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Traits or circumstances? Children's explanations of positive and negative behavioral outcomes

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ABSTRACT

This study examined the extent to which children rely on traits to explain behavior. One hundred twenty-eight 4- to 7-year-olds were told stories about actors' behaviors that led to positive or negative outcomes. Outcomes could be explained with reference to positive or negative traits (niceness or meanness) or transient or irrelevant situational characteristics (such as emotions, biological states, and social categories). Generally, findings indicated that the majority of children referred to traits to explain behaviors and this tendency increased with age. Among non-trait explanations, emotions were used prominently at all ages to explain negative behavior. Older children in particular discounted traits as an explanation for negative outcomes when alternate explanations such as negative emotions were available. Latent Class Analyses captured individual difference attributional profiles among children: although most children were trait theorists, some children referred consistently to non-trait or situational explanations. Two other profiles reflected positivity and negativity biases in children's explanations. These findings contribute to our knowledge about the relative influence of trait and non-trait explanations for positive and negative behavioral outcomes; we also present the first evidence for profiles of personality attribution.

1. Introduction

People spend a great deal of time thinking about the causes of others' behavior (e.g., Wellman, 1990). This effort is unsurprising given that there can be many explanations for a given action. For example, you might reason that your colleague snapped at you because they are a mean person or you might consider other explanations, such as your knowledge that they are feeling unwell or are under duress to meet an external deadline. There is a wealth of information about how adults navigate attributional decisions (e.g., Funder, 1999; Ross & Nisbett, 2011). In contrast, relatively little is known about children's tendency to explain behavior by appealing to causes that are stable (i.e., personality traits) as opposed to transient (e.g., temporary emotional state) or simply irrelevant (e.g., shirt color).

The current study assessed young children's attributions about the causes of positive and negative behavioral outcomes. Specifically, we examined whether 4- to 7-year-old children are more inclined to attribute behavioral outcomes to stable personality traits or to transient or irrelevant characteristics based on the valence of the behavior (i.e., positive or negative) and the valence of the outcome (i.e., positive or negative). For example, a child who has been told about an actor's negative behavior (e.g., stealing a toy) that occurred

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in the context of a negative emotional state (e.g., sadness about a parent leaving on trip) might conclude that the actor is a mean person or might instead attribute temporary sadness as the cause of behavior. Using this type of story scenario, we examined the degree to which children use stable personality trait categories, as compared to transient mental states (i.e., emotions), transient physical states (i.e., biological status), and irrelevant personal attributes (e.g., weight) to explain behavioral outcomes. From this point forward, we refer to these non-personality trait characteristics collectively as transient or irrelevant characteristics (TICs), consistent with how they were presented in this particular context.

An additional goal of this study was to describe profiles of attribution that characterize children's tendency to ascribe behavioral outcomes to personality traits as compared to TICs, or to show patterns of bias in personality reasoning (i.e., negativity or positivity biases). Gaining knowledge about individual differences in personality attribution is worthwhile from a developmental perspective because it may enable us to mark the emergence of maladaptive information processing patterns before they become crystallized. For example, a child who attributes negative behavior systematically to personality traits rather than taking appropriate evidence into consideration (hostile attribution bias; Crick & Dodge, 1994) might be trained to recognize situational causes of behavior. Also, personality understanding affects children's psychosocial adjustment, including peer relations (e.g., Choi & Kim, 2003) and self-concept (e.g., perceptions of academic ability; Heyman & Dweck, 1998; Lapan & Boseovski, 2017).

To achieve our goals, we developed novel, developmentally appropriate methodology for assessment of attributional patterns in early to middle childhood. Traditional attribution paradigms examined whether children ascribe causes of events to actors, entities, or circumstances (e.g., DiVitto & McArthur, 1978; Higgins & Bryant, 1982; Ruble, Feldman, Higgins, & Karlovac, 1979; Schuster, Ruble, & Weinert, 1998). For example, with reference to explaining a character's failure children were asked, "Do you think X did not solve this game because of something about X, something about the game called Y, something about the circumstances, something about both X and the game called Y?" (Schuster et al., 1998).

These paradigms are suitable for use in late childhood, but can be too complex for young children because they involve the manipulation of multiple pieces of information to establish cause (i.e., covariation; see Boseovski & Lee, 2006; but see Seiver, Gopnik, & Goodman, 2013, for evidence of use of multiple pieces of covariation information by 4-year-olds). Moreover, the goal of traditional attributional paradigms was to assess broadly whether children attribute causes of behavior to *something about the actor* versus *something about the situation*. This dependent measure does not provide information about specific causal attributions (e.g., *situation* can refer to several different things; *person* can also capture several different attributes).

We build on developmental research that indicates that children are particularly sensitive to specific characteristics when explaining behavioral outcomes. Beginning in early childhood, children rely on broad trait categories to predict and explain behavior (e.g., Boseovski & Lee, 2006; Heyman & Gelman, 1999). The use of these trait categories enables children to organize and understand the social world (e.g., Boseovski, Shallwani, & Lee, 2009; Gnepp & Chilamkurti, 1988; Heyman & Gelman, 1998; Yuill & Pearson, 1998). Trait understanding becomes more sophisticated with age (e.g., Kalish, 2002; Kalish & Shiverick, 2004; Yuill & Pearson, 1998), but even preschoolers make global trait attributions (i.e., niceness and meanness; Boseovski & Lee, 2006; Cain, Heyman, & Walker, 1997). For example, young children use behavioral information to make positive and negative trait attributions (Boseovski & Lee, 2008; Lapan, Boseovski, & Blincoe, 2016) and in turn use traits to make predictions about future behavior (Liu, Gelman, & Wellman, 2007) and inductive inferences about people (e.g., game preference; Heyman & Gelman, 2000). These abilities have been documented in the laboratory and naturalistically (see Chen, Ng, Corriveau, Yang, & Harris, 2020; Stipek & Daniels, 1990). Given the salience of basic trait categories in this age range, we examined children's use of niceness and meanness as dispositional explanations for positive and negative behaviors.

Similarly, drawing on previous literature, we chose TICs that are likely to be used by children in the focal age range for behavioral explanations: positive and negative emotions (happiness and sadness), biological states (tired vs. energetic; hungry vs. satiated), and social categories (chubby vs. thin; native accent vs. foreign accent). These choices are supported by evidence that children have nascent theories of folk psychology (e.g., Wellman, 1990), folk biology (e.g., Erickson, Keil, & Lockhart, 2010), and that information about social categories, such as nationality, affects children's processing of social information, including personality traits (e.g., Kinzler & DeJesus, 2013). Below, we discuss children's use of each TIC in turn, restricting our review to studies that focus on their use specifically for social attributions.

There is abundant evidence that children are sensitive to emotions as explanations for behavior (see Harris, 1989; Pons, Harris, & de Rosnay, 2004). Children understand the meaning of sadness and happiness at an early age (e.g., Bartsch & Wellman, 1995; Saarni & Harris, 1989). By 5 years of age, children generate causes and consequences of happiness and sadness (Russell, 1990; Widen & Russell, 2010). Between 3 and 7 years of age, children begin to understand that beliefs or desires can affect emotion states (Harris, Johnson, Hutton, Andrews, & Cooke, 1989). Although no studies examined directly whether children appeal to emotions as compared to traits to explain behavioral outcomes, research indicates that young children understand that emotions can impact cognitive performance. In one study, 5- and 8-year-olds predicted that negative emotions such as sadness would cause declines in cognitive motivation and showed increased awareness with age that cognitive performance would also be affected (Bennett & Galpert, 1992).

In an experiment of strong relevance to the current research, Amsterlaw, Lagattuta, and Meltzoff (2009) told 5- to 7-year-olds and adults stories about characters who experienced events that resulted in positive or negative emotions (e.g., happiness; sadness). Next, participants were told that the characters had to complete school tasks (e.g., math problems) and were asked whether the characters would perform as they usually did, better, or worse on the tasks. At all ages, participants in this study recognized that negative emotions could be detrimental to cognitive performance. This finding coalesces with research by Lagattuta and Wellman (2002) that indicates that parents engage in extensive talk with their children about the cause and course of negative emotions; this dialogue is likely to foster the understanding of such emotions. In contrast, there was age-related improvement in the acknowledgement that positive emotions can enhance performance. Indeed, this acknowledgment was strongest in the 7-year-olds and adults. Based on this

research, it is likely that children in the present study would be particularly sensitive to negative emotions as potential explanations of behavior.

Young children are also highly sensitive to biological causes of behavior (see Inagaki & Hatano, 2006, for a review); accordingly, we were interested in the degree to which children would use biological as opposed to trait explanations for positive and negative behavioral outcomes. Even toddlers refer to internal feelings of hunger, thirst, tiredness, and alertness; in some cases, children use these in causal utterances (Bretherton & Beeghly, 1982). Between 3 and 5 years of age, children begin to understand that physiological states generate different desires. For example, children believe that a person who has not eaten breakfast will want to eat lunch more than a person who had a large breakfast (Moses, Coon, & Wusinich, 2000), although these kinds of inferences are more difficult to make than perception or attitude-related desires (e.g., seeing something is related to believing it vs. understanding that the feelings associated with a negative experience may result in a lack of desire to repeat the experience).

