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Valence Effects in Reasoning About Evaluative Traits

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Abstract

Reasoning about evaluative traits was investigated among a group of 7- and 8-year-olds ($N = 34$), a group of 11- to 13-year olds ($N = 25$), and a group of adults ($N = 23$) to determine whether their inferences would be sensitive to the valence of social and academic traits. Four aspects of trait-relevant beliefs were examined: (1) *malleability*, (2) *stability* over time, (3) *origin* in terms of nature versus nurture, and (4) an *inference criterion* that concerns how readily traits are inferred. Although there was evidence of an age-related decrease in the tendency to emphasize positive information, participants of all ages responded that positive traits are less malleable and more stable over time than negative traits, that the positive influences of biological and environmental factors are likely to override the negative influences, and that competence can be more readily inferred from positive outcomes than from negative outcomes.

Trait conceptions, such as *smart*, *antisocial*, and *shy*, can serve as tools for interpreting and making predictions about the social world. An understanding of children's trait conceptions can lead to important insights into the way children acquire an understanding of human mental life. The nature of children's trait conceptions is also thought to have important implications for their social and motivational development (Camhy & Ruble, 1994; Dweck, 1999; Grusec & Redler, 1980; Heyman & Dweck, 1998; Heyman, Dweck, & Cain, 1992; Nicholls, 1978; Rholes, Jones, & Wade, 1988; Stevenson et al., 1990; see also Dweck & Leggett, 1988, and Rholes, Newman, & Ruble, 1990). For example, the belief that important traits are fixed or stable is associated with a tendency to deemphasize processes that are likely to lead to the development of academic and social skills (Cain & Dweck, 1995; Erdley, Cain, Loomis, Dumas-Hines, & Dweck, 1997; Giles & Heyman, 2003; Heyman & Dweck, 1998; see Dweck, 1999).

The present study was designed to examine children's reasoning about *evaluative traits*, defined as traits that vary along a single dimension in which one value is clearly positive and another is clearly negative. The central question is whether there are systematic *valence* effects in reasoning about these traits; that is, whether children's inferences differ when children reason about positive versus negative traits that lie along a single trait dimension.

Rationale for Studying Valence Effects

Researchers from several theoretical perspectives have argued that valence is an important aspect of children's reasoning about people (Costanzo, 1991; Graham & Hoehn, 1995; Harter, 1998; Heyman et al., 1992; Saltz & Medow, 1971). It is important to systematically examine valence effects, because children are often faced with valence-based trait information in the context of social interactions, and the inferences they make based upon this information can

have dramatic effects on their subsequent interactions (see Maas, Marecek, & Travers, 1978). More broadly, an understanding of the ways in which reasoning about valence develops has broad implications for children's developing theories of mind and of human nature: once children learn that there is more to be learned about people than what is directly observable, they begin to make use of unobservable psychological constructs such as beliefs and desires (see Bartsch & Wellman, 1995). As children build upon these constructs to make inferences about what particular individuals are like over time and across situations, they must learn to draw from a wide range of evidence, including valence-based information. For example, if a child is attempting to determine whether a person is trustworthy, he or she must determine not only which behaviors are relevant to the trait, but also how much weight to give to evidence that is consistent versus inconsistent with the trait.

Valence effects in children's reasoning about traits have been seen in a number of studies (e.g., Benenson & Dweck, 1986; Costanzo, Coie, Grumet, & Farnill, 1973; Heyman & Gelman, 1998, 1999; Nelson, 1980; Wigfield, 1988). There are, however, many unanswered questions about the role of valence in children's inferences (see Ruble & Dweck, 1995; Yuill, 1992). This is due in part to the common use of methodologies that investigate only a single aspect of trait-relevant beliefs, which makes it difficult to draw conclusions about children's trait thinking in general. The present study was designed to investigate valence effects on children's reasoning in relation to multiple aspects of trait thinking.

The present study concerns potential valence effects that fall into a more general class of what have been called *positivity biases*. Many types of positivity biases have been described, including a tendency toward positive self-evaluations (Schuster, Ruble, Weinert, 1998; Stipek & Hoffman, 1980), a tendency toward positive evaluations of one's own group (Bettencourt, Miller, & Hume, 1999), and a tendency to make more favorable judgments about specific individuals than about groups as a whole (Miller & Felicio, 1990; see also Sears, 1983). This article focuses on yet another tendency: to interpret available evidence in a favorable light when making inferences about others, such as when positive evidence is given more weight than negative evidence (Heyman & Gelman, 1998, 1999; Newman, 1991; Peterson & Gelfand, 1984; Rholes & Ruble, 1984; Solomon, Johnson, Zaitchik, & Carey, 1996; Yussen & Kane, 1985). This tendency has been observed most often among children age 8 and younger. For example, Newman (1991) found that 1st graders, but not 5th graders or adults, expected future behavior to be more consistent with past behavior when the behavior was diagnostic of positively valenced traits. A related pattern was seen in a study by Solomon et al. (1996) in which children ages 4 to 7 and adults were asked to judge the changeability of a range of psychological characteristics, including temperaments (e.g., whether someone laughs a lot or cries a lot). Children were likely to say that change was possible to the extent that it was also desirable. In contrast, adults tended to judge all features as changeable regardless of their desirability.

Unanswered questions remain about the positivity biases that have been found. For example, Solomon et al. (1996) pointed out that one possible explanation for the positivity bias seen in their study is that children interpreted the task as being about the *probability* of change rather than *possibility* of change. It may also be that children expect greater consistency in behaviors that are associated with positive traits not because they hold different beliefs about the traits in question, but because they differ in the extent to which they see the behaviors as diagnostic of the trait in question (Aloise, 1993).

Evidence also exists that children have shown what appear to be *negativity biases* in some contexts (Aloise, 1993; Nelson, 1980). In one such study, Nelson (1980) gave children scenarios in which the valence of motive and outcome information was manipulated. Forty percent of a group of preschoolers rated a character negatively when there was at least one

negative cue (either the character's motive or the outcome), whereas only 10% showed the reverse pattern (i.e., giving positive ratings when one or more of the cues was positive). These results, and the difficulties with interpreting previous data on valence effects, suggest that further research is needed to determine the role of valence in children's reasoning about traits.

