RESEARCH STARTERS
ACADEMIC TOPIC OVERVIEWS

Theory of Mind

Educational Psychology > Theory of Mind

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Abstract

An overview of Theory of Mind and its role and impacts on student learning in public school education environments is presented. Also presented is a brief look at the current research pertaining to Theory of Mind and its relationship to children and their developmental processes. Further analyzed are ways social skills are impacted by Theory of Mind in accordance with age related behavioral processes. Further presented are implications for classrooms and applications are described that include roles and impacts on certain groups including students, teachers, and administrators. Solutions are offered to help professionals develop the most effective programs through consistent, research based methodologies and philosophies.

Overview

Theory of Mind (ToM) is the term given to "the human ability to infer the intentions of others and to understand that their actions are guided by beliefs about the world" (Mizrahi, Korostil, Starkstein, Zipursky, & Shitij, 2007). Theory of Mind can also be described as "the ability to understand and reason about [a child's] own and others' mental states (such as understanding that the mind can misrepresent reality)" (Birch & Bernstein, 2007, p. 99). According to McHugh, Barnes-Holmes, Barnes-Holmes, Stewart, & Dymond (2007), an individual's "knowledge of informational states in the self and others develops across five levels originating from simple visual perspective taking to understanding true and false beliefs" (p. 518).

The first three levels of Theory of Mind consist of

- Simple visual perspective taking,
- Complex visual perspective taking, and
- Applying information based on the principle of seeing leads to knowing.

Levels 4 and 5 of this framework "consist of the development of understanding true and false beliefs. According to this model, the skills of perspective-taking are believed to be essential prerequisites for the development of true and false beliefs" (McHugh, et al., 2007, p. 518). The study of the Theory of Mind is a relatively new area of brain research. Findings from these studies are leading educators to better understanding developmental processes of children in new and expanded ways. This paper seeks to outline research, practice, and implications for educational professionals and psychologists seeking to better understand how brain development impacts student thinking and behavior.

Keywords

Emotion Understanding

False Belief

Prefrontal Cortex

Self Awareness

Theory of Mind (ToM)

Theory of Mind in Young Children

One of the findings from research is that Theory of Mind is age related and developmentally related. This holds multiple meanings in terms of educational and social planning. In particular, several studies have been conducted with three-year-old children. One such study involved showing a child a closed candy box and asking the child to determine what was inside the box. Typically, three-year-old children state the answer as "candy." However, after the researcher opened the box to reveal pencils and then closed the box again and asked the child what he or she thought was inside the box before it was opened, the child answered, "pencils" (Wellman, Cross, & Watson, 2001). Typically, when adults ask preschool aged children to state facts and later ask them if they have known these facts for a long time or just learned them today, children will insist that they have known these facts all along and that their friend will also know (Taylor, Esbensen, & Bennett, 1994). These are important findings from Theory of Mind research that relate specifically to hindsight.

Hindsight Bias

Conclusions have been proposed that support children's Theory of Mind relationship to hindsight bias in adults as shared core components of a similarly occurring phenomenon. This core component consists of a tendency to be biased by one's current knowledge when attempting to remember or make sense of a more naïve cognitive state. In order to more fully understand hindsight bias a more developmental approach should be able to provide a unified understanding of the nature of hindsight bias (Birch & Bernstein, 2007, p. 99). Researchers studying Theory of Mind need to understand that the research and theoretical framework constructing this new knowledge is potentially explosive in impacting both the fields of education and psychology in brain research and child learning. It could be argued that Theory of Mind is one of the key theories on the forefront of unlocking how to teach and socialize in accordance with developmental milestones based on the notion of when children can begin to integrate interpersonal perspective-taking within their social and learning framework.

Theorists argue that hindsight bias bears a striking resemblance and connection to Theory of Mind and the types of errors that young children make in Theory of Mind reasoning. These errors demonstrate that young children who are taught new information are unable to recall which information they have known longer, information they learned moments before, or information they have known for a long time (Taylor et al, 1994). Moreover, these deficits spill over into their judgments regarding the knowledge of other people. For example, it has been demonstrated that preschool children tend to behave as if seeing a small uninformative part of an object is sufficient for someone else to know the object's identity (Taylor, 1988) regardless of the age or identity of the person with whom they are sharing joint attention. In order to help children develop Theory of Mind, lessons could be constructed in the classroom using quadrants of pictures or art. Children could then be asked to determine the full object based on their model of perception. Misperceptions and myths could then be dispelled using this lesson framework. This lesson could be utilized at various ages to facilitate perception development for older students as well as younger students.