By 4 years of age, children differentiate physical, psychological, and biological causes of behavior. For example, children understand that someone who is tired cannot voluntarily stay awake forever irrespective of their desire to do so (Schult & Wellman, 1997). By 5 years of age, children can predict their own internal physiological states (e.g., hunger after climbing a mountain; Atance & Meltzoff, 2005). In the study by Amsterlaw et al. (2009), participants were also told about characters who experienced positive or negative physiological states (i.e., tired vs. energetic; hungry vs. satiated) that resulted in positive or negative emotions (happiness or sadness) respectively and asked to predict characters' performance on math problems. Consistent with the results for emotions, participants recognized that negative physiological states could result in decreased cognitive performance and that positive states could enhance performance.

In addition to the perception of emotional and biological factors, we assessed the impact of contextually irrelevant, but potentially salient, characteristics on children's attributions of behavioral outcomes. We focused on thinness/obesity and foreign/native accents given that these characteristics affect young children's social judgments, as described below. We describe these characteristics as irrelevant in the current context because they are *inappropriate* explanations for the positive or negative behavior at hand. That said, it is important to note that these characteristics can be construed as social categories, which are often conceptualized in essentialist terms or regarded as inherited, biologically based, and relatively stable (Gelman, Heyman, & Legare, 2007; also see Rhodes, Leslie, & Tworek, 2012). Essentialist views about weight or nationality may result in a tendency to attribute behavioral outcomes to these characteristics despite their irrelevance in the current context.

Concerning obesity, even 3- to 5-year-olds have negative perceptions of overweight as compared to thin individuals (Cramer & Steinwert, 1998) and also use negative adjectives to describe people who are obese (Musher-Eizenman, Holub, Miller, Goldstein, & Edwards-Leeper, 2004). This weight stigma may be motivated in part by essentialist reasoning about obesity. Klaczynski (2008) found that after a taste test of identical beverages, 7- to 10-year-olds preferred drinks ostensibly created by average weight children rather than drinks created by obese children. Also, children endorsed a higher likelihood of becoming ill after drinking the beverage made by the obese child than the one created by the average weight child.

Regarding accents, preschoolers distinguish between their own accent and foreign accents (Girard, Floccia, & Goslin, 2008) and associate accents with outgroup status as early as 3 years of age. Children also make inductive trait inferences based on accent status. For example, 5-year-olds prefer to befriend peers with native over foreign accents (Kinzler & DeJesus, 2013; Kinzler, Shutts, Dejesus, & Spelke, 2009) and show selective trust in native accented rather than foreign-accented people (Kinzler, Corriveau, & Harris, 2011). In support of the notion that children tend to essentialize language, Kinzler and Dautel (2012) found that when 5- to 6-year-olds were asked whether an individual's race or language would remain stable over time, they chose language, which suggests that language is seen as biologically determined.

Both weight and nationality should be irrelevant to behavioral explanations in this context. However, it is possible that children construe these characteristics as reflections of essences, in which case they might consider them to be legitimate causes of behavior that are more specific than the alternative trait option of niceness or meanness.

1.1. Present study

We assessed children's use of positive and negative traits versus positive or negative TICs to explain behavioral outcomes. Four- to 7-year-olds listened to stories about characters who engaged in behavior that resulted in a positive or negative outcome for a recipient. Outcomes were crossed with positive or negative TICs to result in four conditions: negative TICs-negative outcome, negative TICs-positive outcome, positive TICs-positive outcome, and positive TICs-negative outcome stories. In each condition, participants heard about four positive valence and four negative valence TICs (emotion, biological, social category, comparison condition with

Table 1
Schematic of stories received by participants as a function of condition.

		Condition			
		Positive-Positive	Negative-Positive	Positive-Negative	Negative-Negative
TIC	Emotion	Happy/shared	Sad/shared	Happy/did not share	Sad/did not share
	Biology	Energy/shared	Tired/shared	Energy/did not share	Tired/did not share
	Social	Thin /shared	Chubby/shared	Thin/did not share	Chubby/did not share
	Comparison	Shared	Shared	Did not share	Did not share

Note: Participants received two stories for each TIC-Story Type combination.

information about shirt color only; see Table 1 for story structures). Consistent with our goal of determining whether trait categories or TIC explanations would be more appealing as behavioral explanations, participants were given the option to explain each outcome with reference to a positive or negative TIC, or a positive or negative trait category.

Overall, we predicted that children would be more likely to invoke trait explanations of behavior rather than references to TICs irrespective of age, consistent with the finding that trait categories are highly salient early in childhood (e.g., Heyman & Gelman, 1999). We expected that this response pattern would in part reflect the nature of the social category and comparison stories. In these stories, participants could attribute positive or negative outcomes to traits or to social category status (e.g., accent) or irrelevant features (e.g., shirt color). This should generate greater trait explanations as compared to the other story types given their irrelevance to the behavior at hand.

Although we predicted that children would make more trait attributions overall, a second interest of the current study was the circumstances under which children would be most likely to invoke TIC explanations, which we expected to vary by condition. In particular, we hypothesized that the outcomes for the matched valence blocks would result in the strongest responses toward TICs. In these blocks, the cause of behavior should be more difficult to judge given the concordance between TIC valence and outcome valence (e.g., it is unclear whether prosocial behavior reflects a positive TIC or trait and whether antisocial behavior reflects a negative TIC or trait). Conversely, outcomes for mismatched valence stories (NP and PN) were expected to result in greater selections of traits. Specifically, the positive outcome in the NP story, in the presence of a negative TIC, should result in strong positive trait attributions. Similarly, the negative outcome in the PN story, in the presence of a positive TIC, should result in strong negative trait attributions (e.g., in reference to the example above, prosocial behavior is unlikely to reflect a negative TIC, such as a bad mood, and is therefore more likely to be attributed to a positive trait).

Concerning our interest in the use of TICs, we also hypothesized that in cases where children chose TICs to explain behavior, they would choose emotions more frequently than other types of explanations (see Lagattuta & Wellman, 2001; Lagattuta, Wellman, & Flavell, 1997), particularly for stories that centered on negative emotions (see Amsterlaw et al., 2009). For example, we expected that children would choose sadness (i.e., negative emotion) over meanness as behavioral explanations more frequently than they would choose tiredness (i.e., negative biological state) over meanness as a behavioral explanation. That said, we expected this effect to increase with age across conditions such that older children would be more likely to use emotion and biological factors (relative to social category and comparison) than younger children, who were expected to show less differentiation among story types within conditions. We did not have specific predictions concerning gender effects given that participants received same-gender story characters and would therefore not be subject to ingroup favoritism or outgroup bias (e.g., Powlishta, 1995) However, given that previous research reveals that girls sometimes outperform boys on emotion and social attribution measures (e.g., Bosacki, 2000), we tested for these effects.

Finally, our third goal was to explore whether we could characterize children along individual difference profiles of personality attribution. We anticipated four profiles (see Table 2). Participants who invoked trait causes of behavior irrespective of valence (positive or negative) of the outcome or situation were designated person theorists and those who invoked (TIC) explanations of behavior were designated situation theorists. We also anticipated two profiles that reflect biases: participants who invoked dispositional causes for positive outcomes and situational causes for negative outcomes were deemed positivity theorists and those who invoked dispositional causes for negative outcomes and situational causes for positive outcomes were designated negativity theorists. We based these predictions on research that indicates that early to middle childhood is a time during which there are age-related negativity and positivity biases in children's social information processing. Specifically, concerning the negativity bias (see Vaish, Grossmann, & Woodward, 2008), infants are particularly sensitive to negative information in novel or ambiguous circumstances (e.g., unfamiliar toys; Hertenstein & Campos, 2001). Also, young children's discussions with parents center to a greater degree on negative rather than positive emotions (Lagattuta & Wellman, 2002) and memories (e.g., Hudson, 1991), and preschoolers show better memory for threatening over non-threatening behaviors when given trait category information (i.e., that a character is mean; Baltazar, Shutts, & Kinzler, 2012).

There is strong support for a positivity bias in children's social judgments (Boseovski, 2010; Marble & Boseovski, 2020). Young children believe that they are competent irrespective of objective ratings (e.g., Stipek, 1981; Stipek & Mac Iver, 1989) and that traits will change in a positive direction (Lockhart, Chang, & Story, 2002). Between 3 and 6 years of age, children are increasingly likely to draw on performance history to make predictions about success rather than failure (i.e., assume that success begets success, but that

Table 2
Description of conditions and proposed latent classes.

Condition	Person theorist (emphasis on disposition causes) Class 1	Situation theorist (emphasis on situation causes) Class 2	Positivity bias (person causes for positive outcomes) Class 3	Negativity bias (person causes for negative outcomes) Class 4
Positive situation-positive outcome	Trait	Situation	Trait	Situation
Negative situation-positive outcome	Trait	Situation	Trait	Situation
Negative situation-negative outcome	Trait	Situation	Situation	Trait
Positive situation-negative outcome	Trait	Situation	Situation	Trait

failure does not beget failure; Boseovski et al., 2009). Children generate trait explanations for success as early as the 1st grade, whereas such explanations for failure are uncommon until the 4th grade (Benenson & Dweck, 1986). Children also require more behavioral evidence to make negative rather than positive trait attributions (e.g., behavior consistency; see Boseovski & Lee, 2006). Finally, children frequently endorse claims that are framed positively irrespective of a source's credibility (i.e., expertise; Marble & Boseovski, 2020).

Among these profiles, we expected age-related change given that the negativity bias tends to be seen in early childhood (Vaish et al., 2008) and the positivity bias peaks in middle to late childhood (Boseovski, 2010). We expected that a greater number of younger children would be negativity theorists and a greater number of older children would be positivity theorists.

