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Theory of Mind: Language and Cognition in Deaf Children

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What does it mean to say that a child has a Theory of Mind?

As young children mature, they develop an understanding of themselves and other people as psychological beings who think, know, want, feel, and believe. They come to understand that what they think or believe may be different from what another person thinks and believes. They also learn that much of our behavior is motivated or caused by our knowledge and beliefs.

Simon's Cake

An understanding of Theory of Mind might be best illustrated by an example, using a story.

Simon and his father made a cake together. But Simon wanted to go play and eat the cake later. So he put the cake in the cupboard. Then Simon left to play. The father thought that the icing on the cake might melt in the cupboard so he moved it to the refrigerator. Then the father left to go shopping. Later, Simon came home and he wanted to eat his cake. Where will Simon look for the cake?

You probably responded that Simon would look for the cake in the cupboard. He had put it there, and he didn't know that his father had moved it. Your answer shows that you have a Theory of Mind. You can distinguish between what you know and the false belief, or misunderstanding, that Simon has.

Children around age 3, however, will answer this question incorrectly. They typically respond that the boy will look for the cake in the refrigerator, because that is where it is. At this age, children have difficulty distinguishing what they know from what others know. Children at this age are aware that people have thoughts, but they don't realize that sometimes people's thoughts and beliefs can be different from their own.

Major changes happen in the child's understanding of other people's minds around age 4. At this age, children can distinguish what they know from what others know, and they can correctly predict that a

person's behavior is dependent on what he thinks or knows, even when that belief is false. At about 4 years of age, a child can correctly predict that Simon would look in the cupboard, because that is where he left the cake.

Developmental psychologists call this a Theory of Mind because it shows that these children have an integrated set of concepts underlying their understanding of the mind. This is much the same as children's "theories" in areas such as physics and biology. Children's cognitive systems are not merely a collection of facts they have learned about the world. Rather, children develop an understanding that allows them to predict another person's behavior based on what they know about that person's thoughts and beliefs—just like you predicted that the boy would look for his cake in the cupboard. Like a scientific theory, a Theory of Mind allows us to interpret and predict other people's actions by considering their thoughts, beliefs, desires, and emotions.

Theory of Mind and Deaf Children

Research has shown that children who are deaf have significant delay s in their understanding of a Theory of Mind. Previous investigators have speculated that the lack of access to conversations in the environment causes deaf children to miss important information about the world. But deaf children have some access to conversations, and, for the most part, they are socially competent, even when their language delays are severe. They do acquire a great deal of information about the world through visual means.

In addition, much of the research conducted on Theory of Mind skills in deaf children have relied solely on verbal tasks to assess their understanding. It is quite possible that deaf children have a Theory of Mind but don't have sufficient language to understand the stories that are typically used to test them.

For very different reasons, children who have autism also have delays in developing a Theory of Mind. For the deaf child, the delay in acquiring a Theory of Mind is caused by lack of access to language, not by any fundamental cognitive problems. With the child with autism, the delays are a fundamental part of the disability, caused by cognitive differences in the child.

How Do Language Skills Relate to a Theory of Mind?

A recent investigation of Theory of Mind skills in children who are deaf (Language and Theory of Mind, funded by NIDCD to de Villiers, de Villiers, Schick, and Hoffmeister) attempted to determine whether deaf children were equally delayed in tasks that used language and those that didn't. It also explored what aspects of the children's development might be related to their understanding of the mind. The study included 176 children with a profound hearing loss representing three groups: 86 children being educated orally (53 with hearing aids, 33 with cochlear implants), 41 deaf children with hearing families learning American Sign Language (ASL), and 48 deaf children with deaf families exposed to ASL from birth. Unlike most previous studies, all children using ASL were tested by deaf adults who were native signers of ASL, and interpreters were not used.

Not surprisingly, the deaf children with deaf parents performed much like hearing children, while the children with hearing parents were significantly delayed in their understanding of a Theory of Mind. The results also show that the deaf children who were delayed in Theory of Mind were equally delayed in both the verbal

tasks and the tasks that required minimal language. This means that the children lack some fundamental understanding of how the mind works regardless of whether the task requires language to understand it.

The study also revealed that the language skills in the deaf children were directly related to their Theory of Mind skills. However, it wasn't the children's general language skills but rather vocabulary skills and the specific ability to comprehend syntactic complements that predicted Theory of Mind skills. That is, if a child can understand sentences such as, "He thought his cake was in the cupboard," he is more likely to understand and predict behavior premised on a false belief, like that of the boy in the story. Children who had more advanced language skills were far more likely to pass the Theory of Mind tasks.

What this means is that the language delays that are typically observed in children who are deaf are causally related to delays in major aspects of cognitive development. Children who are not able to understand complex syntactic forms like complements have difficulty understanding how their own thoughts and beliefs may differ from those around them.

How Might Delays in Theory of Mind Development Affect Other Areas of Development?

