1986, Schank 1990). Sam's retelling of his adventure falling down the stairs captures some of this. The story not only organizes an event from our past. Both the story and the telling of the story convey important information about relationships and feelings in our family.

By the time most children are three or four they can tell many kinds of stories: autobiography, fiction, and reports they have overheard. They can tell stories with other people, and to other people. By the time most children are adolescents, stories both formal, conversational, and unspoken, pervade daily life. In adulthood narratives provide a form for organizing huge amounts of information and serve a host of powerful psychological and social functions. What goes on in the first three years to prepare us for this astonishing array of abilities?

How is it that children are born with no language, let alone narrative skills, but that within 24-30 months most have learned the rudiments of story telling: how to sequence events, how to set action in place and time, and organize a story around characters. Where did Sam learn that telling a story is a good way of getting the attention of others, and that you can get a lot of social

and emotional mileage out of telling a good story? How and where did he figure out what his community deems to be a good story?

Until about 10 years ago the common wisdom among early childhood specialists was that children are rooted in the here and now. Research had suggested that toddlers are only interested in what they can see and do at the moment, unable to think about things that have happened in the past or will happen in the future. But over the last 15 years a number of studies have shown that, in some cultures at least, parents and their babies talk about the past and future much more frequently and in greater depth than we had ever expected (Nelson 1989, Engel 1995).

At about the same time that research started to show that parents and their toddlers told stories and talked about the past, we were also learning how important personal interaction is as a setting for all kinds of cognitive activities. Studies have shown us that social interaction is not only the site of emerging abilities such as conversation and story telling, but that the input of conversational partners can have a strong influence on what a child learns (Snow and Ferguson 1977, Miller and Sperry 1988). Studies have shown, for instance, that communities (and cultures) vary not only in how much they talk about the personal past, but in what kinds of stories about the past they value (Brice Heath 1983).

Before taking a look at the developmental path of story telling, it might be helpful to outline a working definition of narrative. As anyone who has done developmental research will recognize, one's ideas about the fully developed version of a behavior or process shapes what one will find in a developmental search for its beginnings. For instance, Piaget's model of fully developed scientific thinking strongly influenced what he saw when observing infants.

For my purposes, a story is a description of an event, set in a time and place. Things happen to someone, and they happen over time. The sequence of events must be meaningful; in other words there must be a theme that emerges through the chronological account, there must be at least a hint of a problem or tension, and the resolution of that problem. Choose any great and lasting novel, or well loved story, whether it be *Great Expectations* or the story of Noah's Ark, and it fits these criteria. This then, is the basic narrative structure that children must master. And it turns out children begin using this narrative structure even before they can do it with words. As you will see in the following pages, the first narratives look quite different from the narratives of the 15- or 50-year-old. But all human abilities have to start somewhere.

Play and narrative

Just as Bruner suggested that grammatical structure is embedded in the early play actions and routines of young children, so too the elements of storytelling are



Barbara Young

implicit in the play scenarios of toddlers. A 20-month-old girl, Sarah, holds a small figure of a horse in her hand. She moves the horse as if he is running, and then drops him. "Oh no. Poor horsey. That horsey is sick. But here comes his mommy. His mommy gave him medicine and made him better." While this may not be *Oliver Twist*, it is a story. Sara is describing a sequence of actions. The actions have an underlying theme that is meaningful. There are characters in her story, there is emotion, and there is an ending.

Even children who do not narrate their play are enacting a narrative with their gestures. It has been shown that children engage in this kind of symbolic play more and in richer ways when they do it with a facilitating adult, usually a parent or caregiver. A typical interaction consists of a young child moving a toy around, guiding the toy or toys through a sequence of actions. Often it is the adult who provides the language that highlights the narrative form embedded within the child's play gestures. For instance, a 22-month-old boy moves two figures on a table top. His father says, "Oh look. Are those knights fighting? Oh look there, the green knight pierced the blue knight. Hurrah. Sir Greenie is the champion!"

Reminiscing with others

The other primary way that young children acquire and explore the narrative form is by talking about the past with their parents.

Just as with symbolic play, telling stories about the

past also seem to take place in a kind of intersubjective transaction in which child and adult collaboratively build the story. The youngest reminiscer depends on his partner to create a description of the past. Equipped with an innate drive to tell stories, and the most rudimentary tools for doing so, the youngest story teller looks to the adult to evoke the past so that the child can contemplate, contribute, go over, and ultimately internalize a narrative rendering of his experience.

Long before a baby can refer to his or her past, or even converse with another about the past, parents talk to their children about what has happened.

A mother looks at her fourteen-month-old daughter, and holds up a photograph of them standing under a tree with ice cream cones. "Remember when we went to Friendly's and got ice cream? That was fun wasn't it? You got white ice cream with colored sprinkles. And there were sprinkles all over your face. We laughed, didn't we?"

What is happening here? The mother is teaching her daughter that it is interesting, useful, worthwhile, and satisfying to reminisce. She is helping her child to build up a sense of what Ulric Neisser calls the extended self-knowledge of oneself across time. It is this mental self that gives us each a sense of continuity between the past, the present and the future. The mother is also building up a shared past with her child. Parents and their toddlers tend to talk about experiences they have had together. Not only does this enable them to collaborate in the telling, it is also one of the ways we build and

maintain intimacy (even into adulthood). When this mother talks about the ice cream incident she is also teaching her child what makes a good story. Interchanges like this can be found wherever parents and their young children are together. But the nature of the collaboration changes as the child develops.

An early stage

At a first stage children are attentive and responsive observers to their parents' tales. They not only watch their mother's face carefully as she tells stories of personal experience, they nod, repeat a word now and then as a way of showing interest and or keeping the mother going, and respond with emotion, sometimes anticipating emotion in a well learned story. An interesting detail that will be familiar to any adult who has spent a great deal of time with the same child is that children love to hear the same story over and over again. From a cognitive as well as emotional perspective there are good reasons for this. My son liked to hear the story of falling down the stairs over and over again, not only for the slight dramatic buzz and pleasure of resolution it gave him (just like a game of peek-a-boo for a nine month old). It also gives him a chance to internalize the story and master the pieces.

The following example is taken from a study I conducted several years ago, titled *Learning To Reminisce*. The goal of the study was to trace the emergence of autobiographical conversation. We tape recorded mothers and their 16-month-old toddlers in their homes, every other week for eight months (until the children were two years old). The following example, taken from the study, demonstrates the uses children make of repetition. In this collaborated story the little girl masters more and more of the material as she and her mother repeat it.

Faith is a two year old girl sitting in the kitchen talking with her mother.

Mother: I'm trying to think back about Snork. We got Snork at the toy store, remember? We went to the toy store and we saw a great big Snork at the toy store.

Faith: See it?

Mother: You don't remember?

Faith: See a great big Snork?

Mother: I have to tell you about it. It was a long time ago. Faith and Mommy and Daddy all went to the toy store and we saw a big, big Snork.

Faith: A little Snork?

Mother: And there was a little, little Snork. And remember what the big Snork was doing? The big Snork was waving at Faith.

Faith: Then?

Mother: And the little Snork—you know what the little Snork did?

Faith: Hm?

Mother: The little Snork talked to Daddy and said, (here

mother uses squeaky voice) "I wanna go with Faith."

Faith: Then?

Mother: And so when we left the toy store, after we had looked at all the toys, we left the toy store—Daddy looked in his pocket and saw Snork was there! And he gave it to Faith.

Faith: Again.

Mother: One day Faith and Mommy and Daddy all went . . . to . . . the . . . grocery store?

Faith: Toy store!

Mother: Toy store! And what did we see?

Faith: A big Snork and a little Snork and a big, big one and a little, little Big Bird.

Mother: Oh! What were the big Snork and Big Bird doing? . . .

Little Snork. Remember what the little Snork did?

What did that little Snork do?

Faith: Talk at—talk to . . . talk to . . . Mom, have some more coffee.

Mother: No, thanks. I'm drinking juice, actually.

Faith: Mommy, tell story about toy store.

Mother: Okay, one day Faith and Mommy and Daddy all went to the toy store and when we got there we saw a big Snork and the Snork was waving at you. There was a big Snork and there was a little Snork.

Faith: Snork talk to Daddy.

Mother: Yeah, and what did that little Snork say?

Faith: (in a squeaky voice) I want to go to . . . I want to go to. . .

Mother: Mmm. So what happened after we came out of the toy store?

(they go on to another discussion).

A second stage

At a later stage children begin to participate, adding elements to the story, taking on greater pieces of the authorial responsibility. The mother of George, 30 months, says,

"Georgy, wasn't that fun going to the lake?"

George nods attentively. The mother continues, "You loved the water didn't you? You weren't scared one little bit, were you?"

George offers, "I said Wow".

His mother replies, "Yes that's right. You jumped right in and the water was very cold, and you shouted out, "WOW," didn't you? That was funny.

Georgy adds more, "There was fishes."

His mother again elaborates his contributions. "Oh yes, there were lovely fishes weren't there? And we tried to catch one. But they were too fast for us."

At this point, mother and child construct a story across turns. Though Georgy (or any other toddler) may not yet be able to organize a story, frame it in time or place, or know the syntax for representing past experience, he can join in his mother's description, adding information, details, and perspective at just the right

point. Together the conversational pair constructs a story.

A third stage

Finally, by the time children are three they can tell a whole story by themselves, or contribute pieces to a parent's story that the parent didn't even know about.

While the youngest story tellers (18-36 months) depend on conversation and a strong conversational partner to construct stories, slightly older children are eager to recount stories on their own. By the time children are three they have a well internalized notion of what it means to tell a story, and what the basic requirements of a story are. My son Sam, for instance, at 2 1/2 says, many times a day, "Do you wanna hear THIS story?" and proceeds to tell stories such as the following:

"When Ariel was swimming he saw a huge humongous sting ray and it stung him and he had to go to the hospital." Typical of this stage, Sam's stories often draw on some kernel of a real event (He knows someone named Ariel who did in fact take kayaking trips in Mexico, where there are sting rays). A different man, related to Ariel, did in fact get stung by something in the water. Sam has mixed up these two people and events, but with good reason, and then added a dramatic touch, that Ariel had to go to the hospital (totally made up). But Sam also shows that he understands the social, linguistic and cognitive requirements of the story telling situation.

