Nice at First Sight: Children Infer Helpfulness as a Stable Trait from a Single Observation

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Abstract

From an early age, children evaluate others' actions to determine who is helpful, often using cues like effort, cost, and intention to inform dispositional inferences. While prior research has typically relied on direct comparisons of high- and low-cost helping behaviors, real-world judgments often occur in the absence of such contrasts. This study investigates whether children infer greater helpfulness from a single act of high-cost helping, even without explicit comparison. Using a between-subjects design, we presented 3- to 12-year-old children (N = 106) with a vignette in which an agent helps another character retrieve a toy, either by incurring a high cost (climbing to the top shelf) or a low cost (grabbing it from a lower shelf). Children evaluated the helper's dispositional helpfulness and predicted their likelihood of helping in new situations, including costlier or cross-domain contexts. Because nearly all children judged the helper as maximally helpful, there were no significant differences in explicit assessments of helpfulness based on cost condition. Children predicted the agent to help in all future scenarios, regardless of the cost that the agent initially incurred. However, responses to counterfactual inference questions revealed differences between older and younger children, suggesting that social reasoning about counterfactual scenarios or perceived competence of others may become more sophisticated with age.

Nice at first sight: Children infer helpfulness as a stable trait from a single observation

Humans depend on the help of other people to survive, especially when we are children. This dependency requires us to be skilled at identifying people who are helpful or willing to help us (Tooby & Cosmides, 1996). Intuitively, one way we identify helpers is through observing others' behavior. Research shows that proficiency at identifying helpful agents comes early in life: as soon as infants can make visually guided reaches, they are more likely to reach for puppets that helped a protagonist accomplish a goal, even though they themselves gain nothing from the interaction (Hamlin & Wynn, 2011; Hamlin et al., 2007; Scola et al., 2015). This ability remains consistent throughout development: 4- and 5-year-olds also show preference for puppets that help rather than hinder a third-party character (Van de Vondervoort & Hamlin, 2017). With the knowledge that infants and children reliably identify and prefer helpful agents, the endeavor now is to examine how they accomplish this task so successfully. In other words, how do children use behavioral observations to identify helpful agents, and what contextual information is relevant to their reasoning?

Psychologists have long been interested in explaining the cognitive processes we use to navigate the complex social world that we live in. Decades of research on these topics led to the study of folk psychology, the framework that describes how we intuitively understand, explain, and predict others' thoughts, feelings, and actions. A central feature of adults' everyday folk psychology is the tendency to reason about others' stable dispositions or traits (Heider, 1958; Kelley, 1973; Weiner, 1974). Dispositional attributions play a foundational role in how we interpret, explain, and predict the behavior of those around us because we assume that a person's behavior stems from their disposition (Jones & Harris, 1979). These intuitive theories describe how perceivers make quick dispositional judgments from others' actions.

Kelley's (1973) covariation model of social attribution posits that observers weigh cues like consistency, consensus, and distinctiveness to determine whether a behavior stems from personal traits or situational pressures. Consistency asks whether the individual behaves the same across time in a specific context. Consensus reflects whether other people behave similarly in the same situation, and distinctiveness captures whether the behavior is unique to a particular situation or occurs across many. According to the covariation model, people integrate multiple observations of behavior to infer the most likely cause of someone's actions. For example, a combination of low consensus (Bobby was the only person who stayed after class to help the teacher clean up), high consistency (Bobby always stays after class to help), and low distinctiveness (Bobby also helps his friends and his parents) suggests a dispositional cause for Bobby's behavior (i.e., Bobby is a helpful person). If, instead, there was high consensus (several students stayed to help), low consistency (Bobby rarely offers help to his friends or parents), and high distinctiveness (this is the only time that Bobby stayed after class to help clean up), we would be more likely to attribute his behavior to situational factors (i.e., Bobby's class crush was watching to see if he helped). However, a drawback to this theory is that it fails to account for the fact that people still seem to make these types of inferences in the absence of such rich contextual cues. To fill this gap, more recent research has sought to understand how we might make dispositional inferences from a single context cue or behavior.

One such line of research that accounts for this ability is naïve utility calculus (Jara-Ettinger et al., 2016). Naïve utility calculus posits that both adults and children implicitly assume others act on and hold goals that maximize the rewards they hope to obtain relative to the costs they expect to incur. This framework adds to our understanding of folk psychology by describing how we can infer someone's beliefs, desires, knowledge, preferences, and even characteristics

(such as who is knowledgeable, praiseworthy, blameworthy, or friendly) based on the expected costs and rewards the individual incurs from a single behavior. For example, we can infer that someone who chooses to scale a ladder to get an orange from the top shelf of a cabinet (rather than grabbing an apple from a lower shelf) prefers oranges over apples because they incurred a higher cost to get the orange when they could have retrieved the apple for less cost.

The ability to reason about traits using utility-increasing or -decreasing behavior is well-documented in young children. Children as young as 2 years of age consider the utility of someone's actions to make inferences about an agent's goals, intentions, preferences, and moral character (Jara-Ettinger et al., 2016). One particularly important set of utility-increasing behaviors is helping behaviors. Schlingloff-Nemecz and colleagues (2025) found that preschoolers recognize helping as any action that increases another's utility as opposed to joint actions or actions that enable goal completion. They also found that preschoolers identify which agent is more helpful based on who increases another's utility the most. These results are in line with older developmental research which has shown that children form trait-based explanations that influence their social understanding and motivational beliefs (Cain & Dweck, 1995; Heyman & Dweck, 1998) and guide how children interpret social interactions (Erdley & Dweck, 1993). Taken together, it is clear that utility is used to make inferences about stable character traits like helpfulness, and children reason about helpfulness in this utility framework.

While both cost and reward factor into utility, previous work demonstrated that infants and children are particularly sensitive to the *cost* of helping. For example, 16-month-olds prefer people who help others facing harder tasks as opposed to people who help others facing easier tasks, indicating that greater cost elicited greater preference for that agent (Woo et al., 2024). Similarly, Jara-Ettinger and colleagues (2015) asked toddlers to evaluate the niceness of agents

that *refused* to help someone. Toddlers were more likely to evaluate the less competent agent as nicer than the competent agent. This evaluation was driven by toddlers' sensitivity to the potential costs of helping. When both agents refused to help, toddlers reasoned that refusing to help was more blameworthy for the competent agent (as helping would be less costly for them), than for the incompetent agent (for whom helping would have been more costly).

Research demonstrates that cost alone can elicit different dispositional inferences. By 6 or 7 years of age, children weigh the cost incurred by the helper when judging generosity, and they evaluate helpers more positively when they sacrifice more to help others (Radovanovic et al., 2023). Consistent with these findings, literature on attributions of altruism (other-motivated helping; e.g., Kerber, 1984; Yamamoto et al., 2024), suggests that children make different inferences about an agent's disposition according to the cost the agent incurs to help. Overall, these findings suggest that children may be particularly attuned to the cost of helping and use cost to inform their inferences of dispositional helpfulness.

