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## Trait or testimony? Children's preferences for positive informants

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### ABSTRACT

Research indicates that children often show a positivity bias, or a tendency to favor positive information over negative information, in assessments of informant credibility in social and nonsocial situations. The current study investigated whether young children prioritize positive informant traits (i.e., nice vs. mean informant) as compared with positive speech content (i.e., positive vs. negative evaluation) in conflicting assessments of a work product. A total of 123 4- to 8-year-olds heard stories about a nice informant who gave a negative evaluation of a painting and a mean informant who gave a positive evaluation of the painting. Participants were asked who they would endorse, who they would ask about a future painting, and their friendship preferences. Children endorsed and asked the mean informant who provided positive testimony, but they chose to befriend the nice informant who provided negative testimony. Endorsements of positive testimony increased with age. Findings are considered in the context of the broader literature on selective social learning and trait understanding.

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### Introduction

Children must rely on others' knowledge to learn about the world around them. One challenge in learning from others is that those who provide information, often referred to as informants, might not be correct. This may result from informants' lack of knowledge (e.g., Robinson, Champion, & Mitchell,

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1999) or ill intentions (e.g., [Mascaro & Sperber, 2009](#)). Thus, children must make epistemic decisions, or decisions that affect their learning, by considering different characteristics of informants in an attempt to gain access to the truth.

In various contexts where children must selectively choose between competing information from two different informants, children make rational use of relevant cues to gain knowledge. For example, [Jaswal and Neely \(2006\)](#) presented 3- and 4-year-olds with two informants who provided conflicting labels for everyday objects; one informant consistently labeled the objects correctly, and the other consistently labeled the objects incorrectly. After informants provided conflicting labels for a novel object, children were asked to choose the appropriate label for the novel object. Participants responded with the historically accurate informant's label for the novel object over the historically inaccurate informant's label. From preschool onward, children demonstrate appreciation for cues such as accuracy when deciding who to trust. With age, children also make appropriate use of informants' labels of the physical world in a number of their epistemic judgments (e.g., [Koenig & Harris, 2005](#)).

Notably, the content of informants' speech in the research described above involved labels for novel and familiar items that were largely benign and that did not have any inherent emotional valence. In contrast, content that includes positive and negative evaluations, such as whether a work product or a person is good or bad, may prevent credibility from being inferred as easily. Research of this kind has revealed that evaluative information is influential; children selectively prefer to learn from those who provide positive evaluations over those who provide negative evaluations irrespective of informants' history of accuracy (e.g., [Boseovski, 2012](#)). Similarly, children selectively prefer to learn from informants who are nice over those who are mean (e.g., [Landrum, Mills, & Johnston, 2013, Study 1](#); [Mascaro & Sperber, 2009, Study 1](#)). This preference could be attributed to a general positivity bias during early to middle childhood characterized by heightened attention to and preference for positive information or informants ([Boseovski, 2010](#)). This could also be the result of children's strong distrust in negative informants and information, such that they selectively prefer positive traits and evaluations as an alternative to those that are negative.

Although it is clear that evaluative testimony and traits influence children's social learning, these two types of information were always presented independently in previous research. Here, we examined whether 4- to 8-year-olds would prioritize evaluative informant testimony (positive or negative) or evaluative informant traits (niceness or meanness) when faced with conflicting judgments about a work product. Participants heard about a nice informant who provided negative testimony about a peer's painting (i.e., nice-negative) and a mean informant who provided positive testimony about the same painting (i.e., mean-positive) that participants did not see for themselves. Participants were then asked to endorse one informant as correct, indicate which informant they would choose to ask about a different painting, and indicate their affiliative preference.

Because children are increasingly exposed to performance feedback about themselves and others with age, it is important to know whether they might reject negative feedback even if delivered from a nice person or whether positive feedback is seen as suspect when delivered by an unsavory person. Indeed, given the dominance of social learning in children's understanding of the world, insight into biases that occur during early to middle childhood may encourage more positive learning experiences throughout development. This time period is also characterized by an increased understanding of traits and moral behavior that provides an opportunity to understand how children's ideas about people intersect with their social learning decisions. Moreover, there are few theoretical frameworks of social learning that include the role of evaluative information. By presenting both evaluative feedback and benevolence information concurrently, we can begin to understand where positivity biases may be most potent in everyday selective learning. Below, we review the evidence for the independent influence of informants' benevolent or malevolent traits and their evaluative speech content on children's social learning.

### *Impact of benevolent and malevolent informants*

In social learning, children overextend use of information about informants' benevolence and malevolence (e.g., [Lane, Wellman, & Gelman, 2013](#); [Mascaro & Sperber, 2009, Study 1](#)). In the absence of benevolence cues, children appropriately endorse experts in their domain of expertise (e.g., [Kushnir,](#)

Vredenburg, & Schneider, 2013; Landrum et al., 2013, Study 1). When presented with both expertise and benevolence cues, 3- to 5-year-olds endorsed labels from a nice nonexpert over a mean expert regardless of whether the labeled items were relevant to the mean informant's domain of expertise (Landrum et al., 2013, Study 3). The considerable impact of benevolence information is supplemented by a host of evidence that children rely on nice and mean traits to make broader inferences (e.g., knowledge attributions; Landrum, Pflaum, & Mills, 2016) in ways that other characteristics are not used (e.g., Danovitch and Keil, 2007; Heyman & Giles, 2004; Johnston, Mills, & Landrum, 2015; Lane et al., 2013).

It is important to note that children's broad application of niceness and meanness may reflect fundamental differences in reasoning about these two traits. Children may overextend niceness to infer positivity in an unrelated domain (e.g., smartness; Stipek & Daniels, 1990) and/or may overextend meanness to infer negativity in an unrelated domain. Thus, aforementioned patterns of selective trust could reflect a general preference for positivity and/or avoidance of negativity. Some work has shown asymmetric preference for positive characteristics compared with avoidance of negative characteristics (e.g., Koenig & Jaswal, 2011), but it is possible that both affect children's epistemic judgments. Regardless of their relative impact, it is evident that nice trait information and mean trait information have a profound bearing on selective learning.