From an educational perspective, it should be noted that Theory of Mind changes as children age. Generally, four-and-five-year-olds tend to perform much better on Theory of Mind tasks. With age, research suggests that children improve in their ability to better understand sources of knowledge (Gopnik & Graf, 1988; Roberts & Blades, 2000), about what others are likely to know based on limited information (Taylor, 1988; Taylor et al, 1991), and regarding their own and other's false beliefs (Wellman et al., 2001). However, in other studies of Theory of Mind task correlations were established between children's Theory of Mind and adult's Hindsight bias. Birch and Bloom (2007) demonstrated that when sensitive measures are used, adults can also experience difficulty reasoning about false beliefs. During investigations that sought to determine this connection, findings reported that outcome knowledge can compromise an adult's ability to reason about their own false beliefs and internal assumptions (Birch & Bernstein, 2007, p. 105). Wimmer and Perner similarly determined that younger children could not complete Theory of Mind tasks successfully because they were unable to reconcile the conflict between reality and their own knowledge of the truth (Wellman, Cross, & Watson, 2001).Other studies have demonstrated an even more cogent relationship between age and developmental stages.

The Role of Deception

According to other Theory of Mind research, in order to successfully complete many Theory of Mind tasks, children must reach a developmental stage termed as Level 5. Evidence of this can be found from research that has been done to better understand deception:

> Deception involves understanding other minds, because it requires a person to make someone else believe that something is true when in fact it is false (McHugh et al., 2007, p. 518).

From a Theory of Mind construct, deception involves the deliberate planning and communication of a false belief to another. In typically developing children, deception can occur successfully in a child that is about six-years-old (Marvin, Greenberg, & Mossler, 1976). In order to deceive, Theory of Mind researchers

delve further into the complex cognitive abilities that produce deception. Theorists posture that deception requires a myriad of complex intra-personal perspective taking. First, in order to deceive, a child must be able to take the perspective of another individual to determine what the other person will believe from the information provided. Second, the child must be able to reason within the framework of "if-then relation" controlling the transfer of information. Third, the child must be able to transfer information in accordance with a "relation of distinction" (McHugh et al, 2007, p. 520). Again, this research indicates that very young children are impaired in their ability to take the perspectives of others (p. 521). The inability to possess a well developed Theory of Mind poses several negative impacts for children and adults.

Theory of Mind & Social Skills

In terms of social society, Theory of Mind plays an essential role. An individual with a well developed Theory of Mind should be able to think about, make intelligent inferences, and accurately infer another person's mind set and emotions. This person would be good at speculating what another person might be thinking and would have a greater awareness of other people's thoughts, feelings, and potential motives. Research has suggested that Theory of Mind can be considered as a module within the human mind dedicated solely to reading the intent and mind set of other persons (Abbas, 2006). In terms of children, Theory of Mind activities must be researched and applied in a classroom setting in order to support children in developing a Theory of Mind. However, for some children and adults, Theory of Mind deficits impact empathy and social connectivity.

For example, children with high functioning autism or Asperger Syndrome seem to lack Theory of Mind altogether and possess "mindblindness." Baron-Cohen has argued that these two disorders manifest an imbalance between two types of intelligence and that individuals with these disorders lack an ability to understand people while possessing an overdeveloped ability to understand systems, movement, and mechanical thinking. More interestingly, one theory suggests that the reason males tend to be diagnosed at a greater rate than females is because of the female's natural inclination to possess higher degrees of empathy (DeSoto, Bumgarner, Close, & Geary, 2007, p. 536). Individuals possessing Theory of Mind deficits are unable to infer emotional states and may have difficulties contributing to diverse human behaviors like empathy, forethought, and social intelligence (Geary, 2004; Humphrey, 1976). For both children and adults with Theory of Mind deficits understanding and Social Skills Training should be considered.

