Children's understanding of intentions, emotions, and intention-emotion relationships

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ABSTRACT

This study examined children's understanding of the role of intentionality in social interactions. Four, six, and eight year olds were read stories, illustrated with simple pictures, depicting accidental or deliberate actions. The study used a forced choice paradigm that asked children to indicate which of two pictures showed (1) an intentional (or unintentional) act and (2) a situation in which the victim would be sad (or mad). Six and eight year olds, but not four year olds, correctly identified deliberate actions at above chance levels. Eight year olds identified accidental actions and situations in which the victim would be mad at above chance. Understanding that anger was an expected emotional response to intentional harm, but not to accidental harm, increased with age.

INTRODUCTION

This study investigated children's understanding of intentions, emotions, and the relation of other people's intentions to people's emotional responses. Understanding of intention is an aspect of a child's "theory of mind", which is the understanding a child has of his or her own and other's minds and the relation between the mind and the world (Astington, 1991). This understanding allows children to predict and explain actions by referring to their own and others' mental states. These mental states include beliefs, desires, and intentions (Astington, 1991).

Astington (1991) stated that the child's "theory of mind" develops gradually from infancy through school age; however, the greatest change occurs at age four. Recent studies indicate that, in contrast to younger children, four year olds demonstrate increased understanding of a variety of mental states, including belief, desire, and intentions (Astington & Gopnik, 1991; Perner, 1988; Perner, Leekam, & Wimmer, 1987). Although by the age of four there has been enormous development in a child's "theory of mind", additional understanding emerges during the school years, including awareness of the social implications of cognitive states (Astington & Gopnik, 1991).

An important aspect of "theory of mind" involves the concept of intention as a mental state which leads to an intended action. Several studies suggest that preschool children have some understanding of intentionality. Shultz, Wells, and Sarda (1980) examined intentionality by having three- to seven-year-olds look at various situations dealing with pennies. In some cases the child was misled and chose the incorrect penny. The results showed that children as young as three could tell the difference between their intended choice and the unintended choice in which they chose the wrong penny due to the misleading information. Astington and Lee (1988) showed that four or five-year-olds, but not three-year-olds, could correctly identify appropriate relationships between desire and intentions and the correct emotion for the stated outcome in the story.

Intentions in social situations add another dimension in which a child must understand not only his/her own views but also another person's actions and the consequences experienced by others. The understanding of these social situations may be more difficult to understand and therefore develop at a later point than does the understanding of individual intentions. Justice, Clarke, Haver, and Cassidy (1993) looked at three-, four, and five-year-olds. Each child heard eight stories featuring two children which showed one child doing something either "by accident" or "on purpose". This action resulted in the other child experiencing a negative consequence. Each child was read a story and asked to point to the face that showed the emotion of the victim (sad/mad). The child was also asked about the intentionality of the perpetrator in the story. The results of the study showed that across ages children more often correctly
identified accidental actions to be unintentional than deliberate actions as intentional. Findings also suggested that, even at the age of five, children have not developed the understanding of intentions in social situations, or if they have, they are reluctant to indicate that the harmful action was deliberate.

Several studies suggest that preschool children have the understanding that there is a relationship between a situation and an emotional response. Michalson and Lewis (1985) showed that emotions such as happy, sad, and mad are simple emotions that are understood to correspond with situations and can, in turn, be identified through facial expressions. Furthermore, Michalson and Lewis (1985) have argued that assessment of children's understanding of emotion must take into consideration their lexical knowledge. It has been found that children can identify different emotions at an earlier point than they can label them.

Recent studies have examined children's understanding of the relation of other's intentions to an emotional response to those actions. Barden, Zeiko, Duncan, and Masters (1980) examined whether kindergarten, third, and sixth graders could appropriately match an emotional response to a given scenario. The finding was that there were no age differences for being the target of aggression. Almost all of the children indicated that they would be angry first and sad second.

Michalson and Lewis (1985) looked at a particular situation and the facial expression that would likely occur because of that situation. Children between two and five years of age, plus a small group of adults, were given a scenario and asked to choose the face that the character would express. In the sad scenario, few age differences were found between the three-, Four, and five-year-olds in choosing the sad face. For the anger situation, up to 40% of all children, regardless of age, chose the sad face. In this task, by age five, children could identify the emotional characteristics of certain situations in ways very similar to adults.

Previous studies examined the understanding of emotions in situations where a particular emotion would be expected. In some situations, however, the characteristic emotion would depend on one's interpretation of the situation. Justice et. al. (1993) examined preschoolers' interpretations of the accidental and deliberate actions of others, and the emotional response of the victim to those actions. The children in the study were three-, Four, and five-year-olds. The results showed children were more likely to indicate that the victim would be sad rather than mad in both accidental and deliberate situations. It was hypothesized that these findings may have resulted from children being reluctant to indicate that the action was deliberate and, in particular, to indicate that the victim would respond with anger. The findings of Justice et. al.(1993) suggest that the understanding of intention-emotion relationships develops over an extended age range and is more complex than originally thought.

