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Brief Report

The roles of group membership and social exclusion in children's testimonial learning



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ABSTRACT

Here, we used high- and low-stakes testimonial learning tasks to better understand two important types of social influence on children's learning decisions: group membership and social ostracism. Children (4- and 5-year-olds; N = 100) were either included or excluded by in-group or outgroup members in an online ball tossing game. Then, children were asked to selectively learn new information from either an in-group or out-group member. They also received counterintuitive information from an in-group or outgroup member that was in conflict with their own intuitions. When learning new information, children who were excluded were more likely to selectively trust information from their in-group member. In contrast, when accepting counterintuitive information, children relied only on group membership regardless of their exclusion status. Together, these findings demonstrate ways in which different forms of testimonial learning are guided not only by epistemic motivations but also by social motivations of affiliation and maintaining relationships with others.

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Introduction

Children acquire much of their knowledge from what others tell them, making testimonial learning a quintessentially social and epistemic affair. Whereas many have started to appreciate the epistemic and social factors at play in testimonial learning (e.g., Koenig, Li, & McMyler, 2021; Jaswal & Kondrad,

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2016; Sobel & Finiasz, 2020), one central challenge is to distinguish the role played by the epistemic evaluation of inductive evidence from that of the social processes that govern agents' interactions. Here, we examined two types of testimonial learning—the acceptance of novel claims and the revision of beliefs when accepting counterintuitive claims—with an interest in how each type of learning would be influenced by a purely social influence such as ostracism and an informant's group membership that carries both epistemic and social significance.

Group membership

Children are highly sensitive to social groups from a young age (e.g., Baron & Dunham, 2015; Dunham, Baron, & Carey, 2011) and actively learn from members from their own group. For example, children preferred to seek information from speakers who were similar to them in appearance (Elashi & Mills, 2014; Reyes-Jaquez & Echols, 2013) and selectively learned from native speakers over foreign-accented speakers (Kinzler, Corriveau, & Harris, 2011). This bias to learn from in-group members remains robust even in the presence of negative information about them. For example, although the antisocial behavior of in-group members (e.g., refusal to share with others) reduced children's explicit liking of their in-group members, it did not move children's decisions to selectively learn from them (Hetherington, Hendrickson, & Koenig, 2014) or imitate them (Wilks, Kirby, & Nielsen, 2019). Likewise, children did not show a systematic reduction in learning from in-group members who were inaccurate (Elashi & Mills, 2014; MacDonald, Schug, Chase, & Barth, 2013), suggesting that an agent's group membership weighed in favor of their testimony to some degree.

Why do children sometimes opt to learn information from their own group even when the in-group informant displays antisocial or incompetent behavior? Many developmentalists argue that both evidential processes and social processes are at work in testimonial learning (e.g., Koenig, Li, & McMyler, 2021; Over & Carpenter, 2012; Sobel & Finiasz, 2020; Tong, Wang, & Danovitch, 2019). Specifically, epistemic mechanisms influence children's learning via inferences from evidence such as the probabilistic inferences children make about informants who are likely to provide reliable and relevant information (Sobel & Finiasz, 2020). Conversely, social mechanisms often exert their influence via affiliative, emotional, and affective processes (Harris, 2007; Jaswal & Kondrad, 2016). In line with this proposal, one interesting possibility is that group cues serve as both a powerful *epistemic cue* that signals relevant and reliable information (Henderson, Sabbagh, & Woodward, 2013) and a *social cue* that signals affiliation and willingness to collaborate (Jaswal & Kondrad, 2016; Tomasello, 2019). Indeed, an informant from the child's own group is perceived not only as having competence to transmit culturally relevant skills and knowledge to the child (Kinzler et al., 2011) but also as someone about whom children have robust social preferences and expectations (Baron & Dunham, 2015; Dunham et al., 2011). This "hybrid" nature of group information may make group cues particularly salient for children in learning contexts.