2. Method

2.1. Participants

The original sample consisted of 133 participants who participated in a larger study on children's social cognition in a Southeastern North American city. Data from 3 participants were excluded due to failure to finish the task. Data from an additional 2 participants were excluded due to accidental destruction of consent forms and a failure to subsequently re-gain consent. Note that the profile designations were removed for these participants per Institutional Review Board guidelines. One additional participant had missing data and was included in the main analyses but excluded from the profile analysis.

Among 128 children, there were 30 4-year-olds (15 boys; $M_{age} = 53.7$ months, $SD = 4.2$ months), 32 5-year-olds (21 boys; $M_{age} = 65.3$ months, $SD = 3.8$ months), 34 6-year-olds (14 boys; $M_{age} = 77.2$ months, $SD = 3.5$ months), and 32 7-year-olds (12 boys; $M_{age} = 90.5$ months, $SD = 3.8$ months). The majority of participants were from middle to upper-middle class families, but family income ranged from less than $20,000 per year to over $60,0000 per year. The sample was somewhat racially diverse: 75.2 % White, 14.1 % African American, 1.6 % Hispanic, 8.6 % multi-racial, and 2.3 % who did not disclose this information. Participants were recruited from a laboratory database and via community flyers. Participants were compensated with gift cards for their participation in two testing sessions.

2.2. Materials

Each story was accompanied by a set of three cartoon illustrations. The first image showed the actor alone in front of his or her school. The second showed the actor alone in school or on the playground (based on the story description). The final image showed the actor engaging or not engaging with the recipient based on the outcome (e.g., actor handing crayons to the recipient versus sitting next to the recipient with all crayons on the actor's side of the table). Actors' faces conveyed positive or negative expressions consistent with story type where applicable (i.e., happy actor displayed a smile). Where emotional expressions were not relevant (e.g., overweight actor, comparison actor), actors displayed positive facial expressions. Recipients' facial expressions matched the valence of the story outcome (e.g., a sad face when the actor did not share with them). Because participants received stories about participants of their own gender, there was one set of illustrations with males and another set with females.

2.3. Design

Stories centered on positive or negative TICs (i.e., emotion; biological; physical characteristic) crossed with positive outcomes (actor shares with recipient or helps recipient) or negative outcomes (actor does not share items with recipient or refuses to help recipient). This resulted in four conditions: negative TIC-positive outcome (NP), negative TIC-negative-outcome (NN), positive TIC-positive outcome (PP) and positive TIC-negative outcome (PN). Comparison stories featured benign characteristics (e.g., wears blue shirt); thus, they varied by outcome only. Participants heard 32 stories in total (see Table 1).

Participants received all measures in a within-subjects design over two sessions. In session 1, participants received half of the stories (i.e., PP, NP, and comparison stories). In session 2, they received the remaining stories (i.e., NN, PN, and additional comparison stories). Stories were presented in one of two pre-randomized orders. Benign elements of stories (e.g., a character working on a puzzle) were counterbalanced across story type.

2.3.1. NP and NN story conditions (Negative TICs)

For the emotion stories, participants heard about actors who were upset (e.g., due to a stolen bike; due to a parent leaving for a trip), whereas biological stories centered on actors who were feeling unwell (e.g., stomachache; tired). Social category stories focused on putatively negative characteristics (e.g., foreign accent; overweight). Each negative TIC type was associated with a positive outcome (NP condition) or a negative outcome (NN condition). For example, in an emotion story, participants were told that "[actor] is very sad today because someone stole his new bike." Then, they were told about the actor behaving positively (e.g., inviting the peer to work on an activity together; NP) or negatively (e.g., preventing the peer from joining the activity; NN). Participants also received comparison stories (e.g., shirt color) that resulted in a negative outcome.

2.3.2. PP and PN story conditions (Positive TICs)

For the emotion stories, participants heard about actors who were happy (e.g., about receiving a new bike as a gift; about a parent returning from a trip), whereas positive biological stories centered on actors who were feeling particularly well (e.g., full of energy

from a good night of sleep; feeling well from eating lunch). Social category stories focused on putatively positive characteristics (e.g., thinness; native accent). Each positive TIC story was associated with a positive outcome (PP) or a negative outcome (PN). For example, in an emotion story, participants were told that "[actor] is very happy today because he is getting a new bike." They were then told about the actor behaving positively (e.g., inviting the peer to work on an activity) or negatively (e.g., preventing the peer from joining the activity).

2.4. Procedure

As part of a larger study, participants were tested by a female experimenter in two sessions that took place no longer than one week apart. Participants heard two stories for each of the NP, NN, PP, and PN conditions described above. After each story, participants were asked to explain the event spontaneously, "Why did [actor] act this way?" Consistent with previous research (e.g., Boseovski & Lee, 2006, 2008), participants who gave a general response (e.g., repeated the story circumstances) but did not make a specific reference to the relevant TIC/trait characteristic were asked a forced choice follow up to indicate whether the behavior was due to the TIC or the trait. For example, for an emotion story, children were asked, "Did [actor] do this because he was sad that his bike was stolen or because he is a mean person?" Order of the forced choice options was randomized.

3. Results

Consistent with previous research (Boseovski & Lee, 2006), participants were given a score of 0 for selecting a trait response or 1 for selecting a TIC (i.e., situational) response irrespective of whether they responded to the questions in an open-ended or forced choice manner. Note that in all figures, TICs (i.e., situational responses) are on the y-axes.

We first examined how often children responded with open ended as opposed to forced choice responses. Out of a total of 32 stories, children responded with open ended responses on more than half of the stories ($M = 21.09$, $SD = 9.29$). This did not vary based on age, $F(3, 128) = 0.92$, $p = .43$, $\eta_p^2 = .02$.

Next, a 4 (age: 4-year-olds, 5-year-olds, 6-year-olds, 7-year-olds) x 4 (condition: Positive-Positive, Negative-Positive, Positive-Negative, Negative-Negative) x 4 (story type: Emotion, Biological, Social Category, Comparison) x 2 (gender: Male, Female) mixed ANOVA was conducted with age and gender as between-subjects factors and condition and story type as within-subjects factors. Results indicated main effects of age, $F(3, 116) = 4.83$, $p < .001$, $\eta_p^2 = .11$, condition, $F(3, 348) = 13.21$, $p < .0001$, $\eta_p^2 = .10$, story, $F(3, 348) = 55.42$, $p < .0001$, $\eta_p^2 = .32$, and gender, $F(1, 116) = 4.76$, $p < .05$, $\eta_p^2 = .03$. The following two-way interactions were also significant: story by age $F(3, 348) = 3.40$, $p < .01$, $\eta_p^2 = .08$ and story by condition $F(3, 348) = 5.95$, $p < .05$, $\eta_p^2 = .04$. There were no other significant effects, $ps > .09$.

Below, we present the analyses and findings in accord with our main study hypotheses: (a) children favor trait over TIC explanations; (b) children are more likely to make TIC attributions in matched versus mismatched story valence blocks; and (c) children rely on emotions to a greater extent than other TICs to explain behavior. In cases where significant main effects or interactions were obtained, post-hoc analyses were conducted using Fisher's LSD tests.

3.1. Do children prefer Traits or TICs?

Our first question concerned whether children explained behavioral outcomes to a greater extent with TICs or traits. Consistent with our prediction, across stories and age groups, participants were more likely to make trait attributions than TIC attributions, $t(123) = 5.94$, $p < .0001$. Participants chose trait attributions on 73 % of the trials collapsed across story type ($M = 24.40$, $SD = 6.73$). Notably, this pattern varied by story type, $F(3, 348) = 55.42$, $p < .0001$, $\eta_p^2 = .32$. As expected, trait attributions were higher for comparison ($M = 6.63$, $SD = 1.81$) and social category stories ($M = 6.54$, $SD = 1.63$) than the biological ($M = 6.17$, $SD = 1.94$) and emotion stories ($M = 5.20$, $SD = 1.95$), $ps < .05$.

There was also a significant interaction between story type and age, $F(9, 348) = 3.40$, $p < .01$, $\eta_p^2 = .08$. Four-year-olds' trait attributions were higher for the biological ($M = 5.43$, $SD = 2.16$), comparison ($M = 5.31$, $SD = 2.33$, and social category stories ($M = 5.75$, $SD = 1.76$) as compared to the emotion stories ($M = 4.63$, $SD = 2.22$), $ps < .05$. Five-year-olds' trait attributions were higher for comparison ($M = 6.71$, $SD = 1.63$) than the biological ($M = 6.21$, $SD = 1.97$) and emotion stories ($M = 5.56$, $SD = 1.96$), $ps < .05$. Six- and 7-year-olds' trait attributions, respectively, were higher for comparison stories ($M = 7.12$, $SD = 1.24$; $M = 7.25$, $SD = 1.31$) than the social category ($M = 6.90$, $SD = 1.37$; $M = 6.96$, $SD = 1.58$), biological ($M = 6.75$, $SD = 1.62$; $M = 6.22$, $SD = 1.82$), and emotion stories ($M = 5.72$, $SD = 1.68$; $M = 4.83$, $SD = 1.79$), $ps < .05$. Performance on each of these stories was significantly different from one another with the exception of the comparison and social category stories.

3.2. Do children make more TIC attributions for matched valence conditions?

We expected a greater number of TIC attributions for matched valence conditions (PP and NN) as compared to mismatched conditions (PN and NP), as the former include information that could be used to discount trait explanations. To examine this, we conducted separate mixed ANOVAs on children's TIC responses to story types collapsed across condition (NN, NP, PN, PP) as a within-subjects factor and age and gender as between-subject factors.

