Integration of behavioral frequency and intention information in young children's trait attributions.

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Abstract:

Two experiments examined three- to six-year-olds' use of frequency and intention information to make trait attributions and behavioral predictions. In experiment 1, participants were told a story about an actor who behaved positively once or four times on purpose or incidentally. Children were most likely to make trait-consistent behavioral predictions after hearing about several positive, intentional behaviors. Trait attributions were largely positive. Experiment 2 examined children's use of the same cues concerning negative behavioral outcomes. Participants tended to predict that actors who engaged in negative behavior would do so again, irrespective of intention, although younger children required more exemplars than older children. Participants were most likely to make negative trait attributions after hearing about multiple intentional behaviors; however, there was reluctance with age to describe actors as mean. Implications for children's 'theory of personality' are discussed.

Keywords: trait labels | behavioral frequency | intentions | valence | social development

Article:

Introduction

People draw on many sources of information to make trait attributions. We make attributions about others based on their physical appearance (Todorov, Mandisodza, Goren, & Hall, 2005), knowledge about their intentions and behavior (Malle, 2004), intuitive ideas about their social groups (e.g., Hong, Levy, & Chiu, 2001), and information gathered from their friends (e.g., Funder & West, 1993). These and other factors might be considered independently or in tandem when making a trait attribution. Attributions are also affected by our expectations that behavior varies across situations (see Kammrath, Mendoza-Denton, & Mischel, 2005). In short, there is a daunting amount of information that can be used to make trait attributions.

There is considerable interest in the nature of children's attributions about others, and this is an important topic due in part to its relevance to children's social functioning, including personal relationships (see Runions & Keating, 2007) and prejudice and stereotyping (see Bigler & Liben, 2007). Here, we focus on two sources of information that influence children's trait attributions: behavioral frequency (i.e., number of times a person engages in trait-relevant behaviors) and intention (i.e., intentional versus unintentional behaviors). Previous trait attribution research focused on children's use of frequency and intention independently. Of interest here was whether children can integrate these cues when making trait attributions. For example, children should be highly likely to make a 'mean' judgment after seeing several intentional, trait-relevant behaviors, and less so if they have seen one unintentional, trait-relevant behavior. We also examined the impact of valence (i.e., positive or negative behavior) on trait attributions.

Frequency Information and Trait Understanding

Generally, children's trait attributions vary based on behavioral frequency (e.g., Ferguson, van Roozendaal, & Rule, 1986; Rholes & Ruble, 1984). For example, given an actor's name only ('Tommy') or three exemplars of the actor's behavior, 6- to 10-year-olds were more likely to make trait-relevant behavioral predictions and attributions in the latter case (Gnepp & Chilamkurti, 1988). In another study, three- to six-year-olds were more likely to make appropriate trait attributions about an actor after watching five behaviors rather than one behavior (Boseovski & Lee, 2006). Yet, frequency effects are not always obtained (e.g., Heller & Berndt, 1981) or are found only in late childhood. Rholes and Ruble reported that by nine years of age, children could distinguish between low- and high-frequency information to predict cross-situational stability of behavior.

Discrepant findings concerning frequency effects may be explained by variations in the amount of information provided or whether the information was explicit. For example, Rholes and Ruble did not specify the number of times an actor performed a behavior; thus, it is unknown how children interpreted the ambiguous information. Younger children require more evidence than older children to make trait attributions and behavioral predictions (Boseovski & Lee, 2006). Moreover, children might benefit from explicit intention information to make trait attributions, and this is not always provided. For example, Boseovski and Lee made no reference to actors' intentions. This could be problematic, given findings that children sometimes infer positive intentions (e.g., Jones & Thomson, 2001) or hostile intentions in the absence of explicit information (e.g., Dodge, 2006; Leslie, Knobe, & Cohen, 2006). A central goal of this study was to determine whether provision of strong support cues, in the form of explicit intention and frequency information, results in appropriate trait attributions and behavioral predictions by young children.

Intention Information and Trait Understanding

Intention understanding is central to moral and trait reasoning (Young & Saxe, 2009), and several studies have examined the use of intention in each of these domains (e.g., Bennett, 1985–1986; Killen, Mulvey, Richardson, Jampol, & Woodward, 2011; Rotenberg, 1980). Generally, preschoolers distinguish between intentional and unintentional behavior when making trait attributions. For example, three- and four-year-olds were more likely to label as ‘naughty’ protagonists who violated a rule intentionally (i.e., refusal to wear a hat) instead of unintentionally (hat falls off; Núñez & Harris, 1998).

Other studies examined consideration of intention and behavioral outcome information in moral or trait attributions (Farnill, 1974; Heyman & Gelman, 1998; Zelazo, Helwig, & Lau, 1996). Nelson (1980) gave three- to four-year-olds and six- to eight-year-olds positive or negative motive information and positive or negative outcome information about an actor. In the positive motive-negative outcome condition, participants were told that the actor wanted to throw a ball to the recipient, but accidentally hit him. Even three-year-olds considered intentions when evaluating the actor as ‘good’ or ‘bad’. However, these children had more difficulty than older children recalling the story when there was incongruence between motives and outcomes. Even in older children, who are more capable of integrating intention and outcome information, judgments can be swayed by outcome knowledge (e.g., Farnill, 1974; Heyman & Gelman, 1998). Thus, one question is whether provision of explicit intention information may be especially helpful in guiding children's trait attributions. Also, because previous studies included only one intention-outcome scenario, it is unknown how variations in frequency affect the processing of intention information, and this was another question that guided this work.

Current Study

These experiments are the first to examine whether children integrate frequency and intention information in trait attributions and behavioral predictions. Addressing this question will provide insight about the developmental sequence through which specific cues are implicated in trait understanding, which is nascent in early childhood. Children's perception of behavior as goal directed—coupled with increased attention with age to statistical information—may ultimately enable them to reason about personality traits (Kushnir, Xu, & Wellman, 2010). Thus, we generally expected that children would be more likely to make trait attributions and behavioral predictions when given multiple exemplars of intentional behavior and less likely to do so after a single, unintentional behavior. Provision of strong support cues was expected to be especially

useful for younger children, who typically require more information than older children to make trait attributions (Boseovski & Lee, 2006).