This previous work, however, has always asked children to reason about at least two helping actions or comparisons of helping scenarios (Bennett-Pierre et al., 2018; Jara-Ettinger et al., 2015; Paulus, 2020; Radovanovic et al., 2023; Sierksma et al., 2013; Sierksma & Shutts, 2021; Van de Vondervoort & Hamlin, 2016; Woo et al., 2017; Woo et al., 2024). For example, the aforementioned vignette used by Radovanovic and colleagues (2023) prompted children to consider two helpers, one who gets a ball from a tree with a bee's nest and one who gets a ball from a tree without a bee's nest. These comparisons seem contrived; children would realistically observe only one helper going after one ball, lodged in a single tree. Would children make the same inferences about the helper even without a comparative scenario? That is, would children

evaluate the agent who incurred greater cost to be more helpful than one who incurred less cost without being presented both actions to compare at the same time?

There is reason to suggest that a lack of comparison groups does not always prevent young children from making trait inferences and subsequent predictions. Previous work suggests that children can make mental state inferences based on single observations and use these inferences to predict future behavior. Pesowski and colleagues (2016) found that 3-year-olds can infer an agent's preferences from a single action, judging that the agent preferred a certain, visually undesirable, toy simply because they chose it. Kalish (2002) found that 4- to 8-year-olds' predictions of a third party's future behavior were reliably impacted by observing what a person did on a single previous occasion. Additionally, 3- to 6-year-olds did not make stronger target-consistent predictions or trait attributions after observing five target-consistent behaviors than they did after observing just one, suggesting that additional behavioral information does not enhance trait inferences or behavioral predictions (Boseovski & Lee, 2006).

Considering this research (Boseovski & Lee, 2006; Liu et al., 2007; Pesowski et al., 2016; Jara-Ettinger et al, 2015; Sierksma et al., 2018), it seems plausible that children's rating of an agent's helpfulness will vary based on the amount of cost incurred in a single observation. However, no study to date has examined, between subjects, whether children evaluate an agent's helpful disposition from a single helping action. In the current study, we aim to examine if children make dispositional inferences after observing just one helping interaction between a helper and a helpee, and if the cost incurred by the helper had an effect on how children evaluated their helpfulness. This study investigates how young children evaluate a single helper without comparison and attempts to examine whether the cost of helping alone is enough to inform children's dispositional evaluations. We probe children's inferences and attributions of

third-party others through direct dispositional evaluations (i.e., asking about how helpful the person is) and predictions of their future helping behavior (as predicted behaviors likely stem from dispositional inference). Indeed, evidence suggest that children use behavior to make inferences about traits, and then use these traits to predict future behavior: Liu and colleagues (2007) found that children as young as 4 years of age evaluate someone who hoarded cookies as 'selfish', and subsequently predicted that this 'selfish' agent would stop his sister from playing with his toys. We predict that children will explicitly evaluate helpers who help at a high cost to have a more helpful disposition than helpers that incur lower cost. We also theorize that children who observe an agent incur a high cost to help someone will be more likely to predict that agent to help in different future scenarios than children who observe the agent helping at a low cost.

Method

Participants

Participants were 3- to 12-year-old children (N=106; 62 female, 44 male; M_{age}= 6.76 years, SD_{age}= 2.33 years) who were recruited from and participated in the study at a local children's museum and zoo. A total of 34 participants were excluded for failing the attention check or training phase (n = 27), missing data (n = 3), not completing the study (n = 3), or parental/sibling interference (n = 1). Children were randomly assigned to either the high-cost (HC) condition (n = 45; 27 female, 18 male; M_{age}= 6.7 years, SD_{age}= 2.2 years) or the low-cost (LC) condition (n = 61; 35 female, 26 male; M_{age}= 6.8 years, SD_{age}= 2.4 years). Demographic information was collected with caregiver questionnaires, and caregivers identified participants as either White (n = 51), Hispanic or Latine (n = 20), Asian or Asian-American (n = 10), Hispanic or Latine and White (n = 10) Asian or Asian-American and White (n = 7), other (n = 6), or opted

out of identifying (n = 2). All participants tested at the zoo and museum were compensated with an eraser and/or stickers.

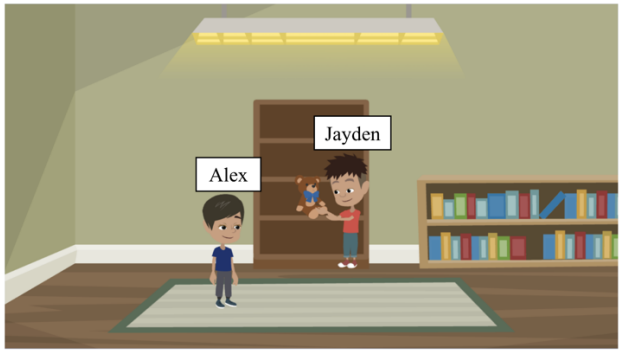
Procedure

After verbally consenting to participate in the study, children sat down at a table next to an experimenter while their parent or guardian filled out a separate demographic survey. The experimenter asked each child for their age to confirm study eligibility, and for their gender to gender-match the characters in the study. Once this information was given, experimenters trained each child on how to use two different scales which were required to answer our dependent measures: a two-part Helpfulness scale (see Figure 4 in Appendix 1) and a Sureness scale (see Figure 5 in Appendix 1). Children learned that the Helpfulness scale was used to express how helpful the child thought the characters in the story were. The child was shown a card with two circles and could point to "helpful" (depicted as a green circle) or "unhelpful" (depicted as a red circle). If they indicated that the character was "helpful," children were shown the second card with four circles and given the additional option to indicate how helpful the character was: "helped this time, but usually doesn't help" (very small green circle), "sometimes helps" (small green circle), "usually helps" (medium green circle), and "would always help" (large green circle). Children were then able to practice using the scale by answering the question: "If someone fell down and a classmate picked them back up again, do you think the classmate was helpful or unhelpful? How helpful?" Children were corrected if they did not say the classmate was helpful. Then, children were introduced to the sureness scale depicted by a little black circle denoting "a little sure "and a big circle denoting "very sure." To practice using the scale, children were asked "*Can you point to the circle that means I am a little sure? Can you point to the circle that means I am very sure?*" Again, children were corrected if they did not point to the correct

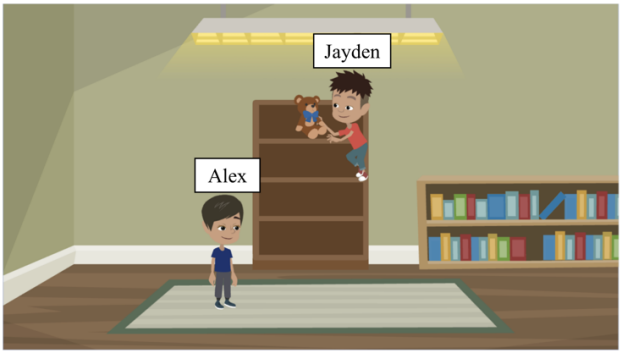
circles. We used the sureness scale to increase variability in children's potential responses. This variability allowed us to examine the effect of our manipulation on each question more accurately. Participants were excluded if they gave the incorrect answer after being corrected twice.

After completing the scale training phase, the experimenter read each child a story booklet. Children were introduced to two gender-matched characters, Alex and Jayden, who are pictured standing near a bookcase. As can be seen in Figure 1, in the LC condition, a teddy bear is pictured on a bookcase shelf eye level with the characters. In the HC condition, the teddy bear is pictured on the top shelf of the bookcase. While showing participants the picture, the experimenter physically pointed out the position of the bear in each condition to draw participants' attention to the bear.