#### *Impact of positive and negative evaluations*

In addition to the potency of benevolent traits, children show a heightened reliance on evaluative testimony (e.g., Boseovski, Marble, & Hughes, 2017; Boseovski & Thurman, 2014) compared with other meaningful cues that they readily use in its absence. Boseovski (2012) showed 3- to 7-year-olds instances of protagonists who behaved positively or negatively. After each instance, the protagonist was labeled as "nice" by one informant and "mean" by the other. One informant consistently labeled the protagonists correctly (i.e., accurate), and the other informant consistently labeled the protagonists incorrectly (i.e., inaccurate). Children were then shown a picture of two new protagonists who did not exhibit any behavior, and each informant provided conflicting labels for the protagonists; one was labeled as mean and the other was labeled as nice by the accurate informant. Children relied more on informants' positive trait labels (i.e., nice) than on previous accuracy in endorsements; the majority of children labeled the third-party protagonist as nice in both scenarios. Given that children use accuracy information when it is presented independently (e.g., Jaswal & Neely, 2006), the greater use of positive testimony in this scenario, where it was presented concurrently with accuracy information, reveals the potency of this cue.

Use of positive testimony extends beyond situations that involve accuracy cues. In one study (Boseovski et al., 2017, Study 1), 4- to 8-year-olds were told about an expert who judged an individual's art or music as "very good" or "very bad." This testimony conflicted with that of either one layperson or a group of laypersons (no consensus vs. high consensus) who made the opposite judgment. The majority of participants identified the informant who gave a positive evaluation as correct irrespective of expertise or consensus level. Thus, despite the use of consensus (e.g., Corriveau, Fusaro, & Harris, 2009) and expertise (e.g., Kushnir et al., 2013) in nonevaluative contexts, positive testimony had the greatest impact on children's selections in an evaluative context (Boseovski et al., 2017, Study 1).

In a study on the role of evaluative testimony and expertise in children's selective trust regarding animals, Boseovski and Thurman (2014) presented children with a maternal figure and a zookeeper who provided conflicting positive information about a novel animal (e.g., "small and cuddly ... really soft ... you could feed it") or negative information about the animal (e.g., "dirty and smelly ... hunt other creatures with their long sharp teeth and claws"). Whereas 3- to 5-year-olds relied more heavily on expertise and endorsed the zookeeper as correct, 6- and 7-year-olds were more likely to endorse the informant who provided positive testimony. Despite the existence of other relevant cues, this positive testimony was particularly potent during middle childhood.

Preference for positive over negative speech content may help children to persevere through the task of considering different pieces of information in an attempt to seek the truth (Boseovski, 2010). Evaluative testimony may be favored because it provides children with information about its

truthfulness, according to the selective skepticism hypothesis (Heyman, Fu, & Lee, 2013). This hypothesis asserts that negative evaluative testimony is met with skepticism because it conflicts with children's biased belief that sources of evaluation are good.

It is important to consider the role of skepticism more broadly in the current task context. The dual-process account posits that selective trust depends on the processes recruited for reasoning (Hermes, Behne, & Rakoczy, 2018). Whereas less sophisticated Type I processes result in broad judgments (e.g., an overall positivity bias), Type II processes engage thought about the relevance of different cues based on domain (Hermes et al., 2018). In the current study, children could not rely solely on a positivity heuristic (i.e., because either the trait or statement is negative) when making judgments. Thus, their judgments may necessitate greater reflection on the context (e.g., when asked which informant they prefer to befriend, a positive trait may prove to be more important than a positive statement). Children's epistemic decisions in the context of two salient cues, therefore, may help us to understand how children might recruit putatively more sophisticated processes to selectively prioritize certain cues and how these processes might function developmentally in decision making based on domain.

Based on the literature reviewed above, there is clear evidence that children prioritize benevolent traits and positive speech independently over other informative social cues (e.g., knowledge status of speaker). Importantly, the potency of benevolence and that of positive speech have only been assessed independently, and it is unclear how children will respond when forced to choose between these positive cues. We chose to assess 4- to 8-year-olds in particular to examine the ways in which epistemic and social preferences function developmentally. This period of childhood captures two important age-related changes relevant to the current study. First, children show an increase in trait understanding with age (e.g., Boseovski & Lee, 2006, 2008; Yuill, 1997) and use relevant characteristics and traits of others in their decisions (e.g., Boseovski, Hughes, & Miller, 2016; Feldman & Ruble, 1988). Indeed, Mascaro and Sperber (2009, Study 3) found that with age children showed greater mistrust in a mean informant and were more likely to attribute this mistrust to knowledge that mean informants are likely to lie.

Second, there is an age-related increase in the positivity bias, which is important to preferences in contexts that incorporate varying degrees of benevolence and evaluative testimony (Boseovski, 2010). Developmental differences in positivity biases are seen through older children's greater selective trust in positive evaluative testimony (e.g., Boseovski & Thurman, 2014) and nice informants (e.g., Mascaro & Sperber, 2009, Study 3) as compared with younger children. Given that this preference exists and changes throughout development, it is important to investigate how preferences for positive information and benevolence function when presented concurrently and how these preferences might shift as positivity biases strengthen into middle childhood.

### *The current study*

In the current study, 4- to 8-year-olds were introduced to a nice informant who said a peer's painting was bad (i.e., nice-negative) and a mean informant who said the same painting was good (i.e., mean-positive). Participants were then asked a variety of questions in both the epistemic and social domains due to observed differences in response that these have elicited in the past (Koenig, Clément, & Harris, 2004). Epistemic questions included children's assessment of who was correct about the painting (i.e., endorsement) and who children would ask about another painting (i.e., ask question). In the social domain, we assessed affiliation preferences by asking children which informant they would prefer to befriend. Children were also asked to make trait attributions about each informant. Notably, the evaluative judgments involved a painting that participants did not view so that the criteria for evaluation were ambiguous (e.g., Boseovski et al., 2016; Mills & Landrum, 2012) and there was no objectively correct answer concerning the quality of the painting.

A consistent-valence baseline condition was included to examine how children would respond when the informants did not possess conflicting traits and testimonies and to verify that, under conditions where both informant traits and testimony were positive rather than negative, children would endorse the nice informant who provided positive testimony. Thus, in this baseline condition, children

were introduced to a nice informant who provided positive testimony and a mean informant who provided negative testimony.