Although some research indicates that children readily make intention inferences, we presented intention information explicitly to examine responses in a maximally supportive condition and also because children sometimes have difficulty remembering mismatched intentions and outcomes or make outcome-based decisions as discussed above. The nature of this difficulty may be representational and is thought to reflect late maturation of the right temporo-parietal junction, which is implicated in moral reasoning (Young & Saxe, 2009). Provision of explicit cues about behavior and intention may be especially useful for children's behavioral predictions, as children find it especially difficult to make behavior-to-behavior inferences (Liu, Gelman, & Wellman, 2007). Strong support cues were expected to result in an enhanced ability to make behavioral predictions in this study as compared to previous research.

Our study design enabled us to add to research that assessed whether children have a psychologically meaningful understanding of traits, which entails the appreciation that behaviors have different implications for trait attributions depending on their associated mental states (Heyman, 2009). Although researchers have examined children's perception of intentional and unintentional behaviors in trait attributions, it is unclear whether variations in behavioral frequency affect the processing of such information, and this is important for determining which cue may be more salient at particular points in development. For example, how might children interpret high-frequency, unintentional behaviors? If they are especially sensitive to behavioral outcomes, as some suggest (e.g., Young, Cushman, Hauser, & Saxe, 2007), then frequency information may override intention information at all ages. However, given children's strong tendency to focus on intention information early in childhood (see Wellman, 2011; Woodward, 2009), the youngest children may be so attuned to intention that they are unable integrate it with frequency information, as older children would be expected to do.

In addition to our main focus on niceness/meanness attributions and behavioral predictions, we asked children to make attributions about the actors' intelligence and to indicate whether they would befriend the actor. Intelligence attributions were included to assess whether children associate intelligence with intentionality (e.g., assume that someone who commits unintentional actions repeatedly is less intelligent) and to examine whether children assume that positive behaviors are associated with intelligence (see Stipek & Daniels, 1990, for a discussion concerning overgeneralization of positive traits). Assessment of friendship endorsement provided an additional way of determining whether children differentiate trait attributions and behavioral predictions based on the information presented. For example, we expected that children would be

more likely to want to befriend an actor who engaged in intentional positive behaviors than one whose behavior resulted in an unintended positive outcome.

Finally, we examined the impact of behavioral valence on trait attributions. Research indicates that children tend to be highly influenced by positive information in social judgments. Three- to six-year-olds are more likely to endorse positive rather than negative testimony about a stranger (Boseovski, 2012), and they prefer to ask for information from, and endorse the testimony of, nice people (Lane, Wellman, & Gelman, in press). Concerning trait attributions, children sometimes disregard negative behavioral information entirely (Boseovski & Lee, 2008) and give greater weight to positive than negative information in their judgments (see Boseovski, 2010). For example, three- to six-year-olds judged an actor as 'nice' irrespective of viewing one or five positive behaviors, but required five negative behaviors to say 'mean' (Boseovski & Lee, 2006). Moreover, children expect positive behavior when given neutral or negative intention information (Grant & Mills, 2011) and assume that negative characteristics will change in a positive direction (e.g., Heyman & Giles, 2004; Lockhart, Chang, & Story, 2002).

Although valence clearly impacts trait attributions, it is unknown whether positive or negative valence information is treated differentially based on variations in intention and frequency, and this can be informative for learning about conditions that perpetuate or attenuate biased processing. For example, children may be less likely to make indiscriminate positive attributions when negative intention information is presented explicitly. Thus, we examined the use of these cues for positive information (experiment 1) and negative information (experiment 2).

Experiment 1

Several studies have investigated children's use of positive behavioral information to make trait attributions. There are mixed findings regarding the importance of frequency information. In some cases, preschool and elementary school-aged children make positive attributions irrespective of frequency (Heller & Berndt, 1981); in others, children make more positive attributions in high-frequency conditions (e.g., Gnepp & Chilamkurti, 1988). As mentioned above, children differentiate intention types (e.g., Nelson, 1980), but they are influenced by positive behavioral outcomes (see Heyman & Gelman, 1998). Finally, even eight- and nine-year-olds treat ambiguous intentional information as positive (Grant & Mills, 2011).

Less is known about children's perception of unintended beneficial outcomes (i.e., actor's intentions are ambiguous, but the recipient gains something desirable). Yuill and Perner (1988; experiment 2) told participants about an actor's accident or intended action that resulted in a positive outcome for a recipient. In the former case, the actor happened to hit the recipient's swing, causing her to swing higher. In the latter, the actor pushed the swing intentionally. In a forced choice comparison between the actors, even three-year-olds rated the recipient as 'more pleased' with the actor who behaved intentionally. Because participants heard about only one behavior, it is unknown how they would respond after hearing about several unintentional behaviors that result in a positive outcome.

We examined children's use of intention (intentional vs. unintentional actions) and frequency (one vs. four exemplars) to make trait attributions concerning positive outcomes (i.e., recipient benefits from actor's behavior). In addition to predicted differences between the high-frequency/intentional and low-frequency/unintentional conditions, we expected that the strong support in the high-frequency/intentional condition would facilitate children's ability to make behavioral predictions. Given that children tend to make positive attributions about others with little evidence, we expected that attributions would be generally positive across conditions and that this would increase with age (see Boseovski & Lee, 2006). Finally, we assessed children's responses to unintended positive outcomes based on frequency. Given children's tendency to make outcome-based judgments, we expected that repeated positive outcomes would result in positive trait attributions and that children would be more likely to make positive behavioral predictions after multiple positive outcomes irrespective of intention status.

Method

Participants

There were 128 three- to six-year-olds (36–83 months, M = 58.1, SD = 13.7, 67 girls). Participants were recruited from day cares and schools in a mid-sized American city. The majority of participants were White; additional demographic information was unavailable. Testing took place at the child's school.