Ostracism

In contrast to group membership, the experience of ostracism or exclusion functions as a purely social or affective factor in social interactions. For adults, being socially excluded by others can induce negative moods, threaten fundamental needs such as belongingness, and increase vigilance toward social cues to facilitate potential reaffiliation (e.g., Lakin, Chartrand, & Arkin, 2008; Williams, 2007). Recent empirical work has found similar effects of vicarious ostracism in children. Compared with those who watched a control video, 4- and 5-year-olds who watched a priming video depicting a group of shapes excluding one single shape drew themselves and their friend closer together (Song, Over, & Carpenter, 2015) and chose to sit closer to an unfamiliar experimenter (Marinović, Wahl, & Träuble, 2017), revealing that ostracism may lead children to express affiliative intentions and the need to belong. Conformity in social learning contexts has also been associated with affiliation in the face of ostracism. For example, viewing third-party ostracism led to higher imitation fidelity of

an adult's actions in 5-year-olds, a finding that was identified as children's signaling similarity with others (Over & Carpenter, 2009; Watson-Jones, Legare, Whitehouse, & Clegg, 2014; see also Hopkins, & Branigan, 2020). In addition, 5-year-olds judged that an ostracized puppet should publicly endorse the majority opinion about the contents of a box, demonstrating children's understanding of conformity as a means to gain social affiliation from a third-party perspective (Cordonier, Nettles, & Rochat, 2018).

To date, despite children's well-documented in-group biases and responses to exclusion, only a few studies have examined how these two types of social influences may interact. In one study, adults reported more satisfaction after being included in an online game by in-group members than by out-group members (Bernstein, Sacco, Young, Hugenberg, & Cook, 2010). However, being rejected by an out-group member felt just as distressing as being rejected by one's own group (Gonsalkorale & Williams, 2007). Only one study to our knowledge has examined the effects of group-based first-party ostracism in children. Using the Cyberball paradigm, an online game commonly used to prime ostracism (Williams, 2007), Watson-Jones, Whitehouse, and Legare (2016) found that 5- and 6-year-olds who were excluded by their own group engaged in higher-fidelity imitation of an in-group member than those who were included by their in-group, possibly because of their motivation to reaffiliate with in-group members.

Types of testimonial learning

As reviewed above, children have a robust preference to seek information from in-group members and show signs of conformity when facing the threat of a breakdown in affiliative relations. But when does children's deference signal pursuit of learning goals, social goals, or both? Evidence so far has focused on children's acceptance of *new information* in the face of ostracism in a group-related setting (i.e., imitating novel actions such as tapping a block on a peg), making it difficult to figure out whether children are conforming for purely affiliative reasons or are more motivated to learn under social influence. One way to distinguish between these two possibilities is to present children with testimonial learning tasks with varying levels of epistemic stakes.

Previous studies have shown that children were more likely to accept adult testimony when they had weaker prior knowledge about the topic compared with cases when they had stronger conflicting intuitions (Chan & Tardif, 2013). Indeed, when adult claims violate children's causal or perceptual knowledge, children sometimes show strong resistance in adjusting their beliefs (e.g., Krogh-Jespersen, & Echols, 2018; Lane & Harris, 2015; Woolley & Ghossainy, 2013). Based on this evidence, we reasoned that novel testimony (i.e., involving new object names and functions) might be more open to purely social influence than testimony requiring that a belief be abandoned and revised (i.e., counterintuitive claims), and we used these two types of testimony to examine the nature and limits of group membership and social exclusion on children's learning decisions.

The primary aim of this study was to investigate the effects and limits of group membership and ostracism on two types of testimonial learning decisions. In our design, we included a *counterintuitive testimony* task to access cases where children need to give up their original belief and a *selective learning* task to access cases when children form new beliefs in the face of novel claims. If it is true that social exclusion functions as a purely social influence, whereas group membership combines both epistemic and social significance, then we would expect children to weigh these two cues differently when evaluating new information (i.e., when deferring to the speaker can be less costly and does not involve overriding children's own beliefs) versus counterintuitive information (i.e., when deferring to the speaker is more epistemically costly and involves evaluating a new claim against one's own beliefs and deciding whether to abandon the prior belief). Specifically, we predicted that whereas both group membership and ostracism would affect children's acceptance of novel claims in the selective learning task, children might defer only to in-group informants when it comes to updating their prior beliefs (i.e., when the epistemic stakes are high) and ostracism, as a purely social cue, might not be strong enough to augment rates of belief revision. An alternative hypothesis was that if both group membership and ostracism function as social influences only and affect children's pull toward cooperative partners, then we would expect these cues to not be sensitive to the epistemic nature of the tasks, indicating that both forms of testimonial learning would be similarly affected by these two cues.

