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Introduction

Developmental psychology is the study of behavioral, social, and cognitive change throughout one's life from birth until death. Our research focuses on the cognitive development in children. "Cognitive domain is the part of human development that includes all the mental processes through which the individual thinks, learns, and communicates, plus the institutions involved in communicating" (Berger, 2001, p.5). Cognitive development helps one to understand how people construct concrete and abstract ideas. Examples of abstract thinking are the ability for a child to no longer be egocentric through perspective taking and their ability to relate to other people with empathy. Our study is concerned with the age at which a child no longer shows signs of egocentrism in relation to perspective taking. At the time when children no longer express egocentrism, they may also begin to develop empathy. Egocentrism is the incapability to distinguish one's own perspective from that of others (Block, Block, & Gjerde, 1986).

Jean Piaget was the first known psychologist to study early cognition among children. He thought young children were extremely cognitively limited by their own perspective (Berger, 2005). Piaget considered the years between two and six to be the period of cognitive development called preoperational thought in which a child is not able to comprehend logical ideas. During this period, a child is known to be egocentric, Piaget did, however, underestimate children's abilities to view perspectives other than their own at an earlier age than seven. Many researchers later found that children become less egocentric at a much younger age than what Piaget predicted. Remarkably, children all the way down to eighteen months are able to have primitive perspective taking skills (Block et al, 1986). Egocentric children often seem selfish or ignorant, but it is only because their brain has not developed enough to see situations in different

perspectives. “Egocentrism is manifested by a failure to perceive an object in more than one way when alternative perspectives are both possible and necessary” (Block et al, 1986, p.1).

Research by Block et al concluded that by the age of four, some children are able to show an adequate understanding of different perspectives, whereas some children are still completely egocentric (1986). Newcombe and Huttenlocher found that children as young as four years old were able to understand the general idea of different perspectives; however, five year olds performed much better at certain tasks than four year olds concerning perspective taking (1992). “There is developmental change after age three in several important aspects of thought, including, most notably, the ability to deal with conflicting frames of reference” (Newcombe, & Huttenlocher, 1992, p. 13). This ability to see different perspectives is a huge leap in cognitive development.

As Piaget acknowledged, adults view the world less egocentrically than children, even though they do not outgrow their childlike tendencies altogether. Many social judgments, even among some adults, are still egocentrically predisposed (Epley, Keysar, Van Boyen, & Gilovich, 2004). Children, developmentally speaking, grow out of and past being egocentric but adolescents and even some adults have egocentric tendencies, such as when they overestimate or exaggerate certain situations without taking into account the perceptions of others (Epley et al, 2004). Royzman, Cassidy, and Baron concluded that adults and children alike may have some of the same general features of human cognition which allow them to solve problems in perspective taking (2003). In adolescence, it is referred to as adolescence egocentrism, which is where an adolescent only focuses on him or herself and feels that his or her life is extremely unique (Berger, 2005). Many adults also have trouble putting aside their own feelings on a subject matter to listen and understand that of another’s, thus demonstrating egocentrism in a more developed manner. As a young child, a person is not able to cognitively demonstrate any form of perspective taking or nonegocentrism, but as that child grows up, he or she is cognitively able to, but opts not to, see other people’s perspectives.

“Perspective taking involves understanding another’s thoughts and motives as well as feelings; unlike some forms of empathy, it does not require an emotional response” (Iannotti, 1985, p. 2). Our research does not focus on the emotional aspect of perspective taking and egocentrism but strictly on the ability that it takes for a child to see what someone else physically sees. From there, if a child can successfully comprehend the task at hand, then he or she is labeled as nonegocentric.

Nonegocentric children also have the ability to understand theory of mind, which is the capability to understand human mental processes (Berger, 2005). When a child is cognitively able to understand what another person is feeling and perceiving, then he or she is no longer egocentric in that area and is showing strong signs of the theory of mind. Developmental psychologists have predicted that the theory of mind strengthens around the age of four, which is approximately around the same age that children are no longer showing signs of egocentrism (Royzman et al, 2003). When a child finally grasps the idea of theory of mind and seeing other’s perspectives, it is a cornerstone in cognitive development and “...a social-cognitive foundation for further communicative and symbolic development” (Slomkowski, & Dunn, 1996, p. 1). This new knowledge is essential for children in latter development because it allows them to develop important human capabilities later on such as empathy and proper social behavior. Being able to see other’s perspectives allows for improvement in communication and interaction as a child advances (Slomkowski, & Dunn, 1996). Slomkowski and Dunn found that when children succeeded on perspective taking tasks, it was predictive of how they successfully communicated and played in a coordinated manner with their peers (1996).