Materials

Toy figures, toy furniture, and miniature toy items illustrated the stories.

Design and Procedure

Intention was crossed with frequency to create four conditions: low-frequency/intentional, low-frequency/unintentional, high-frequency/intentional, and high-frequency/unintentional. Participants were assigned randomly to one condition. The session ranged from 15 to 20 minutes. First, participants received training to ensure understanding of unintentional and intentional behaviors. For the unintentional training, children were told about an actor of their gender who goes over to say hello' to another actor, but stumbles, ‘Oops! She tripped over the ball. She did that by accident. She didn't mean to do that.’ For the intentional scenarios, they were told about an actor who wants to play with a second actor, ‘So she kicks the ball over to her. She wanted to do that. She meant to do that.’ Afterward, participants were asked ‘Did she mean to do that or did she do it by accident?’ Order of scenarios and response options were randomized. If children did not answer correctly, the procedure was repeated. Next, there was a test phase that differed according to condition as described below (with female versions of the stories).

Low-frequency/intentional

Participants heard about an actor who engaged in one intentional action and four neutral actions, each on a different day. Neutral actions equated the number of scenarios across conditions. Each action was presented as taking place on a different day. For the intentional action, they were told, ‘It's lunch time, and Jane has a whole bunch of things to eat. She sets down her [item] beside her. Jane eats her lunch and then gets up to go and play. Oh look! Before she goes, she gives _____ to Meg. She did that because she wanted to. She meant to do that. So now Meg gets to have it. Meg is really happy about this because she doesn't have a _____ to play with.’

For neutral scenarios, participants were told, ‘It's the next day, and it's lunch time again. Jane has a whole bunch of things to eat. She sets down her _____ beside her. Jane eats her lunch and then gets up to go and play. Oh look! Jane brings her _____ with her. Then she goes outside. Meg finishes her lunch and also goes outside to play.’

Afterward, participants were asked a behavioral prediction question about the actor's future behavior toward the recipient, ‘It's the next day at school. Jane is eating her lunch. She sets down her _____ beside her. Jane sees Meg. What do you think will happen next? Do you think that Jane will give his/her _____ to Meg or do you think that she will take it with him/her?’ The order of the forced choice options was randomized. Then, they were asked a trait attribution question, ‘What do you think of Jane? What kind of girl is she?’ Children who did not answer spontaneously were asked, ‘Is she nice, mean, or not nice or mean?’ The order of these options was randomized except that ‘not nice or mean’ was presented last. Participants were asked an intelligence question, ‘Is she a little smart or very smart?’ and a friendship question, ‘If you were in this class, would you like to be Jane's friend?’

High-frequency/intentional

Participants heard about an actor who engaged in four intentional actions and one neutral action. The intentional and neutral actions were similar to those in the low-frequency/intentional condition, but varied in item type. The same dependent measures were used as above.

Low-frequency/unintentional

Participants heard about an actor who engaged in one unintentional action and four neutral actions. For the unintentional action, they were told, ‘Today at school, it's lunch time and Jane has a whole bunch of things to eat. She sets down her _____ beside her. Jane eats her lunch and then gets up to go and play. Oh look! On the way out, Jane leaves her _____ behind. She did that by accident. She didn't mean to do it. So now Meg gets to have it. Meg is really happy about this because she doesn't have any _____ to play with.’ Neutral scenarios were identical to those above.

Participants were asked the same questions as those in the intentional conditions, except for the prediction question, which was phrased slightly differently to suit the unintentional context, ‘Do you think that she will leave her _____ behind when she goes, or do you think that she will take it with her?’

High-frequency/unintentional

Participants heard about an actor who engaged in four unintentional actions and one neutral action identical to those in the low-frequency/unintentional condition. Participants were asked the same set of questions as those listed above.

For all conditions, the isolated action (i.e., single neutral or target event) was presented in the first, third, or fifth position, counterbalanced across children. Also, children were asked verification questions (e.g., identification of actors) to ensure that they listened to the stories.

Data Analysis

Initial chi-square analyses tested whether scores on each dependent variable differed significantly between the high-frequency/intentional condition and the low-frequency/unintentional condition (i.e., the most informative comparison). Logistic regression analyses examined the effects of age, frequency, and intention information on each dependent variable. Interactions were added individually to determine whether they would contribute significantly to the model as assessed by a block $\chi 2$ test.

Results

There were no significant effects of gender or order of the isolated event on any measures. These variables were excluded from further analyses. Note that all tests against chance reported below were conducted using the binomial distribution.

Prediction of the Actor's Future Behavior

Participants received a score of 0 for saying that the actor would ‘give’ the item to the recipient (intentional condition) or ‘leave behind’ the item (unintentional condition), or a score of 1 for saying that the actor would ‘take’ the item with her. A greater number of participants in the high-frequency/intentional condition predicted that the actor would give an item to the recipient in the future whereas a greater number of participants in the low-frequency/unintentional condition predicted that the actor would take the item with her in the future $\chi 2(1, N = 62) = 23.29$, $p < .0001$. Participants were more likely than expected by chance to say ‘take’ in both unintentional conditions ($p = .001$ in both cases) and more likely to say ‘give’ in the high-frequency/intentional condition ($p = .001$; see Figure 1).

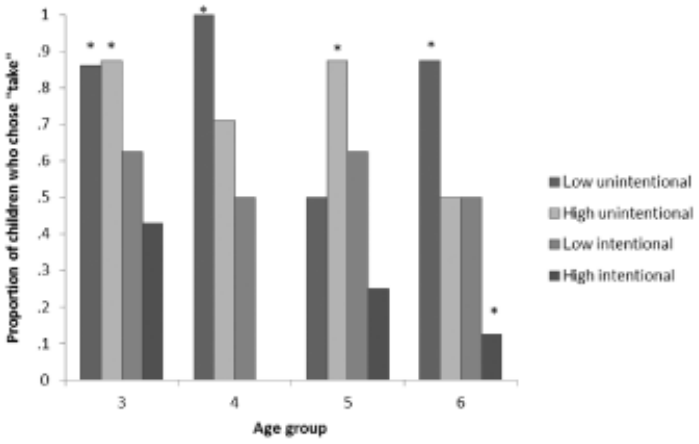

Figure 1. Proportion of Participants Who Said ‘Take’ on the Prediction Question by Age and Condition. 0 = Give (Intentional) or Leave (Unintentional); 1 = Take.