Figure 1: *Visual stimuli presented for LC (left) and HC (right) conditions*.



Alex says, "that bear looks really fun!" Jayden easily reaches over and grabs the bear and gives it to Alex to play with. Now I am going to ask you some questions about Jayden!



Alex says, "that bear looks really fun!" Jayden works hard to climb up the shelf to the very top so that he can reach the bear and gives it to Alex to play with. Now I am going to ask you some questions about Jayden!

In both conditions, Alex expresses interest in the toy bear, and Jayden hands the bear to Alex after either grabbing the bear from the lower shelf (LC condition) or climbing up to the top shelf (HC condition). Experimenters emphasized the amount of effort that Jayden exerted to grab the bear, noting that Jayden "easily reaches over" in the LC condition, and "works hard" in the HC condition. Participants were then shown Alex holding the toy bear (Figure 3, Appendix 1)

and were asked a series of questions. Firstly, children were asked an attention check question about the difficulty of reaching the bear. Children in the HC condition were expected to answer "hard" as was cued in the story. Children in the LC condition were expected to answer "easy" as was cued in the story. Children that answered differently (n = 27) were excluded from the main data analysis.

Our primary question of interest was whether children used information about the cost of helping to make dispositional inferences about a helpful agent. To do this, children were asked a series of questions about Jayden's disposition and future behavior. Their answers were marked by experimenters on a datasheet during the time of the procedure. We asked a total of 5 questions. First, we asked children to explicitly evaluate if Jayden was a helpful person ("*Do you think Jayden is a helpful person, or unhelpful person?*" if "Helpful", then "*How helpful is Jayden?*"), using the two-part Helpfulness scale. Then we asked participants a series of questions asking them to predict whether Jayden would help in a series of different hypothetical scenarios.

If children successfully made dispositional inferences about Jayden's helpfulness, then they should be able to use these inferences to predict Jayden's subsequent or alternative helping behaviors (Liu et al., 2007). We asked children a series of 4 questions asking them to predict Jayden's helping behavior across different contexts. Children responded with "Yes" or "No" and used the Sureness scale ("a little sure" and "very sure") to indicate how sure they were of their answer.

The first of these predictions was if Jayden would help in the opposite condition (a counterfactual situation). Participants in the LC condition were asked "*If the bear had been on the very top shelf, and Jayden would have had to work hard and climb up to get it, do you think Jayden would have helped?*", and participants in the HC condition were asked "*If the bear had*

been on the bottom shelf, and Jayden would have been able to reach it easily without climbing, do you think Jayden would have helped?". Then, we asked participants if Jayden would help even if it were additionally costly to Jayden ("*Do you think Jayden would help Alex even if it meant Jayden wouldn't be able to play with the bear?*"). Subsequently, children were asked if Jayden would help with a different task that required different competencies ("*If Alex needed help with his/her schoolwork, do you think Jayden would help?*"). Lastly, we asked participants whether Jayden would help in the absence of an implied social relationship ("*Do you think Jayden would help Alex even if they were not friends?*"; see Appendix 2 for the complete script for both conditions).

After responding to all the questions, participants were told that they had successfully completed the game, were thanked, and welcomed to pick out a prize (an eraser and sticker). Caregivers and participants then had the opportunity to ask clarifying questions about the study and were debriefed on the purpose and background of the study if asked.

Results

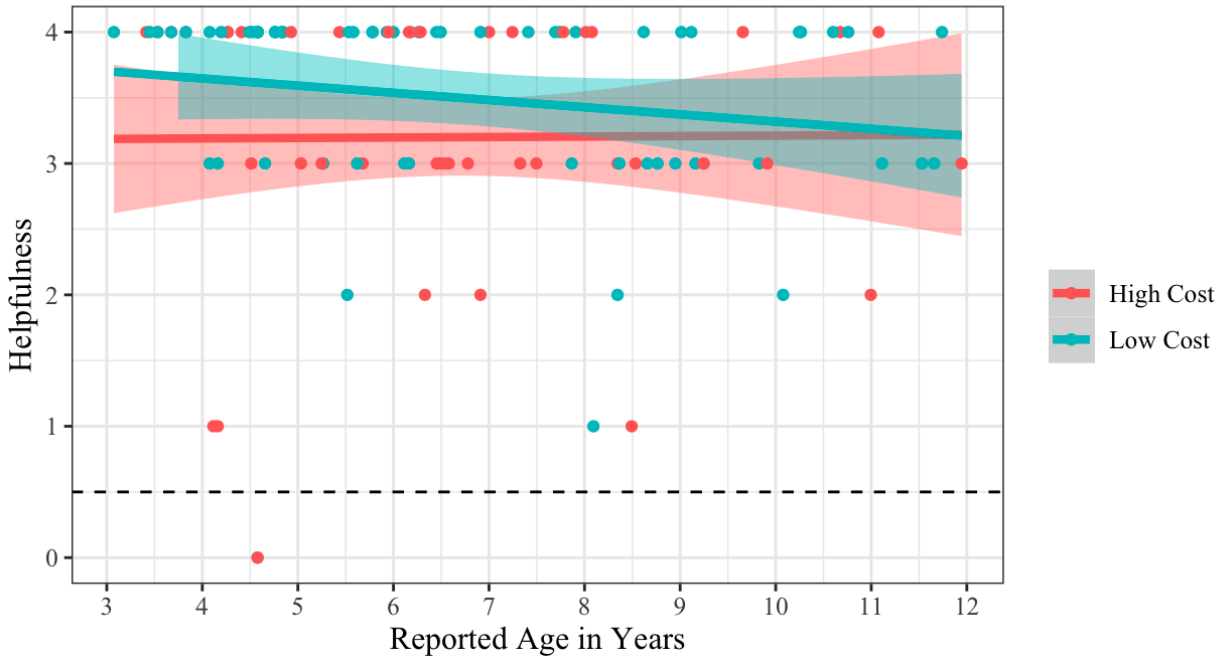
All analyses were conducted in R. We conducted a series of linear regressions for each dependent measure, with condition (HC vs. LC), mean-centered age (continuous, in years), and their interaction as predictors. In addition, we ran binomial tests to determine whether children's helpful/not helpful and yes/no predictions differed from chance (0.5) within each condition.

Direct Dispositional Evaluation

We first asked children to rate how helpful Jayden was after they saw Jayden retrieve the toy bear for Alex to play with ("*Do you think Jayden is a helpful person, or unhelpful person? If helpful: How helpful is Jayden?*"). A linear regression model with specific helpfulness ratings as the outcome (0 = not helpful, 1 = helped this time, but usually doesn't help, 2 = sometimes helps,

3 = usually helps, 4 = would always help) and age and condition as predictors showed no significant effects of condition (b = 0.30, SE = 0.18, $t(102)$ = 1.68, p = .095), or age (b = 0.004, SE = 0.06, $t(102)$ = 0.06, p = .954). These results suggest that children of all ages did not differ in how helpful they thought Jayden was based on whether they saw Jayden climb up the shelf to grab the bear (HC) or simply take the bear from a lower shelf to give to Alex (LC). Additionally, the interaction between condition and age was not significant (b = -0.058, SE = 0.077, $t(102)$ = -0.75, p = .453), indicating that age did not change how children were affected by whether Jayden had to exert more or less effort to reach the bear. As seen in Figure 2, a majority of participants thought that Jayden was maximally or close to maximally helpful.