Method

Participants

Participants were 100 children (47 female; M_{age} = 5.09 years, SD = 0.641, range = 4.09–6.07) from a university-maintained database of children who are predominantly White native English speakers from middle- to upper-socioeconomic-status households from a city in the midwestern United States. We chose to recruit a group of 4- and 5-year-olds to match the age groups in research on children's responses to ostracism (Over & Carpenter, 2009; Watson-Jones et al., 2014) and counterintuitive information (Corriveau & Harris, 2010; Jaswal, 2004). An additional 8 children were not included in analyses due to experimenter error (n = 3) or failure to complete the study (n = 5). The number of participants was based on a simulation-based power analysis for multilevel logistic regressions (Astivia, Gadermann, & Guhn, 2019), which has shown that a sample of 100 is sufficient to achieve 87% power for our key predictors (group membership and condition). Children were randomly assigned to one of four 2 × 2 between-participant conditions: in-group–ostracism, out-group–ostracism, in-group–inclusion, or out-group–inclusion.

Procedure

After being assigned to the blue group, participants were presented with an intergroup attitude measure, the Cyberball game, and testimonial learning tasks.

Group assignment

We used an inherent assignment procedure (Watson-Jones et al., 2016; Wilks & Nielsen, 2018) in which children answered three questions about their personal preferences (e.g., "Which animal do you like better, a dog or a cat?"). Afterward, children saw a picture of a blue T-shirt appear on the screen and were told that they were assigned to the blue group. The experimenter also introduced the red group and explained that people in the red group had different preferences ("You know what? There is also another group, the red group. They like things that are different from you and your group."). Children were then given a pair of blue wristbands and a blue T-shirt to wear. As a comprehension check, children were asked which group they were in. All children included in the analyses answered the question correctly.

Ostracism/Inclusion manipulation

To prime ostracism versus inclusion, participants played a widely used online game of Cyberball (Version 5.0; Williams & Jarvis, 2006). The script used in this game was adapted from Watson-Jones et al. (2016). Depending on the conditions children were in, they were shown their avatar on a touchscreen and told that they would play a ball-tossing game with three other people from the blue group (*in-group* conditions) or the red group (*out-group* conditions). Children were told to touch the player they wanted to pass the ball to and that the other players would also pass the ball to whoever they wanted.

In all conditions, the player on the upper left made the first toss, and the ball was programmed to be thrown a total of 30 times. In the *ostracism* conditions participants received only two ball tosses before being left out of the game, whereas in the *inclusion* conditions participants received the ball seven or eight times throughout the game. As a manipulation check, two research assistants who were blind to the hypothesis and conditions independently coded children's facial, postural, and verbal displays of anxiety or frustration (e.g., frowns, sighs; adapted from Watson Jones et al., 2016). Compared with children in the inclusion conditions (M = 9.75%, SD = 13.7), children who were assigned to the ostracism conditions (M = 31.5%, SD = 27.8%) demonstrated a significantly higher percentage of frustration or anxiety cues, $t(83) = -4.02$, $p < .001$. At the end of the study, we also asked children if other people in the game passed the ball to them "a lot" or "only one or two times." A larger percentage of children in the ostracism conditions (94%) said other players passed the ball to them "only one or two

times" compared with children in the inclusion conditions (34%), $\chi^2(1, N = 100) = 36.5$, $p < .001$, Cramer's $V = .625$, indicating that the ostracism manipulation was effective.

Measures

Counterintuitive testimony task

Pretest trials. After the baseline intergroup attitudes measure and before playing Cyberball, children participated in six pretest trials assessing their baseline perceptual and classification judgments. On each of three *perceptual judgment* trials, children saw three black lines varying in length and were asked to point to the "biggest line" (adapted from Corriveau & Harris, 2010). The location of the biggest line varied across trials. On each of three *classification judgment* trials, children saw a hybrid picture (hat–cup, shoe–car, or button–ball), designed to have features from two objects (Jaswal, 2004), and were asked what they thought each picture was.

Test trials. After playing the Cyberball game, children were told that they would watch videos of "what the blue/red group always thinks." In the in-group conditions, children watched videos featuring an adult female informant in a blue T-shirt. In the out-group conditions, the same informant was filmed wearing a red T-shirt.

In each of the three perceptual judgment trials, children watched videos in which an informant was asked to point to the "biggest" line and then pointed to one of the two smaller lines, saying: "This is the biggest one." In the three classification judgment trials, the informant made category judgments that were different from children's judgments in the pretest trials. For example, if the child had said the shoe–car hybrid picture was a shoe, he or she would hear the informant claim that the object was a car. After watching each clip, the experimenter asked, for example, "Everyone in your group/the other group always thinks this is the biggest line/a shoe. What line do you think is the biggest/do you think this is?"