Notes: Value for high-intentional condition for four-year-olds = 0. For clarity, age is presented categorically. Asterisks indicate that findings differ significantly from chance (p <.05).

Logistic regression analyses revealed that the best fitting model included age, intention, and frequency. The overall model was significant, $\chi^2(3, N = 125) = 30.05$, $p < .0001$, $R_L^2 = .29$. Behavioral predictions did not differ significantly based on age, ($\beta = -.316$, *Wald* = 2.22, $p = .14$, Exp(B) =.72). Participants were more likely to predict that the actor would take the item with her after she left it behind once rather than repeatedly ($\beta = -.563$, *Wald* = 7.04, $p = .008$, Exp(B) =.57) and after she left it behind unintentionally rather than intentionally ($\beta = 1.89$, *Wald*= 19.39, $p < .0001$, Exp(B) = 6.65).

Attributions About the Actor's Personality Traits

Participants received a score of 0 for saying ‘mean’ or 1 for saying ‘nice.’ Data from 8 three- to four-year-olds and 7 five- to six-year-olds who chose ‘not nice or mean’ were excluded.[1] There was no significant difference in children's trait attributions between the high-frequency/intentional condition and the low-frequency/unintentional condition, $\chi^2(1, N = 51) = 1.36$, $p = .244$, as the majority of participants said ‘nice.’ Indeed, participants were more likely than expected by chance to make an attribution of nice across age and intention type (all *p*s <.01) with the exception of the three-year-olds in the intentional conditions; see Figure 2.

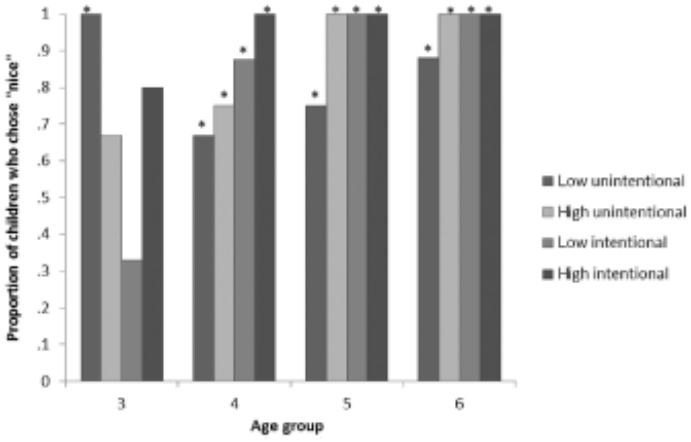

Figure 2. Proportion of Participants Who Said ‘Nice’ on the Trait Question by Age and Condition. 0 = Mean; 1 = Nice.

Note: For clarity, age is presented categorically. Asterisks indicate that findings differ significantly from chance.

The best fitting logistic regression model included age, intention, frequency, and the age × intention interaction. The model was significant, $\chi^2(4, N = 109) = 14.75$, $p < .01$, $R_L^2 = .24$. Trait attributions did not differ significantly with age (β =.33, *Wald* =.68, $p = .41$, Exp(B) = 1.39), and there were no significant effects of frequency (β =.422, *Wald* = 1.62, $p = .21$, Exp(B) = 1.32) or intention (β = −1.788, *Wald* = 2.29,$p = .13$, Exp(B) = 5.97) on participants' trait attributions. The age × intention interaction was significant (β = −.249, *Wald* = 4.36, $p = .037$, Exp(B) = 12.1). Trait attributions for unintentional behaviors did not vary significantly with age (β = −.349, *Wald* =.739, $p = .39$, Exp(B) = 1.42). In contrast, younger children were less likely than older children to say ‘nice’ after hearing about intentional behaviors (β = 2.67, *Wald* = 5.95, $p = .015$, Exp(B) = 14.42). This effect was driven by a tendency of the three-year-olds to say ‘mean’ in the low-frequency/intentional condition ($M = .33$, $SE = .21$) but not the high-frequency/intentional condition (i.e., in which they tended to say ‘nice’, $M = .80$, $SE = .20$).

Attributions About the Actor's Intelligence

Participants received a score of 0 for saying ‘a little smart’ or 1 for saying ‘very smart.’ There was no significant difference in intelligence attributions between the high-frequency/intentional condition and the low-frequency/unintentional condition, $\chi^2(1, N = 64) = .29$, $p = .59$, as the majority of participants said ‘very smart.’ Participants were more likely than expected by chance to say ‘very smart’ than ‘a little smart’ in the low-frequency/intentional condition ($p = .05$) and the high-frequency/intentional condition ($p = .02$). The overall logistic regression model was not significant, $\chi^2(3, N = 128) = 4.20$, $p = .24$, $R_L^2 = .05$.

Friendship With the Actor

Participants received a score of 0 for saying ‘no’ or 1 for saying ‘yes.’ There was no significant difference in response patterns between the high-frequency/intentional and low-frequency/unintentional conditions, $\chi^2(1, N = 57) = .404$, $p = .525$. Participants were more likely than expected by chance to say that they would befriend the actor (i.e., respond ‘yes’) in all conditions (all ps $< .01$). The logistic regression model was not significant, $\chi^2(3, N = 120) = .943$, $p = .815$, $R_L^2 = .01$.

Discussion

To some extent, children integrated intention and frequency information when making behavioral predictions about positive outcomes. Participants predicted that an actor who shared intentionally many times would do so again, and the high-frequency/intentional condition was the only one for which children predicted that the recipient would receive an item (i.e., ‘give’ prediction). The difference between the most informative and least informative conditions suggests that children do not make indiscriminate predictions and instead consider the strength of the evidence. Despite the rich cues, only four- and six-year-olds were more likely than expected by chance to expect giving in the high-frequency/intentional condition. Although the mean for the five-year-olds was in the expected direction, the chance-level performance of both this group

and the three-year-olds is consistent with research indicating that children have difficulty making behavior-to-behavior inferences (Liu et al., 2007).