Figure 2: *Effect of cost and age on children's evaluations of dispositional helpfulness.*



We also ran binomial tests on each condition using children's binary evaluation of Jayden's helpfulness ("*Do you think Jayden is a helpful person, or unhelpful person?*" Yes/No). A binomial test on the HC condition revealed that participants evaluated Jayden as helpful at a rate significantly higher than chance (44 of 45 chose helpful; p < .001, two-tailed; 95% CI [0.88,

0.99]). A binomial test on the LC condition revealed that participants also evaluated Jayden as helpful at a rate significantly higher rate than chance (60 of 61 chose helpful; $p < .001$, two-tailed; 95% CI [0.91, 0.99]).

Counterfactual Scenario

In this study, we also wanted to know what inferences children would make about Jayden's behavior when presented with the opposite condition. This was presented in the form of a counterfactual question (thinking about what would have happened if something in the past was different). This question was answered with binary yes/no predictions and confidence ratings, and we created composite scores to capture both the direction and strength of children's responses. Binary responses were coded as -1 for "no" and +1 for "yes." Confidence ratings were coded as 0.5 for "not sure" and 1.5 for "very sure." These two components were multiplied to produce a composite score ranging from -1.5 to +1.5, with higher values indicating greater confidence that Jayden would help, and lower values indicating greater confidence that Jayden would not help. We ran a linear regression with condition and age as predictors and the composite score as the outcome and found a non-significant main effect of condition ($b = 0.42$, $SE = 0.22$, $t(102) = 1.91$, $p = .059$), indicating that children's predictions of whether Jayden would help in the counterfactual scenario did not significantly differ based on the initial scenario that they saw. There was no significant main effect of age ($b = -0.08$, $SE = 0.08$, $t(102) = -1.01$, $p = .315$), indicating that older and younger children reasoned similarly about the counterfactual scenario. There was also no significant interaction between condition and age ($b = 0.07$, $SE = 0.10$, $t(102) = 0.75$, $p = .453$). An exploratory linear regression including participants that failed the attention check produced different results (see Appendix 3).

We also ran binomial tests on the binary predictions (yes/no) from each condition. In the LC condition, binomial tests revealed that participants predicted above chance that Jayden would help Alex if the bear was counterfactually on the top shelf of the bookcase (47 of 61 chose yes; $p < .001$, two-tailed; 95% CI [0.65, 0.87]). In the HC condition, however, participants did not predict above chance that Jayden would help Alex if the bear was counterfactually on the lower shelf of the bookcase (28 of 45 chose yes; $p = 0.1352$, two-tailed; 95% CI [0.47, 0.76]). Considering this unexpected finding, as well as previous work indicating differences in counterfactual reasoning across age groups, we ran additional separate, exploratory 2x2 Fisher's exact tests on two age groups, examining the relationship between condition (HC or LC) and binary helpfulness predictions (Yes/No) in older children and younger children (see Appendix 3).

Helping with Additional Cost

We then tested whether children expected helping even at an additional, personal cost to the helper. We ran a linear regression with condition and mean-centered age as predictors, and a composite of sureness (not sure = 0.5, very sure = 1.5) and yes (= 1) and no (= -1) answers as the outcome. We found a non-significant main effect of condition ($b = 0.13$, SE = 0.15, $t(102) = 0.85$, $p = .400$), a non-significant main effect of age ($b = 0.03$, $SE = 0.05$, $t(102) = 0.61$, $p = .545$), and a non-significant interaction between condition and age ($b = -0.05$, $SE = 0.07$, $t(102) = -0.79$, $p = .430$). A binomial test on the HC condition revealed that participants predicted Jayden would still help Alex despite the personal cost at a rate significantly higher than expected by chance (39 of 45 chose yes; $p < .001$, ; two-tailed; 95% CI [0.73, 0.95]). A binomial test on the LC condition revealed that participants also predicted Jayden would help Alex at a rate significantly higher than expected by chance (58 of 61 chose yes; $p < .001$, two-tailed; 95% CI

[0.86, 0.99]). Exploratory statistical analyses including participants that failed the attention check produced different results (see Appendix 3).

Helping Across Contexts

We then tested whether children expected helping to generalize across different types of tasks, even when those tasks involved different skills. To do so, we ran a linear regression on Jayden's likelihood of helping Alex with schoolwork using the same scale (-1.5 = would not help, very sure; -0.5 = would not help, a little sure; 0.5 = would help, a little sure; 1.5 = would help, very sure), with age (mean centered), condition (HC vs. LC), and their interaction as predictors. The regression revealed non-significant effects of condition (b = 0.11, SE = 0.20, $t(102) = 0.58$, p = .562), age (b = -0.03, SE = 0.07, $t(102) = -0.50$, p = .620), and their interaction (b = 0.08, SE = 0.09, $t(102) = 0.96$, p = .338). However, follow-up binomial tests suggested that children overwhelmingly expected Jayden to help Alex regardless of task type: in the HC condition (37 of 45 chose yes; $p < .001$, two-tailed; 95% CI [0.68, 0.92]), and in the LC condition (53 of 61 chose yes; $p < .001$, two-tailed; 95% CI [0.76, 0.94]).

Helping Regardless of Relationship

Lastly, we tested whether children expected helping even when characters were explicitly not friends. To do so, we ran a linear regression on Jayden's likelihood of helping a non-friend (-1.5 = would not help, very sure; -0.5 = would not help, a little sure; 0.5 = would help, a little sure; 1.5 = would help, very sure) with age (mean centered), condition (HC vs. LC) and their interaction as factors. The regression revealed non-significant effects of condition (b = -0.28, SE = 0.19, $t(102) = -1.45$, p = .150), and age (b = 0.03, SE = 0.07, $t(102) = 0.39$, p = .696), as well as a non-significant interaction between condition and age (b = -0.04, SE = 0.08, $t(102) = -0.45$, p = .657). However, follow-up binomial tests revealed that these lack of differences were likely due

to overall high expectations for helping: children overwhelming expected Jayden to help Alex even if they were not friends in both the HC condition (41 of 45 chose "yes"; $p < .001$, two-tailed; 95% CI [0.79, 0.98])) and the LC condition (48 of 61 chose yes; $p < .001$, two-tailed; 95% CI [0.66, 0.88]).

Discussion

Children in both conditions directly evaluated Jayden as helpful across both conditions. The findings from the present study contribute to a growing literature on children's use of observed behavior to infer traits and predict future actions. Children appeared to engage in both behavior-to-trait and trait-to-behavior inference patterns: after seeing someone help once, they inferred that the agent was helpful and generalized this trait to future predictions of behavior. Notably, children's predictions were not affected by cues such as whether the agent incurred a high cost or low cost. Consistency across children's predictions of a helper's future behavior suggests that children broadly apply predictions using dispositional inferences to a wide number of contexts.

