

BRIEF REPORT

Undervaluing the Positive Impact of Kindness Starts Early

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Prosociality can create social connections that increase well-being among both givers and recipients, yet concerns about how another person might respond can make people reluctant to act prosocially. Existing research suggests these concerns may be miscalibrated such that people underestimate the positive impact their prosociality will have on recipients. Understanding when miscalibrated expectations emerge in development is critical for understanding when misplaced cognitive barriers might discourage social engagement and for understanding when interventions to build relationships could begin. Two experiments asking children (aged 8–17, Experiment 1; aged 4–7, Experiment 2) and adults to perform the same random act of kindness for another person document that both groups significantly underestimate how “big” the act of kindness will seem to recipients, and how positive their act will make recipients feel. Participants significantly undervalued the positive impact of prosociality across ages. Miscalibrated psychological barriers to social connection may emerge early in life.

Public Significance Statement

Prosociality tends to increase well-being among those performing the prosocial action as well as among those receiving the action. And yet, people may be somewhat reluctant to act prosocially out of concerns about how another person might respond. In two experiments involving children (4–7 years old), adolescents (8–17 years old), and adults, we find that people’s concerns tend to be systematically miscalibrated such that they underestimate how positively others will respond to their prosocial act. The degree of miscalibration is not moderated by age. This suggests that miscalibrated social cognition could make people overly reluctant to behave prosocially, that miscalibrated expectations emerge early in development, and that overcoming these social cognitive barriers could potentially increase well-being across the lifespan.

Keywords: children, prosocial behavior, social cognition, well-being

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Doing good tends to feel good, both for the person performing a prosocial act as well as for the person receiving it (Curry et al., 2018). However, people may be somewhat reluctant to reach out and connect with others in positive ways due to concerns about how another person might respond. Emerging research suggests that these concerns may be miscalibrated such that those performing prosocial actions—including expressing gratitude, sharing compliments,

providing social support, or performing a random act of kindness—tend to systematically underestimate how positively their recipients will respond (see Epley et al., 2023 for a review).

Here we examine the extent to which miscalibrated expectations about prosociality, and the corresponding reluctance to behave prosocially, are robust across the lifespan by examining the extent to which they are present in childhood, adolescence, and adulthood.

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Society for Personality and Social Psychology (poster), and 2019 Society for Judgment and Decision Making (poster).

Margaret Echelbarger served as lead for data curation, formal analysis, investigation, project administration, and writing—original draft. Nicholas Epley served as lead for resources and served in a supporting role for data curation, formal analysis, investigation, supervision, and writing—original draft. Margaret Echelbarger and Nicholas Epley contributed equally to conceptualization, writing—review and editing, and methodology.

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We do so by asking people from age 4 through adulthood to perform a random act of kindness, comparing people's expectations of their recipient's reaction to the recipient's actual reactions. This design provides a conceptual replication of existing research (Kumar & Epley, 2022) across a diverse age range and also provides a novel methodological procedure to measure the calibration of social cognition among children and adolescents. A large body of research examines the early development of prosocial motivation (Eisenberg et al., 2006; Grossman, 2018; Hepach & Warneken, 2018; Spinrad & Gal, 2018), documenting how prosociality can often be an intuitive and automatic response in social situations among both children and adults (Warneken & Tomasello, 2006, 2007; Zaki & Mitchell, 2013). This research does not, however, examine how social cognition—specifically, underestimating recipients' positive reactions—could be a unique mechanism that influences prosocial behavior in children and adolescents, as it may in adults.

Beyond providing a novel method to test a potentially novel mechanism for understanding prosociality in children and adolescents, we believe examining miscalibrated expectations across a wide span of human development is important for two additional reasons. First, prosocial behavior increases well-being across the lifespan (Aknin et al., 2012; Bagwell et al., 1998; Hartup & Stevens, 1999; Holder & Coleman, 2015; Rubin & Thompson, 2003), but prosociality may be especially important when creating new relationships (Edwards et al., 2006). Miscalibrated expectations that decrease the likelihood of connecting with others could be especially important for younger children and adolescents, suggesting that interventions to calibrate social expectations and encourage social connection might be usefully implemented early in life. Indeed, interventions to encourage prosociality through other mechanisms can improve well-being in children and adolescents (e.g., Froh et al., 2009).