It is only at this point that children actually negotiate the past with their parents, suggesting that it is only now that they have an individual internal representation of the experience, separate from the one they might co-construct with a parent.

Even at this point, children are quite tied into the intersubjective frame work. It is typical for a three-year-old to bring up an event from the past and feel quite frustrated and distraught when a parent not only doesn't recall the episode but cannot echo and elaborate in a way that fills out and reflects back the story.

Not all parents and children tell stories equally frequently, for the same purposes, or in the same style. What are some of the individual differences we have found in the way parents and children tell stories?

Reminiscers and practical rememberers

In our study *Learning to Reminisce*, we found that some mothers talk a great deal about the past with their toddlers. They tell fairly well embellished stories about the past that include many details. Parent and child take many conversational turns in describing a shared experience. Perhaps most interesting, these mother/child couples seem to talk about the past for no other reason than because it is an enjoyable, interesting thing to do together. For instance a child points to a flower in a vase on the table. The mother says, "Isn't that a lovely flower? Remember when we picked that flower? We walked way out into the field. The grass was wet, and

you wanted to take off your shoes. Do you remember what else we found out there?

The child offers, "Slug!"

And the mother continues her story, "Oh yes. That was really slimy wasn't it? Ick. We hated that slug." All the while her child is staring at her attentively, sharing in this review of experience.

On the other hand, some mothers and their young children seem to refer to the past fairly infrequently. These mother/child couples tell short, spare stories, with few conversational turns, and few details. Again, perhaps most revealingly, they usually only refer to the past as a way of explaining or clarifying something they are doing in the present. For instance, a practical remembering mother might say to her toddler, "Find your sneaker, Zoe. Did you hide it yesterday? I think you put it under the chair."

We found that by the time these children were 3 1/2 the reminiscers were more able to contribute new information to conversations about the past, keep a conversation going longer, and more likely to initiate conversations about that past. In other words, it appeared that the style the couple had at the outset of the study predicted how much and how the child would talk about the past 6 months later.

Having found stylistic differences in the way toddlers and their parents talked about the past, we decided to see if these differences showed up in the peer interactions of preschoolers. We observed three- and four-year olds in a day care setting and found that the children did in fact use the two narrative styles: reminiscing and practical remembering. Some research has indicated that shy children are less likely to be reminiscers than outgoing children. What we don't know is what causes what. That is, perhaps if you are not adept at story telling you become shy. Or if you are good at story telling you become outgoing. Perhaps the two characteristics tend to coincide, or perhaps shyness inhibits story telling. Any one of these possibilities would be fascinating to explore further.

By the time children reach their fourth year they begin to explore the array of narrative genres available to them. At this point, one striking characteristic is their sensitive ear for style. Children are quite attuned to different kinds of formats, tropes, and other stylistic aspects of story telling. They reveal this sensitivity in the narratives they tell in response to ones that they have heard. For instance, in one study children heard poems and stories written by authors such as Emily Dickinson and Sylvia Plath. When invited to write their own stories in response, many of the children incorporated the rhyming patterns, formats and metaphoric imagery used by Plath, Dickinson and others (Engel, 1995). A perfect example of this is children's eagerness to tell knock knock jokes long before they really understand the mechanics of such a joke. They capture, and use, the format and sound of the joke, filling in with



David Kreider/Photo Agora

their own content. Before children can explain a metaphor, or make up ones that are easily interpretable, they get the basic structure and love exploring its possibilities. This is demonstrated vividly in Kenneth Koch's classic book on writing with children (1973).

A three-year-old girl, Justine, paints with water colors. Her mother asks her if she would like to write anything to go with her picture. The young painter nods immediately and dictates, "The guy who went up the steep nicken and then he fell down and hurt his nicken on the schnocks of the nicks."

This example shows how alive the narrative form is for young children. They are equally consumed by what the story is about, how it is told, and the reasons it is told. The process of telling the story is often as satisfying and psychologically rewarding as the story one ends up with. In the example above, the process of making up words and creating alliterations is as important

as the content of the story. This is a child who has been encouraged to play with language, and to use stories as a form of play.

A three-year-old boy, seemingly out of nowhere, recounts to an adult friend:

"'You know what?' said the mommy. 'You have a stomach ache.' 'No that's not true,' said the little boy. He put his nose right up to his mommy, 'I have a bear on my tummy.'"

This story, though brief, is remarkably complex. He tells the story in terms of tightly interwoven dialogue. The characters in the story respond in contingent sentences (sentences that relate to one another both grammatically and in terms of content). Moreover, the dialogue is used not just as an elaboration or detour, but to build the story. This story-through-dialogue conveys a narrative "problem"—the mother's belief that the boy has a stomach ache. The story ends with a surprising turn of events (the bear on the stomach) that also serves as a resolution to the dramatic problem. This child, as it happens, has been talked and read to a great deal since infancy. It is possible that his precocious mastery and use of narrative techniques comes from his exposure to a wide array of narrative material.

It turns out that story telling is the single strongest predictor of literacy. Gordon Wells has shown in his wonderful study of Bristol children that those who told and heard stories at home under the age of four were the most likely to have ease and interest in learning to read once they got to school (Wells 1986).

What story telling can do

A 2 1/2 year old recounts to an uncle, "We were on the plane. And a man yelled at Dan (his brother). And Mommy got mad at the man. And after we sat down, I said to Mommy, 'That man was a jerk. Right mommy?' And everyone laughed." His audience (his uncle) explodes in laughter.

When a child tells a story, he not only means something, feels something, refers to an event; most important, he DOES something.

What was this child doing? He was sharing part of his life experience, entertaining, surprising and amusing his uncle, practicing his skills as a raconteur, and establishing his identity as brave and audacious. Austin's brilliant book, *How To Do Things With Words*, showed us that words not only mean and refer to things, they do things. We can promise, threaten, marry, decree, etc. The same is true of stories. People do things with stories.

One of the things they do is to narrate an inner life, and an identity, and share that inner life and identity with others.

In studies of Baltimore families talking about the past, Peggy Miller showed that children often describe upsetting experiences to their parents. The stories create two levels of emotional transaction: a replay of what-

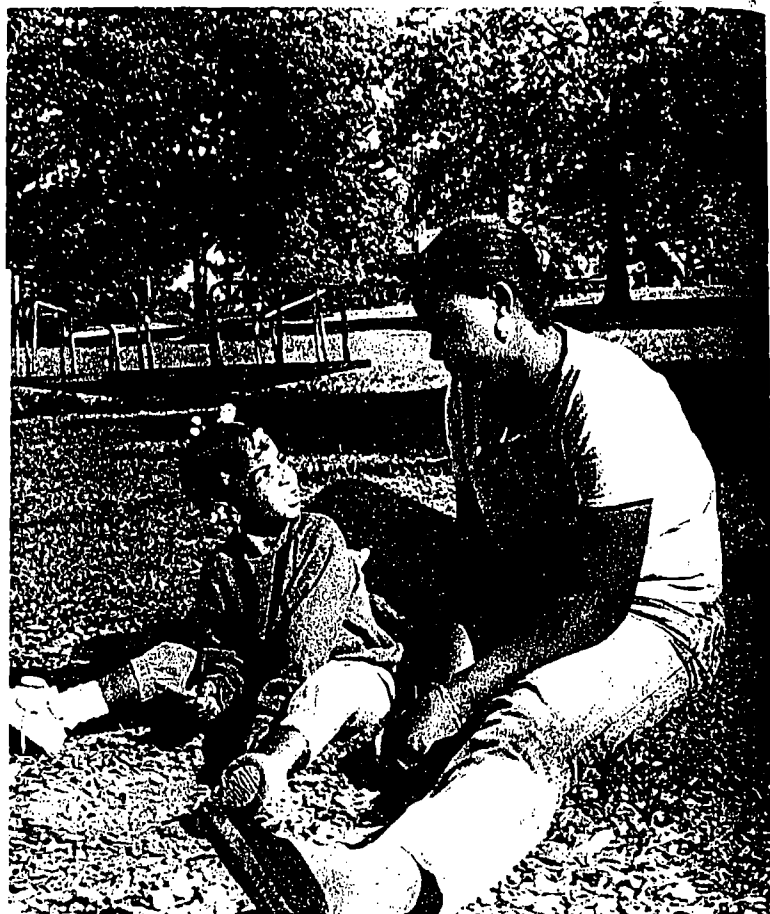
ever they went through, and whatever emotional response they elicit upon telling the story (Miller and Sperry 1986). Bruner has suggested that narratives act as cooling vessels, in which emotionally and cognitively powerful experiences can be reconstructed with less impact than they originally had. When children retell upsetting experiences they benefit from the distance the retelling gives them. Similarly the adult's reaction has the potential to be vivid enough to make the retelling cathartic, and at the same time calm enough to make the retelling safe, and helpful.

As I have described elsewhere, story telling is an essential, perhaps the essential activity of human beings (Engel, 1995). It serves a myriad of functions for the young child. Stories allow children to learn about their culture, but also serve as a kind of passport into the culture. Children tell stories as a way of solving emotional, cognitive and social puzzles and to sort out problems or concerns. Perhaps most importantly, stories are one of the fundamental ways in which we each create an extended self. The developing child's cumulative repertoire of stories gives him or her a sense of self across time and situation. As we tell stories about our selves we weave together the underlying constant inner self with the many different selves that emerge in context, Williams James' experiencing "I" and many "mes".