In the present study, four aspects of trait-relevant beliefs (*malleability*, *stability*, *origins*, and *inference criterion*) were examined for each combination of valence (*positive* and *negative*) by trait domain (*social* and *academic*) across three age groups: 7- to 8-year-olds, 11- to 13-year-olds, and adults. The following section discusses the four trait-relevant beliefs that were investigated.

Some Key Aspects of Trait Reasoning

Malleability

One important aspect of reasoning about traits is perceived *malleability*, or the extent to which individuals are seen as able to modify their own traits (see Dweck, 1999). In the academic domain, for people who view intelligence as relatively fixed (i.e., not malleable), poor performance outcomes become a threat to one's intellectual adequacy rather than a signal that improvement is needed. Consequently, children who view intelligence as relatively fixed are at risk for motivational helplessness in the face of difficulties, with consequences that include negative affect, negative self-cognitions, low expectations, and deteriorating performance (Leggett, 1985; Wood & Bandura, 1989; see also Dweck & Leggett, 1988). Similarly, in the social domain, people who view personality as relatively fixed are especially likely to blame themselves for social rejection (Erdley et al., 1997). They are also more likely to make global, rigid, and enduring personality judgments of others on the basis of limited information (Chiu, Hong, & Dweck, 1997; Erdley & Dweck, 1993) and to show higher levels of stereotyping (Levy & Dweck, 1999).

Stability

A second key aspect of trait reasoning is perceived *stability*: the extent to which one expects traits to be consistent over time. Although the notions of trait stability and malleability are often described as representing opposite ends of a single dimension, they also differ in that stability refers to the *likelihood* of change, whereas malleability refers to the *possibility* of change. For example, one might describe a trait such as *shyness* as both stable and malleable if one believes that most people are unlikely to change their level of shyness (stability), even though it is possible to do so, given the necessary motivation and circumstances (malleability).

Among children younger than age 9, a belief in the stability of negative sociomoral traits, as measured by agreement with the notion that a child who exhibits negative behavior will continue to do so over a long time, is associated with patterns of reasoning comparable to those seen among older children and adults who hold fixed views of traits (Giles & Heyman, 2003; Heyman & Dweck, 1998; Heyman et al., 1992). For example, Heyman and Dweck (1998) found that for 7- and 8-year-olds, a belief in the stability of negative sociomoral traits was associated with a tendency to make negative evaluative judgments about their own work and abilities after making a small error, and to deemphasize processes that mediate academic and social outcomes.

Origin

A third key dimension of trait beliefs concerns their perceived *origin*, which involves notions of how traits emerge (see Heyman & Gelman, 2000; see also Martin & Parker, 1995). There is substantial individual variation in such beliefs among children (Heyman & Gelman, 2000) and adults (Furnham, Johnson, & Rawles, 1985). For example, some people believe that

intelligence is primarily determined by nature, and others believe it is primarily determined by environment (Heyman & Gelman, 2000). Among adults, reasoning about the origins of human characteristics is linked to other beliefs about people, including political ideology. Furnham et al. found a link between political conservatism and the belief that nature plays a strong role in determining psychological traits (although this link may apply to social conservatism only, and not to political-economic conservatism; see Nilsson & Ekehammer, 1989).

Heyman and Gelman (2000) measured children's beliefs about trait origins by posing questions that present a nature-versus-nurture conflict in the form of a *switched-at-birth* task (see Hirschfeld, 1995). Participants heard scenarios about two sets of parents who differ along a key trait dimension. For example, in one scenario, one set of parents was described as *nice* and the other as *mean*. Each scenario described two babies who are switched at birth as the result of an error that goes undetected. Participants were asked whether each baby will grow up to show greater resemblance to the *birth* parents or the *upbringing* parents on the key trait dimension. Results suggest that during the elementary school years, children develop elaborated theories about trait origins, and that by age 10, children tend to emphasize the role of nature to a greater extent when reasoning about the *smart/not smart* dimension than when reasoning about the *nice/mean* dimension. Of particular interest in the present study is whether children's beliefs about trait origins are sensitive to valence.

Inference criterion

A fourth key aspect of trait reasoning is the *inference criterion*: how readily people infer that a trait is present based on specific trait-consistent information. Although the inference criterion is often related to beliefs about the malleability and stability of traits, it is conceptually distinct in that it refers not to general beliefs about the nature of human characteristics, but to the act of using situation-specific information to draw trait inferences (see Dweck, 1999). Children's readiness to make such inferences can be examined by asking children whether they would infer a specific trait in a specific context (Aloise, 1993; Heyman & Gelman, 1999).

Measures of the cross-situational consistency of trait-relevant behavior (Camhy & Ruble, 1994; Heller & Berndt, 1981; Rholes et al., 1988; Rholes & Ruble, 1984) can also be viewed as indices of children's inference criterion. When participants report that they expect cross-situational consistency, it offers indirect evidence that they have used the provided behavioral information to infer the trait in question (see Rholes & Ruble, 1984). For example, if a child reports that a character who shares his lunch is also likely to help rake leaves, he or she may be making use of an underlying trait conception such as *prosocial*. This type of cross-situational inference has been linked to children's functioning within academic and social situations. Rholes et al. (1988) found that among 7- and 8-year-olds who tended to make such cross-situational inferences, initial performance on a puzzle task had a particularly strong influence on their subsequent persistence. Camhy and Ruble (1994) found that 7- to 9-year-olds who tended to make cross-situational inferences expressed particular interest in gathering trait-related information about an unfamiliar peer when they expected to interact with him or her.

In the present study, we examined the inference criterion by providing situation-specific information about a character and asking participants to make inferences. The inferences concerned whether the character holds the trait in question and whether the character would exhibit behavior related to the trait in another context.