Ethical

When conducting any form of research using human subjects, there are four major guidelines that must be followed in order to protect the subjects: the right not to be harmed, right to full-disclosure, right of self-determination, and the right of privacy and confidentiality (Kozier, 2004). The information collected in our study did not harm or put the child in any physical, mental, or social danger whatsoever. Also, the children, as well as the supervisor were

well informed of our intent at the beginning of our study. The children were made aware at the start that they did not have to participate in the collection of our data; they had a right to choose and that right was respected. At the beginning of our study, we composed a consent form for the parents of all the children to sign, but the site for our study, the day care at College Mennonite Church, did not require a consent form from us nor the parents.

The Hypothesis

The ability to take into account and understand that everyone does not have the same beliefs, perceptions, and viewpoints is critical for the social and cognitive domains of human development. Everyone at some point in his or her life has some level of egocentrism even as an adult, but a young child's thoughts are greatly influenced by egocentrism. At what age do children's thought processes develop altruistic thinking? Piaget underestimated the age at which children are able to understand the perspective of others, thus not showing signs of egocentrism any longer. Because Piaget and other researchers do not agree on the age at which children begin to show the ability to understand other's perspectives and no longer express egocentrism, we conducted our own research to identify an age.

Newcombe and Huttenlocher (1992) found that four year olds were able to generally understand tasks of different perspectives but that the older five year olds were correct more often. The first years of childhood are crucial in terms of cognitive development; an immense amount of change happens in just one year. Thus, it is safe to say that a child who is five years old is more apt to see and understand different perspectives than a four year old.

Due to the conflicting age results of Piaget and others, the hypothesis would be that by the age of six years old, a child will no longer show signs of egocentrism pertaining to perspective taking. In addition, children as young as three years old will start to show signs of having the ability to recognize other's perceptions/viewpoints.

Method

The research was performed at College Mennonite Church's day care center in Goshen, Indiana. The age cohorts that were used were from ages three, four, and five. Most of the five

year old children were still in preschool; however, some were already in kindergarten. There were a total of thirty eight children in this research; thirteen three year olds, fourteen four year olds, and eleven five year olds. The set-up of materials and where people sat was quite simplistic. There were three chairs around a small table in a room with no distractions or other children. A child sat in the first chair; the researcher asking the questions sat in the chair between the child and the observer, who sat in the chair opposite of the child. In the middle of the table was a dollhouse with the front of the house facing the observer (See Appendix 1) and the back of the house, with numerous props, facing the child (See Appendix 2). Some of the props that only the child was able to see were a baby in a crib, a swimming pool and slide, a girl in a chair, and several other chairs placed in the dollhouse. The observer's view consisted of the front door, roof, windows, and chimney. Pieces of white paper were placed behind the windows so that the child could not see through the windows and think that the observer could see through them and see what he or she was seeing from the opposite side.

The first question that was asked to the children was "What can you see?" The children responded with numerous answers such as a baby, a crib, a girl, a chair, a bed, and many other objects in accordance to the dollhouse. When the children responded that they saw more than five or six objects, they were then asked the second and final question. The second question asked was, "What can she (meaning the observer) see from where she's sitting?" The children would then respond with many answers and from there, their responses were put into one of three categories. The child was allowed as much time as needed to answer both questions one and two and the session with the child did not end until the child stopped talking about what he or she saw.

The three areas that a child could categorically fall into were 1) egocentric, 2) showing signs of nonegocentrism, and 3) completely nonegocentric. When a child was completely egocentric, it meant that he or she was not able to understand what the observer on the opposite side of the table saw. When a child was showing signs of being nonegocentric, it meant that he or she answered the second question partially right, and that he or she believed that the observer

could see some objects that only the child could see. When a child was completely nonegocentric, he or she understood that the observer was not able to see anything that he or she saw.