Second, examining expectations across development tests the robustness of people's tendency to underestimate the positive impact of prosocial actions on recipients, effects so far documented only in adults. One explanation for the gap between prosocial expectations and recipients' experiences stems from a perspective difference in how two sides evaluate a prosocial act (Dungan et al., 2022; Kumar & Epley, 2018, 2022; Zhao & Epley, 2021). Specifically, those performing the act tend to focus relatively more on aspects related to its competency, such as how articulate a gratitude letter appears or the specific attributes or value of an act of kindness. Recipients, in contrast, tend to focus relatively more on the warmth conveyed by the act, such as how sincere a gratitude letter seems or how kind a random act of kindness was. Existing research suggests that children (4–12 years) and adults do not differ in the extent to which they use their own perspective as a default in social judgment but do differ in the likelihood of correcting that egocentric default when it is clear that their own perspective is unique (Epley et al., 2004). However, existing research does not examine whether those performing a prosocial act recognize that their own perspective differs from that of a recipient and hence would need to be corrected or adjusted to match another's perspective. If those performing prosocial acts are unaware of how their own perspective may be unique, then people ranging from children to adults may underestimate its positive impact. In contrast, if those performing the prosocial act are aware of a recipient's differing perspective, then adults might correct their egocentric perspective and be less miscalibrated than children.

We tested the extent to which children, adolescents, and adults underestimate the positive impact of a prosocial act on a recipient's experience in two experiments using a similar design as employed in Kumar and Epley (2022). In both, participants were given a gift and asked to give it away to a stranger as a random act of kindness. Givers reported how “big” the act would seem to recipients, as a subjective measure of overall value, and how negative or positive they expected the recipients to feel, as a subjective measure of mood, because acts of kindness are meant to be meaningful and make recipients feel good. After receiving their gift from the experimenter, recipients reported how big they actually perceived the act to be, and reported their mood. As an initial exploratory step, Experiment 1 compares children and adolescents aged 8–17 against a sample of adults. Experiment 2 compares a younger group of children aged 4–7 against a sample of adults. In both experiments, givers identified a recipient in the same age category (another child/adolescent or another adult). Preregistrations, survey materials, and data for both experiments are available here: <https://osf.io/uhr7/>. Deviations from preregistrations are noted where needed. Preregistered analyses not reported here are available in the [online supplemental materials](#).

Experiment 1

Participants

We targeted a total sample size of 200 participants (50 pairs of children and 50 pairs of adults), after exclusions, and stopped collecting data once we reached this target. Our final sample included 50 givers 8–17 years of age ($M = 12.08$, $SD = 2.75$, one unreported; 28 female, 21 male, one unreported) paired with 50 recipients 4–17 years of age ($M = 8.82$, $SD = 2.83$, four unreported; 17 female, 29 male, four unreported), and 50 adult givers ($M = 38$, $SD = 15$; 25 female, 25 male) paired with 50 adult recipients ($M = 42$, $SD = 13$, one unreported; 22 female, 27 male, one unreported). We excluded an additional 16 child and six adult givers because we were unable to collect data from their recipients (see [Table S1 in the online supplemental materials](#) for more information on why data from recipients could not be collected across both experiments). An additional child giver was excluded because they did not want to give away one of their pencils. See [Table 1](#) for a distribution of children's and adolescents' ages by roles.

Procedure

Two experimenters advertised the experiment at a table outside a food court in a museum. Givers enrolled by either approaching the table or were recruited from the vicinity by the experimenters. Givers first completed a task for an unrelated experiment, after which they received two museum-branded pencils (or pens, in the case of six participants after the store ran out of pencils). Participants were told: “Here are two pencils (pens). You can keep both for yourself, but we'd really like for you to give one to another person here in the museum today. You can pick out the person and we'll give it to them.” If participants gave the item away, they pointed out another visitor they did not know from their same age group (another adult or child/adolescent) and then completed an online survey. This survey asked givers to predict “how big an act of kindness” their recipient would report their act to be on a scale from 0 (*very small*) to 10 (*very large*), how they expected their recipient would report feeling after receiving the item from them on a

Table 1*Distribution of Child/Adolescent Participants by Whole Age, Role, and Experiment*

Age (in years)	Experiment 1		Experiment 2	
	Giver	Recipient	Giver	Recipient
3 years	—	1	—	0
4 years	—	2	8	3
5 years	—	6	13	7
6 years	—	3	14	8
7 years	—	7	15	10
8 years	7	6	—	5
9 years	5	7	—	5
10 years	10	5	—	7
11 years	4	2	—	2
12 years	7	2	—	1
13 years	2	4	—	1
14 years	5	0	—	0
15 years	5	0	—	1
16 years	1	1	—	0
17 years	3	0	—	0
Unknown	1	4	1	1