As noted in our review of the literature and the discussion of developmental change in trait reasoning and the positivity bias, there are sensible reasons to believe that either positive informant traits or positive informant testimony may be compelling to children in this context. As children become more biased toward positivity with age, older children should show a greater relative focus on niceness or positive testimony compared with younger children. One possibility is that children would show a greater preference for the nice–negative informant given their early use of the terms “nice” and “mean” (Bretherton & Beeghly, 1982) and general preference for nice people (Mascaro & Sperber, 2009). Older children’s more complex trait understanding (as compared with younger children; e.g., Stipek & Daniels, 1990) may lead older children to value the stable nature of niceness more than younger children. If children prefer the nice trait information over positive testimony, age-related increases in positivity may lead older children to favor niceness more than younger children.

A second possibility is that a positivity bias may lead children to expect that the painting is good, resulting in preference for the mean–positive informant. Children are reluctant to believe negative information and may prioritize positive information that is consistent with their own worldview. With age, children’s experiences may shape their confidence in expectations, leading older children to be more skeptical of information that conflicts with their expectations (Harris, Koenig, Corriveau, & Jaswal, 2018).

During middle childhood, an increase in biased positive expectations may produce greater preference for evaluations that are consistent with these expectations (Heyman et al., 2013). If children prioritize positive testimony information, this preference would be expected to increase with age because older children make greater use of such testimony than their younger counterparts (Boseovski & Thurman, 2014). Thus, it is also possible that children’s preference for positive evaluative feedback (Boseovski, 2012) may be more important in their epistemic and social decisions than their preference for positive traits.

## Method

### *Participants*

Among the original sample, 5 children from the main condition (4 4-year-olds and 1 6-year-old) were excluded for failure to pass a manipulation check and 1 5-year-old was excluded for failure to cooperate with the protocol. In addition, 2 children would not choose between the two informants when asked for their affiliation preference, but their data were included for other dependent variables for which they did provide answers. The final sample for the main condition consisted of 123 children aged 4–8 years: 24 4-year-olds ( $M = 54.7$  months,  $SD = 3.5$ ; 8 boys and 16 girls), 25 5-year-olds ( $M = 64.5$  months,  $SD = 3.2$ ; 16 boys and 9 girls), 25 6-year-olds ( $M = 77.4$  months,  $SD = 2.6$ ; 13 boys and 12 girls), 25 7-year-olds ( $M = 90.0$  months,  $SD = 3.5$ ; 16 boys and 9 girls), and 24 8-year-olds ( $M = 101.7$  months,  $SD = 3.2$ ; 10 boys and 14 girls). Participants were of diverse ethnic/racial backgrounds: 56.9% White, 24.4% Black, 5.7% mixed, and 4.1% other (8.9% of families chose not to report on this variable).

A separate sample of participants was recruited to participate in the consistent-valence baseline condition. Among the original sample, 1 4-year-old in this condition was excluded for failure to pass the manipulation check. The final sample for the consistent-valence baseline condition consisted of 20 children aged 4–8 years: 4 4-year-olds ( $M = 55.0$  months,  $SD = 2.5$ ; 2 boys and 2 girls), 4 5-year-olds ( $M = 66.3$  months,  $SD = 1.0$ ; no boys and 4 girls), 4 6-year-olds ( $M = 77.9$  months,  $SD = 1.0$ ; 4 boys and no girls), 4 7-year-olds ( $M = 89.5$  months,  $SD = 3.1$ ; 1 boy and 3 girls), and 4 8-year-olds ( $M = 102.8$  months,  $SD = 4.8$ ; 3 boys and 1 girl). Participants were of diverse ethnic/racial backgrounds: 60% White, 10% Black, 5% mixed, and 5% other (20% of families chose not to report on this variable).

The majority of participants in both conditions were from middle- to upper-class families who were recruited through a laboratory database of children in a mid-sized city in the southeastern United States. Children participated in a larger study examining children’s selective social learning and

were tested by a female experimenter in private rooms located at their preschools or in a developmental science laboratory. All participants had signed consent from a parent or legal guardian and were asked if they would like to participate prior to testing. In addition to verbal assent, participants aged 7 or 8 years filled out written assent forms. Testing took about 15 min per participant.

### *Materials*

Children were first shown a cartoon of an artist next to an easel that contained a painting facing the opposite direction of children. Throughout the task, children were shown cartoon pictures of a mean informant and a nice informant. The informants were female, as is customary in much of the selective social learning research (e.g., Brosseau-Liard & Birch, 2010; Johnston et al., 2015). Informants were differentiated by hair and dress color, which were randomized for each participant with randomizer.org. Informants had differing facial expressions to reflect their traits because keeping affect on informants' faces throughout stories helps to aid children's memory (e.g., Landrum et al., 2013, 2016). Later, when children were given testimony information, there was a speech bubble above the informant with a smiling face and thumb up to indicate a positive evaluation or a frowning face and thumb down to indicate a negative evaluation. Piloting was conducted to ensure that testimony information was not confounded by facial expression used to represent trait information during informant introductions and manipulation checks.

### *Design*

In the main condition, children were introduced to a nice informant who gave a peer negative feedback and a mean informant who gave a peer positive feedback. In the consistent-valence baseline condition, a different sample of children was introduced to a nice informant who gave a peer positive feedback and a mean informant who gave a peer negative feedback. Informants were given trait labels because young children make use of trait labels in making psychological inferences (Heyman & Gelman, 1999, 2000) and predicting future behavior (Liu, Gelman, & Wellman, 2007).

### *Procedure*

#### *Main condition*

Before testing, the researcher introduced herself and said that she would be telling participants stories, followed by several questions about the stories to which there were no right or wrong answers. Children were then asked if they would like to participate in the study.

Following assent, children were shown a picture of a third-party female protagonist named Mary next to an easel that was facing her. Mary was introduced as a person who "paints every once in a while and paints a picture during art class one day." The view of the painting was obstructed so that children would not be able to make their own personal inferences about the quality of the painting.