Applications

Students

For students, Theory of Mind plays a potentially important role in their social relationships with others and in their interpersonal assumptions and intra-personal perspective taking. In children's relationships with one another, Theory of Mind seems to be one of the key factors in helping children form bonds with one another and in developing empathic, socially intelligent relationships. In a classroom setting, Theory of Mind could be a potential explanation for children's behavior. Further study needs to investigate Theory of Mind in terms of physiological and psychological relevance.

Additionally, Theory of Mind deficits serve as predictors of children's social interactions and internal assumptions. Deficits in Theory of Mind or "mindblindness" typically preclude social inadequacies and should be studied further to determine relatedness not only to autism disorders but also mental health disturbances, deceit, and other social disturbances that interfere with success in a classroom setting. For students with these deficits, Social Skills Training should be offered that specifically addresses and names Theory of Mind, Theory of Mind deficits, internal assumptions, and intra-personal perspective taking as indicators for both educational and therapeutic intervention aimed at improved social awareness.

In children identified with an autism disorder or other social deficits, Theory of Mind holds one of the essential components for understanding how current brain research impacts learning and student success. This study goes beyond providing a framework of generalized developmental milestones and links a physiological component for helping researchers understanding the "how" and "why" resulting in specific behaviors.

Teachers

Theory of Mind study clearly extends beyond a simple outline of human behavior presented in most undergraduate educational psychology classes. Instead, Theory of Mind research presents some of the most recent and relevant psychological study aimed at better understanding the human brain. In order to teach children at their level, we cannot forget Piaget or Vygotsky and their contributions to helping educators understand developmental milestones, but we must recognize the current research and relevant contributions of present day psychologists and researchers in helping us unleash the potential of the human mind and the physiological connective tissue that underscores psychological development.

For teachers to better understand how to teach students and help them form positive social relationships with their peers, teachers need to have some background knowledge about Theory of Mind and information about how Theory of Mind brain research impacts how and when students learn. Teachers must teach in accordance with each individualized physiological and psychological composition of each child. Theory of Mind research potentially supports the need for differentiated instruction and meeting each child in accordance with their developmental progress. The investigations that have been conducted to support these findings clearly demonstrate ways that educators can enfold these concepts into rethinking their instruction. However, before teachers can begin to practice these "radical" new ways of thinking, teachers need to understand their own internal assumptions and intra-personal perspective taking. From the research, it has been concluded that adults and hindsight deficits connect

similarly to Theory of Mind deficits in children. Educators may experience some of these same deficits in their own thinking and may not recognize it. If educators are to model strategies for overcoming Theory of Mind deficits, educators must examine their own mental models to transform their thought patterns.

Instructionally, limited research on Theory of Mind has been conducted to better hone the skills for better preparing students to understand the perspectives of others. However, literature circles, group and individual reading activities integrating these kinds of exercises would allow students to practice perspective taking, role plays, and invite them to wrestle with their potential false beliefs. For younger students picture readers or picture books without words that allow children to analyze the facial expressions of characters in the book should allow teachers a window into their student's thinking regarding perspective taking. Finally, teachers need to be keenly observant of their students at various ages to determine if students are able to engage in perspective taking in social and academic situations. Teachers are on the front lines of observing children and facilitating interventions if interventions are required.

Administrators

Administrators serve as key instruments in creating change in educational cultures, and principals are considered as the instructional leaders in schools. Within this framework, many administrators may not be familiar with present research, unless they have been exposed to information that supports a different way of thinking and the research itself. Much of the Theory of Mind research rests in studies pertaining to autism. For educators and researchers, autism is only one lens for the research in this area. The implications for this research are substantial and should be continued to be researched for updated, present, and relevant findings. Administrators should also be aware that they play a key role in facilitating access to the most present educational research that supports student learning. If administrators do not have the time or the ability to function as an instructional leader, professional development specialists or academic coaches could also serve in this role.