Note. Parents were asked to provide both their child's age and date of birth. To calculate the exact age of our samples, we used birthdates. Here, we are able to provide more age information based on parents' opting to provide just their child's (whole) age.

scale from -5 (*much more negative than normal*) to 5 (*much more positive than normal*), and how giving the item away made them feel using the same mood scale. These measures were accompanied by either circles of increasing size to represent increasing subjective value or facial expressions to represent mood, to make them easier for children to understand. To allow for direct comparisons among all participants, adults also responded using the same measures accompanied by circles and facial expressions (distributions of all measures by group and role are provided in [Figure S1 in the online supplemental materials](#)). Due to a mistake, we did not include these circles in the adult survey for the first 14 participants but included them for all remaining participants.

While the giver was out of sight of their recipient, the second experimenter approached the selected recipient (or accompanying adult if a child) and explained that another participant in a study chose to give a pencil to them as a random act of kindness. Givers remained anonymous to recipients. Recipients then reported "how big" the act of kindness seemed to them, and reported their mood, in an online survey using the same scales used by givers. This design decision was made, in part, to avoid asking museum visitors, especially children, to approach strangers. Additionally, among adults, miscalibrated expectations are present both when intermediaries are involved (e.g., [Kumar & Epley, 2022](#)) and when they are not (e.g., [Zhao & Epley, 2021](#)).

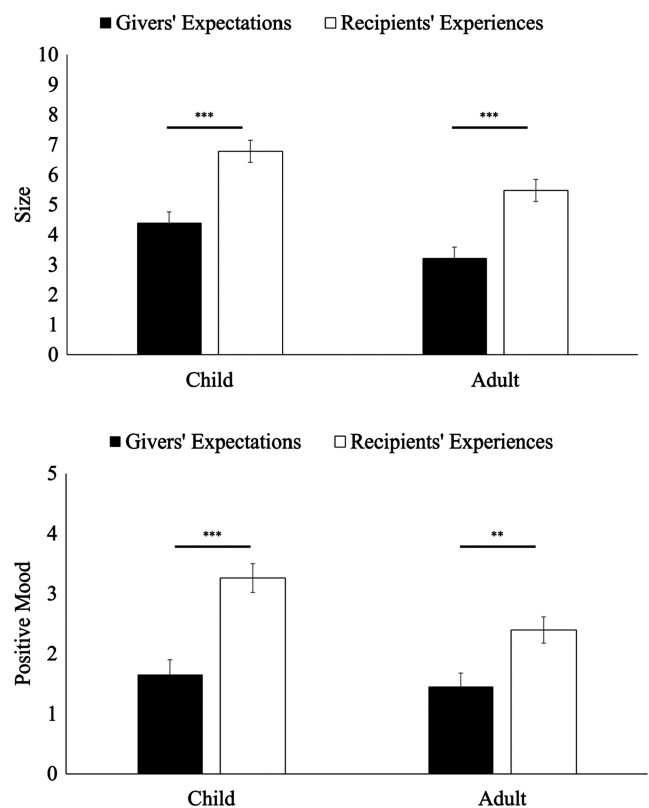
Results and Discussion

First, we report our preregistered analysis of variance (ANOVA) for each measure and then mixed-model linear regressions (preregistered as exploratory) to analyze age as a continuous measure. A 2 (Group: Child/Adolescent vs. Adult) \times 2 (Measure: Giver Expectation vs. Recipient Experience) mixed-model ANOVA on "how big" the act seemed yielded a main effect of measure, $F(1, 98) = 43.98, p < .001, \eta_p^2 = .31$, such that givers ($M = 3.81, SE = .26$) underestimated how

big an act of kindness their recipients ($M = 6.13, SE = .26$) would report receiving the pencil to be, as well as a main effect of group, $F(1, 98) = 10.41, p = .002, \eta_p^2 = .10$, such that children and adolescents ($M = 5.59, SE = .27$) rated the act as bigger than adults ($M = 4.35, SE = .27$). As shown in [Figure 1](#), a nonsignificant interaction between group and measure, $F(1, 98) = 0.03, p = .864, \eta_p^2 = .00$, indicated that the difference between givers' expectations and recipients' experience did not differ significantly between children/adolescents and adults.