The Present Study

The present study was designed to examine positivity biases in reasoning about traits among 7- to 8-year-olds, 11- to 13-year-olds, and adults. The youngest age group was selected because it is thought to be an important period in the development of person perception (see Rholes et

al., 1990), and because younger children might not yet have systematic beliefs about some of the trait dimensions under investigation (see Heyman & Gelman, 2000, for evidence that children younger than age 7 may not hold systematic beliefs about trait origins). Early adolescents and adults were included to help examine the developmental trajectory of positivity biases, in light of claims that such biases decrease dramatically with development (Lockhart, Chang, & Story, 2002; Newman, 1991).

Our study concerns trait-relevant inferences in the academic and social domain. Through a systematic examination of more than one evaluative domain, it is possible to determine whether any reasoning patterns that might be seen are unique to a particular trait or relate more generally to the valence of the trait. The academic and social domains were chosen because they are thought to be salient for elementary school children (see Benenson & Dweck, 1986). There is evidence that 7- and 8-year-olds are capable of making a clear distinction between the academic and social domains (Heyman & Dweck, 1998). Also, children may have different patterns of evaluative reasoning in the academic versus the social domain (see Aloise, 1993).

Valence effects were investigated in relation to the four key aspects of trait-based reasoning that were described previously. The investigation of multiple aspects of trait-based reasoning could potentially bring insights into the conditions under which valence effects are likely to emerge. Although these four aspects of trait-based reasoning are by no means exhaustive, each has important implications for the development of social cognition. Additionally, the use of multiple measures allows the coherence of children's beliefs about evaluative traits to be investigated using multivariate analytical techniques.

Method

Participants

Thirty-four children (20 girls and 14 boys, ages 7;1 to 8;11, $M = 8;4$) and 25 adolescents (11 girls and 14 boys, ages 11;5 to 13;5, $M = 12;8$) from public elementary schools participated in individual interviews. These participants were largely middle-class and were predominantly European American and Asian American. The adult sample was made up of 23 college students (12 females and 11 males, ages 18;8 to 23;10, $M = 21;1$) and were also predominantly European American and Asian American. Written informed consent was obtained from all participants. In addition, written parental consent was obtained for the child and adolescent participants.

Design

Participants were presented with four sets of questions that relate to different aspects of trait reasoning: *malleability*, *stability*, *origin*, and *inference criterion*. The four question sets appeared in random order, determined separately for each participant.

Within each question set were four variants, based on a 2 by 2 combination of Domain (academic, social) by Valence (positive, negative). The four variants were randomly ordered for each question set, under the constraint that the positively valenced and negatively valenced variants of each domain would appear consecutively.

Each participant was randomly assigned to receive questions about male characters or female characters only (except for the origin questions, for which gender was never specified). Questions will be described in the following section as they were asked about males.

Measures

Malleability—Participants were told about a child who wants to change traits, from *nice* to *mean*, *mean* to *nice*, *smart* to *not smart*, or *not smart* to *smart*. In each case, a rationale was

given for why the character desires the change, to help rule out the possibility that participants would say the change is impossible because the character lacks the desire to change (see Solomon et al., 1996). For example, children were told, “I’m going to tell you about a boy who is smart. This boy thinks that he is smart, and wants to change from being a smart person to a not-so-smart person because he thinks he would have more fun and stop worrying about all of the problems in the world if he were not so smart. Do you think he could change and become a not-so-smart person? I mean not just act not so smart, but really be a not-so-smart person?” (The rationale for a child wanting to become *smart* was a desire to do better in school; to become *mean*, a desire to have more fun; to become *nice*, a desire to have more friends.) Responses were coded as yes = 1, not sure = .5, and no = 0.

Stability—Participants were asked whether an 8-year-old child who exhibits a particular trait (*nice*, *mean*, *smart*, or *not smart*) relative to his or her peers will continue to exhibit that trait relative to his or her peers in the short term and in the long term. For example, participants were told: “I know a boy who is 8 years old. This boy is mean compared to most other children his age. Will he be mean compared to most other children his age tomorrow? Will he be mean compared to most people his age when he is grown up?” Again, responses were coded as yes = 1, not sure = .5, and no = 0.

Origin—Participants were presented with two scenarios describing two couples whose babies are accidentally switched at birth. The scenarios were taken from Heyman and Gelman (2000), where they are described in detail. One story concerns a *nice* couple and a *mean* couple, and the other a *smart* couple and a *not-so-smart* couple. Each story was accompanied by a pair of line drawings that portrayed the two sets of parents as exhibiting contrasting traits. For example, in the story relating to the *nice/mean* dimension, one couple was depicted as throwing rocks at dogs and was labeled as *mean*, and the other couple was depicted as picking up other people’s trash and was labeled as *nice*. Participants were told that the babies were accidentally switched at the hospital, and that the switch was never detected. They were asked whether each baby would grow up to be like the birth parents or like the upbringing parents on the trait dimension in question.

Inference criterion—Participants were presented with four scenarios in which characters faced outcomes that varied as a factorial combination of Domain (academic, social) by Valence (positive, negative). The scenarios relating to the academic domain described a child who got some schoolwork back and got “everything right” (positive valence) or “lots and lots wrong” (negative valence). The scenarios relating to the social domain described a child who tried to join some other children in a game and was told to go ahead and join the game (positive valence), or that the other children didn’t want to play with him or her (negative valence).

Following each scenario, participants were asked whether the information presented in the scenario was sufficient to justify an inference about the character’s competence. Specifically, they were asked whether the character is the kind of person who is *good* or *not good* at *schoolwork* or *with people*.

A second question was designed to measure whether participants would infer that the character will experience trait-consistent outcomes in other contexts. Specifically, participants were asked whether the character would do *as well* or *as poorly* on *different schoolwork*, or *in another group*. For all inference criterion questions, trait-consistent responses were coded as 1, responses of uncertainty were coded as .5, and trait-inconsistent responses were coded as 0.

Results

The main goal of our study was to investigate valence effects in reasoning about positive and negative traits, including how such effects might differ across age. A second goal was to investigate possible differences in reasoning about the academic and social domains. Analyses were conducted to determine whether any effects of valence or domain were present. Because preliminary analyses revealed no significant effects of the gender of the participants or the characters who were described, gender was not included as a factor in the analyses.