There are several domains of development where Theory of Mind skills may be a prerequisite or foundation for later development. First, it is very likely that Theory of Mind skills play a central role in children' s understanding and production of narratives. Bruner distinguishes between the "landscape of action" and the "landscape of consciousness," both essential to narration. The fact that many deaf children appear to be delayed in their development of Theory of Mind skills may contribute to impoverished understanding of stories and so to their widely reported delays in reading skills. While many deaf children have difficulties with English grammar and vocabulary, these problems may not be the only cause of reading delays.

Research shows that even preschool storybooks have a great deal of content related to desires and beliefs of the characters. For example, Little Red Riding Hood has a false belief in that she thinks the wolf is her grandmother, but as readers, we know that the wolf is deceiving her and intends to eat her too. In order to appreciate the story, and its landscape of consciousness, a child must be able to see beyond the action and understand that Little Red Riding Hood doesn't know what we know. Otherwise the story becomes a tale of action where Little Red Riding Hood takes food to her grandmother, but for some unexplainable reason, a wolf is there instead. Much of the sense of the story is lost.

Second, it is possible that Theory of Mind skills are important for the development of social interaction skills, particularly those skills required in schools. Astington and Pelletier argue that there may be a relation between children's level of Theory of Mind development and their ability to learn by instruction and collaboration. They suggest that Theory of Mind understanding is also linked to the development of scientific thinking and critical thinking.

In short, education requires children to talk about mutual understandings and misunderstandings, to reflect on their own beliefs as well as others, and to shift perspectives when evidence suggests that another point of view is valid. All of these require Theory of Mind skills.

How Can We Help Children to Learn Theory of Mind Skills?

There are many ways that adults can likely facilitate a child's acquisition of a Theory of Mind. Pretend play and role-playing allow children to escape from the reality of objects and roles. In order to do this, children may need to create separate cognitive representations for what is real and what is imaginary. Talking about past events also has been found to be related to Theory of Mind skills in children, probably because children need to discuss decontextualized events. As mentioned, even preschool books contain numerous references and opportunities to explore how the mind works. And life itself presents many situations where people forget where they put something, misunderstand and tease each other, imagine what could be, and discuss opinions and perspectives. Discussing these events with children will help them acquire both the language of the mind as well as concepts that underlie a mature Theory of Mind.

Finally, research on the development of Theory of Mind skills with children who have limited access to language shows us the powerful role language has in developing fundamental social and cognitive skills. While many professionals are quite aware of how important language is in our lives for communication and learning world knowledge, research on Theory of Mind shows that language provides the scaffolding to understand how minds work.

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Children Talk About the Mind

- Eve at 2 years 3 months

  Adult: Would you like to have a cookie?

  Eve: I want some cookie. Cookies, that make me happy.
- Abe at 2 years 11 months

  Abe: I painted on them [his hands].

Adult: Why did you?

Abe: Because I thought my hands are paper.

- Adam at 3 years 7 months

  Adam tastes some glue.

  Adam: I don't like it.

  Adult: Why would you put that in your mouth?

  Adam: I thought that was good.
- Abe at 4 years 8 months

  Abe: Did you see the clouds?

  Adult: That was smoke left over from the fireworks.

  Abe: You thought that, but I thought they was clouds.

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Children's Storybooks Featuring Theory of Mind Concepts

The Wolf's Chicken Stew , by Keiko Kasza

A delightful story about a wolf who is hungry for a chicken. After searching, he is just about ready to grab it when he changes his mind. The chicken is too thin so he plans to fatten it up. He secretly leaves lots of goodies at the chicken's home at night. Finally, he is ready to get his chicken. When he arrives, he learns that the chicken is the mother of dozens of babies who love the wolf because of all the goodies he left. They call him Uncle Wolf. Later, when he is walking home, he thinks that he will continue to bake for the chickens, but now because they are friends.

Goldilocks and the Three Bears , by numerous authors

The three bears go for a walk. While they are gone, Goldilocks goes into their home. But the bears don't know. Later she falls asleep in their bed. When the bears return, they know someone has been there. There is evidence of a broken chair and some porridge that was eaten. When they go upstairs, they find Goldilocks so now they know who it was. Goldilocks leaves without telling them she is sorry.

The Rainbow Fish , by Marcus Pfister

The Rainbow Fish believes that she is beautiful. All the other fish would like one of her shiny scales, but she wants to keep them all. So the other fish don't like her and don't want to play with her. Later she realizes that friendship is more important than being beautiful, so she gives all but one scale away. She is happier now and doesn't miss her beautiful scales.

Jack and the Beanstalk , by various authors

Jack disappoints his mother by making a poor trade. He thinks he got some magic beans but the mother thinks they are worth nothing. She throws them away. But Jack was correct and the beanstalk grows up into the sky. Jack climbs it and finds a giant's castle. The giant's wife knows Jack is there, but the giant doesn't. Jack steals things from the giant while he is sleeping so he doesn't know. But finally he wakes up and knows that Jack is stealing his gold and chases him. However, Jack was faster and the giant is killed.