We also analyzed age as a continuous measure via an exploratory mixed-model linear regression with role (Giver vs. Recipient), age, and the interaction involving these variables, with random intercepts by ID. This analysis revealed only an effect of role ($B = 2.61, SE = .66, t = 3.93, p < .001$) such that givers underestimated how big an act of kindness their recipients would report receiving the pencil to be. No effect of age ($B = -0.01, SE = .02, t = -0.71, p = .479$) nor interaction involving role and age ($B = -0.01, SE = .02, t = -0.50, p = .619$) was observed.

A similar 2 (Group: Child vs. Adult) \times 2 (Measure: Giver Expectation vs. Recipient Experience) mixed-model ANOVA on mood again yielded a significant effect of measure, $F(1, 98) = 33.43, p < .001, \eta_p^2 = .25$, a significant effect of group, $F(1, 98) = 5.05, p = .027, \eta_p^2 = .05$, and a nonsignificant interaction, $F(1, 98) = 2.26,$

Figure 1*Mean Giver Expectations and Mean Recipient Experiences by Age Group and Measure in Experiment 1*

Note. Error bars depict standard errors. Size ratings are presented in the top panel; mood ratings are presented in the bottom panel.

** $ps < .01$. *** $ps < .001$.

$p = .136$, $\eta_p^2 = .02$. As shown in Figure 1, Givers ($M = 1.56$, $SE = .17$) underestimated how positive their recipients ($M = 2.83$, $SE = .16$) would report feeling after the act of kindness, and both expected and experienced mood were more positive for children and adolescents ($M = 2.46$, $SE = .17$) than adults ($M = 1.93$, $SE = .17$).

We again analyzed age as a continuous measure with an exploratory mixed-model linear regression with role (Giver vs. Recipient), age (continuous), and the interaction, with random intercepts by ID. This analysis revealed only an effect of role ($B = 1.76$, $SE = .40$, $t = 4.41$, $p < .001$); givers underestimated how big an act of kindness their recipients would report receiving the pencil to be. Both age ($B = 0.00$, $SE = .01$, $t = 0.31$, $p = .757$) and the role and age interaction ($B = -0.02$, $SE = .01$, $t = -1.51$, $p = .134$) were nonsignificant.

Preregistered bivariate correlations revealed that, among givers, age was nonsignificantly associated with the expected size and mood ratings, and with the difference between expected and experienced size for givers and recipients ($ps > .51$). Giver age was, however, negatively associated with the difference between expected and experienced mood for givers and recipients ($p = .048$). Among recipients, age was nonsignificantly associated with experienced size and mood ($ps > .05$). See Table 2 for all correlations. Finally, consistent with prior research, both children ($M = 2.54$, $SD = 1.47$), $t(49) = 12.19$, $p < .001$, and adults ($M = 1.62$, $SD = 1.98$), $t(49) = 5.79$, $p < .001$, reported feeling significantly more positive than normal after their act of kindness.

Recall that we recruited a wide age range of participants to test whether miscalibrated expectations currently observed in adults could also be observed prior to adulthood. Our results suggest that children as young as 8 performing a prosocial action may underestimate how positively their recipients will respond, underestimating both its subjective value to recipients and how positive recipients will feel. To further investigate the robustness of this pattern in even younger children, and allow for a stronger test of the robustness of miscalibrated expectations across a wide age range, we modified the measures slightly in Experiment 2 so that they could be used by children as young as 4. We did not test children younger than 4 because we were unsure if younger children would uniformly understand the task instructions.

Experiment 2

Participants

We again targeted a total sample size of 200 participants, after exclusions, but deviated slightly from our preregistered sample of

100 child participants and 100 adult participants. Our final sample included 51 givers 4–7 years of age ($M = 6.31$, $SD = 1.20$, four unreported; 31 female, 18 male, one other, one unreported) paired with 51 recipients 4–15 years of age ($M = 7.75$, $SD = 2.39$, 17 unreported; 27 female, 23 male, one unreported), along with 49 adult givers ($M = 35$, $SD = 15$; 29 female, 20 male) paired with 49 adult recipients ($M = 45$, $SD = 13$; 24 female, 25 male). We excluded an additional 34 child and 20 adult givers because we were unable to collect data from their recipients. No givers opted to keep both pencils for themselves. Table 1 shows children's and adolescents' ages by roles.