Coherence of Measures

To examine the extent to which children's judgments concerning *malleability*, two components of *stability* (*short-term stability* and *long-term stability*), and two components of *inference criterion* (*competence* and *generalizability*) would show coherence, correlations were computed (see Table 1). Collapsing across domain and valence, results indicated that all measures correlated significantly with one another, although the effect sizes were generally small. For example, participants who endorsed the malleability of traits were less likely to infer that traits would show short-term stability, $r(324) = -.20, p < .01$, and long-term stability, $r(324) = -.21, p < .001$.

Malleability

A $3 \times 2 \times 2$ analysis of variance (ANOVA) was conducted on responses to the malleability measure, with Age (child, adolescent, adult) as a between-subjects factor and Valence (positive, negative) and Domain (academic, social) as within-subject factors. There were main effects of Age, with traits being rated as less malleable by older children, $F(2, 313) = 5.37, MSe = .12, p < .01$; Valence, with negatively valenced traits rated as more malleable, $F(1, 313) = 84.85, MSe = .12, p < .001$; and Domain, with social traits rated as more malleable, $F(1, 313) = 4.62, MSe = .12, p < .05$. There was also an Age by Valence interaction, $F(2, 313) = 4.62, MSe = .12, p < .01$, such that children were more likely than adults or adolescents to show valence effects, $F(1, 313) = 5.54, MSe = .12, p < .02$. No other interactions were significant. Means for each group are presented in Table 2.

Stability

A series of $3 \times 2 \times 2$ ANOVAs were conducted on responses to the short-term and long-term stability measures, with Age (child, adolescent, adult) as a between-subjects factor and Valence (positive, negative) and Domain (academic, social) as within-subject factors. There was a main effect of Valence for both short-term stability, $F(1, 313) = 4.72, MSe = .08, p < .05$, and long-term stability, $F(1, 313) = 34.24, MSe = .11, p < .001$, with participants inferring that positive traits would be more stable than negative traits. There were no effects of Age or Domain. Means for each group are presented in Table 3.

Origin

Loglinear analyses were conducted on the origin measure as a function of Age, Domain, and Valence. Results revealed significant effects of Domain, $G^2(1) = 30.35, p < .001$, with participants more likely to give nature responses for the academic domain, and Valence, $G^2(1) = 4.34, p < .05$, with participants more likely to give nature responses for positive traits. There was no significant effect of Age. The observed effect of Domain, with 84% of predictions for the nice/mean dimension and 55% of predictions for the smart/not smart dimension indicating similarity with upbringing parents, is consistent with Heyman and Gelman's (2000) finding that children hold more nativist views for the academic domain than for the social domain.

Across age groups, 89% of responses to individual scenarios were consistent with either a nurture or a nature interpretation (see Heyman & Gelman, 2000, for a similar pattern of results). By definition, these consistent responses were balanced in valence, because they involved predicting that one baby will grow up to exhibit a positive trait and the other will grow up to exhibit a corresponding negative trait. However, an effect of Valence is possible if one looks within the inconsistent responses. Such a pattern was indeed evident within these responses, with participants giving positive responses 100% of the time. These results can be understood in terms of the 19 participants (23% of total participants) who gave inconsistent responses to the origin measure for at least one scenario (15 for the academic domain, 3 for the social domain, and 1 for both domains). In all cases of inconsistent responses, participants gave a nature response concerning the child *born to* parents holding a positive trait, and a nurture response concerning the child *raised by* parents holding a positive trait. This pattern of responses appears to express the view that either the right inherited biological predisposition or the right environment is sufficient to make a child grow up to express the positive traits. Interestingly, participants were more likely to make inconsistent responses regarding the academic domain than regarding the social domain, $G^2(1) = 8.71$, $p < .01$, with 5% of participants responding inconsistently on the nice/mean scenarios and 20% of participants responding inconsistently on the smart/not smart scenarios, which suggests that a positivity bias may be especially likely to emerge when children are reasoning about the origins of intelligence.

Inference Criterion

A series of $3 \times 2 \times 2$ ANOVAs were conducted on responses to the competence judgment and cross-situational inference measures, with Age (child, adolescent, adult) as a between-subjects factor and Valence (positive, negative) and Domain (academic, social) as within-subject factors. Analyses of competence judgments revealed main effects of Age, $F(2, 313) = 20.01$, $MSe = .11$, $p < .001$, with competence being inferred less readily with age; Valence, with positive traits inferred more readily, $F(1, 313) = 60.32$, $MSe = .11$, $p < .001$; and Domain, with competence inferred more readily for the academic domain, $F(1, 313) = 6.91$, $MSe = .11$, $p < .01$. There were no significant interactions.

Analyses of cross-situational inferences revealed main effects of Age, $F(2, 313) = 21.69$, $MSe = .10$, $p < .001$, with cross-situational inferences made less frequently by older children, and Valence, with participants showing a greater tendency to make situational inferences across contexts for positively valenced traits, $F(1, 313) = 24.62$, $MSe = .10$, $p < .001$. Means for each scenario are presented in Table 4.

Predicting inference criterion judgments—Previous research has suggested that a relationship exists between viewing traits as fixed or stable and a tendency to infer traits based upon limited behavioral information (Erdley & Dweck, 1993; Heyman & Dweck, 1998; see Dweck, 1999). To test this possibility, we analyzed responses to the inference criterion measures using stepwise regression procedures, in which responses to the malleability, short-term stability, long-term stability, and origins measures were set as independent variables.

A hierarchical stepwise regression computed on the competence judgment measure revealed that competence judgments could be predicted by responses to the long-term stability measure, $F(1, 324) = 10.44$, $MSe = .16$, $p < .02$, with participants who inferred stability being more likely to infer competence; and by responses to the malleability measure, $F(1, 324) = 10.98$, $MSe = .16$, $p < .01$, with participants who did not infer malleability being more likely to infer competence. In other words, participants who conceived of behavior as stable over time and unchangeable were especially likely to draw inferences about a person's more general competence based on limited behavioral information.