Children are not only "set" to tell stories but highly attuned to the response of their listeners, eager to be good story tellers, driven to tell about what matters to them, and to communicate who they are. Interesting to think that by the time children are 2½, an age we have traditionally thought of as physical (i.e., sensory motor) children seem so absorbed with shaping experience into stories, and using those stories to affect the people around him. As they create an identity with their stories, children also reveal their inner lives. If you want to know what a child thinks about, listen to his stories.

One might ask, then, what can we do to promote story telling during the early years? There are three kinds of experience that promote storytelling ability during the first three years. Having conversations, plenty of them, and long ones, with adults. Talking about the past and the future, even before your child can do this on his or her own. Hearing and participating in stories of all kinds.

Let me elaborate on each of these ideas. As anyone knows who lives or works with young children, sustained conversation can be a rare commodity in any kind of group setting. Whether its breakfast with three siblings or playtime at day care, having a conversation that involves more than three turns (someone speaks, the other responds, the first person speaks again) can be hard to come by. This is particularly true with children between two and four years old whose conversational skills can be uneven. Typically a three-year-old offers a tidbit to get a conversation going, but depends on the adult to use that tidbit as a basis for a longer fuller dis-



Marilyn Nolt

cussion. When a young child announces, "I went to a museum and saw a shark," it is easy to nod as you continue what you were doing, or say "You did? That's nice." But these responses close the door to story telling. As our research with mothers and children shows, what a three-year-old story teller needs is a participatory audience, an adult who can ask a genuinely interested and substantive question, one that leads the child to build the story.

Some of the time, what this requires is simply attentive listening, another somewhat scarce phenomenon in a busy day. Many of us now know that play is truly a child's work, and that most of their days should be spent at what is commonly called free play. But conversation is an equally important to the budding story teller. As wonderful as play doh, dress up, and blocks are, conversations are a powerful part of any curriculum and very alluring to a child. While circle time gives children a chance to share toys or news with one another, group meetings are not conducive to long conversations. These take place most often around the snack or lunch table, at a drawing corner, or snuggled up against some pillows (Engel 1996). These conversations in which stories are embedded are at least if not more likely to happen spontaneously as they are during a time earmarked, "Story telling".

Listening attentively to your student, patient, or

child's stories not only has a powerful effect on their experience of telling the story, it is an invaluable source of insight into your child's experience. One reason why it is so important to have plenty of adults working with children in group settings is so that there are enough conversational partners to go around. If you are responsible for 8-12 children by yourself it's hard to have real conversations with all of them, each day.

A second related way to promote the development of story telling is to talk frequently about the past and the future. Children at least as young as 16 months love to hear about their own past and about plans for the future, whether it's what they will do later that day, or about a holiday coming at the end of the month. Long before children show a full understanding of the past and the future, or of time itself, they love to hear about their extended selves from those around them. In day care or therapeutic settings, having conversations with children about their lives is an essential means to building up a relationship that extends beyond the immediate context. Moreover, the more this kind of planning and reminiscing takes place, the more opportunities for them to develop an internal repertoire of stories. Children also love to hear about the lives of the adults around them. In order to develop a real relationship with a child in your care, you need to have genuine conversations. This means that you have to talk about yourself as well. Clearly we make choices about what to share and what not to share. But one-sided conversations are skimpy versions of the real thing and bar children from learning about the adults around them, and from experiencing genuine dialogue.

Finally, children need to hear and participate in a wide array of stories. As I have tried to show, young language learners have amazingly sensitive ears for style. They relish and absorb all kinds of stories, story telling formats, and genres, from allegories to poems. It is natural to choose stories to read aloud that fit a topic of interest. For instance teachers choose stories about separation at the beginning of the year, and stories about the harvest in the fall. But it is important to choose stories as much for their language, style, and sensibility as well. Children love and benefit from stories, poems, and songs that they don't fully understand, but that contain something (tone, rhythm, imagery, for instance) they can relate to. A good example of this is the wide appeal of T.S. Eliot's *Book of Practical Cats*. Too often stories written for children about popular topics lack any kind of narrative or linguistic power.

One of the most effective ways to show children that people live in differing communities is to share stories with them that come from those cultures. Thus, rather than hearing about a culture, they hear the culture through its narratives. It is important not only to introduce children to other communities through stories from those communities, it is also an effective way to validate the narrative styles and habits of the children

one is working with. As I have tried to show, children internalize the story telling values of their community. It can be seriously limiting for a child to enter a setting where their way of telling or responding to stories is neither accepted or celebrated. Instead of correcting the way a child tells a story, or what they put into their story, listen, respond, and assume their style is a worthwhile one.

Stories need not only come in the form of books. Many communities have a flourishing tradition of oral stories. One of the most important lessons I have learned from my own research is that stories can form a tremendously rich strand of everyday spoken conversation. Here again there is room for all kinds of story telling. These differences can reflect personality, culture, and interest. The richer the repertoire of story telling styles a child is exposed to, the more possibilities for that child to develop his or her own powerful narrative voice, one that reflects both his community, his family, and his inner life.

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Shrinking Trolls and Expanding Minds:

How Very Young Children Learn To Understand and Use Symbols

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T

he early cognitive development of children is to a large extent the development of the ability to mentally transcend time and space, a feat made possible by the development of symbolic capacities. Symbolization is, indeed, the hallmark of human cognition; there is nothing that so clearly distinguishes us from other creatures as our creative and flexible use of symbols. Virtually anything can be a symbol, so long as some person intends that it be responded to not as itself, but in terms of what it represents. The particular symbols of a culture may include, among other things, writing systems, number systems, maps, and models. Mastering the symbols of their culture is a central developmental task for children.

Whatever their culture, all typically developing children begin learning language and gestures in the first year of life. In Western societies, older infants and toddlers start to learn informally about other kinds of symbolic media, such as pictures and television. Most preschool children are taught the alphabet and numbers, many begin to read, and some even start to do simple arithmetic. Many young children also encounter a variety of less common symbols, such as maps, models, musical notation, and computer icons.

Because of the universality and centrality of symbols to human culture, it is important to examine how and when children come to understand and use symbols as adults do. Adults are so experienced and skilled with symbols and symbolic reasoning that they generally "see through" symbols to their referents: They can judge the technical quality of a photograph or consider the cartographic characteristics of a map, but the photo automatically evokes thoughts of the depicted loved one, and the map primarily serves to provide information about the represented area. Moreover, adults, whose everyday experience includes a wealth of symbols and symbol systems, assume that many of the

novel entities they encounter will have symbolic import. This is not the case with young children. My research on early symbolic development reveals that children only gradually appreciate that entities should be responded to as representations of something other than themselves—in other words, as symbols. These findings have important practical implications for parents, early care and education professionals, and anyone working directly with young children or designing their caregiving environments.

Symbolic development

My research addresses the issue of how very young children first gain insight into novel symbol-referent relations and how they begin to use symbols as a source of information and a basis for reasoning.

In our research, my colleagues and I present young children with a particular symbolic representation—most often a scale model, picture, or map—that provides information needed to solve a problem. Use of the symbol requires: 1) some awareness of the relation between symbol and referent; 2) mapping the corresponding elements from one to the other; and 3) drawing an inference about one based on the other. The majority of our research has involved scale models. Because young children rarely, if ever, encounter real models in which the symbol maps onto a specific referent, we can use scale models to examine how children first gain insight into and exploit a novel type of symbol-referent relation.

In our standard task, the model stands for a room (either a full-sized real room or a tentlike, portable room). The model is very realistic, and there is a high degree of physical similarity between the objects—items of furniture—within the model and the room. The model is in the same spatial orientation as the room, but it is located outside the room, so the child can see only

one space at a time. The model-room relation is explicitly and elaborately described and demonstrated for the three-year-old children. In the task, children watch as a miniature toy is hidden behind or under a miniature item of furniture in the model, and they are told that a larger version of the toy is hidden with the corresponding piece of furniture in the room. ("Watch! I'm hiding Little Snoopy here. I'm going to hide Big Snoopy in the same place in his big room.") If the children appreciate the relation between the two spaces, then their knowledge of the location of the miniature toy in the model can be used to figure out where to search for the larger toy in the room, and vice versa. (It does not matter whether subjects see the hiding event in the model or the room. For convenience, I refer to the situation in which the hiding event occurs in the model.)

In numerous studies, 36-month-old children have typically succeeded in this task (>75 percent errorless retrievals), but 30-month-olds have usually performed very poorly (<20 percent correct) (DeLoache, 1987, 1991; DeLoache, Kolstad & Anderson, 1991; Dow & Pick, 1992; Marzolf & DeLoache, 1994). Failure in the task is not due to memory or motivational factors: Virtually all children can retrieve the toy they actually observe being hidden in the model. Nevertheless, the younger children fail to relate their knowledge of the model to the room. These children understand that there is a toy hidden in the room, and they readily search for it. What they do not realize is that they have any way of knowing—other than by guessing—where it is.