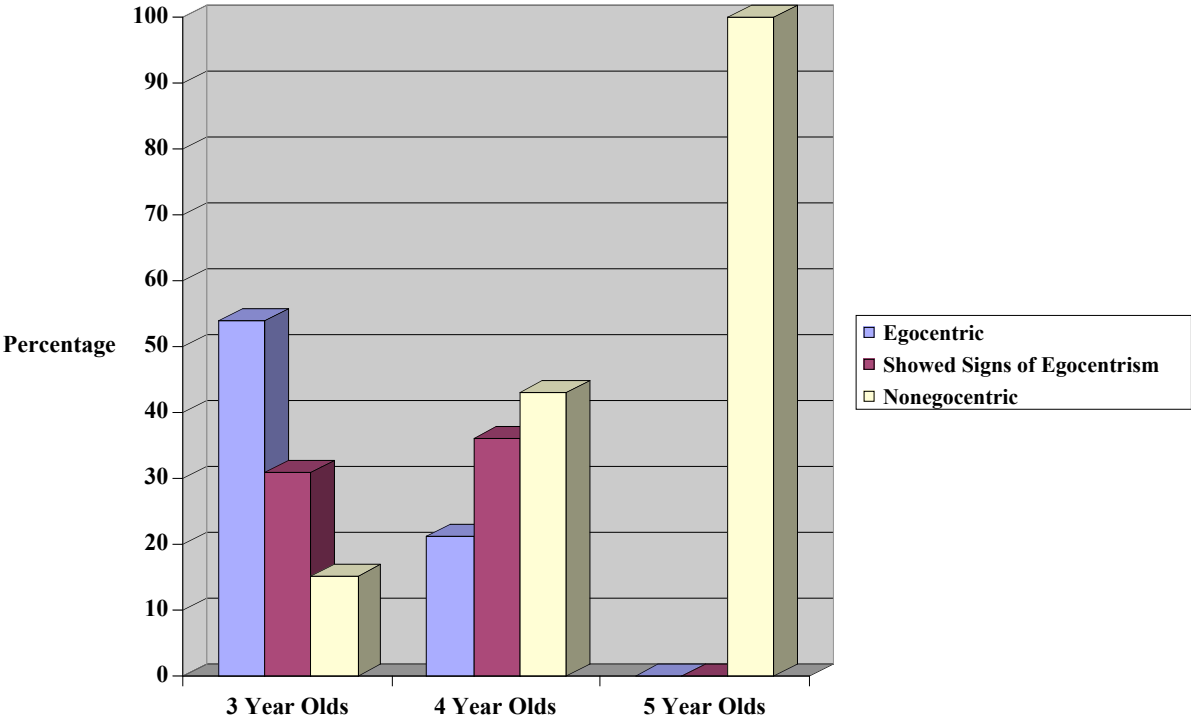
The observer, the person sitting opposite of the child, recorded everything that the child said relating to the study. After all of the data was collected, the children's responses were calculated to determine which category each child belonged to. Percentages were used to show the relative amount of each child from a specific age cohort in each category to determine a statistical significance.

Although this was the final method used to collect data, much change took place to the initial process before the actual study was conducted. A pilot study was conducted at College Mennonite's day care center and two children from each age group were used. It allowed us to see flaws in the method such as needing to put pieces of white paper over the windows. It also established that only one person should be asking the child questions to escape any confusion on the child's part. This pilot study allowed for revision in the types of questions asked to make them clearer and simpler for the children. The results of this pilot study were not included in the final results of the entire project. This strategy helped further refine the method and made it more understandable for the children and the researchers.

Results

There were thirty eight children studied. Fifteen percent of the three year olds were already nonegocentric, forty three percent of the four year olds were nonegocentric, and as the hypothesis predicted, one hundred percent of the five year olds were nonegocentric. The five year old children who were completely nonegocentric were asked why the observer was not able to see what they saw and they answered "Because she is not sitting where I am sitting." This gave further proof that the children who answered correctly knew and understood a perspective other than their own.

Comparison of Age at Which Children Become Nonegocentric



Conclusion

The data collected gave the expected results that were similar to other studies in relation to cognitive development and perspective taking in young children. The children under five were showing signs of nonegocentrism and some were even completely nonegocentric, even at age three. In fact, the results from this study show that the hypothesis was indeed correct, as one hundred percent of the five year olds were nonegocentric and children as young as three were showing signs in relation to perspective taking.

The results from the study were outstanding and in some ways surprised the researchers; three year olds were not expected to be nonegocentric in perspective taking skills. An implication to this study may be that we only performed the study at one child care facility. The facility is quite expensive and provides quality day care and teachers who motivate the children to learn. Most likely, the children at this facility come from a loving, caring, and resourceful family that pushes the children to become intelligent and ambitious. In other words, the children we studied at CCYC might have been above average for the particular age group because of the background benefits. Perhaps if the studied would have been done at another facility of different background nature, the children would have shown different results.

The findings from this study show that children's minds are extremely intricate and that they are able to think logically at a very young age, younger than some people give them credit for. This study focused on only one area of egocentrism; a young child is able to be nonegocentric in terms of perspective taking but he or she might not be able to understand what a friend or parent is feeling or thinking. Children are great thinkers, even at the age of three, and these results further emphasize the fact that they are able to think logically at a young age, years before Piaget thought feasible.

As children grow older, it is obvious that their brains are continually developing, and suddenly they become able to think in new ways. Through development, children begin to think by taking into consideration other people's beliefs and perspectives, while sometimes developing

empathy. The hypothesis was rejected because results show that all the children became completely nonegocentric at age five instead of the hypothesized age of six. Also, children showed signs of becoming nonegocentric and some children were completely nonegocentric by age three. The hypothesis was that children would not begin to show signs of becoming nonegocentric until the age of four. Conclusions can be made that Piaget underestimated the age at which children would become completely nonegocentric in perspective taking skills. Present day technology has increased greatly since Piaget's time, which could be a factor that influences the development of children. The cognitive development of children is a hot topic for research and has been for many years partly because of Piaget's interest. We hope that our research on children's cognitive development is beneficial and will provide evidence that children's brains and thought processes are developing faster than one might imagine.

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