Across conditions, children did not appear to differentiate the helpfulness of the agent based on the cost incurred during the helping act. That is, participants were equally likely to view the agent as helpful whether they incurred a high cost (climbing up the bookshelf to reach the bear) or minimal cost (grabbing the bear from a lower shelf). This lack of sensitivity to cost was evident even when we probed children's predictions about what the agent would do in different situations. Even when the agent had reasons not to help again, whether it was because doing so would incur additional cost, because the task was in a different domain, or because the social relationship between the characters was changed, children predicted that the agent would help again. Thus, one observation of an agent's behavior can inform children's inferences about their

disposition, regardless of how much cost the agent incurred. This suggests that, at least for children, first impressions can lead to inferences of what kind of person someone is, and strong opinions can be formed based on a single interaction or observation. Therefore, children may decide that someone is nice or friendly from quick inferences they make from the minimal data they acquire from a first impression. These first impressions may have a surprisingly strong effect on downstream behaviors like friendship initiation, such that people who have a positive first impression from others feel more desire to initiate a friendship with them (Baker et al., 2025). Additionally, projecting positive intent onto unknown others helps people gain the confidence needed to develop friendships (Beck et al., 2025). The positivity bias seen in the current study and supported by past literature (Boseovski, 2010; Radavanovic et al., 2023) therefore seems to serve a social purpose. By evaluating agents as positively as possible, we maximize our chances of acquiring new friends and enjoying all the benefits (see Hartup, 1998) that come with good friendships.

Several limitations to the present study should be noted. The study relied on hypothetical vignettes, which may differ from children's responses to live interactions or to situations in which they themselves are participants. Prior work suggests that third-party judgments can differ substantially from first-person decision-making (Nadelhoffer & Feltz, 2008). Moreover, our sample skewed young, which may obscure developmental shifts that emerge more strongly in older children. Additionally, although our findings are consistent with trait-based reasoning, they do not exclude the possibility that children were simply following learned social expectations about how people ought to behave. Based on their explicit dispositional evaluations, children appear to have made dispositional inferences from an agent's behavior, but this interpretation is restricted by the fact that children's responses were generally at ceiling. Children always thought

the agent was helpful, which overshadowed possible effects of the cost of helping on evaluations of the agent's helpfulness. When cues are minimal and each child only observes one agent in one condition, they may default to a positivity bias, assuming that people are generally helpful unless shown otherwise. It is therefore unclear whether the subsequent predictions were based on their trait inferences or whether they were simply predicting an agent that followed a norm once to follow it again.

Alternatively, children may require a comparison group to make differing dispositional evaluations based on cost. That is, children will not differentiate that an agent is more or less helpful according to the cost that they incur unless they can compare the agent to someone else incurring a different amount of cost. This would suggest that children may still make dispositional inferences using cost, but that our study design did not allow children to demonstrate this ability. Another possibility is that children are purely using statistical inference to infer future behavior. That is, when they observed Jayden help Alex, they now have an example of Jayden helping, with no example to the contrary. Therefore, children would always predict Jayden to help in the future because they were previously observed to only help (Jayden helped 1 of 1 times, 100%). Thus, children may not be making a dispositional inference, but merely a statistical prediction of an agent's future behavior. This raises an avenue for future research that can differentiate between children truly making trait inferences, versus relying on a social norm heuristic (e.g., "people are supposed to help others") or using simple statistical inference (e.g., "Jayden usually helps, so she will help again?").

Future research should explore whether children continue to make consistent predictions of helping behavior in future scenarios when the initial high- and low-cost behaviors are presented side-by-side. Additionally, it may be useful to find out when children make exceptions

to apparent heuristics when evaluating behavior. For example, children seem to think that an agent who acts in an unintentionally helpful way (Woo et al., 2017) is not helpful, even though the action itself was helpful. Therefore, there may be a way to use intentionality in between-subjects manipulations of young children's predictions that avoids positivity bias. Additionally, manipulating the value of the outcome to the recipient could help clarify whether children factor in the utility of the help given. For instance, children may evaluate a helper differently if their high-cost helping led to high-value outcomes while low-cost helping led to lower-value outcomes. This may help dissociate judgments about the helper's character from judgments about social norms in general.

Conclusion

Taken together, the present findings provide evidence that 3- to 12-year-olds use single instances of helping to infer stable, dispositional traits, applying these inferences broadly across contexts. Contrary to our hypothesis, this pattern held regardless of the cost incurred by the agent during the helping act; children judged the agent to be helpful whether the help was relatively easy or came at a higher cost. Children across both conditions also predicted the agent to act similarly in different scenarios, including those with additional disincentives such as increased personal cost to the agent, and those that eliminated any social relationship between the agent and the helpee. These results suggest that the cost incurred by the agent in a single observation matters less to children than the simple fact that the agent helped. Consistency in predictions of the agent's future behavior highlights the strength of children's applications of social inference.

References

Baker, L. R., Sizemore, R. N., & Vrshek-Schallhorn, S. (2025). Biased first impressions yield positive illusions that facilitate friendship initiation. *Journal of Social and Personal Relationships*, 42(3), 873–900. https://doi.org/10.1177/02654075241310539

Beck, L. A., Aragón, O. R., & Clark, M. S. (2025). Perceiving and responding to another's interest in initiating friendship: The role of attachment insecurity. *Journal of Social and Personal Relationships*. https://doi.org/10.1177/02654075251331796

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

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

Bridgers, S., & Gweon, H. (2018). Means-inference as a source of variability in early helping. *Frontiers in Psychology*, 9, 7. https://doi.org/10.3389/fpsyg.2018.01735

Cain, K. M., & Dweck, C. S. (1995). The relation between motivational patterns and achievement cognitions through the elementary school years. *Merrill-Palmer Quarterly*, 41, 25 – 52.

Dahl, A., Gross, R. L. & Siefert, C. (2020). Young children's judgments and reasoning about prosocial acts: impermissible, suberogatory, obligatory, or supererogatory? *Cognitive Development*, 55, 100908.

Erdley, C. A., & Dweck, C. S. (1993). Children's implicit personality theories as predictors of their social judgments. *Child Development*, 64, 863 – 878.

Gautam, S., Owen Hall, R., Suddendorf, T., & Redshaw, J. (2023). Counterfactual choices and moral judgments in children. *Child Development*, 94(5). https://doi.org/10.1111/cdev.13943

Guajardo, N. R., & Turley-Ames, K. J. (2004). Preschoolers' generation of different types of counterfactual statements and theory of mind understanding. *Cognitive Development*, 19(1), 53–80. https://doi.org/10.1016/j.cogdev.2003.09.002

Hamlin, J. K. (2015). The case for social evaluation in preverbal infants: Gazing toward one's goal drives infants' preferences for helpers over hinderers in the hill paradigm. *Frontiers in Psychology*, 5. http://dx.doi.org/10.3389/fpsyg.2014.01563.

Hamlin, J. K., Wynn, K., & Bloom, P. (2007). Social evaluation by preverbal infants. *Nature*, 450, 557–559.

Hamlin, J. K., & Wynn, K. (2011). Young infants prefer prosocial to antisocial others. *Cognitive Development*, 26(1), 30–39. https://doi.org/10.1016/j.cogdev.2010.09.001

Harris, P. L., German, T., & Mills, P. (1996). Children's use of counterfactual thinking in causal reasoning. *Cognition*, 61(3), 233–259.

Hartup, W. W. (1998). The company they keep: Friendships and their developmental significance. In *The Social Child*. Psychology Press.