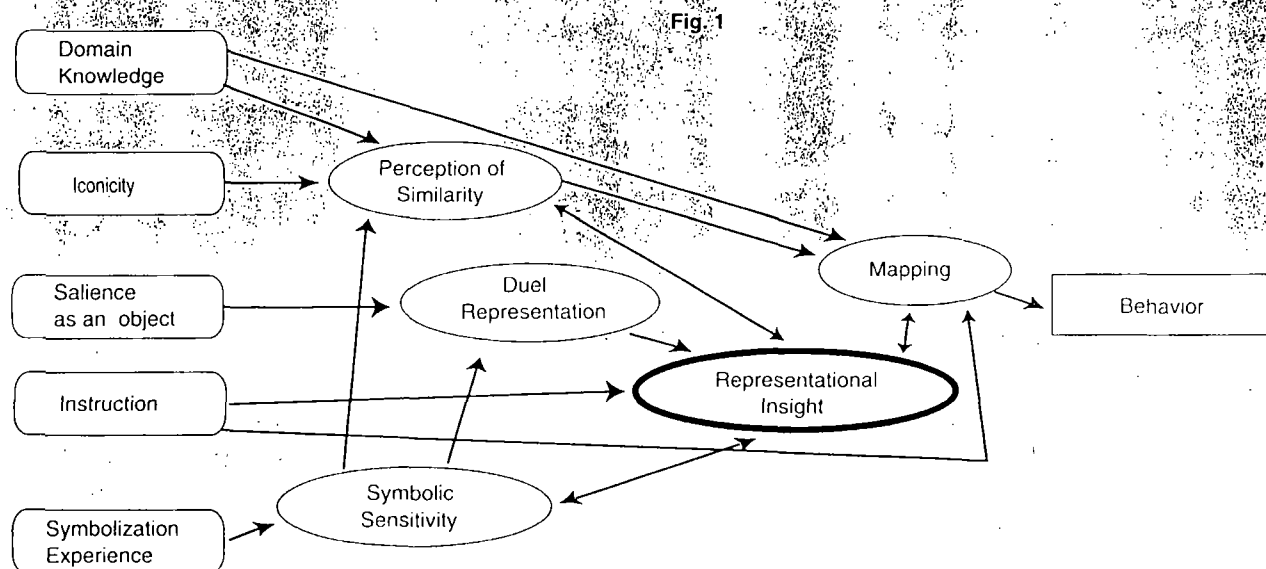
A model of symbol understanding and use

Research conducted with this and related tasks has led to the development of a conceptual model of young children's understanding and use of symbols (see Fig. 1

below.) (To avoid confusion, henceforth I use the term Model, with a capital M, to refer to the conceptual model.) The Model incorporates several factors we have discovered to be important in young children's symbol use (left side of Fig. 1), including characteristics of the symbol itself (salience), the symbol-referent relationship (iconicity), the symbol user (experience), and the social context (instruction). As is apparent from the figure, these factors interact in complex ways to determine performance.

The end point of the Model is the behavior of using a symbol as a source of information (right side of Fig. 1), which always requires mapping between symbol and referent. Numerals must be mapped onto the appropriate quantities; the individual elements on a road map must be mapped onto the corresponding roads and cities in the real world. In the model task, the individual objects—items of furniture—within the model must be mapped onto the corresponding objects in the room. The relation between the hidden toy and its hiding place must also be mapped from one space to the other.

The pivotal element in the model is representational insight—the basic realization of the existence of a relation between a symbol and its referent. This awareness includes both the fact that there is a relation between symbol and referent and some knowledge of how they are related. The nature or level of an individual's mental representation of the relation between a symbol and its referent can vary greatly. It could be conscious, explicit knowledge that the symbol stands for its referent. A touchstone example of the dawning of explicit insight is Helen Keller's dramatic and life-transforming realization of the point of her teacher's finger movements. Representational insight could also be some inexpressible, implicit sense of relatedness, such as a





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young child might have. My research has repeatedly shown that representational insight can be surprisingly difficult for young children to achieve, but that developmental progress can be very rapid.

It is important to note, in this context, that a person can encounter and even learn something about a symbol and not realize what it stands for. My younger brother had been obediently reciting the Pledge of Allegiance for some time when he one day asked, "What are witches' stands?" Preschool children can happily sing the alphabet song and learn to recognize letters without at all understanding the role of letters in reading and writing. Similarly, young children can readily reel off a correctly ordered list of number names without being able to count even a small array of objects. Anyone who attempts to teach young children or to assess their cognitive skills should not confuse knowing a set of symbols with understanding how those symbols relate to their referents.

For young children, iconicity (referring to the physical similarity between symbol and referent) plays an important role in symbol use. Many symbol-referent relations are purely arbitrary and conventional, with no physical resemblance at all—for example, numerals, letters, and musical notation. Other symbols are highly iconic: A color photograph, for example, closely resembles its referent. Except for size, the scale model used in my research looks very much like the room it represents. Iconicity generally facilitates symbol use: The more a symbol resembles its referent, the easier it is to perceive the similarity between the two. Perception of similarity facilitates both the achievement of representational

insight and mapping. In the model task, we found similarity to be very important, both in terms of surface similarity of the individual objects within the two spaces and in terms of the overall resemblance between the model and the room. For example, 3-year-olds are highly successful if the furniture in the two spaces is highly similar, but they perform poorly if there is a low level of similarity. When object similarity is high and, in addition, model and room are similar in overall size, even two-and-one-half-year-olds succeed in the model task (DeLoache, Kolstad, & Anderson, 1991).

Note that the Model specifies two-way influences between representational insight and perception of similarity. A child who realizes that a symbol and referent are related will presumably search for similarity between the elements within them, thus leading to improved mapping. For example, in the model task, a child who realizes that the model and room are related will actively look for similarities between the individual items within the spaces.

The role of instruction

The social context of symbol use is very important. We expect direct instruction by other, more knowledgeable people to be necessary for children to master many symbols. Reading is an obvious example. Although there are fascinating examples of children who seem to have learned to read on their own, most children require direct, extensive instruction to learn to recognize letters and read words.

The importance of instruction about the nature and appropriate interpretation of symbols is not restricted to

abstract, purely conventional symbols like letters and numbers. Even highly iconic symbols like realistic pictures are not necessarily interpreted correctly without social interaction and communication about their nature and use. Recent research in my laboratory (DeLoache, Pierroutsakos, Uttal, & Rosengren, 1995; Pierroutsakos, 1994) has established that 9-month-old infants are confused about the nature of two-dimensional stimuli. They often treat realistic color photographs of objects as if they were real objects. Specifically, 9-month-olds touch, rub, pat, and even try to pick up depicted objects. These fruitless efforts are not due to an inability to discriminate real objects from their pictures: Presented with a real object and a color photograph of that object, the infants always reach for the real object. However, perceiving that there is a difference between three- and two-dimensional objects is not the same as understanding the nature of that difference: These babies simply do not yet understand what pictures are. Or perhaps it would be more accurate to say that they do not yet understand what pictures are *not*.

By 20 months of age, such manual exploration of pictures is rare in the middle-class children we have observed. Presumably as a function of experience with pictures—especially picturebook interactions with parents, older siblings, and child care providers—these toddlers have learned two important lessons. First, they know that pictures share only some of the characteristics of their referents. A picture of a banana looks like and makes one think about bananas, but it cannot be picked up or eaten. Second, these American toddlers have learned the culturally appropriate use of pictures—we look at them, think about them, show them to someone else, and talk about them. Thus, before their second birthday, middle-class children understand that pictures are objects of contemplation and conversation, not action.

This research raises the possibility that some picture-

books might make the child's task a bit more difficult. There are many popular books that have three-dimensional features—from the famous old standard, *Pat the Bunny*, to books in the shape of trucks, books that fold out to make a dinosaur, or any number of variants. Charming as these books sometimes are, they invite young children to treat pictures as objects rather than as representations. Thus, instead of helping them figure out the important differences between objects and pictures, such books actually obscure those differences.

In the model task, also, direct instruction plays an important role. Experiments in which we have manipulated the instruction given to the children about the model-room relation show a significant effect on the likelihood that they will notice the relation between the two spaces. The extent and nature of instruction that is needed (or useful) depends on the age of the child. With two-and-a-half-year-olds, not even extensive, explicit instructions are enough to lead them to apply their knowledge of the model to the room. Three-year-olds are very successful if they are given an extensive orientation, including a description of the two toys, a description of their rooms as being alike, and a demonstration and explanation of the correspondence between all the relevant objects in the two spaces. Furthermore, the experimenter explains that she always hides the two toys in the "same places" in their rooms. When less complete instructions are given, three-year-olds, and even three-and-a-half-year-olds perform very poorly (DeLoache, 1989).

How does instruction help inexperienced symbol users (i.e., very young children) achieve representational insight? We assume that our instructions contribute in various ways. For one thing, they direct the children's attention to the respects in which the two spaces are similar; for example, they emphasize the correspondences between individual objects, which children must detect to succeed, and they de-emphasize the size difference between the spaces. Furthermore, telling children that the spaces are alike may lead them to actively compare the model and room and hence to discover additional similarities that the experimenter does not mention (e.g., the spatial relation among the objects, or features of the spaces such as windows, bookshelves, pictures on the walls, doors, etc.). In addition, instructions convey the general structure of the task, including the crucial parallel between the hiding events in the two spaces.

Dual representation (and shrinking trolls)

Another important factor is the salience of the physical properties of the symbol. All symbols of the sort under consideration have both a concrete and an abstract nature. A consequence is that understanding and using them requires what I have termed dual representation—simultaneously representing both the concrete and



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the abstract nature of a symbol (DeLoache, 1987, 1991). To the extent that one's attention is drawn to the physical properties of a symbol, it will be more difficult to appreciate its symbolic status. As Langer (1942) said, a peach would be a poor symbol because "we are too much interested in peaches themselves."

To succeed in the model task, the child must mentally represent the model both as a real, concrete object (or set of objects) and, at the same time, as an abstract symbol for something other than itself. The high salience of the model and young children's keen interest in it prevent them from representing it both ways. They pay attention to the model itself, encoding and remembering the location of the hiding event in it, but that memory representation remains separate from their mental representation of the room. Hence, they fail to use their knowledge about the model to draw an inference about the room.

The dual representation hypothesis has received strong support from the confirmation of a series of counterintuitive but theoretically motivated predictions. First, I reasoned that because a picture is much less salient and interesting as an object than a model is, substituting a picture for the model should make our task easier (even though two-dimensional stimuli are generally less informative and effective than three-dimensional ones) (DeLoache, 1987, 1991). As predicted, two-and-a-half-year-old children succeeded when pictures, but not a model, were used to convey the location of a hidden toy.