Selective learning task

To further probe the influence of group membership and social exclusion on testimonial learning, we included a selective learning task (e.g., Kinzler et al., 2011) after the Cyberball game. Before each of four test trials, participants were shown an image of a novel object. Across all conditions, participants then saw a still image of two informants, one in a blue T-shirt and one in a red T-shirt, sitting side by side behind a table. Note that both actors were different from the informant in the counterintuitive testimony task to eliminate transfer across tasks. On each trial, children were first presented with an *ask* question: "Hmmm, I wonder what this is called/used for? I bet one of these people can tell us. Who would you like to ask? The girl from the [blue/red] group or the girl from the [red/blue] group?" After children made a selection, the experimenter showed a video with the two speakers making conflicting claims about the name or function of the object (e.g., "This is a *tunk*", "This is a *smope*"). The experimenter then repeated what each person said, and children were then asked to endorse one of the two claims (*endorse* question; e.g., "The girl from the blue group said it's called a tunk. The girl from the red group said it's called a smope. What do you think this is called, a tunk or a smope?"). The order in which each informant spoke and the positions of the informants were counterbalanced across participants. The order of the counterintuitive testimony task and the selective learning task was also counterbalanced across participants.

Intergroup attitudes measure

We also assessed children's intergroup attitudes: once following the group assignment (*pre-manipulation*) and the other following the Cyberball game (*post-manipulation*). Children were presented with a member from each color group and were asked how much they liked each agent on a 6-point Likert scale that was paired with incrementally happy to sad cartoon faces (6 = *really like,* 1 = *really don't like;* adapted from Dunham et al., 2011).

Results

Preliminary analyses revealed no effect of gender or the order of the two testimonial learning tasks. Thus, subsequent analyses collapsed these factors. For each of the following analyses, we also ran fuller models to test for potential interactions between the fixed effects, but the interactions were not significant and did not improve model fit. Thus, the results of the parsimonious models were reported.

Counterintuitive testimony task

Given that children's responses on each trial of the counterintuitive testimony task are dichotomous (deferred to the speaker = 1, did not defer to the speaker = 0), mixed-effects binary logistic regression models were conducted with age (continuous or mean-centered), condition (inclusion or ostracism), group membership (in-group or out-group), and judgment type (perceptual judgments or classification judgments) as fixed effects and participant as a random effect. We found a significant main effect of group membership, odds ratio (OR) = 5.61, 95% confidence interval (CI) = [1.51, 23.53], $p = .01$, indicating that children were more likely to defer to counterintuitive testimony provided by their own group regardless of whether they were excluded or included in the Cyberball game. There was also a main effect of judgment type, OR = 4.08, 95% CI = [2.14, 8.31], $p < .01$, indicating that children were more likely to accept the speaker's countervailing testimony about hybrid objects compared with the lengths of lines. We found no effect of condition (i.e., whether children were ostracized, $p = .91$) or age ($p = .24$) on children's acceptance of counterintuitive testimony.

Selective learning task

Preliminary analyses revealed no significant effects of question type (ask or endorse question) or the order of the informants in the selective trust task; thus, we collapsed ask and endorse responses for all subsequent analyses (as in, e.g., Doebel & Koenig, 2013; Elashi, & Mills, 2014). A set of mixed-effects binary regression models were run, including age, condition, group membership, and type of knowledge (object labels or object functions) as fixed effects and participant as a random effect. Here, we found a significant main effect of condition, OR = 1.49, 95% CI = [1.04, 2.16], $p = .028$, indicating that children in the ostracism conditions were more likely to selectively trust an in-group member over an out-group member for novel information compared with children in the inclusion conditions. Follow-up binomial tests comparing rates of learning from the in-group member with chance (50%) showed that children selectively learned from the in-group member at above-chance levels in the in-group–ostracism condition ($p = .003$) and the out-group–ostracism condition ($p < .001$) but were at chance in the in-group–inclusion condition ($p = .43$) and the out-group–inclusion condition ($p = .08$) (see Fig. 1). There was also a main effect of age, OR = 1.41, 95% CI = [1.04, 1.93], $p = .026$. Older children were more likely to ask for, and endorse, information from the in-group member than younger children. In addition, we also found a main effect of type of knowledge, OR = 1.78, 95% CI = [1.32, 2.40], $p < .001$. In general, children were more likely to trust the in-group member over the out-group member when learning new information about object functions compared with object labels.