Although there were significant differences between performance on these stories, $F(3, 348) = 11.48$, $p < .0001$, $\eta_p^2 = .09$, this hypothesis was only partially supported (see Fig. 1). Children's responses differed significantly by age, $F(3, 116) = 4.89$, $p = .003$, $\eta_p^2 =$

.11, however this effect was qualified by a significant interaction with condition, $F(5.79, 348) = 2.10$, $p = .05$, $\eta_p^2 = .05$. Children were significantly more likely to make TIC attributions in the NN stories as compared to each of the other conditions, however this pattern was only significant for 6- and 7-year-olds, ($ps < .05$), and not the 4- and 5-year-olds ($ps > .40$). Seven-year-olds were also significantly less likely to make TIC responses in the NP condition as compared to all other conditions, ($ps < .03$). Finally, girls were more likely to make TIC responses ($M = 8.58$, $SD = 6.95$) as compared to boys ($M = 6.57$, $SD = 6.40$), $F(1, 116) = 4.65$, $p = .03$, $\eta_p^2 = .03$. No other differences emerged significant ($ps > .10$).

3.3. When children chose TICs to explain behavior, which TICs did they prefer?

Although children chose traits as behavior explanations the majority of the time, we also sought to determine under what circumstances TICs (i.e., situational explanations) were favored. For these analyses, each TIC response was awarded 1 point; thus, the scores for each combination ranged from 0 to 2 points. We conducted individual mixed ANOVAs on the number of TIC responses for each condition (NN, NP, PP and PN) with age (4, 5, 6, and 7 years) and gender as between-subject factors and story type (emotion, biology, social category, and comparison stories) as a within-subject factor.

3.3.1. Negative-negative stories

There was a significant effect of story type, $F(3, 354) = 32.64$, $p < .0001$, $\eta_p^2 = .22$ qualified by a story type x age interaction, $F(9, 354) = 3.46$, $p < .0001$, $\eta_p^2 = .08$ (see Fig. 2). No other effects emerged statistically significant ($Fs < 1$, $ps > .2$). For 4-year-olds, there was no overall significant difference between the stories, $F(3, 87) = 1.66$, $p > .05$, $\eta_p^2 = .05$. Among 5-year-olds there was a significant difference between the stories, $F(3, 93) = 5.98$, $p = .001$, $\eta_p^2 = .16$. Five-year-olds made more TIC attributions in the emotion story as compared to the social category and comparison stories. Additionally, they made more TIC explanations for behavior in the biological rather than the comparison stories, and for the social category than comparison stories (ps< .05).

For 6-year-olds, there was a significant difference between stories, $F(3, 96) = 8.91$, $p < .0001$, $\eta_p^2 = .22$. These children made more TIC attributions for the emotion stories as compared to each of the other stories; there were also more TIC responses for the social category than the comparison stories (all $ps < .05$). For the 7-year-olds, there was a significant difference between stories, $F(3, 90) = 31.8$, $p < .0001$, $\eta_p^2 = .51$; all pairwise comparisons emerged significant (ps < .05). Participants made more TIC attributions for the emotion as compared to the biology, social category, and comparison stories. Seven-year-olds also made more TIC attributions for the biological stories as compared to the social category and comparison stories. Finally, there were significantly more TIC attributions for the social category than comparison conditions.

3.3.2. Negative-positive stories

There was a significant effect of story type, $F(3, 354) = 4.05$, $p = .007$, $\eta_p^2 = .03$ and age, $F(3, 118) = 5.38$, $p = .002$, $\eta_p^2 = .12$ (see Fig. 3). No other effects emerged statistically significant ($Fs < 1$, $ps > .5$). Emotion stories elicited significantly more TIC attribution as compared to the social category ($p = .003$) and comparison stories ($p < .001$), which did not differ significantly from each other. No other pairwise comparisons were significant ($ps > .15$). Four-year-olds were more likely to make TIC responses than the 6-year-olds ($p = .019$) and 7-year-olds ($p < .0001$), and 5-year-olds were more likely to make TIC responses than the 7-year-olds ($p = .007$).

3.3.3. Positive-positive stories

There was a significant effect of story type, $F(3, 357) = 18.85$, $p < .0001$, $\eta_p^2 = .13$, age, $F(3, 119) = 4.64$, $p = .004$, $\eta_p^2 = .105$, and gender, $F(1, 119) = 7.88$, $p = .006$, $\eta_p^2 = .062$. Responses to the emotion stories differed significantly from the biological ($p < .0001$),

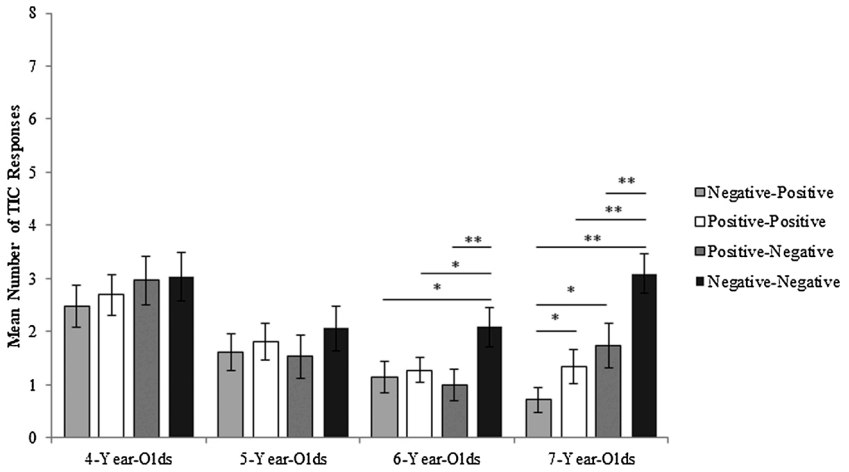

Fig. 1. Mean Number of TIC Responses by Age and Condition.
Note: These scores are collapsed across the various story types. Asterisks refer to pairwise comparisons ** $p < .01$, *$p < .05$. Scores out of 8.

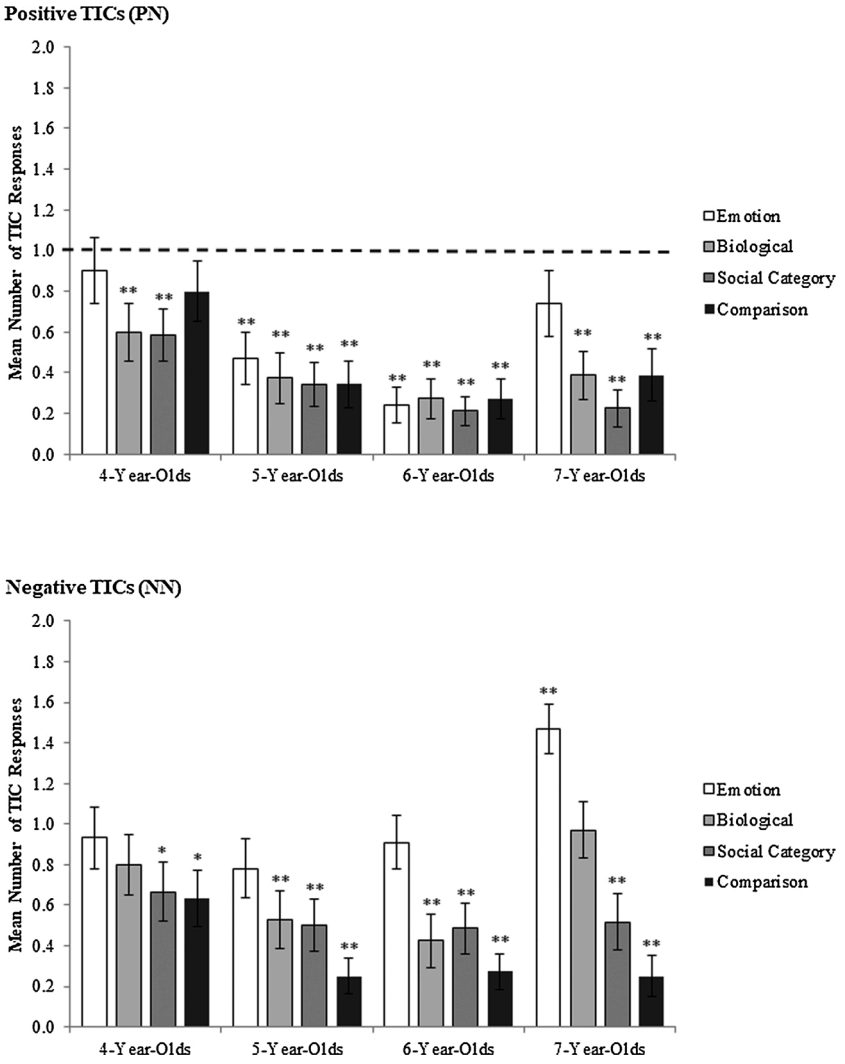

Fig. 2. Mean Number of TIC Responses by Age, Story Type, and Negative Behavioral Outcome Conditions.
Positive TICs (PN).
Negative TICs (NN).
Note: Asterisks refer to tests against chance *p < .05, ** p < .01. Scores out of 2.

comparison ($p < .0001$), and social category stories ($p < .0001$) such that there were more TIC responses to the emotion stories (see Fig. 3). Children were less likely to choose the trait response with age. Concerning gender, girls ($M = 2.12$, $SD = 2.02$) were more likely than boys ($M = 1.37$, $SD = 1.64$) to choose TIC responses ($p = .006$).