Procedure

We conducted Experiment 2 in the same location using the same procedure as Experiment 1 with a few modifications. First, we adapted the initial instructions to better suit younger children. Participants were told, "Here are two pencils. This one [experimenter draws attention to one of the pencils] is for you! And this other one [experimenter draws attention to the second pencil], we want you to give it away. You get to give this pencil away to another (kid/adult) at the museum today. So, let's look. Who do you want to give this pencil to?" We also modified the survey items and associated scales for younger children. Specifically, givers first indicated whether their recipient would perceive their random act of kindness to be small or big, and then how small (1 = *really, really small*, 2 = *really small*, 3 = *a little small*) or big (4 = *a little big*, 5 = *really big*, 6 = *really, really big*) the act would seem. This method yielded a 6-point scale. Similarly, givers first indicated whether their recipient would feel happy, sad, or about the same. If happy or sad, they indicated how happy (1 = *a little happy*, 2 = *really happy*, 3 = *really, really, happy*) or how sad (−3 = *really, really sad*, −2 = *really sad*, −1 = *a little sad*). About the same was scored as 0. This method yielded a 7-point scale. Givers reported their own mood on the same scale. As in Experiment 1, each scale was accompanied by either circles of increasing size to represent increasing size or facial expressions to represent mood (distributions of all measures by group and role are provided in Figure S2 in the online supplemental materials).

Results and Discussion

Experiment 2 largely replicated the results of Experiment 1. A 2 (Group: Child vs. Adult) \times 2 (Measure: Giver Expectation vs. Recipient Experience) mixed-model ANOVA on "how big" the

Table 2
Bivariate Correlations Between Giver and Recipient Age and Ratings in Experiment 1

Measure	1	2	3	4	5	6	7	8	9
1. Giver age	—								
2. Recipient age	.71***	—							
3. Predicted size	−.07	−.19	—						
4. Predicted mood	.05	−.10	.45***	—					
5. Experienced size	−.12	−.16	.14	.00	—				
6. Experienced mood	−.20*	−.19	.22*	.09	.59***	—			
7. Giver mood	−.16	−.17	.44***	.62***	.10	.09	—		
8. Size difference	−.05	.00	−.62***	−.31**	.66***	.31**	−.22*	—	
9. Mood difference	−.20*	−.09	−.13	−.64***	.41***	.68***	−.37***	.44***	—

* $p < .05$. ** $p < .01$. *** $p < .001$.

act seemed yielded a significant main effect of role, $F(1, 98) = 13.56, p < .001, \eta_p^2 = .12$, of group, $F(1, 98) = 10.93, p = .001, \eta_p^2 = .10$, and a nonsignificant interaction, $F(1, 98) = 0.72, p = .400, \eta_p^2 = .01$. As shown in Figure 2, givers again underestimated how big their act of kindness would seem to recipients ($M = 2.46, SE = .14$ vs. $M = 3.23, SE = .16$), and children expected and experienced the act as bigger than did adults ($M = 3.20, SE = .15$ vs. $M = 2.49, SE = .15$). Among givers, child age again was not significantly associated with the expected size ratings, the difference between the expected and experienced measures, or recipients' ratings ($ps > .36$). Child age was also nonsignificantly associated with reported size ratings among recipients ($p = .924$).

A 2 (Group: Child vs. Adult) \times 2 (Measure: Giver Expectation vs. Recipient Experience) mixed-model ANOVA on mood also yielded a significant effect of role, $F(1, 98) = 5.82, p = .018, \eta_p^2 = .06$, of group, $F(1, 98) = 34.38, p < .001, \eta_p^2 = .26$, and a nonsignificant interaction, $F(1, 98) = 0.01, p = .926, \eta_p^2 = .00$. As shown in Figure 2, givers again underestimated how positive their recipients would feel both among children and adults ($M = 1.14, SE = .11$ vs. $M = 1.48, SE = .10$), and children expected and experienced a more positive mood than adults ($M = 1.77, SE = .11$ vs. $M = 0.86, SE = .11$). Among givers, child age again was nonsignificantly associated with the expected mood ratings and the difference between the

expected and experienced measures ($ps > .82$). However, the age of child recipients was negatively correlated with experienced mood ratings, such that younger children reported feeling more positively after the act of kindness ($p = .037$).

Finally, as in Experiment 1, both children ($M = 1.59, SE = .19$), $t(50) = 8.53, p < .001$, and adults ($M = 0.84, SE = .11$), $t(48) = 7.33, p < .001$, reported being in a significantly more positive mood than normal after performing their random act of kindness.