A hierarchical stepwise regression computed on the cross-situational consistency judgment measure revealed that consistency judgments could be predicted by responses to the long-term stability measure, $F(1, 325) = 26.18$, $MSe = .12$, $p < .001$, with participants who inferred stability over time being more likely to generalize behavior to novel situations.

Discussion

Our study provides evidence that valence information plays an important role in reasoning about the nature of evaluative traits. Across a range of ages, participants showed a tendency to be positive and optimistic in their inferences about people with reference to four aspects of trait-relevant beliefs. On the *malleability* measure, participants were more likely to report that traits can be changed in a positive direction than in a negative direction. For example, they were more likely to agree that a person can change from *not so smart* to *smart* than to agree that a person can change from *smart* to *not so smart*. One child participant illustrated this finding by explaining, “When you’re smart it’s hard to be unsmart.” Participants were presented with a reason that each character wanted to change, which helps to rule out the possibility that participants did not predict change in a negative direction simply because they believed it would not be desired (see Solomon et al., 1996).

On the *stability* measure, participants identified positive traits as more stable than negative traits, both in the short term (the next day) and in the long term (over a period of years). For example, they were more likely to predict that a boy who is nice compared to his peers will remain that way in the future than to make the corresponding prediction for a boy who is mean. Because this measure asked about traits directly, rather than about properties associated with traits, these results cannot be explained in terms of differences in the extent to which behaviors are seen as diagnostic of the trait in question (see Aloise, 1993).

On the *origin* measure, children were more likely to predict that characters would exhibit positive traits than would be expected by chance. Specifically, whenever participants’ responses within an individual scenario were not consistent with either a nature or a nurture explanation, they predicted that both babies would grow up to have the positive characteristic (either *nice* or *smart*). In other words, participants were more likely to reason that a positive characteristic held by a birth parent or an upbringing parent is sufficient for a child to develop that characteristic than to make a corresponding inference about a negative characteristic.

Finally, results from the *inference criterion* measure showed that participants made trait inferences more readily in response to positive outcomes than negative outcomes. Specifically, they were more likely to predict that a character who experiences a positive social or academic outcome is the kind of person who is “good at schoolwork” (for the academic domain) or “good with people” (for the social domain) than to make a corresponding prediction about a character who experiences a negative outcome. Participants were also more likely to predict that an individual who experiences a positive social or academic outcome will experience a similar outcome in another context than to make a corresponding prediction about a negative outcome.

Limitations

Readers should keep several limitations in mind when interpreting our results. First, it may be that responses were affected by the presence of many valenced-based questions, which may have highlighted valence and caused it to affect participants’ judgments more than it might have otherwise. In addition, further research will be necessary to determine how well the results of the present study apply when individuals reason about people they know. The work of Droege and Stipek (1993), in which students were asked to make ratings of classmates, provides a good model for examining ecological validity while maintaining a great deal of experimental control. Finally, it is not possible to determine how the particular wording of the questions may

have affected certain results. For example, the rationale for desired trait change might have implicitly conveyed information about the traits of the individual in question. As one adult noted, “The wish that she wants to be nice shows that she is inherently nice.”

Relation to Previous Research

How can our results be understood in relation to the negativity biases that have been seen in children’s reasoning (e.g., Nelson, 1980)? One possibility is that negativity biases are especially likely to be seen when individuals are described with both positive and negative information. In contrast, in the present study, the information provided about each character was either exclusively favorable or exclusively unfavorable. Another topic for future research is the possibility that individual differences in positivity biases are associated with individual differences in the willingness to accept the coexistence of positive and negative characteristics within the same person (see Harter, 1998; Livesley & Bromley, 1973; Saltz & Medow, 1971), or to interpret or remember information of conflicting valence so as to make it consistent (Heyman & Gelman, 1999; Nelson, 1980).

One might also ask how the results of our study can be reconciled with results from a large body of literature suggesting that adults often place a greater emphasis on negative information than on positive information when making inferences about people (see Skowronski & Carlston, 1989; Ybarra & Stephan, 1999). One reason for this apparent conflict is that the types of inferences assessed in the present study differ in important ways from those that have generally led to negativity biases in previous studies. For example, in the present study, the inference criterion measure was used to ask participants to reason about competence. Previous research has shown that adults often give greater weight to positive information than to negative information when reasoning about competence (e.g., Reeder & Fulkes, 1980). This is because adults often assume that success is clear evidence of competence, whereas failure is often explained by factors other than incompetence, such as situational and motivational factors (see Heider, 1958; but see Rothbart & Park, 1986, for evidence that this pattern is not always evident, such as when high levels of effort are expected).

Our results build upon earlier research suggesting that a belief in the fixed or stable nature of traits is associated with an increased tendency to make global inferences about people based upon limited information. For example, Erdley and Dweck (1993) found that 4th and 5th graders who tended to view personality in a fixed way (e.g., agreeing with statements such as “People can do things to get people to like them, but they can’t change their real personality”) were especially likely to make global negative judgments of others who commit minor transgressions. In addition, Heyman and Dweck (1998) found that 2nd graders who endorsed stable views of antisocial behavior such as stealing tended to make negative trait judgments based upon limited behavioral or outcome information and to ignore mediating factors such as whether a transgression was committed by accident.

Domain Effects

The present study was designed to investigate children’s reasoning about the social and academic domains. Very different responses across the domains would provide evidence of domain-specific patterns of reasoning, whereas similar responses would provide evidence that valence effects in children’s reasoning about traits are more general than any particular trait. In general, response patterns tended to extend across domains. Some domain effects, however, did not interact with age. For example, participants assumed that academic traits are less malleable and more attributable to nature. These effects may be related to a tendency to reason about academic competence with reference to the brain, as in the common use of the word *brains* to describe a high level of intelligence (see Heyman & Gelman, 2000, for evidence that

children tend to view biological characteristics as more fundamental aspects of individuals than psychological traits).

What Changes With Development?

Although the design of the present study is cross-sectional, our results suggest that as people grow older, they are less likely to believe that traits can be changed with effort. The youngest age group was most likely to endorse the malleability of traits, and this effect was especially evident regarding positive traits. These results are consistent with other findings that show age-related decreases in the perceived malleability of traits (e.g., Droege and Stipek, 1993; Lockhart et al., 2002).