Children were then presented with a picture of the first informant while the experimenter introduced the informant: "This is Amy. Amy is really nice." The order of which informant (i.e., nice or mean) was introduced first was counterbalanced, and names of informants were randomized. Children were then shown new pictures of the same informant staring with a speech bubble above her head containing the relevant facial and nonverbal expressions (e.g., a frowning face with a thumb down) to indicate her testimony as the researcher said, "Amy has taken many art classes. Amy looks at the painting done by Mary, and she says that it looks very bad." Children were then presented with manipulation checks on the informant's trait and testimony in counterbalanced order. If children did not pass a manipulation check, the researcher repeated the information and children were then given a second opportunity to pass the manipulation check.

The same procedure was repeated with the trait and testimony information of the second informant. Children were shown a photo of a mean informant and told, "This is Colleen. Colleen is really mean." They were then shown a photo of the informant's relevant testimony as she faced the painting and were told, "Colleen has taken many art classes. Colleen looks at the painting done by Mary, and

she says that it looks very good.” Manipulation checks on the second informant’s trait and testimony were presented in the same order as the first informant.

Order effects have not been found in studies that presented children with two different characteristics of informants (see Johnston et al., 2015, Study 2), but to assess whether children’s responses on manipulation checks and dependent measures were dependent on presentation order, a smaller subset of children were given the trait information of both informants prior to their testimony information. In this group, the traits of both informants were presented first, followed by the nice and mean manipulation checks. Then, children were told each informant’s testimony, followed by the positive and negative testimony manipulation checks. Randomization, counterbalancing, stimuli, and scripts for presenting trait and testimony information were identical to the aforementioned presentation order.

Children who passed the manipulation checks after a maximum of one reminder indicated that they remembered relevant information about the informants. Questions assessing epistemic preferences and social evaluations were presented in a fixed order (i.e., endorsement, ask question, trait attribution, affiliation), and order of informant presented first was randomized for each dependent variable. When asked for explanations for endorsement, ask question, and affiliation preferences, children who did not indicate their preference based on the chosen informant’s trait or testimony received a follow-up question to clarify whether their selection was based on the informant’s trait or testimony (order of cue presented first was randomized).

*Endorsement.* Endorsement was measured through asking children, “Who do you think is right about the painting, Amy or Colleen? Why?” Along with the ask question, this measure fell under the epistemic domain.

*Ask question.* To assess children’s preference for who they would ask about a future painting, children were asked, “Who would you ask about another painting, Amy or Colleen? Why?” Along with endorsement, this measure fell under the epistemic domain.

*Affiliation.* To measure children’s desire to affiliate with one of the two informants, children were asked, “Who would you rather be friends with, Amy or Colleen? Why?” This measure assessed judgments in the social domain.

*Trait attribution.* To measure children’s perceptions of each informant’s niceness or meanness, children were asked, “What do you think of Amy/Colleen? What kind of person is she?” If children did not provide an answer that was indicative of benevolence/malevolence, the researcher asked, “Is she nice, mean, or not nice or not mean?” The order of the words “nice” and “mean” was randomized in follow-up questions.

*Data coding.* Two raters independently coded explanations for the endorsement, ask question, and affiliation dependent variables. Children’s responses were coded based on their explanations for selecting their chosen informant on each dependent variable and follow-up responses when their explanations were irrelevant. Explanations that reflected selecting an informant to avoid selection of the other informant (e.g., an endorsement of the mean–positive informant because the nice informant said the painting was bad) were coded as avoidance of nonchosen informant. Explanations that were irrelevant (e.g., “I don’t know”) were coded as “other.” All other responses were coded based on the informant children selected for each dependent measure. Explanations for selection of the mean–positive informant were coded for preference for positive testimony (e.g., “She said the painting was good”) or preference for mean trait (e.g., “She’s mean”). Explanations for selection of the nice–negative informant were coded for preference for negative testimony (e.g., “She said the painting was bad”) or preference for positive trait (e.g., “She’s nice”). Coders met and reviewed the coding protocol once to improve reliability.

### *Consistent-valence baseline condition*

Procedures including randomization, counterbalancing, manipulation checks, and dependent variables were identical to those of the main condition with the exception of informant characteristics. These differed from the main condition in that the nice informant said Mary's painting was "good" and the mean informant said Mary's painting was "bad." In this condition, children were given the traits of both informants, followed by the trait manipulation checks, and then were given each informant's testimony, followed by the testimony manipulation checks.

## **Results**

All analyses were conducted on data from children who demonstrated memory for the traits and testimonies of both informants by passing all four manipulation checks. Dependent variables did not differ based on the order in which informants' traits and testimonies were presented.

### *Consistent-valence baseline condition*

Participants received a score of 0 if they preferred the nice-positive informant and a score of 1 if they preferred the mean-negative informant. In general, participants overwhelmingly selected the nice-positive informant over the mean-negative informant in endorsements ( $M = 0.00$ ,  $SD = 0.00$ ), who they preferred to ask ( $M = 0.05$ ,  $SD = 0.22$ ), and affiliation preferences ( $M = 0.00$ ,  $SD = 0.00$ ). For trait attributions, children were assigned a score of 0 if they provided a response that was inconsistent with the trait and testimony of both informants, a score of 1 if they provided a response that was consistent with the trait and testimony of one informant and inconsistent with the trait and testimony of the other informant, and a score of 2 if they provided a response that was consistent with the trait and testimony of both informants. All children responded consistently with each informant's testimony and trait ( $M = 2.00$ ,  $SD = 0.00$ ) in their trait attributions (i.e., attributed niceness to the nice-positive informant and meanness to the mean-negative informant).