Intergroup attitudes measure

To determine whether social ostracism influenced children's intergroup preferences, we compared children's intergroup attitudes before and after playing Cyberball (see Table 1). Two separate linear mixed-effects models were conducted for each group (in-group ratings or out-group ratings). In each model, we tested for fixed effects of time (pre-manipulation or post-manipulation), condition (inclusion or ostracism), group membership (played with in-group or played with out-group), and age as well as for random effects of participant.

For the in-group explicit liking scores (6 = *really like,* 1 = *really don't like*), there were no significant main effects of group membership ($p = .47$), condition ($p = .18$), age ($p = .06$), or time ($p = .95$). The

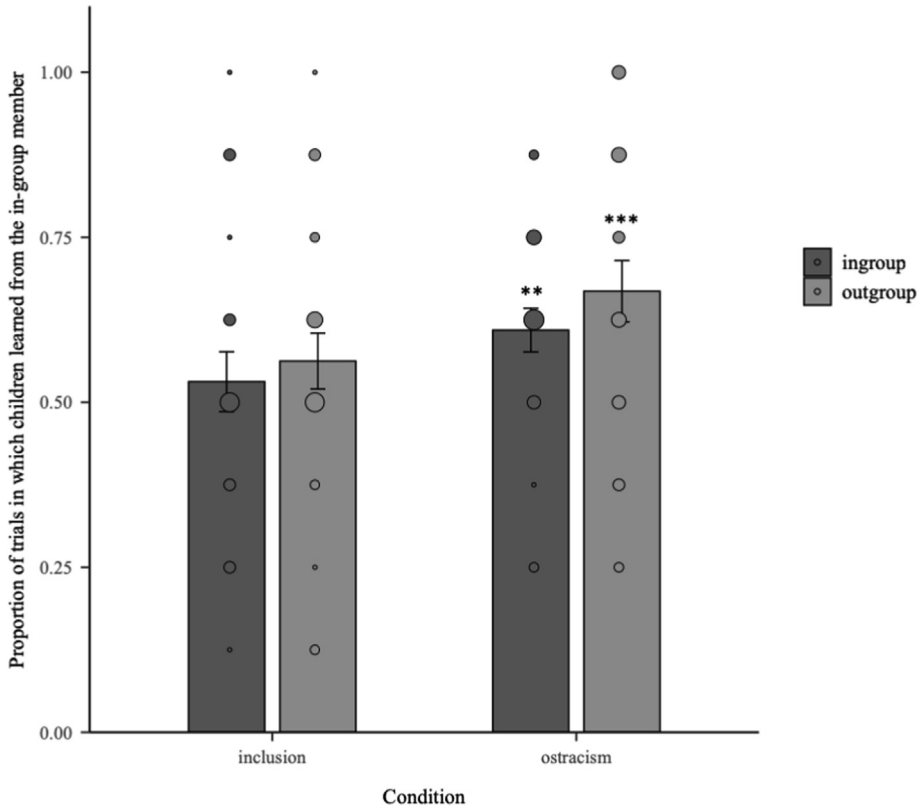


Fig. 1. Proportions of trials in which children selectively learned from the in-group member in the in-group–inclusion, out-group–inclusion, in-group–ostracism, and out-group–ostracism conditions, with error bars indicating standard errors. Dots represent individual data (the average proportion of times each participant chose to learn from the in-group member), with dot size scaled by number of participants with data at the same value. Results of comparison of performance against chance are noted: $^{**}p < .01$; $^{***}p < .001$.

Table 1
Means (and standard deviations) of children's intergroup attitude scores at pre-manipulation and post-manipulation as a function of condition and group membership.

		In-group–inclusion	In-group–ostracism	Out-group–inclusion	Out-group–ostracism
In-group ratings	Pre	5.12 (1.33)	4.88 (1.45)	4.92 (1.26)	5.35 (1.20)
	Post	4.79 (1.32)	5.17 (1.17)	4.85 (1.76)	5.42 (1.17)
Out-group ratings	Pre	3.58 (1.74)	4.17 (1.86)	3.50 (1.94)	3.12 (1.99)
	Post	3.42 (1.95)	4.00 (1.77)	4.12 (2.05)	3.04 (2.01)

mixed-effects model examining children's out-group explicit liking scores also found no significant main effects of group membership ($p = .26$), condition ($p = .80$), age ($p = .17$), or time ($p = .79$), suggesting that children's explicit liking scores for both groups remained stable before and after playing Cyberball regardless of which group they played the game with and whether they were excluded.