An additional age-related difference is that the tendency to draw inferences about competence and behavior in other contexts based on a single outcome decreased with age (see Rholes et al., 1991, for a discussion of related results). One possible explanation for this finding is that as individuals mature they become more aware that a direct one-to-one correspondence between outcomes and underlying traits does not exist.

Despite the age-related differences seen in the present study, age differences in reasoning with respect to valence were not nearly as strong or pervasive as what one might expect based upon earlier research (e.g., Lockhart et al., 2002). For example, there was no evidence of significant age-related change in beliefs about stability. It is also notable that the age-related changes that were seen tended to reflect changes in magnitude: the older children and adults gave greater weight to positive versus negative information about people, as did the younger children.

Why Give Greater Weight to Positive Information?

A number of researchers have suggested that it is adaptive for young children to emphasize the positive when reasoning about people (see Bjorklund & Green, 1992; Lockhart et al., 2002). For example, such an approach may allow individuals to learn from difficulties without internalizing failure. The assumption that others can and will change in positive ways may also lead children to use strategies with others that facilitate good social relations, such as compromising, bargaining, and negotiating. However, it may be the case that in certain social environments, it is more adaptive for people to be suspicious of positive information and to focus on self-protection. Consequently, future research is needed to investigate the possibility that valence-related biases might be affected by particular social experiences, such as peer rejection (see Coie & Dodge, 1998).

Given that the adults in our study showed the same types of positivity biases that are said to characterize the immature reasoning patterns of young children, one might also ask whether such a pattern of reasoning should be considered to be immature, or even biased. It is possible that some examples of what have been described as positivity biases may reflect a realistic understanding that social and environmental factors are likely to work in favor of positive change. One potential factor is the effect of socializing agents, such as parents and teachers, who generally try to discourage negative behavior and encourage positive behavior. In addition, one might expect children to be more motivated to create normatively desirable change in themselves than to create normatively undesirable change.

Conclusion and Future Directions

The present study provides clear evidence that children across a range of ages place more emphasis on positive information than on negative information in both the academic and social domains. Evidence suggests that some but not all of these tendencies become weaker across development. Further research will be needed to discover more about the consequences of these tendencies and the contextual factors that may influence them.

One way to investigate these issues would be to examine the nature of individual differences in the tendencies that were seen in this study. For example, it would be useful to examine whether the way children reason about others is associated with their reasoning about the self, and how individual differences in these beliefs might affect the way children encode, interpret, and respond to social information (see Ross, 1989, for related findings). For example, an individual who is especially likely to give more weight to positive information than to negative information may tend to remember social information that conforms to this belief and forget or distort social information that does not (see Greenhoot, 2000; Heyman, Gee, & Giles, 2003; and Martin & Halverson, 1983, for related findings).

A second way to investigate these issues would be to examine flexibility in the way children give weight to positive versus negative information. Given a wide range of evidence that children's beliefs and strategies show a great deal of flexibility (Heyman & Gelman, 2000; Karniol & Ross, 1979; Shrager & Siegler, 1998), it would be surprising to find that children were locked into only one way of thinking about valence information. For example, it is possible that children tend to emphasize positive information because they want to think well of others, but that this tendency can be overridden (see Stipek, Roberts, & Sanborn, 1984, for related evidence concerning wishful thinking in children's expectations for performance). It may also be that the way children assign weight to evaluative information is sensitive to a variety of factors, such as their emotional state, and the accessibility of different types of social information.

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References

- Aloise PA. Trait confirmation and disconfirmation: The development of attribution biases. *Journal of Experimental Child Psychology* 1993;55:177–193. [PubMed: 8501425]
- Bartsch, K.; Wellman, HM. *Children talk about the mind*. London: Oxford University Press; 1995.
- Benenson JF, Dweck CS. The development of trait explanations and self-evaluations in the academic and social domains. *Child Development* 1986;57:1179–1187. [PubMed: 3769605]
- Bettencourt BA, Miller N, Hume DL. Effects of numerical representation within cooperative settings: Examining the role of salience in in-group favoritism. *British Journal of Social Psychology* 1999;38:265–287.
- Bjorklund DF, Green BL. The adaptive nature of cognitive immaturity. *American Psychologist* 1992;47:46–54.
- Cain KM, Dweck CS. The relation between motivational patterns and achievement cognitions through the elementary school years. *Merrill-Palmer Quarterly* 1995;41:25–52.
- Camhy M, Ruble DN. Information-seeking during acquaintanceship: Effects of level of social understanding and personal relevance. *Social Development* 1994;3:89–107.
- Chiu C, Hong Y, Dweck CS. Lay dispositionism and implicit theories of personality. *Journal of Personality and Social Psychology* 1997;73:19–30. [PubMed: 9216077]
- Coie, JD.; Dodge, KA. Aggression and antisocial behavior. In: Damon, W.; Eisenberg, N., editors. *Handbook of child psychology: Vol. 3. Social, emotional and personality development*. 5th ed.. New York: Wiley; 1998. p. 779-862.(Series Ed.) (Vol. Ed.)
- Costanzo, PR. Morals, mothers, and memories: The social context of developing social cognition. In: Cohen, R.; Siegal, AW., editors. *Context and development*. Hillsdale, NJ: Erlbaum; 1991. p. 91-132.