Heider, F. (1958). Perceiving the other person. In F. Heider, *The psychology of interpersonal relations*, (pp. 20–58). John Wiley & Sons Inc. https://doi.org/10.1037/10628-002

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

Jara-Ettinger, J., Tenenbaum, J. B., & Schulz, L. E. (2015). Not So Innocent: Toddlers' Inferences About Costs and Culpability. *Psychological Science*, 26(5), 633-640. https://doi.org/10.1177/0956797615572806

Jones, E. E., & Harris, V. A. (1967). The attribution of attitudes. *Journal of Experimental Social Psychology*, *3*(1), 1–24. https://doi.org/10.1016/0022-1031(67)90034-0

Kalish, C. (2002). Children's predictions of consistency in people's actions. *Cognition*, 84(3), 237–265. https://doi.org/10.1016/s0010-0277(02)00052-5

Kelley, H. H. (1973). The processes of causal attribution. *American Psychologist*, 28(2), 107–128. https://doi.org/10.1037/h0034225

Kerber, K. W. (1984). The perception of nonemergency helping situations: Costs, rewards, and the altruistic personality. *Journal of Personality*, 52(2), 177–187. https://doi.org/10.1111/j.1467-6494.1984.tb00351.x

Liu, D., Gelman, S. A., & Wellman, H. M. (2007). Components of young children's trait understanding: behavior-to-trait inferences and trait-to-behavior predictions. *Child Development*, 78(5), 1543-1558. https://doi.org/10.1111/j.1467-8624.2007.01082.x

McCormack, T., Ho, M., Gribben, C., O'Connor, E., Hoerl, C. (2018) The development of counterfactual reasoning about doubly-determined events. *Cognitive Development*, 45, 1-9, https://doi.org/10.1016/j.cogdev.2017.10.001

Nadelhoffer, T., Feltz, A. The Actor–Observer Bias and Moral Intuitions: Adding Fuel to Sinnott-Armstrong's Fire. *Neuroethics* 1, 133–144 (2008). https://doi.org/10.1007/s12152-008-9015-7

Nyhout, A., & Ganea, P. A. (2019a). Mature counterfactual reasoning in 4- and 5-year-olds. *Cognition*, 183, 57–66. https://doi.org/10.1016/j.cognition.2018.10.027

Nyhout, A., & Ganea, P. A. (2019b). The Development of the Counterfactual Imagination. *Child Development Perspectives*, 13(4), 254–259. https://doi.org/10.1111/cdep.12348

Paulus, M. (2020). Is young children's helping affected by helpees' need? Preschoolers, but not infants selectively help needy others. *Psychological Research*, 84(5), 1440–1450. https://doi.org/10.1007/s00426-019-01148-8

Pesowski, M. L., Denison, S., & Friedman, O. (2016). Young children infer preferences from a single action, but not if it is constrained. *Cognition*, 155, 168–175. https://doi.org/10.1016/j.cognition.2016.07.004

Radovanovic, M., Chao, T. W., Onyshko, E., Huynh, Q. D. T., Liu, Y. L., & Sommerville, J. A. (2023). Not just if, but how much: Children and adults use cost and need to make evaluations about generosity across contexts. *Cognition*, 238, 105533. https://doi.org/10.1016/j.cognition.2023.105533

Rafetseder, E., Schwitalla, M., & Perner, J. (2013). Counterfactual reasoning: From childhood to adulthood. *Journal of Experimental Child Psychology*, 114(3), 389–404. https://doi.org/10.1016/j.jecp.2012.10.010

Scola, C., Holvoet, C., Arciszewski, T., & Picard, D. (2015). Further evidence for infants' preference for prosocial over antisocial behaviors. *Infancy*, 20, 684–692.

Schlingloff-Nemecz, L., Pomiechowska, B., Tatone, D., Revencu, B., Mészégető, D., & Csibra, G. (2025). Young children's understanding of helping as increasing another agent's utility. *Open Mind*, 9, 169–188. https://doi.org/10.1162/opmi_a_00183

Sierksma, J., Lansu, T. A. M., Karremans, J. C., & Bijlstra, G. (2018). Children's helping behavior in an ethnic intergroup context: Evidence for outgroup helping. *Developmental Psychology*, 54(5), 916–928. https://doi.org/10.1037/dev0000478

Sierksma, J., Thijs, J., Verkuyten, M., & Komter, A. (2013). Children's reasoning about the refusal to help: The role of need, costs, and social perspective taking. *Child Development*, 85(3), 1134–1149. https://doi.org/10.1111/cdev.12195

Sierksma, J., & Shutts, K. (2021). Competence-based helping: Children's consideration of need when providing others with help. *Journal of Experimental Child Psychology*, 210, 105206. https://doi.org/10.1016/j.jecp.2021.105206

Tooby, J., & Cosmides, L. (1996). Friendship and the banker's paradox: Other pathways to the evolution of adaptations for altruism. In *Evolution of social behaviour patterns in primates and man* (119–143). Oxford University Press.

Van de Vondervoort, J. W., & Hamlin, J. K. (2017). Preschoolers' social and moral judgments of third-party helpers and hinderers align with infants' social evaluations. *Journal of Experimental Child Psychology*, 164, 136–151. https://doi.org/10.1016/j.jecp.2017.07.004

Weiner, B. (Ed.). (1974). *Achievement motivation and attribution theory*. Morristown, NJ: General Learning Press.

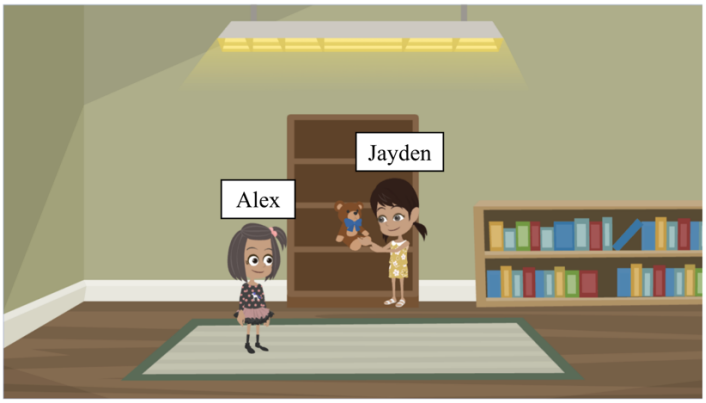
Woo, B. M., Liu, S., Gweon, H., & Spelke, E. S. (2024.). Toddlers Prefer Agents Who Help Those Facing Harder Tasks. *Open Mind*, 8 483–499. https://doi.org/10.1162/opmi_a_00129

Woo, B. M., Steckler, C. M., Le, D. T., & Hamlin, J. K. (2017). Social evaluation of intentional, truly accidental, and negligently accidental helpers and harmers by 10-month-old infants. *Cognition*, 168, 154–163. https://doi.org/10.1016/j.cognition.2017.06.029

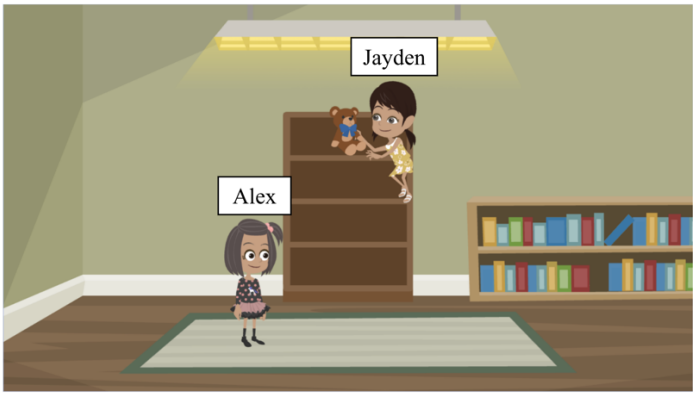
Zhao, X., Zhao, X., Gweon, H., & Kushnir, T. J. C. (2021). Leaving a choice for others: Children's evaluations of considerate, socially-mindful actions. *Child Development*, 92(4), 1238–1253.