Several changes in Justice et. al. (1993) were made to address methodological problems in the study. The first change included the way in which the story was presented. In the current study, a forced choice format was used in which intentional and unintentional acts were portrayed. Control questions were used to ensure that the child understood the difference between the two scenarios presented. Finally, a broader range of ages was used in order to elicit a clearer developmental pattern.

It was hypothesized that the understanding of intention and the expected emotional responses would increase with age. Furthermore, it was hypothesized that the older the child, the more certain he/she would be of his/her choice. Lastly, it was hypothesized that understanding of the relation between perceived intention and emotional response would increase with age.
METHOD

Subjects

The participants in this study were 64 four, six, and eight year-old children, with approximately equal numbers of male and female children at each age. Children participated with parental permission.

Materials

The materials used were eight stories, illustrated with simple drawings, depicting two, same-sex, children in a social interaction. Each interaction involved some behavior on the part of one child that resulted in a negative consequence for the other child. Four stories involved property loss which included: losing a balloon; an ice cream cone falling on the floor; a doll falling onto the floor; and a house made of blocks being knocked down. Four stories involved physical harm: fingers getting pinched in a window; a ball hitting an arm; a child falling off a merry-go-round; and a child being tripped.

In each story the first picture established the baseline. In the next two pictures the intentionality was established through the use of word bubbles. In one picture the perpetrator stated the intention to harm, while in the other there was a stated intention not indicating intentional harm. The last picture showed the outcome of the actions, which was the same for both intentions.

Pretest materials included a page with a picture of both a mad and a sad face. Also, there were four pictures illustrating a story in which one child experienced a negative consequence for his own intentional and unintentional actions. The child in the story was playing with a sand castle and did something deliberately in one picture and accidentally in another. In one picture the child kicks down the sand castle, and in the other, the child trips and falls on the sand castle. In the final picture, the sand castle has collapsed.

Also used in the study was a certainty judgment scale. This scale consisted of five bar graphs which increased in height from left to right. The smallest bar represented the least amount of certainty, and the largest bar represented the most amount of certainty.

Procedure

Children were brought into a quiet room at their school and seated next to the experimenter. They were told that they would hear some stories and would be asked questions about the children in the stories. The pretest was given to test whether the child could identify the emotions of sad (S) or mad (M). This was done by asking the child to point to a sad and a mad face. If the child could not identify the emotions, each face was explained until the child understood.

Children were also pretested for their understanding of the difference between on purpose (OP) and by accident (BA). The sand castle story, in which a child experienced a negative consequence to his own actions, was presented to the child. Three control questions were asked to establish if the child could identify the actions in each picture. The first question asked what happened in the story. The next two questions asked the child to point to the picture that matched the appropriate word bubble. If the child was incorrect, the story was read again until the child could answer the control questions. Then the child was asked to point to the OP picture and then point to the BA picture. Also in the pretest, the child was asked to make certainty judgments about his/her selections about intentionality. Each child was shown a bar graph and was asked to point to the bar which showed how much the child believed the intention to be OP or BA, depending upon the question type.

Following the pretest, the eight stories were read. After each story, three control questions were asked. The child was then asked one intention question (OP or BA), and one emotion question (M or S) for each story. There were four possible combinations of intention/emotion questions. These combinations included: OP question asked with a M question; an OP question asked with a S emotional question; a BA question asked with a M question; and, finally, a BA question posed with a S question. Each child received two
of each intention/emotion combinations. The way in which the questions were asked within each order was random, with the exception that no two like combinations were asked in a row. Also, each child was shown each story only once.

RESULTS

The dependent variables in this study were the percent correct for each child on each type of intention question (OP or BA) and the percent correct on each type of emotion question (S or M). Certainty judgments for each question type were also measured.

Understanding of Intentions

An age (3) x sex (2) x intention question type (2, OP/BA) analysis of variance was conducted on the percent correct on OP and BA questions with repeated measures on the last factor. There was a significant age effect, $F(2,58) = 20.59$, $p < .01$, and a significant type effect, $F(1,58) = 10.46$, $p < .01$. Correct identification of accidental and deliberate actions increased with age. Mean percent correct for deliberate actions was .53, .81, .90, for four, six, and eight year-olds, respectively. Mean percent correct for accidental actions was .48, .60, and .77 for four, six, and eight year olds, respectively. The number correct for OP actions was greater than that for BA actions. Mean percent correct was .75 and .62 for OP and BA, respectively. As shown in Figure 1, this tendency increased with age. However the grade x type interaction did not reach significance.