- Costanzo PR, Coie JD, Grumet JF, Farnill D. A reexamination of the effects of intent and consequence on children's moral judgments. *Child Development* 1973;44:154–161. [PubMed: 4706063]
- Droege KL, Stipek DJ. Children's use of dispositions to predict classmates' behavior. *Developmental Psychology* 1993;29:646–654.
- Dweck, CS. *Self-theories: Their role in motivation, personality, and development*. Philadelphia: Psychology Press/Taylor & Francis; 1999.
- Dweck CS, Leggett EL. A social-cognitive approach to motivation and personality. *Psychological Review* 1988;95:256–273.
- Erdley CA, Dweck CS. Children's implicit personality theories as predictors of their social judgments. *Child Development* 1993;64:863–878. [PubMed: 8339700]
- Erdley CA, Cain KM, Loomis CC, Dumas-Hines F, Dweck CS. Relations among children's social goals, implicit personality theories, and responses to social failure. *Developmental Psychology* 1997;33:263–272. [PubMed: 9147835]
- Furnham A, Johnson C, Rawles R. The determinants of beliefs in human nature. *Personality and Individual Differences* 1985;6:675–684.
- Giles JW, Heyman GD. Preschoolers' beliefs about the stability of antisocial behavior: Implications for navigating social challenges. *Social Development* 2003;12:182–197.
- Graham S, Hoehn S. Children's understanding of aggression and withdrawal as social stigmas: An attributional analysis. *Child Development* 1995;66:1143–1161.
- Greenhoot AF. Remembering and understanding: The effects of changes in underlying knowledge on children's recollections. *Child Development* 2000;71:1309–1328. [PubMed: 11108098]
- Grusec JE, Redler E. Attribution, reinforcement, and altruism: A developmental analysis. *Developmental Psychology* 1980;16:525–534.
- Harter, S. The development of self-representations. In: Damon, W.; Eisenberg, N., editors. *Handbook of child psychology: Vol. 3. Social, emotional and personality development*. 5th ed.. New York: Wiley; 1998. p. 553–617.(Series Ed.) (Vol. Ed.)
- Heider, F. *The psychology of interpersonal relations*. New York: Wiley; 1958.
- Heller KA, Berndt TJ. Developmental changes in the formation and organization of personality attributions. *Child Development* 1981;52:683–691.
- Heyman GD, Dweck CS. Children's thinking about traits: Implications for judgments of the self and others. *Child Development* 1998;64:391–403. [PubMed: 9586214]
- Heyman GD, Dweck CS, Cain KM. Young children's vulnerability to self-blame and helplessness: Relationship to beliefs about goodness. *Child Development* 1992;63:401–415. [PubMed: 1611943]
- Heyman GD, Gee CL, Giles JW. Preschool children's reasoning about ability. *Child Development* 2003;74:516–534. [PubMed: 12705570]
- Heyman GD, Gelman SA. Young children use motive information to make trait inferences. *Developmental Psychology* 1998;34:310–321. [PubMed: 9541783]
- Heyman GD, Gelman SA. The use of trait labels in making psychological inferences. *Child Development* 1999;70:604–619. [PubMed: 10368912]
- Heyman GD, Gelman SA. Beliefs about the origins of human psychological traits. *Developmental Psychology* 2000;36:663–678. [PubMed: 10976605]
- Hirschfeld LA. Do children have a theory of race? *Cognition* 1995;54:209–252. [PubMed: 7874877]
- Karniol R, Ross M. Children's use of a causal attribution schema and the inference of manipulative intentions. *Child Development* 1979;50:463–468.
- Leggett, EL. Children's entity and incremental theories of intelligence: Relationships to achievement behavior; Paper presented at the annual meeting of the Eastern Psychological Association; Boston. 1985 Mar.
- Levy SR, Dweck CS. The impact of children's static versus dynamic conceptions of people on stereotype formation. *Child Development* 1999;70:1163–1180.
- Livesley, WJ.; Bromley, BD. *Person perception in childhood and adolescence*. New York: Basic; 1973.
- Lockhart KL, Chang B, Story T. Young children's beliefs about the stability of traits: Protective optimism? *Child Development* 2002;73:1408–1430. [PubMed: 12361309]

- Maas E, Marecek J, Travers JR. Children's conceptions of disordered behavior. *Child Development* 1978;49:146–154.
- Martin CL, Halverson CF. The effects of sex-typing schemas on young children's memory. *Child Development* 1983;54:563–574.
- Martin CL, Parker S. Folk theories about sex and race differences. *Personality and Social Psychology Bulletin* 1995;21:45–57.
- Miller CT, Felicio DM. Person-positivity bias: Are individuals liked better than groups? *Journal of Experimental Social Psychology* 1990;26:408–420.
- Nelson SA. Factors influencing young children's use of motives and outcomes as moral criteria. *Child Development* 1980;51:823–829.
- Newman LS. Why are traits inferred spontaneously? A developmental approach. *Social Cognition* 1991;9:221–253.
- Nicholls JG. The development of the concepts of effort and ability, perception of academic attainment, and the understanding that difficult tasks require more ability. *Child Development* 1978;49:800–814.
- Nilsson I, Ekehammer B. Social attitudes and beliefs in heredity: A replication and extension. *Personality and Individual Differences* 1989;6:675–684.
- Peterson L, Gelfand D. Causal attributions of helping as a function of age and incentives. *Child Development* 1984;55:504–511.
- Reeder GD, Fulkes JL. When actions speak louder than words: Implicational schemata and the attribution of ability. *Journal of Experimental Social Psychology* 1980;16:33–46.
- Rholes WS, Jones M, Wade C. Children's understanding of personal dispositions and its relationship to behavior. *Journal of Experimental Child Psychology* 1988;45:1–17.
- Rholes, WS.; Newman, LS.; Ruble, DN. Understanding self and other: Developmental and motivational aspects of perceiving others in terms of invariant dispositions. In: Higgins, ET.; Sorrentino, R., editors. *Handbook of motivation and cognition: Foundations of social behavior: Vol. II*. New York: Guilford Press; 1990. p. 369–407.
- Rholes WS, Ruble DN. Children's understanding of dispositional characteristics of others. *Child Development* 1984;55:550–560.
- Ross M. Relation of implicit theories to the construction of personal histories. *Psychological Review* 1989;96:341–357.
- Rothbart M, Park B. On the confirmability and disconfirmability of trait concepts. *Journal of Personality and Social Psychology* 1986;50:131–142.
- Ruble, DN.; Dweck, CS. Self-conceptions, person conceptions and their development. In: Eisenberg, N., editor. *Review of personality and social psychology: Vol. 15. Social development*. CA: Thousand Oaks; 1995. p. 109–139.
- Saltz E, Medow ML. Concept conservation in children: The dependence of belief systems on semantic representations. *Child Development* 1971;42:1533–1542.
- Schuster B, Ruble DN, Weinert FE. Causal inferences and the positivity bias in children: The role of the covariation principle. *Child Development* 1998;69:1577–1596.
- Sears DO. The person-positivity bias. *Journal of Personality and Social Psychology* 1983;44:233–250.
- Shrager J, Siegler RS. SCADS: A model of children's strategy choices and strategy discoveries. *Psychological Science* 1998;9:405–410.
- Skowronski JJ, Carlston DE. Negative and extremity biases in impression formation: A review of explanations. *Journal of Personality and Social Psychology* 1989;105:131–142.
- Solomon GE, Johnson SC, Zaitchik D, Carey S. Like father, like son: Young children's understanding of how and why children resemble their parents. *Child Development* 1996;67:151–171. [PubMed: 8605825]
- Stevenson HW, Lee S, Chen C, Stigler JW, Hsu C, Kitamura S. Contexts of achievement: A study of American, Chinese and Japanese children. *Monographs of the Society for Research in Child Development* 1990;55 (1–2, Serial No. 221).
- Stipek DJ, Hoffman JM. Development of children's performance-related judgments. *Child Development* 1980;51:912–914.