Appendix 1:

Figure 3. *Female-matched characters in the LC (left) and HC (right) conditions*



Alex says, "that bear looks really fun!" Jayden easily reaches over and grabs the bear and gives it to Alex to play with. Now I am going to ask you some questions about Jayden!



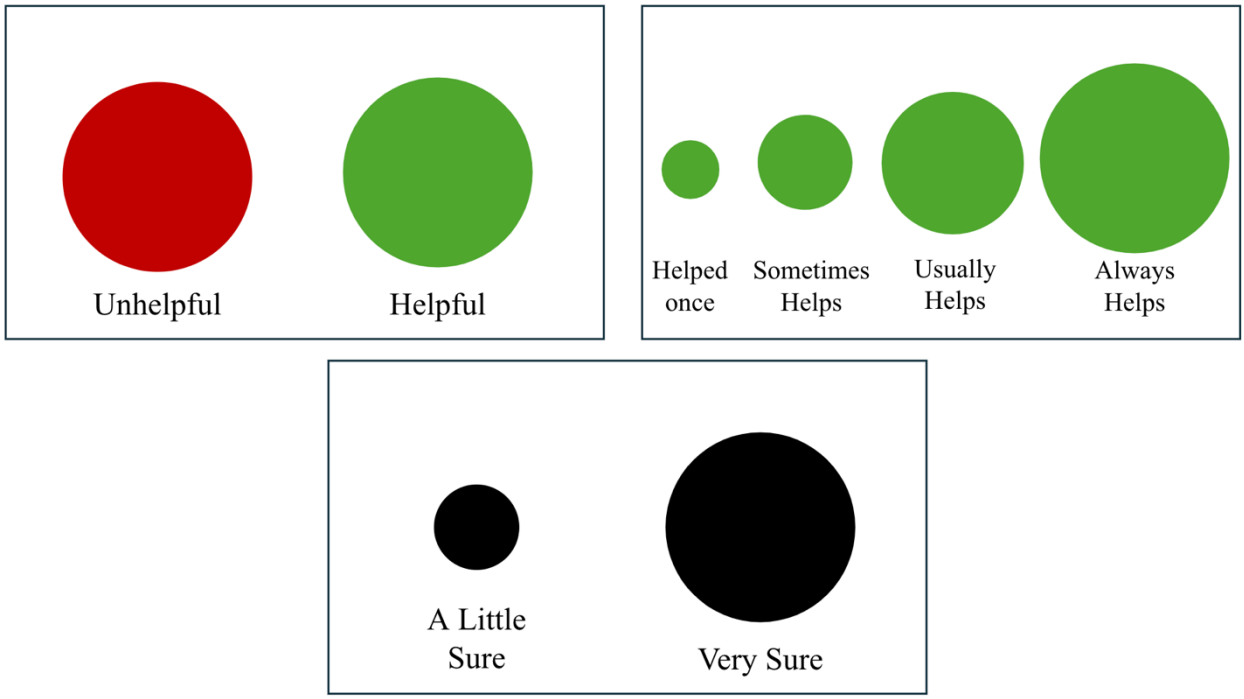
Alex says, "that bear looks really fun!" Jayden works hard to climb up the shelf to the very top so that she can reach the bear and gives it to Alex to play with. Now I am going to ask you some questions about Jayden!

Figure 4. *Stimuli shown to participants while they answered study questions.*

Q1: Was it easy or hard for Jayden to grab the bear?
Q2: Do you think Jayden is a helpful person, or unhelpful person? How helpful?
Q3: If the bear had been on the very top shelf, and Jayden would have had to work very hard and climb up to get it, do you think Jayden would have helped? How sure are you?

Q4: Do you think Jayden would help Alex even if it meant Jayden wouldn't be able to play with the bear? How sure are you?
Q5: If Alex needed help with her schoolwork, do you think Jayden would help? How sure are you?
Q6: Do you think Jayden would help Alex even if they were not friends? How sure are you?

Figure 5. *Helpfulness and Sureness scales.*



Appendix 2:

Low Cost Helping Condition

Hi! My name is ____. In this game, I am going to tell you about some people and then ask you some questions. Are you ready?

HELPFULNESS TRAINING
In this game, I will ask you how helpful someone is. We are going to use these circles to answer the questions. (show Un/Helpful Scale) If you think someone is unhelpful you can point to this red circle. If you think someone is helpful you can point to this green circle.

If you think someone is helpful, we will use these circles (show Helpful Mini Scale) to talk about how helpful they are. The smallest circle (far left) means you think they helped this time, but they usually don't help. This smaller circle (left center) means you think they sometimes help. The medium circle (right center) means that you think they usually help. And the large circle (far right) means you think they would always help. Let's practice!

Practice 1: If someone fell down and a classmate picked them back up again, do you think the classmate was helpful or unhelpful? (correct if don't say helpful)
How helpful are they?

(FL) helped this time, but usually doesn't help (LC) sometimes helps (RC) usually helps (FR) would always help

(show the sureness card) In this game, I will also ask you how sure you are about your answers. For example, this little circle (point) means I'm a little sure. This big circle means (point) I'm very sure.

Practice 2: Let's practice. Can you point to the circle that means I am a little sure? Can you point on the circle that means I am very sure?

<u>Experiment</u>
Okay let's start our game! (show Test Booklet)
(flip)

I am going to tell you a story about two kids: in the same class, Alex and Jayden.
(flip)

Alex and Jayden are standing near a shelf, and Alex decides she wants to play with the toy bear which is on the bottom shelf.
(flip)

Alex says, "That bear looks really fun!" Jayden easily reaches over and grabs the bear and gives it to Alex to play with. Now I am going to ask you some questions about Jayden!

(flip)
Q1: Was it easy or hard for Jayden to grab the bear?

Q2: Do you think Jayden is a helpful person, or unhelpful person?
If helpful: How helpful is Jayden?

Q3: If the bear had been on the very top shelf, and Jayden would have had to work hard and climb up to get it, do you think Jayden would have helped? Yes/No

Q4: Do you think Jayden would help Alex even if it meant Jayden wouldn't be able to play with the bear? Yes/No

Q5: If Alex needed help with his/her schoolwork, do you think Jayden would help? Yes/No

Q6: Do you think Jayden would help Alex even if they were not friends? Yes/No

That's the end of our game. Thank you for playing!

High Cost Helping Condition

Hi! My name is ____. In this game, I am going to tell you about some people and then ask you some questions. Are you ready?

HELPFULNESS TRAINING
In this game, I will ask you how helpful someone is. We are going to use these circles to answer the questions. (show Un/Helpful Scale) If you think someone is unhelpful you can point to this red circle. If you think someone is helpful you can point to this green circle.