![Figure 1. Percent correct identification of OP and BA actions across age.](image)

An age (3) x sex (2) x intention question type (2) analysis of the certainty judgments on OP and BA trials showed a significant type effect, $F(1,58) = 9.02$, $p < .01$. The children were more certain of their judgment on the OP than the BA trials. Mean certainty judgments were 4.42 and 3.98 for OP and BA, respectively.

Additional analysis addressed the question of whether the percent correct judgments for each age and question type differed significantly from chance. For the OP question type, both the six and eight year olds, but not four year olds, differed significantly from chance, $t(21) = 2.23$ and 2.86, $p < .05$, for six and eight year olds, respectively. For the BA question type, only the eight year olds differed significantly from chance, $t(23) = 2.09$, $p < .05$.

Understanding of Emotions

An age (3) x sex (2) x emotion question type (2, M/S) analysis of variance was conducted on the percent correct on sad/mad questions, with a repeated measure on the last factor. Results showed main effects for age, $F(2,58) = 3.35$, $p < .05$, sex, $F(1,58) = 6.72$, $p < .01$, and question type, $F(1,58) = 30.54$, $p < .01$, and an age x question type interaction, $F(2,58) = 6.08$, $p < .01$. Males scored higher than females on both mad and sad questions. Mean scores for males were .72 for mad and .45 for sad, and for females .62 for mad .34 for sad. The age x question type interaction resulted from the finding that scores on mad increased with age, whereas the scores for sad did not. This is illustrated in Figure 2.

A binomial test for significant differences from chance found that only the eight year olds were significantly different from chance on the mad questions, $t(23) = 2.46$, $p < .05$. None of the age graphs differed from chance on the sad question.

An age (3) x sex (2) x emotion question type (2, M/S) analysis of variance of the certainty judgments on emotion questions showed no significant effects. Certainty on the emotion questions did not differ across age or question type.
CHILDREN'S UNDERSTANDING OF MENTIONS, EMOTIONS AND INTENTION-EMOTION RELATIONSHIPS

Understanding of the Intention-Emotion Relationship

To address children's awareness of the relation of perceived intention to emotional response, children's ability to correctly answer both intention and emotion questions for each intention question/emotion question combination was examined. This analysis addressed children's ability to correctly choose the same picture on BA/S and OP/M trials, and different pictures on BA/M and OP/S trials.

An age (3) x sex (2) x trial type (4, BA/S, BA/M, OP/S, OP/M) analysis of variance with repeated measures on the last factor was conducted on the percent of trials on which the child was correct on both intention and emotion questions. There was a significant age effect, $F(2,58) = 11.17, p < .01$, and trial type effect, $F(3,56) = 30.57, p < .01$, and a significant age x trial interaction, $F(6,112) = 3.17, p < .01$. As illustrated in Figure 3, performance on both the OP and BA trials, which included the M component, increased with age, whereas the OP and BA trials did not.

DISCUSSION

Results of this study indicate that understanding intention in a social situation may develop significantly later than understanding of individual intentionality. In contrast to previous research demonstrating preschool understanding of the intentional or unintentional nature of behavior, (Astington, 1991), only six and eight year olds correctly identified deliberate behavior as intentional at above chance levels. These data suggest that the development of children's "theory of mind" continues well into the grade school years. Building on initial understanding of the relation of intentions, beliefs, and desires to an individual's behavior, advances in perspective-taking skills during the early school years may contribute to an understanding of the role of others' mental states in their behavior.

The current findings also indicate that understanding that emotional response is related to the perceived intentions of others may follow understanding of intentionality. Although six and eight year olds correctly identified intentional behavior at above chance levels, only eight year olds were above chance in identification of anger as the expected emotional response to deliberate harm. Although preschool children can identify simple emotions (Michalson & Lewis, 1985), the ability to infer the expected emotional response of another in a social situation appears to develop much later. Consistent with this is the current finding that understanding that anger is an expected emotional response to deliberate harm, but not accidental harm, showed significant developmental increases between four and eight years of age.

An interesting finding in this study was that there were no developmental changes in identification of sadness as a response to accidental, but not deliberate, harm. This finding may reflect the fact that sadness may be an appropriate response to both deliberate and accidental actions. Also, findings by Justice, et al. (1993)
suggest that preschool children are reluctant to indicate that they or others would respond with anger, even in a deliberate harm situation.

A number of additional questions are posed by these findings. In the current study, the intentional or unintentional nature of the behavior was explicitly stated by the perpetrator. In most everyday interactions, intentions are implicit and, therefore, more difficult to identify. Research on developmental changes in identification of explicitly or implicitly intentional behavior are needed. Also, studies examining understanding of the mental states of others should be broadened to include information on children's understanding of the relation of emotion to interpersonal cognitions. Additional studies on emotions including sadness, happiness, and fear in response to the perceived intentions or beliefs of others are needed. Such data would contribute importantly to understanding the role of children's "theory of mind" in social interactions.

REFERENCES