3.3.4. *Positive-negative stories*

There were significant effects of story type, $F(3, 351) = 6.23$, $p < .0001$, $\eta_p^2 = .05$ and age, $F(3, 117) = 4.05$, $p = .009$, $\eta_p^2 = .09$ (see Fig. 2). Responses to the emotion stories differed significantly from the biological ($p = .002$), comparison ($p = .03$), and social category stories ($p < .0001$) such that there were more TIC responses given for the emotion stories. Concerning age effects, the 4-year-olds were more likely than the 5-year-olds ($p = .03$), 6-year-olds ($p = .001$) and 7-year-olds ($p = .025$) to make a TIC response.

3.4. *Profiles of personality attribution*

Finally, we conducted a constrained latent class analysis (LCA) to explore the latent classes, or profiles, of personality attribution (see Table 2). LCA assumes that relations between responses on the variables of interest reflect group membership and it assigns probabilities of class membership that reveal the likelihood of an individual coming from a given class (see Hagenaars & McCutcheon, 2002). LCA was constrained based on our a priori theory about how classes should respond to the items.

Three models were estimated with different constraints on the parameters that reflected our a priori hypotheses about how

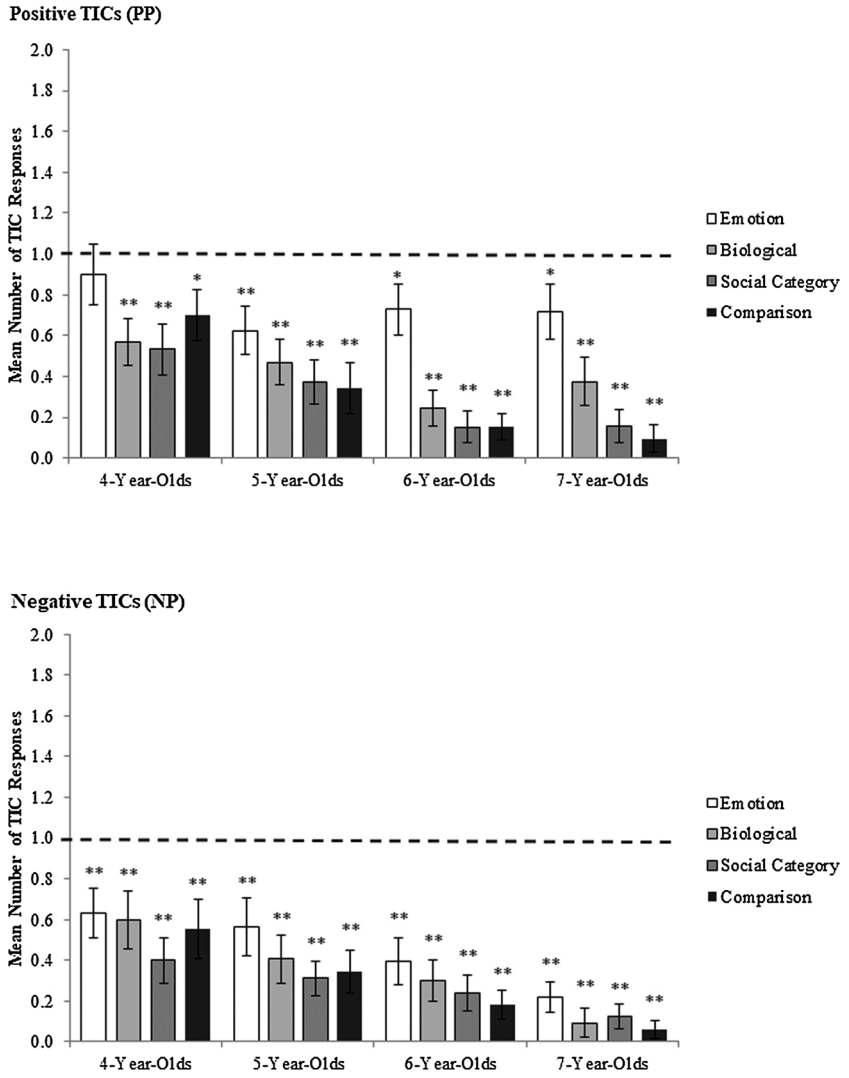

Fig. 3. Mean Number of TIC Responses by Age, Story Type and Positive Behavioral Outcome Conditions.
Positive TICs (PP).
Negative TICs (NP).
Note: Asterisks refer to tests against chance *$p < .05$, ** $p < .01$. Scores out of 2.

different classes of participants would be expected to respond to the different conditions and item types. In this manner, constrained LCA as applied here is akin to a confirmatory factor analysis (as compared to an exploratory LCA or an exploratory factory analysis). The first, most restrictive model (Model 1), constrained the probability of trait responses to be equivalent across experimental condition and class. The second, less restrictive model (Model 2) constrained the probability of similar responses across experimental conditions within class to be equal. The third, least restrictive model (Model 3) placed constraints on individual items (see Table 3 for the proportion of TIC responses by class).

Model quality was judged using fit criteria, with lower values on all three indices suggesting a better fitting model. Fit indices were lowest for the third model (see Table 3), which is unsurprising given that it had the least restrictive constraints. Although this approach

Table 3
Model fit indices, entropy, and sample sizes within class.

Model	Fit			Entropy	Classification			
	AIC	BIC	Sample-Size Adjusted BIC		Person 1	Situation 2	Positivity	Negativity
1	3036.420	3050.640	3034.825	0.866	18	80	6	21
2	3021.400	3047.000	3018.538	0.855	7	74	20	24
3	2851.350	2996.410	2835.123	0.909	70	18	14	23

allows the model to approximate the data most closely, these indices also penalize for model complexity. The lowest indices achieved for the third model suggest that the added complexity (i.e., fewer constraints) was justified by fit improvement. Entropy values also helped to determine model quality. These values range from 0 to 1, with values close to 1 suggesting higher certainty in classification. The entropy value of 0.909 for the third model was the highest of the three models. Thus, this model was retained. Seventy respondents (56 %) were classified in the person theorist class, 18 (14.4 %) in the situation theorist class, 14 (11.2 %) in the positivity theorist class, and 23 (18.4 %) in the negativity theorist class (see Table 3 and also Appendix A for the proportion of situation responses for each class in this model). A follow-up Chi-square analysis revealed that overall response patterns were dependent on age ($p < .05$), but there was limited support for our hypothesis that there would be greater positivity theorists with age and fewer negativity theorists with age ($ps = .10$).

4. Discussion

Our first question was whether children prefer trait category or TIC explanations for positive and negative behavioral outcomes. Collapsed across age, condition, and story type, the results revealed that children had an overall strong preference for trait explanations of behavior when given the option to choose between traits or TICs. This is consistent with previous research that indicates that even very young children can make trait inferences based on behavioral exemplars (e.g., Liu et al., 2007) and reveals the potency of trait explanations for behavior. That said, the tendency to make trait attributions increased with age across three of the four story scenarios, with the NN stories as the sole exception. The increase in trait attributions may reflect the emergence of "trait-like" cognitive schemas for behavior with age in which children readily apply trait categories, in some cases irrespective of their relevance (Seiver et al., 2013). Indeed, children require fewer behavioral exemplars with age to make trait attributions (e.g., Boseovski & Lee, 2006; Lapan et al., 2016). The 4-year-olds were differentiated from older children in exhibiting a preference for situational explanations, which is also consistent with previous research (e.g., Gnepp & Chilamkurti, 1988; Seiver et al., 2013). In contextualizing the high percentage of trait attributions in general, it is important to note that this finding also reflects, in part, the expectation that children would readily make such attributions for the social category and comparison stories given that the TIC information offered in these stories was clearly irrelevant to the outcomes at hand.

Our second question concerned the effects of condition on children's explanations of behavior with the aim of obtaining insight about the nature of children's reasoning. If children used covariation reasoning in their attributions in our simplified paradigm, it should have been more difficult to ascribe trait attributions in the PP and NN stories, as there is situational information available to discount the positive and negative behavioral outcomes, respectively. In contrast, the NP and PN stories should result in stronger trait attributions because they resulted in positive and negative outcomes, respectively, *in spite of* situational factors that could yield the opposite outcome. Our predictions were fully supported only for the NN stories and solely among older children.

Although speculative, it is possible that this pattern resulted from a positivity bias, which peaks at this time developmentally. Perhaps situational explanations enabled children to avoid negative behavioral explanations in these stories. In the case of the PP and NP stories, children could choose a positive explanation by deferring to positive TICs or traits, whereas in the NN stories, the *only* way to maintain a positive interpretation of the event was to choose a situational explanation, as exhibited by a minority of children. In contrast, making the situational attribution in the PP stories is tantamount to rejecting a positive trait. Moreover, these children were least likely to make situation responses in the NP condition as compared to all of the other blocks (i.e., meaning that they chose the positive trait explanation). That said, the 7-year-olds were not uniformly positive in their attributions, as seen in performance on the PN condition. It is possible that this circumstance – behaving negatively even *in light of* feeling very well or happy – was particularly salient and undeniable as representative of a negative trait.

Our third question addressed the prevalence of children's use of specific TICs to explain behavior based on the TIC-outcome valence combination. As predicted, participants treated some TICs as more relevant than others as explanations of behavior. Specifically, emotions generally emerged as the strongest TIC to elicit situation attributions irrespective of the type of behavioral outcome. This is consistent with Lagattuta and Wellman (2001), who found that as early as the preschool years, children make connections between people's emotions and their previous experience. For example, children understand that a character who was upset that a clown broke her doll would again feel negative emotions on reencountering the clown.