Administrators should also note that leadership today is a formative and an ongoing process of facilitating change and transformation. The educator's job has been designed to foster the developmental and educational needs of children. The administrator's job is to foster the developmental and educational needs of adults they serve in educational settings. These are important mandates for all educational professionals to look at our times and the amounts of information being gathered pertaining to the dramatic physiological constructs of learning. This decade alone has produced an onslaught of new ideas and different ways of thinking supported by research. These are new lenses for looking at ourselves and our practices. Administrators play a crucial role in leading staffs to research and renewed thinking.

Issues

Overcoming Barriers to Understanding Theory of Mind

Theory of Mind has been most presently regarded as a lens for understanding social deficits experienced by individuals with special needs, particularly those impacted by autism disorders. However, after reviewing the research and literature pertaining to Theory of Mind and Theory of Mind deficits, the relevance of Theory of Mind and its connection to schizophrenia and psychotic disorders (Korostil and Starkstein, 2007), child deception (McHugh et al, 2007), physiological and hormonal predeterminants (DeSoto et al, 2007), self-awareness and perspective-taking (Howlin, Baron-Cohen & Hadwin, 1999) deeply impact present thought in terms of educational and social implications in a public education classroom environment. While once only a narrow field of research, Theory of Mind research has become an extremely broad field, encompassing multiple components of mental-state reasoning within both normal and atypical development. Presently, much of the Theory of Mind research includes representations of conscious awareness of beliefs, desires, intentions, including deception, and knowledge. Based on children's conceptions of what others know or do not know is the primary lens for researching Theory of Mind (Thompson & Thornton, 2007, p. 161).

One of the barriers to understanding Theory of Mind is that most practitioners only understand the relevance of Theory of Mind and its relationship to atypical social development. However, based on present research, Theory of Mind is deeply relevant in broader academic and social arenas. As an undergraduate student, Theory of Mind might only be "covered" in a surface overview, or it may not be taught at all. To better understand Theory of Mind and to engage students in the most recent, brain research and child developmental processes, these theories should be introduced in educational psychology courses at the university level if this has not occurred.

The last critical barrier to overcome to better understand Theory of Mind is that researchers should shift their focus to academic applications. Theory of Mind has largely been conducted in theoretical arenas. Now it is time to apply the research in academic settings with meaningful curriculum that encompasses the brain research and developmental processes. Students need to be engaged in practices that allow them to think in terms of intra-perspective taking, because Theory of Mind holds the key for helping students socially connect. Since the classroom is both a socially and academically rich environment, Theory of Mind research could dramatically improve social and academic relationships especially with instruction specifically geared toward constructing new ways of thinking and acting.

Conclusion

Theory of Mind is a relatively new area of brain research that has amazing potential for creating new ways of thinking about the connection between social and academic relationships. This area of research possesses unique properties with vast potential in helping educators better understand how to work with all children and especially those expressing difficulties showing empathy or social connectivity. This area of study also fits nicely with internal assumption making practices by both children and adults. Most notably, the Theory of Mind research while once limited to evaluating individuals with incapacities for intra-personal perspective taking can now be extended to all children in help-

ing them develop emotional understanding, dispel false beliefs, improve social cognition and social relationships, and examine their own assumptions. Armed with some knowledge about Theory of Mind, teachers should be able to evaluate students to better understand their internal assumption making processes and teach them new ways of thinking. Especially useful for this kind of work is collaboration with peers and opportunities to discuss internal assumptions in a guided methodology that allows all children the opportunity to share their thoughts and assumptions in a safe environment. The goal in this work is to create a "system of diversity" that makes school a safe and nurturing place both academically and socially.

Terms & Concepts

Emotion Understanding: Emotion Understanding has been described as a developmental milestone when children begin to set aside their own ultimately inappropriate emotion to attribute a false emotion to a given situation. An example is that despite receiving a disappointing gift a child will exhibit happiness.

False Belief: Mastery of false belief has been described as the first clear evidence that children realize their beliefs are mental representations and not direct reflections of reality.

Prefrontal Cortex: The Prefrontal Cortex is the part of the brain that research has demonstrated impacts theory of mind tasks, the ability to understand deception, and intra-personal perspective taking.

Self Awareness: The developmental stage when children are aware of and able to articulate their own psychological state.

Theory of Mind (ToM): Theory of Mind can best be described as an individual's ability to think about, make intelligent inferences about, and accurately assess another individual's mind set and emotions.

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