If you think someone is helpful, we will use these circles (show Helpful Mini Scale) to talk about how helpful they are. The smallest circle (far left) means you think they helped this time, but they usually don't help. This smaller circle (left center) means you think they sometimes help. The medium circle (right center) means that you think they usually help. And the large circle (far right) means you think they would always help. Let's practice!

Practice 1: If someone fell down and a classmate picked them back up again, do you think the classmate was helpful or unhelpful? (correct if don't say helpful)
How helpful are they?

(FL) helped this time, but usually doesn't help (LC) sometimes helps (RC) usually helps (FR) would always help

(show the sureness card) In this game, I will also ask you how sure you are about your answers. For example, this little circle (point) means I'm a little sure. This big circle means (point) I'm very sure.

Practice 2: Let's practice. Can you point to the circle that means I am a little sure? Can you point on the circle that means I am very sure?

Experiment
Okay let's start our game! (show Test Booklet)
(flip)

I am going to tell you a story about two kids: in the same class, Alex and Jayden.
(flip)

Alex and Jayden are standing near a shelf, and Alex decides she wants to play with the toy bear which is all the way on the top shelf.
(flip)

Alex says, "That bear looks really fun!" Jayden works hard to climb up the shelf to the very top so that she can reach the bear and gives it to Alex to play with. Now I am going to ask you some questions about Jayden!
(flip)

Q1: Was it easy or hard for Jayden to grab the bear?

Q2: Do you think Jayden is a helpful person, or unhelpful person?
If helpful: How helpful is Jayden?

Q3: If the bear had been on the bottom shelf, and Jayden would have been able to reach it easily without climbing, do you think Jayden would have helped? Yes/No

Q4: Do you think Jayden would help Alex even if it meant Jayden wouldn't be able to play with the bear? Yes/No

Q5: If Alex needed help with his/her schoolwork, do you think Jayden would help? Yes/No

Q6: Do you think Jayden would help Alex even if they were not friends? Yes/No

That's the end of our game. Thank you for playing!

Appendix 3

Exploratory analyses of the counterfactual scenario.

Response frequencies across composite score values suggest a difference across conditions, as 57% of children in the low-cost condition gave the highest score (1.5), compared to 38% of children in the high-cost condition. Past research suggests that children over 6 are proficient in counterfactual thinking when it comes to evaluating other people's actions, but children younger than 6 years of age are not (Gautam et al., 2023; McCormack et al., 2018; Zhao et al., 2021). However, there is preliminary evidence that younger children of 3- to 4-years of age are able to reason about relative helpfulness using counterfactual reasoning (Bridgers et al., 2020). Thus, the youngest children in our sample may be able to successfully complete this task.

To investigate whether this was true, we conducted two 2x2 Fisher's exact tests, one with children under 6 years of age and one with children 6 years of age and older. Younger children did not significantly differ in their predictions according to condition, (p = 1, OR = 0.96, 95% CI [0.20, 4.26]). Older children showed a significant effect of condition (p = 0.046, OR = 3.52, 95% CI [0.98, 13.98]) on their predictions, such that those in the HC condition were more likely to predict Jayden to not help Alex when presented with the counterfactual situation (the LC scenario) than those in the LC condition were when presented with the counterfactual situation (the HC scenario).

Children above 6 years of age may have engaged in more sophisticated reasoning about the reduced need of the helpee into their judgments about the counterfactual scenario to the high-cost condition. In other words, when older children that saw Jayden help Alex get the bear from the top shelf were asked about whether Jayden would have still helped Alex if the bear was on the bottom shelf, they may have reasoned that because the bear was now more accessible, Jayden

would not help Alex since the utility of Jayden's help was now decreased. In contrast, younger children appeared less likely to adjust their predictions based on contextual nuances, possibly relying on a simpler heuristic that helpers continue to help regardless of circumstance. These exploratory findings suggest a developmental shift in how children integrate information about cost when making dispositional inferences and reasoning about others' future actions.

Another possibility is that younger children are capable of integrating and considering contextual information about need and competence, but simply did not have sophisticated enough counterfactual reasoning to fully consider this information. There is evidence that children's ability to engage in counterfactual reasoning develops gradually (McCormack et al., 2018; Rafetseder et al., 2013; Nyhout et al., 2017), though there is debate on when exactly children develop competency in counterfactual thinking. Nyhout & Ganea (2019a) suggest that 4-5 year olds show adult-like capabilities of counterfactual reasoning when they are thinking about specifically physical paradigms, while others suggest that children as young as 3 years of age show mastery in counterfactual reasoning (Guajardo & Turley-Ames, 2004; Harris et al., 1996). Other research suggests that younger children can reason counterfactually about physical events but lack the ability to reason counterfactually about social agents. Children 6 years and older, but not younger, incorporate counterfactual possibilities into moral evaluations, judging agents based not only on their actual behavior but also on what they could have done (Gautam et al., 2023; Wong et al., 2023). Six-year-olds also show adult-like reasoning by judging it nicer to leave snack options for others, but only when the agent had the choice to do so. In contrast, 4- and 5-year-olds' moral judgments about a character's choice did not consider whether the agent had a choice to leave options (Zhao et al., 2021). If younger children had difficulty reasoning about the counterfactual, they may have resorted to a simple heuristic to answer the question.

Analyses including participants that failed the attention check:

A couple statistical analyses produced different results when we ran them without excluding participants that failed the attention check (participants that were excluded because of interference or missing data were still excluded). Although conclusions cannot be accurately drawn from these results, we thought it was worthwhile to report them as the addition of these participants increased the statistical power of the analyses. Participants (N = 133; 79 female, 54 male; M_{age} = 6.54 years, SD = 2.45 years) were randomly assigned to either the low-cost (LC) condition (n = 70; 41 female, 29 male; M_{age} = 6.72 years, SD = 2.49 years) or the high-cost (HC) condition (n = 63; 38 female, 25 male; M_{age} = 6.34 years, SD = 2.42 years). The mean age of participants was slightly younger (6.54 years vs. 6.7 years) than the mean age after participants that failed the attention check were excluded.

Counterfactual Scenario

We ran a linear regression with condition and age (centered) as predictors and the composite score as the outcome. Composite scores were produced by multiplying the binary Yes/No answer (-1 = No, 1 = Yes) with the Sureness answer (0.5 = a little sure, 1.5 = very sure). We found a significant main effect of condition (b = 0.49, SE = 0.19, p = .012), wherein children in the LC condition gave significantly higher composite scores than those in the HC condition. There was no significant main effect of age (b = -0.04, SE = 0.06, p = .447), suggesting that children's responses did not vary as a function of age. There was also no significant interaction between condition and age (b = 0.01, SE = 0.08, p = .902), indicating that the effect of condition did not differ by age.

Helping with Additional Cost

We ran a linear regression with condition and mean-centered age as predictors, and a composite score as the outcome. We found a significant main effect of condition (**b** = 0.30, *SE* = 0.15, *p* = .049), indicating that children in the LC condition gave higher composite scores than those in the HC condition. There was also a significant main effect of age (*b* = 0.12, *SE* = 0.05, *p* = .009), suggesting that older children tended to give higher composite scores overall. The interaction between condition and age was not significant (b = -0.12, SE = 0.06, p = .061), indicating that the effect of condition did not differ by age.