- Stipek DJ, Roberts TA, Sanborn ME. Preschool-age children's performance expectations for themselves and another child as a function of the incentive value of success and the salience of past performance. *Child Development* 1984;55:1983–1989.
- Wigfield A. Children's attributions for success and failure: Effects of age and attentional focus. *Journal of Educational Psychology* 1988;80:76–81.
- Wood R, Bandura A. Impact of conceptions of ability on self-regulatory mechanisms and complex decision making. *Journal of Personality and Social Psychology* 1989;56:407–415. [PubMed: 2926637]
- Yuill N. Children's production and comprehension of trait terms. *British Journal of Developmental Psychology* 1992;10:131–142.
- Ybarra O, Stephan WG. Attributional orientations and the prediction of behavior: The attribution-prediction bias. *Journal of Personality and Social Psychology* 1999;76:718–727.
- Yussen, SR.; Kane, PT. Children's conception of intelligence. In: Yussen, SR., editor. *The growth of reflection in children*. Orlando, FL: Academic Press; 1985. p. 207-241.

Table 1

Intercorrelations Between Five Measures

	1	2	3	4	5
<i>Overall</i>					
1. Malleability	–	–.20**	–.21**	–.22**	–.15*
2. Short-term stability		–	.21**	.11*	.11*
3. Long-term stability			–	.22**	.30**
4. Competence				–	.32**
5. Generalizability					–
<i>Social domain only</i>					
1. Malleability	–	–.11	–.19*	–.18*	–.12
2. Short-term stability		–	.27**	.27**	.20*
3. Long-term stability			–	.25**	.33**
4. Competence				–	.34**
5. Generalizability					–
<i>Academic domain only</i>					
1. Malleability	–	–.29**	–.23**	–.25**	–.17*
2. Short-term stability		–	.17*	.01	.05
3. Long-term stability			–	.18*	.26**
4. Competence				–	.29**
5. Generalizability					–
<i>Positive valence only</i>					
1. Malleability	–	–.12	.09	.01	.15
2. Short-term stability		–	.21*	.14	–.01
3. Long-term stability			–	.10	.20*
4. Competence				–	.26**
5. Generalizability					–

	1	2	3	4	5
<i>Negative valence only</i>					
1. Malleability	-	-.09	-.03	-.04	-.13
2. Short-term stability		-	.08	-.04	.07
3. Long-term stability			-	.00	.15
4. Competence				-	.18*
5. Generalizability					-

* $p < .05$;
** $p < .01$

Table 2

Mean Malleability Scores by Age Group, With Standard Deviations in Parentheses

Direction of trait change	Age group		
	Children	Adolescents	Adults
Nice / Mean	.62 (.41)	.32 (.41)	.48 (.46)
Mean / Nice	.90 (.24)	.92 (.24)	.80 (.33)
Smart / Not smart	.50 (.46)	.28 (.34)	.15 (.28)
Not smart / Smart	.87 (.28)	.88 (.26)	.76 (.37)

Note: Malleability scores ranged from 0 to 1, with 0 indicating that change was impossible.

Table 3

Mean Stability Scores by Age Group, With Standard Deviations in Parentheses

Trait	Age group		
	Children	Adolescents	Adults
Nice			
short-term stability	.94 (.16)	.88 (.22)	.83 (.24)
long-term stability	.88 (.22)	.68 (.32)	.74 (.26)
Mean			
short-term stability	.85 (.29)	.76 (.30)	.78 (.29)
long-term stability	.37 (.38)	.42 (.37)	.41 (.33)
Smart			
short-term stability	.88 (.25)	.90 (.20)	.91 (.19)
long-term stability	.76 (.33)	.72 (.33)	.74 (.26)
Not smart			
short-term stability	.68 (.44)	.72 (.33)	.72 (.36)
long-term stability	.46 (.42)	.50 (.38)	.41 (.29)

Note: Stability scores ranged from 0 to 1, with 0 indicating that the character would not continue to exhibit the trait in question relative to his or her peers.

Table 4

Mean Inference Criterion Scores by Age Group, With Standard Deviations in Parentheses

Trait	Age group		
	Children	Adolescents	Adults
<i>Tendency to make inferences about competence</i>			
Nice	.96 (.14)	.76 (.36)	.48 (.38)
Mean	.66 (.38)	.26 (.36)	.22 (.36)
Smart	.99 (.09)	.90 (.20)	.65 (.38)
Not smart	.74 (.37)	.46 (.43)	.33 (.36)
<i>Tendency to make inferences across situations</i>			
Nice	.82 (.27)	.54 (.35)	.48 (.35)
Mean	.44 (.34)	.24 (.29)	.41 (.36)
Smart	.79 (.25)	.52 (.38)	.61 (.30)
Not smart	.56 (.34)	.22 (.29)	.52 (.32)

Note: Inference criterion scores ranged from 0 to 1, with 0 indicating that no trait inferences would be made.