### *Main condition*

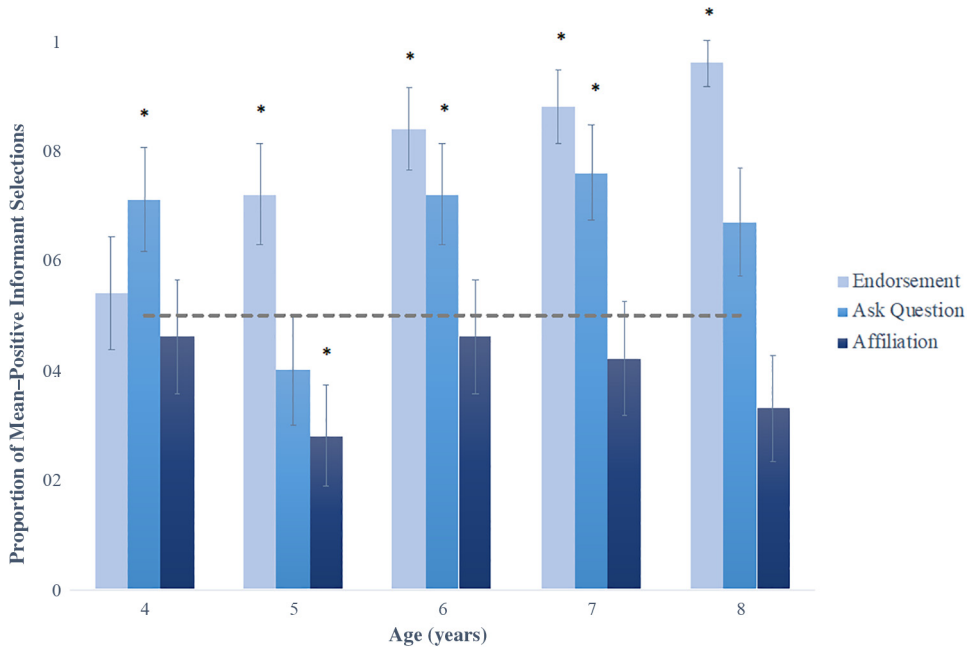
In this condition, separate logistic regression analyses of the contribution of standardized age in months as the independent variable were conducted on endorsement, ask question, and affiliation as dichotomous dependent variables. Children received a score of 0 for endorsing, asking, or affiliating with the nice-negative informant and a score of 1 for endorsing, asking, or affiliating with the mean-positive informant. See Fig. 1 and Table 1 for means, standard errors, and tests against chance for endorsement, ask question, and affiliation dependent measures by age group.

### *Endorsement*

The overall model was significant for endorsement,  $\chi^2(1, N = 123) = 13.77$ ,  $p < .001$ , Nagelkerke  $R^2 = .17$ . There was a significant effect of age ( $\beta = 1.02$ ,  $Wald = 11.35$ ,  $p = .001$ ). Older children endorsed the mean-positive informant more than younger children. Two-tailed  $t$  tests against chance revealed that children preferred to endorse the mean-positive informant more often than would be expected by chance,  $t(122) = 7.81$ ,  $p < .001$ . Only 4-year-olds did not differ from chance,  $t(23) = 0.40$ ,  $p = .692$ , all other age groups systematically endorsed the mean-positive informant.

*Endorsement justification.* Responses to why children endorsed an informant were coded into the following categories: preference for positive testimony (74.8%), preference for nice trait (17.1%), preference for negative testimony (4.1%), preference for mean trait (1.6%), avoidance of nonchosen informant (1.6%), and other (0.8%). Cohen's kappa was .94. See Table 2 for examples of responses and codes.





**Fig. 1.** Means of endorsement, ask question, and affiliation dependent variables by age. Error bars represent standard errors. Dependent variables were scored such that 0 indicated a preference for the nice informant with negative testimony and 1 indicated a preference for the mean informant with positive testimony. Chance performance is indicated by the dashed horizontal line. Asterisks indicate that performance differed from chance ( $p < .05$ ).

**Table 1**

Tests against chance for endorsement, ask question, and affiliation by age.

Age (years)	Endorsement	Ask question	Affiliation
4	$t(23) = 0.40, p = .692$	$t(23) = 2.20, p = .038$	$t(23) = -0.40, p = .692$
5	$t(24) = 2.40, p = .024$	$t(24) = -1.00, p = .327$	$t(24) = -2.40, p = .024$
6	$t(24) = 4.54, p < .001$	$t(24) = 2.40, p = .024$	$t(23) = -0.40, p = .692$
7	$t(24) = 5.73, p < .001$	$t(24) = 2.98, p = .006$	$t(23) = -0.81, p = .426$
8	$t(23) = 11.00, p < .001$	$t(23) = 1.70, p = .103$	$t(23) = -1.70, p = .103$

Note. Dependent variable scores: 0 = selection of nice-negative informant, 1 = selection of mean-positive informant.

### Ask question

The overall model was not significant for the ask question,  $\chi^2(1, N = 123) = 1.52, p = .218$ , Nagelkerke  $R^2 = .02$ . There was no significant effect of age ( $\beta = 0.26, Wald = 1.50, p = .221$ ). A two-tailed  $t$  test against chance indicated that children were more likely than expected by chance to ask the mean-positive informant,  $t(122) = 3.48, p < .001$ .

**Ask question justification.** Responses to why children asked an informant were coded into the following categories: preference for positive testimony (59.3%), preference for nice trait (24.4%), preference for negative testimony (10.6%), preference for mean trait (3.3%), avoidance of nonchosen informant (1.6%), and other (0.8%). Cohen's kappa was .97. See Table 2 for examples of responses and codes.

### Affiliation

The overall model was not significant for affiliation,  $\chi^2(1, N = 121) = 0.06, p = .808$ , Nagelkerke  $R^2 = .00$ . There was no significant effect of age ( $\beta = -0.05, Wald = 0.06, p = .808$ ). A two-tailed  $t$  test

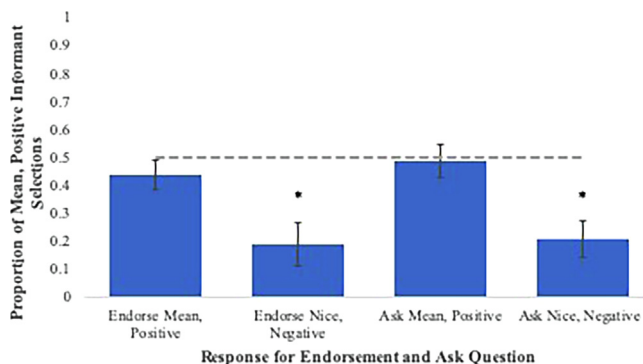
**Table 2**  
Examples of coding scheme for endorsement, ask question, and affiliation explanations.