Second, we attempted to decrease the physical salience of the model by placing it behind a window, thus preventing the children from touching it or interacting directly with it. We reasoned that denying children access to the model would decrease its salience as an object, hence making it easier for them to achieve dual representation. The predicted improvement in the performance of a group of two-and-a-half-year-olds occurred. In a third study in this series, we attempted instead to increase the salience of the model by letting children play with it for several minutes before testing them in the standard task. The idea was that playing with and manipulating the model would make it more salient as an object and hence would make dual representation more difficult to achieve. The predicted poor performance by a group of three-year-olds occurred (DeLoache & Burns, 1993).

We recently conducted an even more stringent test of dual representation by attempting to eliminate the need for it (DeLoache, Miller, & Rosengren, *in press*). In this study, we endeavored to convince a group of two-and-a-half-year-old children that a "shrinking machine" could shrink a troll doll and a room. Our reasoning was that if children believe the machine has shrunk the room (into the scale model of that room), then there is no representational relation between model and room. Instead, there is an identity relation: The model is the

room. Hence, the task of retrieving the hidden toy is simply a memory problem. Therefore, we predicted that two-and-a-half-year-olds, who typically fail the standard model task, would succeed in the nonsymbolic shrinking-room task.

In the orientation, the child was introduced to "Terry the Troll" (a troll doll with vivid fuschia hair) and was shown "Terry's room" (a tent-like, portable room that had been used in many previous model studies). Then the shrinking machine (which looked suspiciously like an oscilloscope with flashing green lights) was introduced, and its remarkable powers were demonstrated. The troll was placed in front of the machine, which was "switched on," and the child and experimenter waited in the adjoining area, listening to computer-generated "sounds the shrinking machine makes when it's working." The child then returned to discover a miniature troll in place of the original one. The child was then shown that the machine could also make the troll "get big again." A similar demonstration showed the power of the machine to shrink and enlarge Terry's room. The sight of the model in place of the room was very dramatic.

The child then watched as the experimenter hid the larger doll somewhere in the portable room. After waiting while the machine shrank the room, the child was asked to find the hidden toy. The miniature troll was, of course, hidden in the model in the place corresponding to where the child had seen the larger troll being hidden in the room. Thus, just as in the model task, the child had to use his or her knowledge of where the toy was hidden in one space to know where to search in the other. However, in this task, the child thought the room and the model were the same thing. (Both the experimenters and the parents were convinced that all but one child firmly believed the shrinking-room scenario. Remember, most of these children also believed in Santa Claus.)

As predicted, performance was significantly better in this nonsymbolic task than in a control task involving the usual symbolic relation between the model and the room. This superior performance occurred even though the shrinking-room scenario was more complicated and the delay between the hiding event and the child's retrieval was much longer than in the standard model task. This study thus provides very strong support for the dual representation hypothesis.

(Yes, we always debriefed the children fully at the end of the session, showing them the two dolls and the room and model together and explaining that we were "just pretending." Most children appeared uninterested in our explanation. Several, after listening to it, responded, "Can we shrink him again?")

The development of symbolic sensitivity

A key element in our Model of children's understanding and use of symbols is the individual child's symbolization experience. This includes both the child's general



experience with a variety of symbols and specific experience with any particular type of symbol. Such experiences lead to the development of symbolic sensitivity, a general expectation or readiness to look for and detect the presence of symbolic relations between entities. A child who has had the experience of responding to a given entity as a representation of something other than itself is readier to respond to other entities in an abstract rather than concrete mode (DeLoache & Marzolf, 1992). Given typical caregiving environments, children's symbolic experience, and hence their symbolic sensitivity, increases naturally with age.

A series of standard "transfer-of-training" studies has provided evidence for the role of symbolic sensitivity. Children who are first tested in a relatively easy task (i.e., one in which they detect the symbol-referent relation and perform well) subsequently perform better in a more difficult task (i.e., one which their age group normally fails). Thus two-and-a-half-year-olds who did well using a picture to guide their search for a hidden toy subsequently succeeded using a model as a source of information. Children of the same age also showed significant transfer from a relatively easy model task to the standard task. Three-year-old children who first participated in the task with high similarity between model and room were subsequently successful with low similarity between the two spaces, although 3-year-olds typically fail the latter task (Marzolf & DeLoache, 1994).

Although we have examined symbolic experience within our model task paradigm, the concept of symbolic sensitivity is presumably quite general. In our conceptual Model, symbolic sensitivity is the primary mechanism for developmental change. We would expect it to increase as a function of a child's experience with widely disparate symbols. Thus, the increased performance that we observe in our picture and model studies during the third year of life might result in part from the children's experience with picturebooks, television, pretend play, and other forms of symbolic experience.

One would thus expect that children with less experience with common early symbols like picturebooks might achieve success in our standard scale model task somewhat later than children with more of such experience. Data consistent with this expectation come from a comparison of a group of children who attended a local child care center serving primarily lower socioeconomic status (SES) families with the performance of children attending a predominantly middle-class center. The three-year-old children in the lower SES group were less successful (39 percent) in our high object-similarity model task than the middle-SES children (78 percent). By age three-and-one-half years, however, the children in the lower-SES sample performed well in the task (81 percent).

In another comparative study, a group of mostly mid-

dle-class Argentinean children performed less well in this task than our typical sample of middle-class Illinois youngsters. According to the teachers in the Argentinean center, these children received relatively little exposure to picturebooks and representational toys. There are, of course, myriad differences between the various groups in these studies, in addition to symbolic experience, so these results must be interpreted with great caution. Nevertheless, they are consistent with the hypothesis that greater experience with symbols in general should facilitate performance in the scale model task—and, more importantly, that as children become more sensitive to the possibility of symbolic relations, they become capable of detecting them with less support.

Implications and application

The Model of children's growing understanding and use of symbols that has been described here has a number of clear practical implications for parents, early care and education professionals, and others who work with very young children.

First, one cannot take for granted that young children will detect a symbolic relation, no matter how obvious it is to adults or even to older children. Only through experience do young children come to appreciate the abstract, representational relation that holds between a symbol and referent, regardless of how physically similar they may be. Thus, although three-dimensional educational materials ("manipulables") are often designed with the assumption that children will figure out the relation between various-sized blocks and number concepts, my research indicates that this assumption cannot be made blithely—and will not always be valid. Hence, the utility of any such educational aids cannot simply be taken for granted (see Uttal, Scudder, & DeLoache, in press). Similarly, anatomically explicit dolls are commonly used in investigations of suspected child abuse on the assumption that the self-doll relation will be obvious to young children and will help them provide more complete and accurate testimony. Recent research in my laboratory and others questions this assumption. There is increasing evidence that, as predicted by dual representation, very young children do not find it natural or easy to use a doll as a representation of themselves (DeLoache, 1995; DeLoache & Marzolf, 1995).

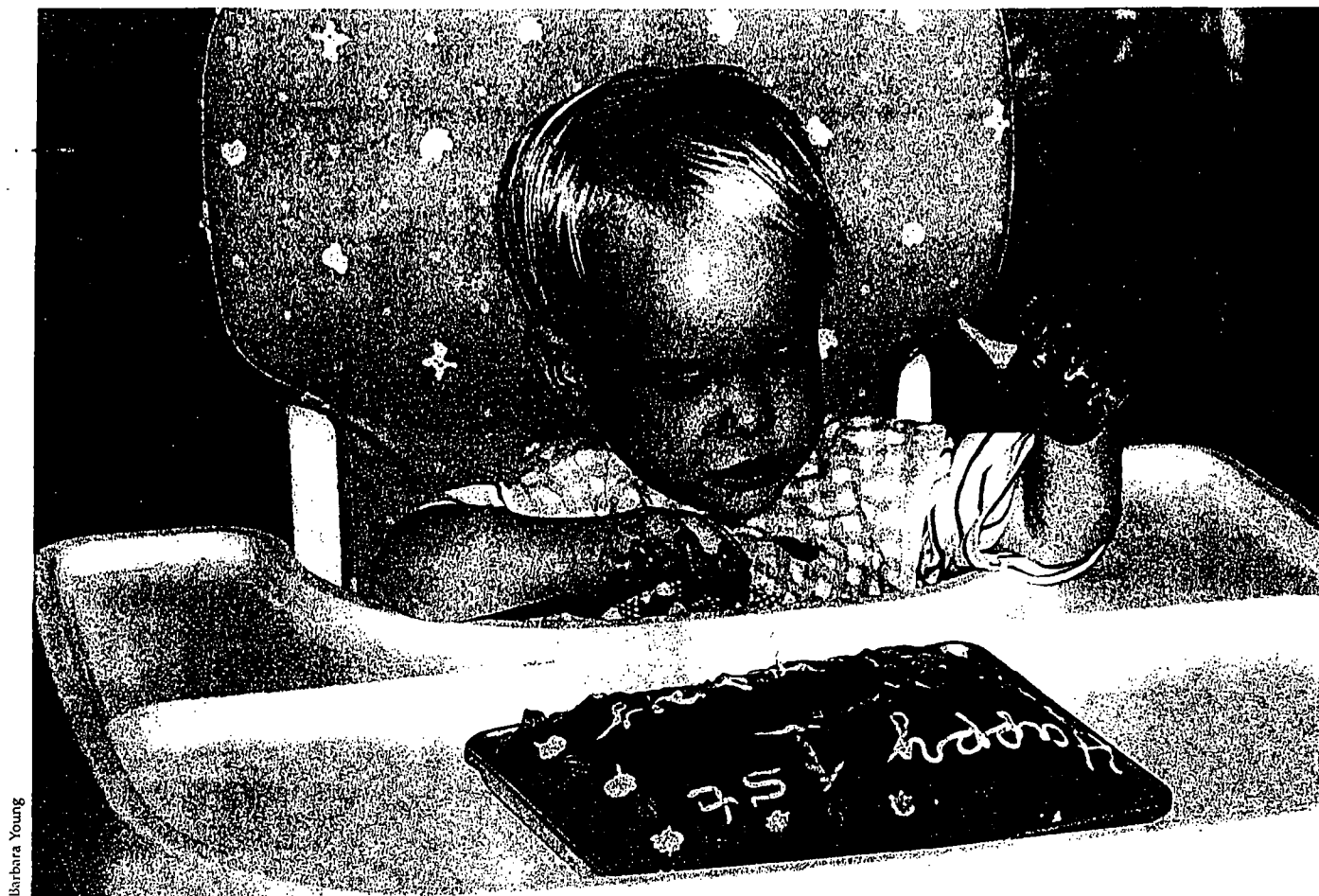
Second, parents, educators, and caregivers should guard against assuming that young children who have learned particular symbolic terms understand the significance of those symbols. I mentioned earlier that knowing one's ABC's does not necessarily imply understanding the role of letters on the printed page. Playing in a meaningful way with a doll does not guarantee that the child can readily use the doll as a representation of him- or herself.