Also of interest was children's processing of unintentional action based on frequency. Contrary to predictions, participants as a group expected that an actor who left an item behind would correct the error irrespective of frequency. This is somewhat surprising given a large literature that indicates that children engage in statistical learning early in life (e.g., Marcovitch & Lewkowicz, 2009). However, this pattern held true only for the three-year-olds, who had strong expectations of goal-directed behavior. This is consistent with evidence of particular sensitivity to intention information early in life. For example, even 18-month-olds will reproduce an actor's goal, rather than his or her error, when it was not attained (see Meltzoff, 1995). In contrast, expectations about unintentional behavior changed with age such that variations in frequency, as well as intention, had a greater influence on behavioral predictions (i.e., children considered both cues). Indeed, recent research indicates that there are advances in statistical learning with age (Arciuli & Simpson, 2011). By six years, children expected that a single unintentional behavior would not recur, but showed chance performance as a group for multiple behaviors.

As expected, trait attributions were generally positive, likely due to the lack of basis for a negative trait attribution. It is also possible that the neutral information in the unintentional conditions was perceived positively (see Grant & Mills, 2011) or that the positive outcome across conditions contributed to positive trait attributions (e.g., Heyman & Gelman, 1998). There were two exceptions to this pattern. First, 15 participants responded ‘not nice or mean,’ 7 of whom were in the low-frequency/unintentional condition. These children may have been reluctant to make a trait attribution given so little information. Second, three-year-olds exhibited chance-level responding in the intentional conditions, although the mean for the high-frequency/intentional condition was in the expected direction. These children tended to attribute meanness to an actor who gave the recipient an item only once. One potential explanation is that three-year-olds viewed the purportedly neutral interactions as missed opportunities for giving.

Across conditions, children wanted to befriend the actor, consistent with previous research in which children readily endorse a desire for affiliation (e.g., Boseovski & Lee, 2008). Apparently, children were unperturbed by forgetful behaviors, perhaps because such behaviors are not seen as aversive. As with the positive trait attributions, the decision to befriend actors may have been based on the lack of negative information about them. Consistent with the notion that positive behaviors are associated with intelligence, there was a tendency to label the actor as smart. However, children were especially likely to do so in the intentional conditions, suggesting that they associated goal-directed behavior with intelligence. It is somewhat surprising that

participants made positive attributions about the actor's intelligence even in the high-frequency/unintentional condition in which items were left behind repeatedly. The decreased tendency with age to describe the actor as ‘very smart’ may reflect the notion that repeated forgetting reflects lower intelligence.

Experiment 2

We examined children's use of behavioral frequency and intention information to make trait attributions concerning negative behavioral outcomes. Some research indicates that younger children require more behavioral exemplars than older children to make a negative trait attribution (Boseovski & Lee, 2006) or behavioral prediction (Ferguson et al., 1986). In other cases, one behavior is sufficient (e.g., Liu et al., 2007). These discrepancies likely reflect differences in the amount of information provided or the response options presented. For example, Boseovski and Lee gave children three options (e.g., ‘Is he nice, mean, or not nice or mean?’) whereas Liu et al. provided the trait label (‘Is Bobby selfish?’).

There are also mixed findings concerning sensitivity to intentions regarding negative outcomes. Preschoolers distinguish negative from positive intentions (e.g., Heyman & Gelman, 1998) and some research indicates that children also differentiate between intentional and unintentional negative outcomes when making negative trait attributions (Rotenberg, 1980). For example, three- to seven-year-olds judged an actor more harshly when he knocked a girl off a swing intentionally rather than by accident (Yuill & Perner, 1988). However, this ability is nascent in early to middle childhood. Grant and Mills (2011) reported that the use of information about negative intentions to make behavioral predictions peaked between 10 and 13 years of age. Moreover, as is the case with positive information, younger children tend to be more outcome-focused than older children (e.g., Zelazo et al., 1996).

We expected that participants would be more likely to make negative trait attributions about actors who engaged in high-frequency, intentional behaviors than low-frequency, unintentional behaviors and that behavioral predictions would be strongest in the high-frequency/intentional condition. In contrast to previous research in which children judged actors positively despite negative behaviors, we predicted that children would make negative attributions in this highly informative condition. We expected that children would be hesitant to make negative trait attributions under unintentional circumstances, particularly when they occurred infrequently, and that this effect would increase with age.

Method

Participants

A new group of 128 three- to seven-year-olds was tested (36–88 months, M = 59.2, SD = 13.5, 63 girls). Participants were of mixed ethnic/racial identity: 55.1 percent White, 9.6 percent African American,.7 percent Latino/Hispanic,.7 percent Asian, 1.5 percent Native American, and 1.5 percent who self-classified as multiracial. An additional 30.1 percent did not report on this variable. Families were from middle to upper-middle-class backgrounds.

Materials

The same materials were used as in experiment 1.

Design and Procedure

The same conditions were created as in experiment 1, with negative rather than positive behavioral outcomes. After intentionality training, procedures differed by condition.

Low-frequency/intentional

Participants heard about an actor who engaged in one intentional action and four neutral actions. For the intentional action, participants were told, ‘It's recess and Sam wants to play. Sam sits down next to Bobby. Then, he gets up to go and play on the swings. Oh look! Sam took Bobby's ball away from him to the swings. He did that because he wanted to, he meant to do that. Bobby is really sad because he doesn't have a ball to play with.’ For the neutral scenarios, participants were told, for example, ‘It's the next day, and it's recess again and Sam wants to play. Sam sits down to play in the sand for a while. Then, Sam gets up to go and play on the swings.’