Although this finding was generally consistent across age, there were some notable exceptions that revealed greater differentiation between the potential explanations by particular age groups and that bring attention to the importance of valence in children's reasoning about behavior. Specifically, for the NN stories, both 6- and 7-year-olds showed greater use of emotions as compared to other TICs as explanations for behavior. The specificity of this finding may reflect greater empathic understanding of the effects of negative emotion on behavior (e.g., Pons, Lawson, Harris, & de Rosnay, 2003) rather than a positivity bias.

Surprisingly, biological factors did not figure prominently as explanations of behavior. Across conditions, there was little evidence of differentiation between biological causes as compared to social category and comparison characteristics, even in older children. On initial consideration, this result seems to contrast with research showing that even preschoolers have relatively sophisticated theories of biology. For example, children understand that heartbeats are not voluntary or that people cannot control drowsiness directly (Hatano & Inagaki, 1994). As noted previously, children also readily connect positive or negative biological states to cognitive performance (e.g., Amsterlaw et al., 2009). In this case, however, the cognitive demands were arguably greater. Specifically, children were required to connect biological states to putative psychological states, and then ultimately to behavior. The understanding of these kinds of psychogenic interactions is relatively protracted (see Notaro, Gelman, & Zimmerman, 2001), which may explain why children largely neglected positive or negative biological states as causal factors of behavior. Notably, for emotions, it was easier to make a one to one mapping from psychological states to behavior.

As a final point with respect to TIC preferences, it is notable that social categories and irrelevant characteristics did not elicit systematically greater trait attributions as compared to the other TICs, although this was likely due to a floor effect in the overall frequency of situation attributions. That said, for the NN stories, 5−6-, and 7-year-olds were more likely to make situation attributions (i.e., in this case, to choose characteristics such as weight or accent) than trait attributions for the social category stories as compared to the comparison stories. Given previous research that indicates that children spontaneously generate trait inductions about social categories (e.g., accents; Kinzler & DeJesus, 2013), it is unclear whether this response pattern actually reflected a more specific trait attribution than the options we offered, essentialist reasoning, or negative stereotypes associated with people who possess these characteristics.

Our final goal was to explore whether we could capture individual difference profiles in children's attributional responses. As anticipated, the majority of participants were classified as person theorists who used traits to explain behavioral outcomes. This again verifies the potency of trait categories for children and is consistent with adults' tendency to explain others' behavior with reference to traits, even in inappropriate circumstances (Funder, 1999). Moreover, and somewhat compatible with our results, children tend to use more person explanations of behavior with age (Seiver et al., 2013) and require fewer behavioral exemplars to do so (Boseovski & Lee, 2006). In contrast to the sizable number of person theorists, there were relatively few situation theorists. In part, this profile reflected younger children's tendency to cite irrelevant characteristics as causes of behavior, although these children also relied heavily on emotion explanations as discussed previously.

These results also suggest that children can be classified into two additional profiles of attributional bias: negativity and positivity theorists. Somewhat consistent with predictions, there was a trend toward a decrease with age in the number of children who showed a negativity bias and an increase in the number of children who showed a positivity bias. Although these biases have been documented in previous research, it was unknown whether they reflected a consistent approach among children in behavioral explanations. Our findings reveal that some children systematically use personality traits as explanations for positive outcomes and situational explanations for negative outcomes (positivity theorists), whereas others use personality traits as explanations for negative outcomes and situational explanations for positive outcomes (negativity theorists). These distinct profiles may help to explain discrepancies between studies that reported negativity biases and those that reported positivity biases (see Boseovski, 2010).

There are several potential avenues for future research that can address limitations of the current study and extend these findings. First, children preferred trait explanations in the current study, but our coding scheme was restricted to responses that ultimately fell clearly into one of two categories (i.e., traits vs. situations). It is possible that the pattern of results would have differed had we considered other types of responses that children generated rather than presenting children with a forced choice option when their initial responses did not align with our coding scheme. Although uncommon, in some cases, children's initial responses made reference to other explanations such as relationship norms (e.g., "Sally shared because they are friends.") or moral concerns (e.g., "Sally shared her snack because she didn't want her to go hungry."). Additionally, children sometimes referred to situations that were not presented in the story (e.g., in response to a comparison study that only described a protagonist's clothing, a child stated that "Sally shared because she is feeling happy."). This reasoning may reflect attempts to make sense of others' actions when there is a lack of available evidence for their behavior. Thus, it is important to explore further how children prioritize (or generate) putative causal factors of behavior.

It would also be useful to examine the extent to which children attribute intentionality to the different behaviors, as this is a key factor in causal attribution (e.g., Malle, Knobe, & Nelson, 2007). Previous research indicates that children interpret intention information differently depending on whether they receive it in the context of negative versus positive outcomes (Boseovski, Chiu, & Marcovitch, 2013). In the present study, we did not provide intention information explicitly; thus, it remains an open question as to whether children took it under consideration, or what kinds of assumptions they made about intentions, in the different conditions.

Second, it is unclear why children preferred trait explanations, particularly given that they had only one behavioral exemplar on which to base their judgments. Children may have perceived traits as strong causal factors in these cases irrespective of the amount of behavioral evidence, but it is also possible that default trait judgments reflected an inability to deal with complex information in some cases (e.g., the uniform valence conditions) that might have resulted in a situational attributions had we used a sample of older children. One way to approach this issue would be to require children to explain their answers and code whether they show evidence of using covariation principles, discounting, and/or making inferences about the stability of behaviors. Older children may explicitly recognize, for example, that it is more difficult to ascertain cause of behavior when both TICs and outcomes are uniformly positive.

Concerning the attributional profiles, these data need to be interpreted cautiously given the relatively small sample size, but they provide a springboard for larger scale studies of attributional profiles in the future. It is important to replicate these findings with a larger sample, and if this pattern holds, to determine whether the profiles are stable over time. If they do indeed remain relatively stable, it may be important to understand their impact on psychosocial adjustment. Longitudinal research would reveal the trajectory of the attributional profiles and provide insight about which particular profiles are optimal at different developmental timepoints. For example, overly positive views of others may be adaptive in early childhood, when children are just starting to make friends and have limited exposure to other people. As children grow older and face more diverse social surroundings, the emergence of selective skepticism in trait attributions is likely to become increasingly important.

It is possible that attributional profiles reflect individual differences in specific skills and can thus provide insight about mechanisms involved in social judgments. Mental state reasoning (Boseovski et al., 2013; Heyman & Gelman, 1998; Lapan & Boseovski, 2016), causal reasoning (Seiver et al., 2013), and information processing (Boseovski & Lee, 2008) all play roles in children's social judgments; future research can establish how these skills map on to the profiles. For example, the situation theorist profile may reflect advanced perspective taking given that the ability to consider contextual factors in explanations of behavior is associated with advanced theory of mind skills (e.g., de Rosnay & Hughes, 2006; Heyman & Gelman, 1998). If this were the case, it might be favorable

to foster this kind of thinking among young children. It is also possible that situation theorists in this study required more behavioral evidence to invoke a causal trait schema (see Seiver et al., 2013) or that they do not yet view traits as causal (see Yuill & Pearson, 1998). In short, additional research is needed to understand why these children choose to focus on transient internal states and social categories rather than trait attributions, and whether this profile has distinct developmental significance as compared to the trait theorist profile. The putative role of gender ought to be considered as well. Although it was not a uniform finding, our data suggest that girls are more sensitive to situational information than boys in some contexts.

Finally, it is important to understand to extent to which positivity or negativity theorist profiles are meaningful to children's everyday lives. It is possible, for example, that negativity theorists might ultimately develop a hostile attribution bias and that positivity theorists will develop a benign attributional bias (see Nelson & Crick, 1999). These kinds of biases have implications for psychosocial functioning. Further, these profiles may reflect, or be intensified by, children's social experiences. For example, it is possible that children in impoverished contexts may experience adverse social interactions that lend themselves to a pessimistic view of others. Conversely, adverse experiences may increase optimism and resilience; for example, recent research indicates that children of incarcerated parents describe their parents with positive terms more frequently than negative terms (Dunlea, Wolle, & Heiphetz, 2020).

In sum, the current study revealed that (a) as a group, children prioritize trait categories over other behavioral explanations when given the opportunity to invoke either type of explanation and that this pattern increases with age; (b) children do not employ covariation reasoning systematically to reason about the causes of behavior even in a simpler attributional paradigm; (c) emotions are the most prominent transient explanations for behavior; and (d) there are individual difference profiles in attributional patterns such that children can be described as person, situation, positivity, or negativity theorists. The novel conceptual and methodological approach used here can be applied in future research to help us better understand how children make sense of social behavior.