Third, there is no more important developmental task than mastering the set of symbols important to

one's culture. It is not possible to function fully and effectively in any society without understanding the symbolic media through which individuals in the society communicate. Early symbolic sensitivity develops only through interaction with skilled symbol users. Young children learn some symbol-referent relations simply as a consequence of everyday communication with other people—for example, learning about the nature of pictures and how they are used through picturebook interactions. Direct instruction and training are necessary for mastering other symbol-referent relations—for example, learning to read or do math. In all cases, however, the older individuals providing guidance to young children need to realize that symbol-referent relations that are transparent to them can be surprisingly opaque to those with limited symbolic experience. Although the adult easily "sees through" the symbol to its referent, the child may see only the symbol itself.

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Children's Memory for Personal Experience: *Individual and Cultural Variations in Development*

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Children's memory for their own experiences—events they take part in—has become of particular interest to both researchers and practitioners in recent years. There are many reasons for this interest, among them important practical issues involved in child abuse and children's testimony in court cases. From a different but related perspective researchers have pursued the intriguing question of why events of infancy and early childhood are closed off to later memory. As is well known, most people cannot recall events from their lives before the age of about 3 1/2 years or even later (sometimes as late as 8 or 10 years of age). Freud referred to this lack as infantile or childhood amnesia and attributed it to repression of early memories. However, contemporary developmental psychologists find this explanation unpersuasive.

For one reason, researchers have in recent years found strong evidence for retention of memory for ordinary events in infancy and toddlerhood over weeks and even months, and the question then becomes: what happens to these memories? If they are not repressed, as Freud claimed, are earlier memories different from later? If so in what way? What is it about memories formed in later childhood that enables individuals to retain them for many years and into adulthood?

To understand this problem it helps to think of different kinds of memory that may all be involved in remembering aspects of a personal experience. We can identify at least three such kinds:

1. The experienced event may fit a general schema or script for familiar activities. For example, a child may have a standard "going to bed script" based on past

experience, and each re-experience of this event is not then retained as a specific memory but only as a "general script." Parents and practitioners are usually quite familiar with strong expectations based on such scripts, leading to insistence by a child that the routine be done exactly the same way each time.

2. A new or novel event or a salient variation in a standard familiar event may be remembered as a specific episode that has personal meaning. Such experiences are those that typically enter into an adult's autobiographical memory, forming a kind of personal history and storehouse of anecdotes that one may tell others or oneself. These may be positive or negative, a source of joy, sadness, triumph, or embarrassment. Sometimes they appear trivial and meaningless yet still enter into the fabric of one's life and self-understanding.

3. Rather than a whole story, parts of the experience may be retained in semantic memory, that is, as general information or knowledge. For example, a song learned in pre-school may be retained for many years, but the occasion or even the context of learning it may not be held in memory. It has entered into general knowledge, based on personal experience, but no longer with a personal experience "tag" to identify its source. Much of our general knowledge or facts about the world we live in are of this kind—we know them, but we don't remember when or why we learned them.

Over the past 15 years researchers from many laboratories have provided substantial evidence that even very young children (at least by 2 years of age) have each of these three kinds of personal memory. Some of the most interesting examples have come from the study of a 2-year-old child's pre-sleep monologues. The child Emily was tape-recorded periodically from the age of 21 months to 36 months as she talked to herself before falling asleep after her parents left the room. Here are examples of each type taken from the resulting transcripts of her talk:

Script (2 years):

I can't go down the basement with jamas on. I sleep with jamas. Okay sleep with jamas. In the night time my only put big girl pants on. But in the morning we put jamas on. But, and the morning gets up . . . of the room. But, afternoon my wake up and play. Play with Mommy, Daddy . . . (24 mo.)

Although this account is somewhat inaccurate, it reflects Emily's concern with how things go. Later in the third year her "scripts" became highly extended; one concerned with the day's routine contained over 50 separate propositions reporting events in their canonical order, with several repetitions of the same event sequence. It is notable that these were formulated in terms of what will happen tomorrow, that is, the script served as the basis for anticipation of familiar event sequences.

Specific Episode (at 32 months):

We bought a baby, cause, the well because, when she, well;

we thought it was for Christmas, but when we went to the s-s-store we didn't have our jacket on, but I saw some dolly, and I yelled at my mother and said I want one of those dolly. So after we were finished with the store, we went over to the dolly and she bought me one. So I have one.

In this example, Emily was recounting to herself what apparently was a significant episode in her life (she had not rehearsed this recent episode with her parents or others).

Semantic Memory (28 months):

Emily is talking with her father about tomorrow's breakfast before he leaves her alone in the room for sleep:

E: I want yogurt.

F: And you want yogurt. I know and I think I'll have some raspberries for you tomorrow.

E: And I cereal!

F: Today you had strawberries, tomorrow I think you'll have raspberries.

E: Cereal! Cereal!

F: You'll have cereal? Okay. Cereal and yogurt? You want bananas in yogurt, or raspberries in your cereal?

E: Yeah.

F: Okay. That'll be good.

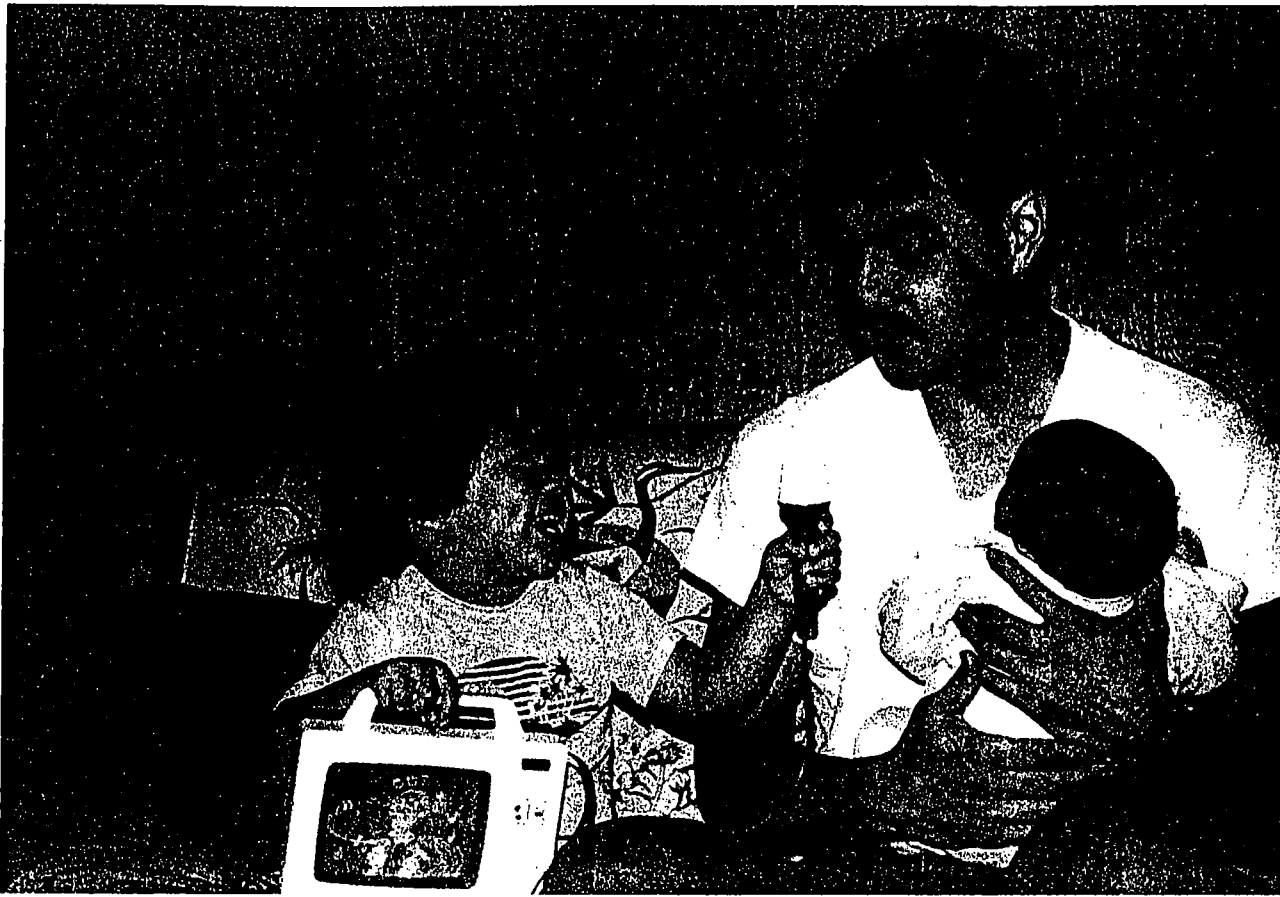
E: And strawberries in my cereal.

Here Emily demonstrates that she has extracted from the different experiences of breakfast a general knowledge category of breakfast foods such as yogurt, cereal, fruit, eggs. Her category of alternatives for breakfast was specific to that event, but independent of any specific occasion of that event.

These excerpts from a highly articulate little girl indicate that by two and a half years of age she had good command of all three of the kinds of memory derived from personal experience outlined above. But Emily, like most of us, did not retain memories later from this early period of her life. To understand why not, it is necessary to consider the value of each of these kinds of memory for the individual, and ways in which such values may change with development.