Afterward, children were asked a behavioral prediction question, ‘It's the next day at school. Sam is playing at recess. Then, Sam gets up to go play on the swings. What do you think will happen next?’ Do you think Sam will take Bobby's toy or leave it behind?’ Next, children were asked a trait attribution question, ‘What do you think of Sam?’ Children who did not respond spontaneously were given forced-choice options as in experiment 1. Children were asked the same intelligence and friendship questions as in experiment 1.

High-frequency/intentional

Participants heard about an actor who engaged in four intentional actions and one neutral action. The intentional and neutral actions were identical to those in the low-frequency/intentional condition. Participants were asked the same questions as above.

Low-frequency/unintentional

Participants heard about one unintentional action and four neutral actions. For the unintentional action, children were told: ‘Today at school it's recess, and Sam wants to play. He sits down next to Bobby. Then, Sam gets up to go and play on the swings. Oh look! Sam took Bobby's ball away from him to the swings. He did that by accident. He didn't mean to do it. Bobby is really sad because he doesn't have a ball to play with.’ The neutral actions and questions were the same as those above.

High-frequency/unintentional

Participants heard about four unintentional actions and one neutral action that were identical to those for the low-frequency/unintentional condition. Participants were asked the same questions as those described above.

Results

Prediction of the Actor's Future Behavior

Participants received a score of 0 for saying that the actor would ‘leave’ the item behind and a score of 1 for saying that the actor would ‘take’ the item. There was no significant difference in behavioral predictions between the high-frequency/intentional condition and the low-frequency/unintentional condition, $\chi^2(1, N = 64) = 1.46$, $p = .226$. Figure 3 presents means by age and condition.

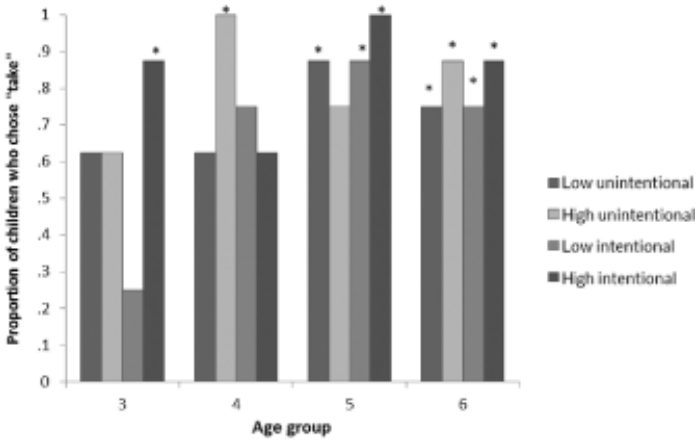

Figure 3. Proportion of Participants Who Said ‘Take’ on the Prediction Question by Age and Condition. 0 = Leave; 1 = Take.

Note: For clarity, age is presented categorically. Asterisks indicate that findings differ significantly from chance.

The best fitting logistic regression model included age, intention, and frequency. The model was significant, $\chi^2(3, N = 128) = 8.82$, $p = .03$, $R_L^2 = .11$. Older children were more likely than younger children to say that the actor would ‘take’ the item ($\beta = .507$, *Wald* = 4.89, $p = .027$, Exp(B) =.602). Three- and four-year-olds were more likely than expected by chance to predict that the actor would ‘take’ the item in the high-frequency conditions whereas the five- and six-year-olds did so in the low- and high-frequency conditions (all *p*s <.05; except $p = .07$ for the three-year-olds). There was no significant effect of intention. Participants were more likely than expected by chance say that the actor would ‘take’ the item in both the intentional ($M = .75$, $SE = .05$) and unintentional conditions ($M = .76$, $SE = .05$); *p*s <.01.

Attributions About the Actor's Personality

Participants received a score of 0 for saying that the actor was ‘nice’ or 1 for saying that the actor was ‘mean.’ Data from 6 three- to four-year-olds and 7 five- to six-year-olds who chose ‘not nice or mean’ were excluded.[2] A greater number of participants judged the character as ‘mean’ in the high-frequency/intentional condition than the low-frequency/unintentional condition, $\chi^2(1, N = 57) = 7.53$, $p = .006$. The best fitting logistic regression model included age, intention, and frequency, $\chi^2(3, N = 113) = 11.1$, $p = .01$, $R_L^2 = .13$. Younger children were more likely than older children to say ‘mean’ ($\beta = -.393$, *Wald* = 3.4, $p = .06$, Exp(B) =.675). Participants were more likely to say ‘mean’ after hearing about intentional rather than unintentional taking ($\beta = .895$, *Wald* = 4.87, $p = .027$, Exp(B) = 2.45) (see Figure 4).

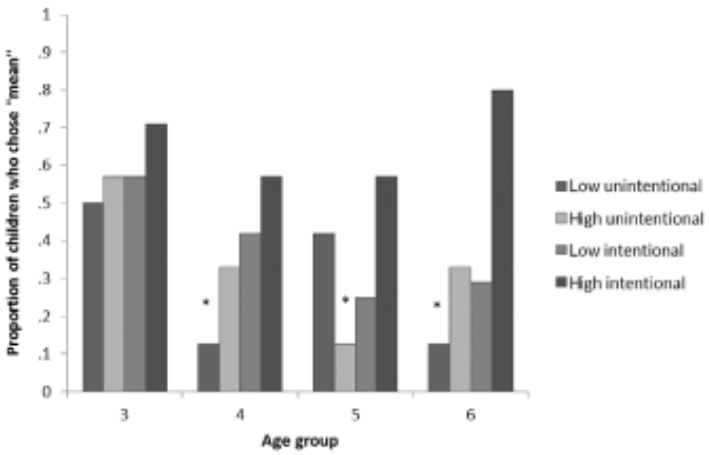

Figure 4. Proportion of Participants Who Said ‘Mean’ on the Trait Question by Age and Condition. 0 = nice; 1 = mean.

Notes: For clarity, age is presented categorically. Asterisks indicate that findings differ significantly from chance (p <.05).