General Discussion

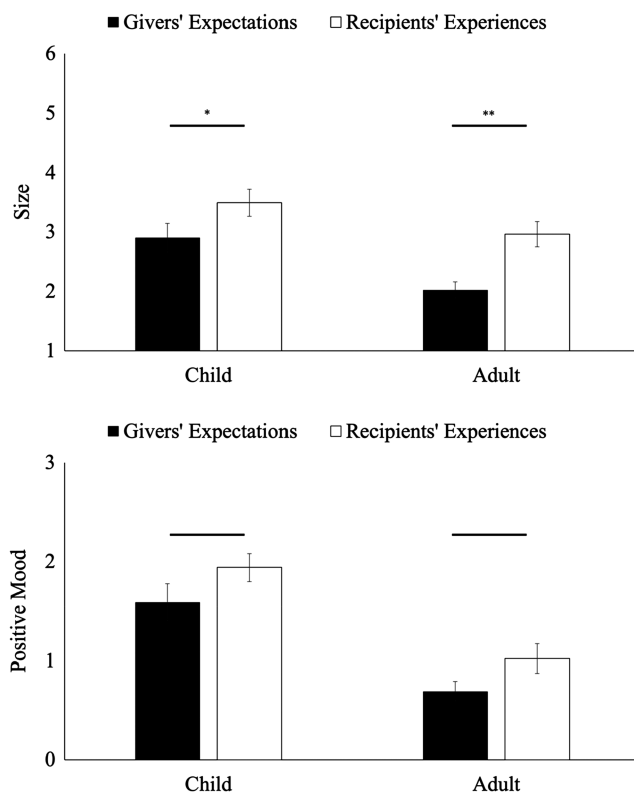
Positive social connections are critical for happiness and health among children, adolescents, and adults alike, and yet reaching out to connect with others can sometimes be hindered by concerns about how a recipient might respond. A growing body of recent research indicates that people consistently underestimate how positively prosocial actions will make a recipient feel, meaning that social cognition may create a misplaced barrier to social connection (Epley et al., 2022). Two experiments using a novel kindness procedure indicated that miscalibrated expectations arise early in development. In our experiments, children as young as 4–7 years along with adults underestimated how much their recipient would value their prosocial act and how positive they would feel afterward. Psychological barriers to prosocial behavior appear to emerge early and persist into adulthood.

This may seem somewhat surprising given that experience with prosociality would presumably calibrate expectations. However, people can learn from their experience only when they have experience to learn from. Expectations that encourage avoidance may keep people from having the very experiences that would calibrate their expectations (Epley et al., 2022). In addition, people may not recognize the positive impact they have had on another person even after going through an interaction with them. Strangers who have just had a conversation tend to underestimate how much their partner actually liked them (Boothby et al., 2018), another social cognitive bias that has recently been documented in young children over age 5 as well (but not among 4-year-olds; Wolf et al., 2021). These results suggest that even if the givers in our experiments had been able to interact with their recipients while performing their act of kindness, they may still not have been able to recognize how positive recipients felt. Future research should examine how people do, or do not, learn from their experiences in ways that could maintain miscalibrated social expectations and also examine outcomes across a range of other prosocial acts and among a larger sample of children and adolescents than we studied here.

Although our research found little evidence of age-related differences in the magnitude of miscalibrated expectations in our child and adolescent samples, this could stem from insufficient power to detect more nuanced differences. We see no reason to suspect differences across age in how well participants could understand our procedures or scales; future research using this novel procedure in children could include comprehension checks to assess understanding across ages.

In addition, future research should investigate whether children, adolescents, and adults might differ in the extent to which the miscalibrated expectations we documented guide their social behavior. Children, in particular, and adults may not differ in their expectations about the minds of others once prompted to think of them but may differ in the likelihood of thinking about the minds of others in the first place (Epley et al., 2004; Flavell et al., 1995; Wellman, 2011).

Figure 2
Mean Giver Expectations and Mean Recipient Experiences by Age Group and Measure in Experiment 2



Note. Error bars depict standard errors. Size ratings are presented in the top panel; mood ratings are presented in the bottom panel.

* $ps < .05$. ** $ps < .01$.

Everyday life provides many opportunities to reach out to others in positive ways that could build relationships and increase well-being. Our experiments suggest that misunderstanding the positive impact that our prosocial actions could make people—from kindergartners to adults—less kind than might be optimal.

Constraints on Generality

We expect that people aged 4 and older will tend to underestimate how positively others will respond to actions that are perceived as prosocial by both givers and recipients—that is, perceived as actions intended to benefit a recipient. Factors that influence how prosocial an action is perceived to be should moderate both givers' expectations and recipients' reactions. We have no reason to believe that our results depend on other characteristics of the participants, setting, or materials.

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