Both the first and third types of memory—scripts and categories of things—consist of general knowledge that has a function in the child's current understanding of her own world, the people, objects and events that have their places in it. This kind of memory is of obvious significance to the child's intelligent functioning in everyday life; it constitutes the substance of her mental models of the world she lives in, and supports her ability to act intelligently within it.

What about the second, memory for a specific episode? Although Emily talked about specific experiences in her crib monologues from the age of 24 months, these recounts tended to be about everyday routines and not about novel happenings (the example quoted above is one of those that did incorporate a significant departure from a familiar event, in this case buying a desired doll in a toy store). Moreover, Emily did not



repeat recounts of specific events in more than one monologue, suggesting that she did not find them of importance to self knowledge or of particular interest in their own right. We speculate that these specific episodic recounts served the same function and had the same value for the child as did the scripts and general knowledge categories; that is, recounting the event served to represent it as part of her general understanding—or mental model—of the world. For example, in the case of the doll-buying episode, it may have revealed the possibility of persuading a parent to purchase a highly valued article, a bit of general knowledge based on, but not forever attached to, a specific episode.

What changes might we expect in the function and value of memories of personal experience after the early childhood period? Most adults and older children engage in sharing memories with others—family members, friends, and acquaintances—both for entertainment value and for the “lessons in living” they illustrate. Most adults (at least in Western societies) also report that they possess a lifelong history of significant episodes that define who they were and who they are in different epochs and contexts of their lives—an autobiographical memory system with personal significance. Thus we would expect that retention of specific episodic memories would come to be valued for these reasons. The question is how, when, and why does this change come about?

Role of conversations with adults

Sometime between 2 and 4 years of age parents typically begin to talk with their children about the events they have experienced together, in addition to accompanying their shared experiences with commentary about what is happening. A number of researchers have established that talking about an experience may have an important impact on how the child remembers that experience, and may dispose children to engage in reminiscing about experiences themselves. Talk about an experience may affect all of the types of memory outlined previously and may affect these memories in different ways, depending on what is talked about. An example from a 4-year-old boy of our acquaintance illustrates how such talk may affect memory for a novel event.

While swinging on a rope attached to a swing set at preschool, Adam fell and hurt his elbow. Adam talked to his father after the fall on the phone and later on the drive home. Later that evening he talked to his mother about it. At bedtime he complained of more pains and his father, fearing that Adam had sustained more serious injuries, took him to the hospital emergency room, where it was discovered that he had injured his collarbone. After treatment, Adam and his father went for ice cream and then returned home. The next day, when Adam went to the playground, he found that a bar had been placed where he had swung, to prevent other children from swinging the way he had. The extra bar, placed mid way up on the end



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where the two pipes form an inverted "V" as a brace for the cross beam that holds the swings, now forms the letter A. Adam and his parents now refer to the structure as the "Adam bars."

Adam and his parents talked about the event frequently in the days and weeks that followed, and in this process we can see how the shared memory was incorporated in different ways. His parents talked to him about the event in terms of the need to listen to the teacher, not to use playground equipment for purposes other than they were intended. Adam reports that he now knows that you need to hold on with two hands when swinging on a rope so you don't fall off. Thus, he gained general knowledge about the need to hold on with both hands when swinging. (This is not, however, the knowledge that parents and teacher attempted to convey; they emphasized the importance of using equipment in the way it is intended to be used. Often it appears that children may not take from talk the message adults intend.) Adam also reconfirmed his script knowledge about what happens when he's hurt: Daddy is available, looks after him. He also acquired an episodic memory of how "Adam bars" came to the playground, as well as the combined episodic and script memory of the emergency room scenario. Thus talking about the event serves more than one personal memory function. In general, research in this area suggests that talking about events establishes the importance of

remembering and the internalization of a framework that will later allow the child to engage in remembering with less and less dependence on the cueing of adults.

Starting from a very early age children are introduced to and engaged in the discourse of memory of their own social group. For many families in the West, photographs are the center of such talk as they are shown to children while the adult carries out both sides of the conversation. The adult thus scaffolds (Bruner, 1983) the child's memory talk, being both the questioner and respondent in the discourse: "Who's that?" or "Do you remember last Thanksgiving when this was taken?" or "Who's in the picture?" (Engel, 1986). As they engage in conversations about events with children, adults introduce the social form of talking about memories as well as the importance of doing so. Such interaction emphasizes the social value placed on talking about events as well as how such talk is conducted.

The effects of scaffolding in parent talk about the past have been studied by a number of researchers. In one such study, McCabe and Peterson (1991) traced the influence of parental framing as it developed in mother-child dyads for over a year. They found that parental questions during the first two interviews, at delayed intervals, provided young children with a skeletal framework of information needed for constructing a narrative report. At the third visit, when the experimenter interviewed the children, the children whose

parents had been more persistent in questioning and had asked topic-extension questions, provided longer narratives than the children whose parents were less persistent and asked fewer elaborative-type questions.

Children seem to develop particular ways of structuring memories based on the conversational style that the adults around them encourage. The questions adults ask direct children as to what is important to relate in a memory narrative. If the particular questions are not asked, the relevant pieces of information are not necessarily provided by the children. Thus, much of the information provided by children depends on the interviewing skills of the adults speaking to them. Moreover, if an adult asks either too many or too few questions, he or she may be seen as either too inquisitive and unaccepting or uninterested. Either of these extremes may discourage narration (McCabe and Peterson, 1991).

Mothers differ in the style of interaction they engage in with their children around the topic of events, whether as the event is in process, after it occurs, or in looking at picture books (Nelson, 1994; Tessler and Nelson, 1994). In two studies, Minda Tessler identified two distinct styles of parental talk in ongoing discourse as an event was taking place. The **narrative style** is dynamic, emphasizing temporal and causal sequences of actions, motivations and feelings, movement toward a goal or endpoint. The **paradigmatic style** is more static and descriptive, focusing on identification of features and parts with less emphasis on the whole event. Similar styles have been identified in previous studies of mother-child past talk (Engel, 1986; Fivush & Hamond, 1990).

Narratives, like stories, usually have a distinctive beginning, a sequence of actions that lead to a high

point that provides the sense or the drama, an evaluation (e.g. "That was fun, wasn't it?") and an ending. This structure provides coherence in the telling and also in the remembering. An example from Engel's dissertation data illustrates the way in which a parent can turn a memory fragment from even a very young child into a narrative-like story.

In this excerpt from her transcript the mother (M) and child (C) have been talking about memories based on family pictures. The 2-year-old introduces a new topic:

C: Mommy, the Chrysler building

M: The Chrysler building?

C: The Chrysler building?

M: Yeah, who works in the Chrysler building?

C: Daddy

M: Do you ever go there?

C: Yes, I see the Chrysler building\ picture of the Chrysler building\

M: I don't know if we have a picture of the Chrysler building. Do we?

C: We went to . . . my Daddy went to work

M: Remember when we went to visit daddy? Went in the elevator, way way up in the building so we could look down from the big window?

C: big window

M: mmhm

C: ()

When . . . we did go on the big building

M: mmhm, the big building. Was that fun? Would you like to do it again? Sometime.

C: I want to go on the big building.

(Unpublished data from Engel, 1986, used with permission.)

Here the mother picks up the child's topic (the Chrysler Building) and appropriately locates the experience that the child is focused on, a visit to Daddy. She supplies the action, the high point (looking down from the big window), and the evaluation (was that fun?) As the child follows along, affirming the mother's construction. In this way the fragment is jointly reconstructed into a coherent whole that may contribute to its further retention and accessibility.

Paradigmatic structures invoked by parents in memory talk may provide a categorical framework that also has a certain coherence. For example, many mothers looking at pictures of urban scenes with their 4-year-olds in Teller's study (see below) encouraged the child to name all of the fruits and vegetables displayed in a food store. This may encourage the child to form groups of items as categories that can form the basis of hierarchical taxonomies, a cognitive skill that clearly has value for later school learning. However, our research tends to indicate that for young children (and even for adults) the narrative format is naturally more memorable.

Tessler and Nelson studied ongoing commentary by



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mother and child during two events, visiting a museum and taking pictures on a neighborhood walk. We found that mothers were consistent across contexts—looking at books, commenting on ongoing experiences, and talking about the event experienced. Moreover, style of parental talk influenced the child's memory for the experience in two ways—children remembered more of the experience spontaneously, and they remembered more in the style that mothers used. When researchers attempted to elicit memories from the children in the opposite style to that of the mother, there was no contrasting effect; that is, children of narrative mothers recalled more in the style of their mothers regardless of the type of discourse used by the interviewer, and similarly for children of paradigmatic style mothers.

A striking result of these studies is that children recalled things they had seen in the museum or on the walk only if they had talked about the objects at the time. In the museum study if only one member of the mother-child dyad had discussed the object at the museum, this object was not recalled later with an interviewer. We concluded that, based on these results, "the child's verbalized memory for an experience is strongly influenced in form and content by the way in which the event is talked about during the ongoing experience, as well as after the experience" (Tessler & Nelson, 1994 p. 319).

Taken together, these studies indicate that over time and experience with co-reconstructing experiences with adults, children tend to adopt the styles and values of the adult model, formulating their own recall in ways that reflect the model, and focusing on aspects that the adult model typically emphasizes. This suggests that some children may learn to be good "narrativisers" or story-tellers, while other children may learn to analyze events into their component parts, and perhaps become good "categorizers."

Still, the results of many different studies suggest that the effects of adult modeling are not the result of simple imitation but are products of the active efforts of children to reconstruct for themselves the events of their lives. For example, studies of repeated conversations about a particular event have found that information provided by mothers during one recall session does not affect a later recall session (Fivush, 1994). In other words, the child does not incorporate the new information added by the mother during one conversation to the narrative told to the experimenter during a later conversation. Children report a greater number of units of information over recall sessions, but they do not necessarily report the same units across sessions. Fivush and Hamond (1990) speculate that this may be a result of the extensive cueing younger children depend on when reporting their memories. If the cueing is inconsistent across sessions, it may elicit different pieces of information at the different times. Older children and adults, however, are usually more consistent than younger children because they have internalized a narrative struc-

ture and they do not need to rely upon another person's cues or framing for recall of an experience.