Attributions About the Actor's Intelligence

Participants received a score of 0 for saying ‘a little smart’ or 1 for saying ‘very smart.’ Participants' attributions of intelligence did not differ significantly between the high-frequency/intentional and low-frequency/unintentional conditions. For all conditions, participants exhibited chance-level responding (all *p*s >.20). The logistic regression model was significant, $\chi^2(3, N = 128) = 10.06$, $p = .02$, $R_L^2 = .10$. Younger participants ($M = .59$, $SE = .06$) were more likely than older participants ($M = .33$, $SE = .06$) to say ‘very smart’ ($\beta = -.50$, *Wald* = 6.78, $p = .009$, Exp(B) =.605). There were no significant effects of frequency or intention.

Friendship With the Actor

Participants' selections differed significantly for the high-frequency/intentional and low-frequency/unintentional conditions, $\chi^2(1, N = 63) = 7.45$, $p = .006$. Participants in the low-frequency/unintentional condition were more likely than expected by chance to say that they would befriend the actor ($M = .77$, $SE = .07$), $t(30) = 3.59$, $p = .001$ whereas participants in the high-frequency/intentional condition exhibited random responding ($M = .44$, $SE = .08$), $t(31) = -.70$, $p = .48$.

The logistic regression model was significant, $\chi^2(3, N = 127) = 9.37$, $p = .025$, $R_L^2 = .10$. There were no significant effects of age or frequency on friendship selections. Participants were more likely to befriend the actor after hearing about unintentional negative behavior ($M = .76$, $SE = .05$) rather than intentional negative behavior ($M = .55$, $SE = .06$), ($\beta = -.99$, *Wald* = 6.40, $p = .01$).

Furthermore, participants were more likely than expected by chance to befriend the actor in the unintentional conditions (*p*s <.001) but not the intentional conditions (*p*s >.10).

Discussion

Contrary to expectations, participants did not predict future negative behavior more frequently in the high-intentional condition as compared to the low-unintentional condition. However, all groups, except for the four-year-olds, were more likely than expected by chance to predict taking in the high-frequency/intentional condition. Thus, provision of intention and frequency generally enhanced children's ability to make behavioral predictions, which are typically difficult (Liu et al., 2007). High-frequency information was especially influential to the three- and four-year-olds, who predicted taking only after multiple exemplars, consistent with previous findings that young children require a greater number of behavioral exemplars than older children to make trait attributions (Boseovski & Lee, 2006).

Overall, intention alone did not impact behavioral predictions, although the results were in the expected direction for the low versus high intentional conditions. The use of unintentional information was not straightforward. As a group, children did not expect correction of accidental taking, but the specific patterns across frequency varied with age. For example, the youngest children performed at chance whereas the oldest children expected taking irrespective of the number of accidental occurrences. Overall, behavioral outcome seemed to have a greater impact on predictions than in experiment 1, a finding that we address in the General Discussion.

Trait attributions were differentiated as expected: as a group, participants were more likely to say ‘mean’ in the high-frequency/intentional condition than the low-frequency/unintentional condition. However, consistent with previous research (e.g., Boseovski & Lee, 2006), participants were somewhat reluctant to say ‘mean.’ This was particularly true for the four- and five-year-olds irrespective of information type. Although the three- and six-year-olds technically exhibited chance responding, inspection of the means revealed a tendency to say ‘mean’ in the high-frequency/intentional condition, indicating that these children make negative attributions when given extensive evidence. The five- and six-year-olds were less likely than expected by chance to say ‘mean’ in the unintentional conditions (i.e., said ‘nice’).

Children's answers to the intelligence question were random irrespective of cue. In contrast to the association between intentionality and higher intelligence for positive behaviors, negative behaviors were not systematically associated with low or high intelligence. The majority of participants were highly likely to want to befriend an actor who caused a single unintended

negative outcome, but were ambivalent about befriending an actor who intentionally caused multiple negative outcomes. This is consistent with previous findings indicating that three- to six-year-olds choose not to befriend mean actors (Lane et al., in press).

General Discussion

We examined whether children integrate frequency and intention in a meaningful way to make trait attributions and behavioral predictions. Generally, we expected that participants would be more likely to make relevant trait attributions and behavioral predictions in highly informative (i.e., high-frequency/intentional rather than low-frequency/unintentional) circumstances.

Summary of Findings

In experiment 1, participants showed the expected pattern for behavioral predictions, but not trait attributions. Generally, children judged the actors as 'nice'. The only difference in attributions across conditions was that actors who behaved intentionally rather than unintentionally were deemed more intelligent. Children as a group expected that unintentional behaviors would not occur again irrespective of frequency. Finally, children chose to befriend actors across conditions. In experiment 2, participants did not show the anticipated pattern for behavioral predictions. Instead, they predicted taking readily, although younger children benefited from high-frequency information. However, participants as a group were more likely to say 'mean' after viewing multiple, intentional behaviors rather than one behavior, revealing the expected pattern for trait attributions. Younger children were more likely than older children to attribute meanness and higher intelligence to the actor. Friendship choices followed the expected pattern.

Insights About Children's Theory of Personality

Frequency and intention information are not used in a straightforward manner for trait judgments; use of the cues varied based on judgment type (prediction vs. attribution) and outcome valence. Several insights can be gleaned from these studies. With increasing age, children tend to attribute niceness to others under conditions of positively valenced or minimal information. The latter is consistent with reports that children judge people as nice in the absence of negative cues (e.g., Grant & Mills, 2011; Jones & Thomson, 2001). This pattern extended to friendship attributions, but less so to intelligence attributions, which became increasingly neutral with age. Perhaps this reflects increased awareness over time that intelligence cannot be inferred based on niceness.

Notably, children's attributions about others were not solely positive. Children made negative attributions when they were given negative behavioral information, but they had a higher threshold for doing so with increasing age (i.e., required high-frequency, intentional information). Participants were reluctant to say ‘mean’, as the majority of responses were random across conditions or instead were attributions of ‘nice’ when characters behaved negatively unintentionally. These findings extend previous research (e.g., Boseovski & Lee, 2006) in revealing that children's reluctance to make negative attributions is unlikely to be explained solely by an assumption that negative behavior is unintentional: the actor's negative intentions were mentioned on every trial. These findings also suggest that difficulties with trait attribution are unlikely to be explained solely by a representational deficit account, given that children were provided with explicit reminders about intention.