Code	Endorsement	Ask Question	Affiliation
Preference for positive testimony	Because she said it was good. Because it seems good. Because it looks nice.	Because she likes the painting. Because she says it's good. Because she I think is actually nicer about paintings.	Because she said it's really nice. Because she said the painting was very good. Because she likes paintings.
Preference for negative testimony	Because she said it's bad. Because she said the right thing.	Because she said it looks bad. Because she doesn't like it.	Because she gave a thumbs down.
Preference for positive trait	Because she was a nice person. Because she's nicer.	Because she's nice. Because she's good.	Because even though she doesn't like the artwork, she's still nice. Because she's nice and I don't like being friends with mean people.
Preference for negative trait	Because she's mean.	Because she's mean. Because she's not nice.	Because she's mean and I like mean people.
Avoidance of nonchosen informant	Because it's not nice to say that other people's paintings are bad.	Because I wouldn't want to hear her being mean words.	Because it says this one is a bad person so I wouldn't want to be friends with her.
Other	I don't know.	Because she might do something as good as hers.	'Cause she's my friend.

against chance revealed that children preferred to affiliate with the nice-negative informant more often than would be expected by chance,  $t(120) = -2.51, p = .013$ .

Next, participants were grouped according to their responses for the endorsement and ask question (see Fig. 2). Those who endorsed the mean-positive informant did not systematically prefer to affiliate with either informant,  $t(94) = -1.12, p = .261$ . The same pattern was found for the ask question; children who preferred to ask the mean-positive informant did not systematically prefer to affiliate with either information,  $t(77) = -0.23, p = .823$ . Children who endorsed the nice-negative informant systematically preferred to affiliate with this informant,  $t(25) = -3.90, p < .001$ . Once again, the same pattern was found with the ask question where children who preferred to ask the nice-negative informant also preferred to affiliate with this informant,  $t(42) = -4.63, p < .001$ .

*Affiliation justification.* Responses to why children affiliated with an informant were coded into the following categories: preference for positive testimony (37.2%), preference for nice trait (56.2%),



**Fig. 2.** Means of affiliation grouped by response on endorsement and ask question. Error bars represent standard errors. Dependent variables were scored such that 0 indicated a preference for the nice informant with negative testimony and 1 indicated the mean informant with positive testimony. Chance performance is indicated by the dashed horizontal line. Asterisks indicate that performance differed from chance ( $ps < .001$ ).

preference for negative testimony (3.3%), preference for mean trait (1.7%), avoidance of nonchosen informant (0.8%), and other (0.8%). Cohen's kappa was .97. See Table 2 for examples of responses and codes.

### Trait attribution

To examine whether children relied on testimony valence or trait valence in their trait attributions, children were assigned a score of 0 for a response that matched the valence of the informant's testimony, a score of 0.5 for a response of "not nice or mean," and a score of 1 for a response that matched the valence of the informant's trait. A total trait attribution score ranging from 0 (i.e., responses consistent with the valence of both informants' testimonies) to 2 (i.e., responses consistent with the valence of both informants' traits) was compiled by adding each child's trait attribution for both informants. A one-way analysis of variance (ANOVA) with age as the independent variable and trait attribution as the dependent variable revealed no significant effect of age,  $F(4, 118) = 0.37, p = .832$ . A two-tailed  $t$  test against chance revealed that children relied on informants' given traits in their trait attributions greater than would be expected by chance,  $t(122) = 11.18, p < .001$ , by responding with a trait attribution that was consistent with each informant's trait. See Table 3 for tests against chance by age.

Participants were split into groups by their responses for endorsement and ask question to examine differences in trait attributions. Children relied on trait information in attributing traits greater than would be expected by chance regardless of whether they endorsed the mean-positive informant,  $t(96) = 8.59, p < .001$ , or the nice-negative informant,  $t(25) = 10.46, p < .001$ . The same pattern was found when children were split by who they preferred to ask, where children systematically relied on trait information in their trait attributions regardless of whether they preferred to ask the mean-positive informant,  $t(79) = 6.83, p < .001$ , or the nice-negative informant,  $t(42) = 12.94, p < .001$ .

## Discussion

Children are thoughtful consumers of information; according to rational competence accounts, children practice selective trust through sensitivity to domains of competency (e.g., knowledge vs. physical strength) and degrees of competency (e.g., knowledgeable vs. not knowledgeable) (Hermes, Behne, Bich, Thielert, & Rakoczy, 2015). That said, studies that have examined social learning in contexts with nice and mean informants, or positive and negative evaluations, revealed biases where children disregard important cues such as knowledge and expertise and instead favor positive evaluations and nice informants.

Children use relevant learning cues when they are presented independently, so their decision not to use these cues in the presence of nice and mean trait information and evaluative testimony might not reveal lapses in judgment. Perhaps these cues are prioritized because they suggest information that other cues do not. For example, children may endorse a nice nonexpert because they believe that someone who is nice would likely not attempt to deceive them. The potency of niceness and positive

**Table 3**  
Descriptive statistics and tests against chance for trait attribution by age.

Age (years)	Trait attribution	
	<i>M</i> ( <i>SD</i> )	Test against chance
4	1.79 (0.59)	$t(23) = 6.59, p < .001$
5	0.76 (0.60)	$t(24) = 6.36, p < .001$
6	1.60 (0.82)	$t(24) = 3.67, p = .001$
7	1.66 (0.64)	$t(24) = 5.15, p < .001$
8	1.63 (0.77)	$t(23) = 3.98, p = .001$

*Note.* The trait attribution dependent variable score was combined for both informants. Trait attribution scores: 0 = chose consistent with testimony for both informants, 1 = chose consistent with testimony for one informant or consistent with trait for the other informant, 2 = chose consistent with trait for both informants.

evaluations in these contexts may reveal differences in the types of inferences that are made from these cues compared with others, as discussed below.

#### *Epistemic domain: Selective trust in information acquisition*

In the epistemic domain, positive evaluative content was prioritized over nice informant traits in both endorsements and preference for gaining information about another painting. Given that children have a generally positive outlook about others (Boseovski, 2010), perhaps they favored positive evaluative information in epistemic decisions because it met their expectations for the painting. Consequently, children may have been skeptical of negative feedback because they are less receptive to testimony that is largely discrepant with their own beliefs and expectations (Boseovski, 2012; Jaswal & Malone, 2007; Jaswal, McKercher, & VanderBorgh, 2008). It is important to note that this skepticism does not mean that children rejected negative testimony information; all children demonstrated that they accepted testimony cues by passing manipulation checks. Instead, this skepticism reflects the way in which positivity biases interact with evaluative feedback to produce preferences for positive evaluative content in epistemic domains.