Retaining memories: Effects of reinstatement

Overall these recent studies have shown that children learn to talk about their experiences in distinct ways. They also indicate that forming a **narrative** of the experience aids retention of the personal memory, and that parents who use a narrative style of discourse about past events tend to have children with more extensive personal memories. But does the parental talk actually affect the memory? Does it cause the memory of the event to be retained? If so, how does it have these effects? We are now studying the impact of talk on the retention of specific memories, under the assumption that talk has the effect of reinstating the child's experience of the event, in a mentally vicarious fashion. That is, we believe that talk about the event reactivates the child's memory, and that this private vicarious re-experience of the event influences its retention over a longer period of time than would otherwise be the case. Thus we believe that memory for events is socially mediated through talk about the shared experience, but the long term effect is on personal memory about the self.

In a first study investigating the effects of reinstatement, we (Walkenfeld and Nelson, 1995) found that children who were guided in talk about a shared experience with an experimenter after a two-week delay were better able to recount details of the event at a later time than children who did not discuss the event. These effects are now under further study, and preliminary findings suggest that amount of information recalled is related to the familiarity and skill of individual adult interviewers, whether or not the child had shared the experience with the interviewer. This finding is consistent with that of McCabe and Peterson on maternal talk effects, as reported earlier.

Our current research also replicates the earlier findings that talk about an event on one occasion has a positive effect on the child's memory for details at a later time, although as Fivush and her colleagues have shown, different interviewers may elicit different details. This inconsistency in reporting by children suggests that the effect of the talk on memory is global—it does not invoke rehearsal of particular details, but rather reactivates and thus reinstates the memory of the experience itself.

Although verbal recall is generally a facilitator of memory, some kinds of verbal intervention may lead to memory distortions. For example, someone unsure about the details of a given event is more likely to accept another version of the story than someone who accurately recalls the details of that event. This is apparent in the resistance that children sometimes show to parents' attempts at correcting a child's account. Researchers studying the effects of misleading post-event informa-



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tion, for example false suggestions about what occurred, have concluded that young children's memory is easily distorted when faced with misleading questions.

However, the evidence on suggestibility of children's memory is not entirely consistent and depends on a number of factors, such as those discussed here, that enter into how a child constructs and reconstructs the memory of the experience. Verbal suggestions can be very powerful if they do not contradict the child's own memory, but may have no effect if they do. In our studies contradictory suggestions have been put forth in the reinstatement sessions, and we have found little or no effect on children's subsequent recounts.

The positive effects of talk about the past with young children are important in conveying the structure and value of narratives to be shared with others and to treasure for one's own self history, the ultimate source of self knowledge and self concept. The possible negative effects of distorting a true memory through false suggestions certainly exist, and may be more powerful for young children just beginning to participate in this kind of discourse. However, the possibility of memory distortion is a minor part of the story of early memory development.

Cultural variations

As the previous discussion has indicated, individual variations in parental style—narrative or paradigmatic—

influence children's style and their retention of memories. These style differences may reflect different social or cultural values—an emphasis on individualism or on factual knowledge. The different styles that we find among mothers in conversations with their young children about experiences they have shared in the past, or about events that they are taking part in or anticipate for the future are reflected in the number and coherence of memories that the children report later, as previously discussed. In view of the fact that memory for specific personal episodes—autobiographical memory—is only one of several memory functions, we may ask how important this function is for an individual child's development, and what effect variations in it may have on individual or cultural variations in cognitive or personality development. We know from recent research that memory is not a unitary capacity, and that different memory skills do not always cohere together (Weiner, 1991).

An important perspective on this issue can be obtained from the study of personal memory in different cultural contexts. As the research cited here has documented, organizing a memory as a narrative with a beginning, a high point, an evaluation, and an ending, provides the coherence that makes the experience accessible as a whole and therefore leads to its longer retention. In these memory stories the child is usually presented as the protagonist, the one who undertakes goal-oriented action and for whom the outcome is evaluated



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positively or negatively ("You felt sad, didn't you?"). This kind of "narrativising" appears to be learned from parents and other adults who at first provide the story framework and the evaluative commentary.

- Mullen (1994, 1995) investigated the possibility that children from a culture that focused less on the child as independent actor and more on persons within activities and goals of groups as wholes might experience less memory talk organized as child-focused stories, and therefore have fewer and later early childhood memories. In her first studies, she compared the age of first memories for groups of university students from two contrasting cultural backgrounds: European-American and Asian (Korean, Chinese, and Japanese). Social psychologists have theorized that the latter groups share a "group-oriented" rather than an "independent-agent-oriented" self system, suggesting that the personal value of memories would be late to develop and would be less salient for students from these cultural backgrounds. This hypothesis was supported in her studies, which consistently showed significantly later early memories for the Asian groups than for the Euro-American groups. Subsequently, Mullen and Yi (1995) compared the amount and kind of talk about the past between Korean mothers and their pre-school children (in Korea) and US mothers and children of the same age. She found, as expected, that there was less talk about

- the past and it was less focused on the child's activities and feelings about the experience among the Korean sample.

These studies, although very important in originating the investigation of the relation between cultural practices and early autobiographical memory, are only a beginning in the effort to connect this kind of personal memory with other aspects of cognitive and personality development. It is intriguing that what is found on the social-interactive familial practices that are typical of a general cultural "style" may have pervasive effects on the self histories and self understandings of the individuals who grow up in those cultures. But at the same time, it is important to bear in mind that in our own multi-cultural individually-oriented social environments families may display quite different orientations along the same dimensions, as the studies of Tessler, Fivush, and others have shown.

The question then remains as to whether, aside from the possible effects on a child's early self-understanding, there are other discernible consequences of engaging in this kind of memory talk, and of forming coherent narrative memories of personal experience. Although the research on these issues is still in progress and conclusions cannot be definitive at this time, we can make some educated guesses on the basis of what has been learned thus far. To do this we return to the distinction outlined at the beginning between semantic memory organized around categories of things and episodic memory organized around experienced events, and we relate these to the distinction, made by Bruner (1986) and used in Tessler's analyses of mother-child talk, between paradigmatic and narrative thinking and discourse styles.

Conclusion

The type of personal memory that we have focused on here has two faces, one more or less automatic - events are remembered because something in them is salient, relevant to self, novel, emotionally arousing, or otherwise of interest. No special effort is needed to remember in this case. The memory might give rise to a script if the event is repeated, or features of it might be related to other bits of general knowledge. But the other face of memory requires reflection to extract specific meaning from the experience, to relate to self knowledge, to reconstruct as a meaningful whole. It is this aspect that is facilitated by talk with others, and specifically by narrative type talk with adults who have shared the experience, or who can co-construct a non-shared experience with the child.

In this process the child is confronted with important aspects of understanding self and the social world. The past is brought into present consciousness, such that the child can newly realize the continuity of past-present-future time. This is an achievement that is beyond the grasp of the infant or even the young preschooler (Nelson, 1996). The differing perspective of others on the same event confronts the child with the fact that there is more than one version of reality and thus that there is more than one possible representation of the same experience. The reconstruction of the experience by the adult

provides the child with reflections on the self, evaluations of actions and emotions, self-descriptions and traits. Such evaluations may have very powerful effects on the developing self-image. At the same time, the adult's reconstruction connects the component parts of the experience into a temporal and causal sequence that might have not been apparent to the young child. Although our script research (Nelson, 1986) has shown that pre-schoolers are very good at sequencing repeated events, they may need help in reconstructing the sequence of a complex novel event. These effects are not easily differentiated into cognitive effects, social effects, or emotional effects. Rather, all are potentially present in the child's participation in these memory discourses.

This is not to say that children who engage in less narrative talk about the past will not develop a sense of past-present-future, or of causally related actions, or of a self-image; as with most complex developments there are many sources of these kinds of knowledge structures. But as emphasized previously, narrativized memory talk appears to be an especially rich source of these important developmental achievements. Moreover, practice with personal narratives provides a base from which the child can move on to comprehend fantasy narratives, myths, history, drama—even television cartoons. What research has uncovered is the value of one-on-one talk of small child with adult in a scaffolding or co-constructing paradigm. As we have noted, children seem to need a great deal of support at first to tell their memory stories to a sympathetic adult. Telling one's story to a group or telling a made-up story are both more advanced competencies not usually achieved by pre-schoolers.

What might children gain from paradigmatic type talk—that is, focus on analyzing experience into its parts, including descriptions of objects, categories of things, rules, and roles? This kind of memory also has two faces, an automatic aspect that registers features of the world, and a reflective aspect that, like memory narratives, is facilitated through talk with adults. Indeed, parents who emphasize paradigmatic talk usually believe that they are engaging in cognitive discourse of a particularly valuable kind. Much remembering in school calls on paradigmatic structures—lists, categories, rules that must be consciously committed to memory. Certainly children who participate in much talk focused on this kind of information are also gaining important experience in how to remember certain kinds of things. We do not need to denigrate one kind of experience or one style of interaction to place value on the other.

All cultures rely on narratives to construct the social cultural world through story, myth and history. Even those that put less emphasis on the individual side of the shared narratives and more on the communal side use the form to enculturate children in the ways of the group. In this country at this time in history, the cultural

narratives emphasize the individual, and therefore most children in this society today gain understanding of their social world as they gain understanding of themselves while reflecting on their own past through others' eyes. As Bruner (1986) emphasized, we have long recognized the importance of objective paradigmatic memory. What now needs to be given equal recognition by both teachers and parents is the importance and significance for the young child of narratives of personal memory.

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