These findings also revealed dissociations between trait attributions and behavioral predictions, particularly in that there are limits to children's willingness to give the benefit of the doubt to others concerning expectations for future behavior. Participants needed abundant evidence to predict future intentional giving but not future intentional taking, and this was especially true for older children. This may result from heightened vigilance for the negative actions of others that could indicate threat (see Baltazar, Shutts, & Kinzler, 2012), irrespective of whether the actor is ultimately labeled negatively. In contrast, whether it occurs intentionally or unintentionally, receiving items is a low-stake situation. Moreover, despite the strong support cues, children had difficulties with behavioral predictions, consistent with previous research (Liu et al., 2007). Participants assigned positive traits readily, but required multiple, explicit exemplars to predict giving, with only some children benefitting from this information. For negative outcomes, children readily predicted taking, but this was again more pronounced in the high-intentional condition. Despite the difficulties, the finding that even the three-year-olds predicted future taking in the latter case suggests that strong support had somewhat of a facilitative effect on behavioral predictions.

Finally, this research reveals novel information about children's treatment of unintentional information based on age, frequency, and valence. Although the youngest children expected goal-directed behavior in the context of positive outcomes, responses were unsystematic by six years of age. This pattern may reflect a struggle to integrate frequency information with intention information as children approach middle childhood. It is possible that those children who predicted future accidental taking after it happened repeatedly saw this behavior as trait-like (i.e., forgetfulness). In contrast, for negative outcomes, children readily predicted negative behavior. There are many possible explanations for this pattern. As mentioned above, this response is

consistent with the notion of heightened vigilance to the possibility of negative future actions to avoid harmful or aversive situations, although it is unclear why children often labeled these same actors favorably. Another possibility concerns the ‘side-effect’ effect wherein children assume that negative outcomes that an actor caused, but does not know or care about, are intentional (Leslie et al., 2006; Pellizzoni, Siegal, & Surian, 2009). Although actors' unintentional behavior was emphasized, the salience of the negative outcome, coupled with lack of information about actors' knowledge of the outcome, may have influenced responses. Based on the view that people who behave intentionally rather than unintentionally are more intelligent, children may have been motivated to continue to view the actors positively (i.e., by assuming that they would act intentionally).

Across experiments, another explanation concerns the response options offered for the prediction questions and children's assumptions about the type of behavior that is intentional. Specifically, children may have expected future behavior to be intentional irrespective of outcome valence, but their ideas about intentionality may be tied to action rather than inaction. This explains the tendency to say ‘take’ in the unintentional conditions of both studies; the word itself may be associated with intentional action. Moreover, participants may have said ‘take’ excessively in experiment 2 because it was used in all scenarios, in contrast to the unintentional conditions in experiment 1.3 It is also likely that children are more accustomed to accidents with negative than positive outcomes.

Concerning trait attributions associated with unintentional negative outcomes, four-, five-, and six-year-olds made positive attributions more than expected by chance in at least one unintentional condition whereas three-year-olds performed at chance levels on this question. Thus, with age, children appear to gain increased sensitivity that unintentional information does not necessarily warrant a negative trait attribution. Notably, however, even three-year-olds were more likely to choose to befriend the actor in the unintentional negative conditions as compared to the intentional negative conditions, suggesting that specific contexts may elicit greater sensitivity to unintentional behavior by young children.

Limitations and Future Directions

There are limitations in these studies that warrant discussion. First, we used a between-subjects design to maximize the possibility that participants would keep in mind both frequency and intention and minimize confusion resulting from cue variations across stories. However, this design may have obscured children's abilities at trait reasoning. Had participants been given the opportunity to make judgments across scenarios, they may have shown stronger differentiation

between their judgments. Use of a within-subject design might allow for better detection of sophistication in children's trait reasoning.

Second, a controlled investigation of the cues necessitated the use of somewhat artificial stories. Children are not typically given explicit information about intentions when judging behavior. Although our goal was to examine the ability to make trait attributions under maximally supportive conditions, the nature of the unintentional conditions may have been problematic. Specifically, the extent to which children found the evidence plausible is unclear, particularly in the case of high-frequency, unintentional behaviors. As noted above, the use of the word ‘take’ may have implied intention and led to undue influence on these results. The interpretation of the neutral story information was another issue in that it may have been interpreted somewhat negatively by the three-year-olds when contrasted with the positive target information. Although there was no obvious indication that children found the stories to be strange, it will be important to study the interpretation of intention information more naturalistically in future research.

Third, the behavioral exemplars presented were variations along one theme (i.e., taking or sharing). This was done to maximize children's ability to form an integrated impression from the events presented. However, provision of several representative behaviors of each trait (e.g., for niceness: helping a person cross the street; picking up dropped papers) may have resulted in a greater tendency to make trait-consistent judgments. In future research, the effects of exemplars that vary in quality, not just quantity, should be examined systematically.

Finally, future research should aim to identify mechanisms that underlie the age-related change described here. As noted by Heyman (2009), we know little about the degree to which trait reasoning draws on domain-general versus domain-specific mechanisms. An investigation of children's executive functioning abilities may be particularly fruitful in this regard. Young and Saxe (2009) suggest that very strong representations, combined with increased cognitive control, are particularly important for overriding the salience of negative outcome information in situations of accidental harm. Thus, individual differences in executive functioning might predict children's performance on tasks like the one presented here. From a practical standpoint, it will also be important to understand how the individual differences in the processing of frequency, intention, and valence information impact children's social relations in everyday life.

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Notes

1 Data were distributed as follows: seven children in the low-unintentional condition, one child in the high-unintentional condition, three children in the low-intentional condition, and four children in the high-intentional condition.

2 Data were distributed as follows: one child in the low-unintentional condition, five children in the high-unintentional condition, three children in the low-intentional condition, and four children in the high-intentional condition.

3 We thank an anonymous reviewer for this suggestion.