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Appendix A. Proportion of "Situation" responses by class for Best-Fitting Model

Item				Class			
Label	Situation	Outcome	Type	1	2	3	4
PP1	Positive	Positive	Emotion	0.37	0.67	0.36	0.42
PP2	Positive	Positive	Biological	0.08	0.50	0.00	0.33
PP3	Positive	Positive	Comparison	0.07	0.56	0.00	0.38
PP4	Positive	Positive	Social	0.07	0.44	0.07	0.33
PP5	Positive	Positive	Comparison	0.07	0.39	0.00	0.25
PP6	Positive	Positive	Emotion	0.08	0.83	0.21	0.79
PP7	Positive	Positive	Biological	0.10	0.56	0.00	0.50
PP8	Positive	Positive	Social	0.00	0.50	0.00	0.33
NP1	Negative	Positive	Social	0.06	0.28	0.00	0.46
NP2	Negative	Positive	Comparison	0.03	0.44	0.00	0.25
NP3	Negative	Positive	Emotion	0.07	0.67	0.07	0.71
NP4	Negative	Positive	Biological	0.03	0.56	0.14	0.38
NP5	Negative	Positive	Comparison	0.04	0.50	0.00	0.38
NP6	Negative	Positive	Emotion	0.08	0.72	0.07	0.71
NP7	Negative	Positive	Social	0.03	0.50	0.00	0.17
NP8	Negative	Positive	Biological	0.10	0.50	0.00	0.33
PN1	Negative	Negative	Comparison	0.03	0.61	0.50	0.13
PN2	Negative	Negative	Emotion	0.03	0.50	0.50	0.29
PN3	Negative	Negative	Social	0.07	0.61	0.64	0.13
PN4	Negative	Negative	Biological	0.08	0.89	0.79	0.21
PN5	Negative	Negative	Emotion	0.10	0.72	0.57	0.21
PN6	Negative	Negative	Social	0.10	0.67	0.64	0.04
PN7	Negative	Negative	Comparison	0.06	0.94	0.86	0.13
PN8	Negative	Negative	Biological	0.03	0.33	0.36	0.13
NN1	Positive	Negative	Biological	0.03	0.39	0.43	0.21
NN2	Positive	Negative	Comparison	0.34	0.94	0.79	0.33
NN3	Positive	Negative	Social	0.07	0.67	0.64	0.13
NN4	Positive	Negative	Emotion	0.15	0.83	0.71	0.25
NN5	Positive	Negative	Comparison	0.46	0.83	0.93	0.33
NN6	Positive	Negative	Biological	0.17	0.61	0.71	0.33
NN7	Positive	Negative	Emotion	0.08	0.61	0.21	0.17
NN8	Positive	Negative	Social	0.11	0.83	0.86	0.29

Note: Class 1 = Person; Class 2 = Situation; Class 3 = Positivity; Class 4 = Negativity.

References

Amsterlaw, J., Lagattuta, K., & Meltzoff, A. N. (2009). Young children's reasoning about the effects of emotional and physiological states on academic performance. *Child Development, 80*(1), 115–133. https://doi.org/10.1111/j.1467-8624.2008.01249.x

Atance, C. M., & Meltzoff, A. N. (2005). My future self: Young children's ability to anticipate and explain future states. *Cognitive Development, 20*(3), 341–361. https://doi.org/10.1016/j.cogdev.2005.05.001

Baltazar, N. C., Shutts, K., & Kinzler, K. D. (2012). Children show heightened memory for threatening social actions. *Journal of Experimental Child Psychology, 112*(1), 102–110. https://doi.org/10.1016/j.jecp.2011.11.003

Bartsch, K., & Wellman, H. M. (1995). *Children talk about the mind*. New York, NY, US: Oxford University Press.

Benenson, J. F., & Dweck, C. S. (1986). The development of trait explanations and self-evaluations in the academic and social domains. *Child Development, 57*(5), 1179–1187. https://doi.org/10.2307/1130441

Bennett, M., & Galpert, L. (1992). Developmental changes in understanding the influence of emotion upon cognitive performance and motivation. *Motivation and Emotion, 16*(2), 103–115. https://doi.org/10.1007/BF00995514

Bosacki, S. (2000). Theory of mind and self-concept in preadolescents: Links with gender and language. *Journal of Educational Psychology, 92*, 709–717. https://doi.org/10.1037/0022-0663.92.4.709

Boseovski, J. J. (2010). Evidence for "rose-colored glasses": An examination of the positivity bias in young children's personality judgments. *Child Development Perspectives, 4*(3), 212–218. https://doi.org/10.1111/j.1750-8606.2010.00149.x

Boseovski, J. J., & Lee, K. (2006). Children's use of frequency information for trait categorization and behavioral prediction. *Developmental Psychology, 42*(3), 500–513. https://doi.org/10.1037/0012-1649.42.3.500

Boseovski, J. J., & Lee, K. (2008). Seeing the world through rose-colored glasses? Neglect of consensus information in young children's personality judgments. *Social Development, 17*(2), 399–416. https://doi.org/10.1111/j.1467-9507.2007.00431.x

Boseovski, J. J., Chiu, K., & Marcovitch, S. (2013). Integration of behavioral frequency and intention information in young children's trait attributions. *Social Development, 22*(1), 38–57. https://doi.org/10.1111/sode.12008

Boseovski, J. J., Shallwani, S., & Lee, K. (2009). "It"s all good': Children's personality attributions after repeated success and failure in peer and computer interactions. *The British Journal of Developmental Psychology, 27*(4), 783–797. https://doi.org/10.1348/026151008X377839

Bretherton, I., & Beeghly, M. (1982). Talking about internal states: The acquisition of an explicit theory of mind. *Developmental Psychology, 18*(6), 906–921. https://doi.org/10.1037/0012-1649.18.6.906

Cain, K. M., Heyman, G. D., & Walker, M. E. (1997). Preschoolers' ability to make dispositional predictions within and across domains. *Social Development, 6*(1), 53–75. https://doi.org/10.1111/j.1467-9507.1997.tb00094.x

Chen, E. E., Ng, T. K. C., Corriveau, K. H., Yang, B., & Harris, P. L. (2020). Talking about personality: Evidence for attributions to self and others in early childhood. *Journal of Cognition and Development, 21*(2), 191–212. https://doi.org/10.1080/15248372.2019.1709466

Choi, D., & Kim, J. (2003). Practicing social skills training for young children with low peer acceptance: A cognitive-social learning model. *Early Childhood Education Journal, 31*(1), 41–46. https://doi.org/10.1023/A:1025184718597

Cramer, P., & Steinwert, T. (1998). Thin is good, fat is bad: How early does it begin? *Journal of Applied Developmental Psychology, 19*(3), 429–451. https://doi.org/10.1016/S0193-3973(99)80049-5

Crick, N. R., & Dodge, K. A. (1994). A review and reformulation of social information-processing mechanisms in children's social adjustment. *Psychological Bulletin, 115*(1), 74–101. https://doi.org/10.1037/0033-2909.115.1.74

de Rosnay, M., & Hughes, C. (2006). Conversation and theory of mind: Do children talk their way to socio-cognitive understanding? *The British Journal of Developmental Psychology, 24*(1), 7–37. https://doi.org/10.1348/026151005X82901

DiVitto, B., & McArthur, L. Z. (1978). Developmental differences in the use of distinctiveness, consensus, and consistency information for making causal attributions. *Developmental Psychology, 14*(5), 474–482. https://doi.org/10.1037/0012-1649.14.5.474

Dunlea, J. P., Wolle, R. G., & Heiphetz, L. (2020). Enduring positivity: Children of incarcerated parents report more positive than negative emotions when thinking about close others. *Journal of Cognition and Development, 4*(21), 494–512. https://doi.org/10.1080/15248372.2020.1797749

Erickson, J. E., Keil, F. C., & Lockhart, K. (2010). Sensing the coherence of biology in contrast to psychology: Young children's use of causal relations to distinguish two foundational domains. *Child Development, 81*(1), 390–409. https://doi.org/10.1111/j.1467-8624.2009.01402.x

Funder, D. C. (1999). *Personality judgment: A realistic approach to person perception*. San Diego, CA, US: Academic Press.

Gelman, S. A., Heyman, G. D., & Legare, C. H. (2007). Developmental changes in the coherence of essentialist beliefs about psychological characteristics. *Child Development, 78*(3), 757–774. https://doi.org/10.1111/j.1467-8624.2007.01031.x

Girard, F., Floccia, C., & Goslin, J. (2008). Perception and awareness of accents in young children. *The British Journal of Developmental Psychology, 26*(3), 409–433. https://doi.org/10.1348/026151007X251712

Gnepp, J., & Chilamkurti, C. (1988). Children's use of personality attributions to predict other people's emotional and behavioral reactions. *Child Development, 59*(3), 743–754. https://doi.org/10.2307/1130573

Hagenaars, J. A., & McCutcheon, A. L. (2002). *Applied latent class analysis*. Cambridge: Cambridge University Press.

Harris, P. L., Johnson, C. N., Hutton, D., Andrews, G., & Cooke, T. (1989). Young children's theory of mind and emotion. *Cognition and Emotion, 3*(4), 379–400. https://doi.org/10.1080/02699938908412713

Harris, P. L. (1989). *Children and emotion: The development of psychological understanding*. Cambridge, MA, US: Basil Blackwell.

Hatano, G., & Inagaki, K. (1994). Young children's naive theory of biology. *Cognition, 50*(1-3), 171–188. https://doi.org/10.1016/0010-0277(94)90027-2

Hertenstein, M. J., & Campos, J. J. (2001). Emotion regulation via maternal touch. *Infancy, 2*(4), 549–566. https://doi.org/10.1207/S15327078IN0204_09

Heyman, G. D., & Dweck, C. S. (1998). Children's thinking about traits: Implications for judgments of the self and others. *Child Development, 69*(2), 391–403. https://doi.org/10.2307/1132173

Heyman, G. D., & Gelman, S. A. (1998). Young children use motive information to make trait inferences. *Developmental Psychology, 34*(2), 310–321. https://doi.org/10.1037/0012-1649.34.2.310

Heyman, G. D., & Gelman, S. A. (1999). The use of trait labels in making psychological inferences. *Child Development, 70*(3), 604–619. https://doi.org/10.1111/1467-8624.00044

Heyman, G. D., & Gelman, S. A. (2000). Preschool children's use of trait labels to make inductive inferences. *Journal of Experimental Child Psychology, 77*, 1–19.