Another possible interpretation is that children who endorsed and asked the mean-positive informant may have been prone to forgive negative trait information because negative traits are seen as more malleable and less stable than positive traits (Heyman & Giles, 2004). This belief was not expressed in these participants' trait attributions given that they attributed meanness to the mean-positive informant. Furthermore, children who chose to endorse and ask the mean-positive informant did not show a preference to affiliate with this informant. This demonstrates that these children did not forgive the informant's meanness given that it was considered and used in their friendship decisions and trait attributions.

A third possibility is that that epistemic preference for the mean-positive informant resulted from a negativity bias. This is unlikely for several reasons. Primarily, in their explanations, children overwhelmingly expressed a preference for positive attributes in their preferred informant for all dependent measures. That is, children who selected the nice-negative informant did so because she was nice (as opposed to a preference due to her negative testimony), and children who selected the mean-positive informant did so because she said the painting was good (as opposed to a preference due to her mean trait). Second, a negativity bias would have feasibly resulted in a focus on negativity among all dependent measures. Instead of attributing negative traits to both informants, children attributed traits based on each informant's given trait label. Moreover, children who preferred the mean-positive informant did so only in their epistemic preferences given that they did not show a preference to affiliate with either informant. For these children, preferences were different based on the domain. Lastly, the consistent-valence baseline condition established that children preferred both positive traits and testimony over negative traits and testimony, which weakens an argument that children are biased toward negative traits or testimony.

Consistent with prior work (Boseovski & Thurman, 2014), endorsement of positive testimony strengthened with age. Perhaps increased endorsement of the mean-positive informant resulted from decreased focus on negative trait information among older children. Indeed, older children are better able to look past informants' niceness and meanness to endorse based on knowledge (Lane et al., 2013). In the case of the current study, however, there was no obvious advantage to look past benevolence information to use testimony because neither provided credibility information. Furthermore, decreased focus on meanness during middle childhood would have likely resulted in age-related differences on other dependent measures, which did not occur. Therefore, it is improbable that greater endorsement of the mean-positive informant during middle childhood was due to decreased focus on negative trait information at this age.

Consistent with the dual-process account, age-related changes in endorsements may reflect greater sophistication in selective reasoning. With age and better cognitive resources, Type II processes develop to allow consideration of domain when evaluating different cues, fostering domain-specific trust in the most competent informant (Hermes et al., 2018). Notably, the current task had no obvious epistemic cues and, thus, no objectively rational response to epistemic questions. Relatively speaking, priority of testimony information may be considered most rational based on the nature of these ques-

tions. Endorsement was reached by consideration of who was correct about the painting; therefore, an informant's positive testimony may be more central to this question than positive trait information. Use of prior testimony about a peer's painting may also be more relevant when deciding who to ask about another peer's painting because this question relies on what an informant will say about this new but similar context. In the absence of obvious or objective cues, rational use of the most relevant cue based on the nature of these epistemic questions may arguably reflect use of more reflective Type II processes during middle childhood.

Use of Type II processes requires conceptual background knowledge (Hermes et al., 2018), perhaps influenced by experience that comes with age. Children have a working model of how to gather information that is shaped by their experiences (Harris et al., 2018) such as those in structured educational settings where verbal testimony is a vehicle for information. Educational experience affects children's working model to better incorporate testimony as an important tool for learning. Children in the current study varied in their experiences of structured educational settings; the youngest children were in their early preschool years, and the oldest children had several years of classroom experience. Perhaps age-related increases in positive testimony endorsement reflect different working models of how to use this information in learning settings. Thus, better cognitive resources, greater experience, and improved working models may lead older children to arguably more reasoned endorsements in a context where pure rationality could not be employed.

In contrast to age-related changes in endorsement, age was unrelated to the informant who children preferred to ask. Although both measures are epistemic, the endorsement question relies heavily on a one-time instance of testimony, whereas the ask question's focus on a future instance may provoke beliefs about stability and, consequently, draw on trait information. Accordingly, the relevant cue (i.e., trait or testimony) for the ask question is less distinct, which may have resulted in a lack of developmental findings. Given that older children are better able to differentiate positive characteristics by domain (e.g., Stipek & Daniels, 1990), the lack of age-related findings in the ask question may reflect its greater ambiguity.

#### *Social domain: Preferences in companionship*

The current study extends findings not only in the epistemic domain but also by providing insight into the way in which children make affiliation decisions in the social domain. In contrast to findings in the epistemic domain, children relied on positive trait information in the social domain and preferred to befriend the nice-negative informant over the mean-positive informant. From an affiliation perspective, the stable nature of traits may be the more valuable and arguably more rational cue in friendship preferences. This finding should be viewed with caution because affiliation with the nice-negative informant was significantly weaker than endorsement of the mean-positive informant. Importantly, divergent performance across these measures is consistent with claims that they are not closely related (Lane et al., 2013) and provides theoretical support that children make distinctions within and between domains to evaluate competence (Hermes et al., 2015).

If children had been presented with examples of nice and mean behaviors to accompany each informant's trait label, perhaps affiliation with the nice-negative informant would have been stronger. A trait label of nice with no supporting evidence could have conceivably made niceness difficult to reconcile in the face of negative testimony. The decision to use only trait labels was motivated by a number of studies in which children used nice and mean trait labels in the absence of examples of related behaviors to make trait-related inferences (e.g., Heyman & Gelman, 1999, 2000; Heyman & Giles, 2004; Liu et al., 2007, Study 2; Stipek & Daniels, 1990). Moreover, during early childhood, trait labels bolster appropriate use of this information compared with trait-related behaviors (Liu et al., 2007). Finally, prior work has shown that there are no differences in children's endorsements, knowledge attributions, moral attributions, and explicit judgments when benevolence is described through trait labels compared with behaviors (Johnston et al., 2015). These findings suggested that children in the current study were able to understand and use trait labels.

If our use of trait labels resulted in weaker affiliation due to a struggle to reconcile the nice trait label with negative testimony, this effect would have likely been apparent across several measures. First, children would have failed the nice manipulation check if they were unable to accept this infor-

mation. Conceivably, children would further fail to incorporate the nice trait label to attribute niceness to this informant. Finally, given that both nice and mean traits were described with labels, we would expect a similar failure to incorporate mean trait information. None of these patterns occurred; all children passed the nice and mean manipulation checks and used informants' trait labels to attribute traits. In addition, most children who preferred the nice–negative informant for any of the selective dependent measures (i.e., endorsement, ask question, or affiliation) referred to this informant's trait in their explanations. Therefore, it is unlikely that weaker affiliation was due to an inability to reconcile trait information given that this information was reconciled for other dependent measures.

On the whole, participants affiliated with the nice–negative informant, but when examined by age, only 5-year-olds affiliated systematically. The lack of systematic affiliation among all other age groups is somewhat surprising, given that children rely on this information in their affiliation preferences above and beyond other cues (i.e., intellectual ability). Although children reference benevolent and malevolent traits from a young age (e.g., Bretherton & Beeghly, 1982; Heyman, Gee, & Giles, 2003), there are distinct developments in trait understanding that occur at around 5 years of age. Although 4-year-olds use trait information to make simple inferences (e.g., motives), it is not until kindergarten that children use this information to a more sophisticated extent (Heyman & Gelman, 1999). Perhaps improved trait understanding allowed 5-year-olds to focus on the arguably more relevant trait information in the social affiliation domain.

Why, then, is this pattern not seen in 6- to 8-year-olds who have already developed advanced trait understanding? The lack of age-related change in affiliation preferences could reflect the influence of added testimony information. Positivity biases and selective skepticism during middle childhood may have increased the salience of negative testimony, which resulted in no systematic patterns of affiliation. Although social trait information is arguably more meaningful for friendship decisions, evaluative testimony continues to affect 6- to 8-year-olds' judgments in this social domain.

In sum, among age groups, patterns of affiliation were likely caused by several factors involving trait reasoning, positivity biases, and skepticism. These developmental factors affected selective preferences across domains. For instance, 5-year-olds were distinct from all other age groups not only in their affiliation preferences but were also unsystematic in who they preferred to ask. Whereas other age groups focused on positive testimony information, perhaps a greater focus on trait information (as seen in their affiliation preferences) resulted in 5-year-olds' decreased focus on positive testimony in this domain. Hence, the current findings may reflect valuable differences between the potency of different cues throughout development.

### *Limitations and future directions*

Future work should continue to investigate children's use of different domains of positive information. Because children were presented with traits and testimonies that were cross-valenced (i.e., a nice–negative informant and a mean–positive informant), a methodological limitation of the current study is that it cannot definitively conclude that epistemic preferences reflected the positive testimony of the mean–positive informant. Research on the motives behind these preferences could help specify the degree to which they are generated by a preference for positive testimony and/or avoidance of negative testimony.

It is important to note that had we given children evaluations about a close friend or themselves, their epistemic trust and affiliation preferences may have been different. Research has shown that 5- and 6-year-olds incorporate personal relationships into their evaluations and show greater flattery of another's drawing when the artist is someone who they know compared with a stranger (Fu & Lee, 2007). Social context not only influences their own evaluations but also influences the way in which children perceive the evaluations of others. Chinese children trust performance evaluations that are exaggerated compared with understated based on whether they are about others or oneself (Ma et al., 2019). Future research should examine how selective learning might be sensitive to manipulations in contextual variables regarding the target of evaluation, including first-person scenarios where the participant is the target of evaluation.

In the same vein, the findings of the current study might have differed had the nature of the positive and negative testimonies been different. Everyday evaluations may differ in significance; children

may place less emphasis on a negative opinion of a painting and more emphasis on a negative opinion of another person. Specificity in negative feedback could also alter the way in which it is perceived and later used. For instance, negative feedback that promotes improvement (Boseovski et al., 2017) may be approached with less skepticism and greater trust. Comparison of negative evaluations that are unnecessarily harsh (i.e., negative and uninformative) and those that are intended to help may specify the mechanism at play in children's selective trust in testimony.

Furthermore, individual differences in preference for different types of testimony may reveal mechanisms important to selective learning such as motivation in knowledge acquisition. For instance, a preference for flattery (exaggerated positive information; Fu & Lee, 2007) suggests a positive social motive in learning from others with less concern for the truth, whereas a preference for accurate information, even if it is negative, suggests motivation to acquire truth. In addition to these motives, individual differences in skepticism could affect how evaluative testimony is evaluated as truthful (Mills & Elashi, 2014); whereas some may be credulous, others' trust may depend on valence (Boseovski, 2010). Thus, motivation and skepticism may affect which cues are dominant in knowledge acquisition, and individual differences in executive function may then affect inhibition of these dominant cues (e.g., Best & Miller, 2010).

There are many contextual manipulations of the current paradigm that could help to explain how children practice selective learning. Informant biases are less relevant in objective contexts, which may alter children's perceptions of evaluative testimony. This would be especially interesting to examine during middle childhood, when children make greater use of objectivity (Mills & Landrum, 2012) but are also skeptical of negative evaluations. Whether these objective evaluations are about the self or another may reveal age differences in children's sensitivity to others' self-interest. More generally, these contextual manipulations would help to specify the findings of the current study to identify conditions under which these preferences may deviate or stay the same (Mills, 2013).

## Conclusions

The current study revealed that children prefer to learn from informants who say positive things in this subjective social learning context but also that children prioritize the possession of positive traits over positive speech content when making decisions about friendship. These results extend previous knowledge by identifying the type of positive information that is most potent when multiple positive sources of information are available and, thus, serve to clarify the nature of the positivity bias in social learning. From a developmental perspective, understanding the sources of information that are most compelling to children has implications for both learning (e.g., awareness that children may have trouble in accepting unpleasant information) and social functioning (e.g., understanding that children may reject friendships with mean children, particularly when entering the elementary school years). Furthermore, this research provides a springboard for examining individual differences in response patterns and the mechanisms that underlie them.

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