Higgins, E., & Bryant, S. L. (1982). Consensus information and fundamental attribution error: The role of development and in-group versus out-group knowledge. *Journal of Personality and Social Psychology, 43*(5), 889–900. https://doi.org/10.1037/0022-3514.43.5.889

Hudson, J. A. (1991). Learning to reminisce: A case study. *Journal of Narrative and Life History, 1*(4), 295–324.

Inagaki, K., & Hatano, G. (2006). Young children's conception of the biological world. *Current Directions in Psychological Science, 15*(4), 177–181. https://doi.org/10.1111/j.1467-8721.2006.00431.x

Kalish, C. W. (2002). Children's predictions of consistency in people's actions. *Cognition, 84*(3), 237–265. https://doi.org/10.1016/S0010-0277(02)00052-5

Kalish, C. W., & Shiverick, S. M. (2004). Children's reasoning about norms and traits as motives for behavior. *Cognitive Development, 19*(3), 401–416. https://doi.org/10.1016/j.cogdev.2004.05.004

Kinzler, K. D., & Dautel, J. B. (2012). Children's essentialist reasoning about language and race: Language and race. *Developmental Science, 15*(1), 131–138. https://doi.org/10.1111/j.1467-7687.2011.01101.x

Kinzler, K. D., & DeJesus, J. M. (2013). Children's sociolinguistic evaluations of nice foreigners and mean Americans. *Developmental Psychology, 49*(4), 655–664. https://doi.org/10.1037/a0028740

Kinzler, K. D., Corriveau, K. H., & Harris, P. L. (2011). Children's selective trust in native-accented speakers. *Developmental Science, 14*(1), 106–111. https://doi.org/10.1111/j.1467-7687.2010.00965.x

Kinzler, K. D., Shutts, K., Dejesus, J., & Spelke, E. S. (2009). Accent trumps race in guiding children's social preferences. *Social Cognition, 27*(4), 623–634. https://doi.org/10.1521/soco.2009.27.4.623
Klaczynski, P. A. (2008). There's something about obesity: Culture, contagion, rationality, and children's responses to drinks "created" by obese children. *Journal of Experimental Child Psychology, 99*(1), 58–74. https://doi.org/10.1016/j.jecp.2007.08.005
Lagattuta, K. H., & Wellman, H. M. (2001). Thinking about the past: Early knowledge about links between prior experience, thinking, and emotion. *Child Development, 72*(1), 82–102. https://doi.org/10.1111/1467-8624.00267
Lagattuta, K. H., & Wellman, H. M. (2002). Differences in early parent-child conversations about negative versus positive emotions: Implications for the development of psychological understanding. *Developmental Psychology, 38*(4), 564–580. https://doi.org/10.1037/0012-1649.38.4.564
Lagattuta, K. H., Wellman, H. M., & Flavell, J. H. (1997). Preschoolers' understanding of the link between thinking and feeling: Cognitive cuing and emotional change. *Child Development, 68*(6), 1081–1104. https://doi.org/10.2307/1132293
Lapan, C., & Boseovski, J. J. (2016). Theory of mind and children's trait attributions about average and typically stigmatized peers. *Infant and Child Development, 25*(2), 158–178. https://doi.org/10.1002/icd.1923
Lapan, C., & Boseovski, J. J. (2017). When peer performance matters: Effects of expertise and traits on children's self-evaluations after social comparison. *Child Development, 88*(6), 1860–1872. https://doi.org/10.1111/cdev.12941
Lapan, C., Boseovski, J. J., & Blincoe, S. (2016). "Can I believe my eyes?" three- to six-year-olds' willingness to accept contradictory trait labels. *Merrill-Palmer Quarterly: Journal of Developmental Psychology, 62*(1), 22–47. https://doi.org/10.13110/merrpalmquar1982.62.1.0022
Liu, D., Gelman, S. A., & Wellman, H. M. (2007). Components of young children's trait understanding: Behavior-to-trait inferences and trait-to-behavior predictions. *Child Development, 78*(5), 1543–1558. https://doi.org/10.1111/j.1467-8624.2007.01082.x
Lockhart, K. L., Chang, B., & Story, T. (2002). Young children's beliefs about the stability of traits: Protective optimism? *Child Development, 73*(5), 1408–1430. https://doi.org/10.1111/1467-8624.00480
Malle, B. F., Knobe, J. M., & Nelson, S. E. (2007). Actor-observer asymmetries in explanations of behavior: New answers to an old question. *Journal of Personality and Social Psychology, 93*(4), 491–514. https://doi.org/10.1037/0022-3514.93.4.491
Marble, K. E. M., & Boseovski, J. J. (2020). Content counts: A trait and moral reasoning framework for children's selective social learning. *Advances in Child Development and Behavior, 58*, 95–129.
Moses, L. J., Coon, J. A., & Wusinich, N. (2000). Young children's understanding of desire formation. *Developmental Psychology, 36*(1), 77–90. https://doi.org/10.1037/0012-1649.36.1.77
Musher-Eizenman, D. R., Holub, S. C., Miller, A., Goldstein, S. E., & Edwards-Leeper, L. (2004). Body size stigmatization in preschool children: The role of control attributions. *Journal of Pediatric Psychology, 29*(8), 613–620. https://doi.org/10.1093/jpepsy/jsh063
Nelson, D. A., & Crick, N. R. (1999). Rose-colored glasses: Examining the social information-processing of prosocial young adolescents. *The Journal of Early Adolescence, 19*(1), 17–38. https://doi.org/10.1177/0272431699019001002
Notaro, P. C., Gelman, S. A., & Zimmerman, M. A. (2001). Children's understanding of psychogenic bodily reactions. *Child Development, 72*(2), 444–459. https://doi.org/10.1111/1467-8624.00289
Pons, F., Lawson, J., Harris, P. L., & de Rosnay, M. (2003). Individual differences in children's emotion understanding: Effects of age and language. *Scandinavian Journal of Psychology, 44*(4), 347–353. https://doi.org/10.1111/1467-9450.00354
Powlishta, K. K. (1995). Gender bias in children's perception of personality traits. *Sex Roles, 32*(1-2), 17–28.
Rhodes, M., Leslie, S.-J., & Tworek, C. M. (2012). Cultural transmission of social essentialism. *Proceedings of the National Academy of Sciences, 109*(34), 13526–13531. https://doi.org/10.1073/pnas.1208951109
Ross, L., & Nisbett, R. E. (2011). *The person and the situation: Perspectives of social psychology*. New York, NY, England: Mcgraw-Hill Book Company.
Ruble, D. N., Feldman, N. S., Higgins, E. T., & Karlovac, M. (1979). Locus of causality and the use of information in the development of causal attributions. *Journal of Personality, 47*(4), 595–614. https://doi.org/10.1111/j.1467-6494.1979.tb00211.x
Russell, J. A. (1990). The preschooler's understanding of the causes and consequences of emotion. *Child Development, 61*(6), 1872–1881. https://doi.org/10.2307/1130843
Saarni, C., & Harris, P. L. (1989). *Children's understanding of emotion*. New York, NY, US: Cambridge University Press.
Schult, C. A., & Wellman, H. M. (1997). Explaining human movements and actions: Children's understanding of the limits of psychological explanation. *Cognition, 62*(3), 291–324. https://doi.org/10.1016/S0010-0277(96)00786-X
Schuster, B., Ruble, D. N., & Weinert, F. E. (1998). Causal inferences and the positivity bias in children: The role of the covariation principle. *Child Development, 69*(6), 1577–1596. https://doi.org/10.2307/1132133
Seiver, E., Gopnik, A., & Goodman, N. D. (2013). Did she jump because she was the big sister or because the trampoline was safe? Causal inference and the development of social attribution. *Child Development, 84*(2), 443–454. https://doi.org/10.1111/j.1467-8624.2012.01865.x
Stipek, D. J. (1981). Children's perceptions of their own and their classmates' ability. *Journal of Educational Psychology, 73*(3), 404–410. https://doi.org/10.1037/0022-0663.73.3.404
Stipek, D. J., & Daniels, D. H. (1990). Children's use of dispositional attributions in predicting the performance and behavior of classmates. *Journal of Applied Developmental Psychology, 11*(1), 13–28. https://doi.org/10.1016/0193-3973(90)90029-J
Stipek, D., & Mac Iver, D. (1989). Developmental change in children's assessment of intellectual competence. *Child Development, 60*(3), 521–538. https://doi.org/10.2307/1130719
Vaish, A., Grossmann, T., & Woodward, A. (2008). Not all emotions are created equal: The negativity bias in social-emotional development. *Psychological Bulletin, 134*(3), 383–403. https://doi.org/10.1037/0033-2909.134.3.383
Wellman, H. M. (1990). *The child's theory of mind*. Cambridge, MA: MIT Press, A Bradford Book.
Widen, S. C., & Russell, J. A. (2010). Children's scripts for social emotions: Causes and consequences are more central than are facial expressions. *The British Journal of Developmental Psychology, 28*(3), 565–581. https://doi.org/10.1348/026151009X457550d
Yuill, N., & Pearson, A. (1998). The development of bases for trait attribution: Children's understanding of traits as causal mechanisms based on desire. *Developmental Psychology, 34*(3), 574–586. https://doi.org/10.1037/0012-1649.34.3.574