Discussion

The current study investigated the influence of group membership and ostracism on children's social learning. Specifically, we sought to examine whether children's acceptance of testimony, in

the form of counterintuitive and new information, would be similarly or differentially affected by the experience of social exclusion in group contexts. We found effects of ostracism in the selective learning task, such that children were more likely to trust an in-group member to learn about novel objects when they were previously excluded rather than included in an online game. In contrast, no effects of ostracism emerged when accepting counterintuitive claims; children were more likely to accept counterintuitive claims made by in-group members than by out-group members regardless of whether they were previously ostracized or not.

The result that children's selective learning decisions was influenced by ostracism is consistent with evidence demonstrating that ostracism often increases children's cultural learning of social conventions (Over & Carpenter, 2009; Watson-Jones et al., 2014) and such conformity might be group specific (Watson-Jones et al., 2016). Given that children were more likely to selectively learn new information from an in-group member in the ostracism conditions regardless of the group that excluded them, it is possible that general psychological or emotional effects of ostracism increased children's tendency to favor information from the in-group member, possibly as a way to signal agreement and gain affiliation with their own group. That is, children likely sought and endorsed novel information from the in-group informant to communicate their similarity to the speaker and the social group (Over & Carpenter, 2012).

Empirical work on testimonial learning has focused on the kinds of inductive evidence children use about speakers to make social learning decisions (Harris, Koenig, Corriveau, & Jaswal, 2018; Koenig, Li, & McMyler, 2021). Thus, even when social characteristics (e.g., accent, niceness, familiarity) were explored, children's decisions were often interpreted as being based in inductive social evidence used to assess the truth or relevance of a claim (Kinzler et al., 2011; Sobel & Finiasz, 2020). In other words, it can be theoretically and empirically challenging to assess the *social motivations* driving children's learning decisions because the speaker characteristics that are conventionally treated as "social" carry epistemic implications. Importantly, in the current study, the evidential or epistemic account alone cannot explain why children who were ostracized by their own group would have an elevated preference to learn new information from an in-group member. Indeed, the experience of being excluded does not in any way improve the in-group informant's epistemic status or her ability to provide accurate information. In this case, it is likely that children's learning of novel conventional information was guided by *social goals* such as the desire to belong and inclinations to conform or maintain positive relationships with others (Jaswal & Kondrad, 2016; Over & Carpenter, 2012, 2013).

The other main finding that children's acceptance of counterintuitive testimony was influenced by the group membership of the informant adds to a growing body of research suggesting that group membership exerts a powerful influence over children's social learning (Kinzler et al., 2011; MacDonald et al., 2013). To our knowledge, this is the first study showing that children's preferential in-group biases were not restricted to selective learning of novel information but included the acceptance of counterintuitive claims as well. In contrast, as discussed, the experience of ostracism influenced children's deference to new claims but not their acceptance of counterintuitive testimony. This is consistent with our hypothesis that group membership likely functions as both an epistemic influence and a social influence, whereas social exclusion is more purely social. Specifically, because belief revision can be more "epistemically costly" and involves overriding one's own prior judgments or knowledge, children require the epistemic license provided by group membership for such decisions (Harris et al., 2018). In other words, the informant's group status provided both epistemic evidence and social relevance, which could explain why it might have had a stronger effect on children's acceptance of countervailing information. In contrast, the need for affiliation invoked by social ostracism amplified children's preference to seek and endorse new information from in-group members but did not provide a sufficient basis to alter children's existing beliefs. In support of this possibility, we also found that the percentage of frustration or anxiety cues displayed by children was correlated with their responses in the selective learning task ($r = .11$, $p = .002$), but the percentage of emotional cues was not correlated with children's responses in the counterintuitive testimony task ($r = -.05$, $p = .18$). This is consistent with our hypothesis regarding the nature of the two testimonial learning tasks that we presented to children. When the epistemic stakes are relatively low, as in the case of novel conventional claims, purely social influences such as social exclusion are more likely to exert their effects, which are often mediated and accompanied by children's affective

responses. In contrast, when children are given some form of inductive evidence or epistemic reasons to give up their belief, with group membership providing a sufficient source of such evidence, emotional responses did not play a mediating role. An important avenue for future research is to continue disentangling the epistemic and social bases underlying children's selective learning decisions by directly assessing the purely social or affective circumstances that amplify children's motivations or desires to affiliate. Future studies should also include purely epistemic cues (e.g., knowledge or expertise of a speaker) to see whether the effects of purely social factors such as ostracism will be further attenuated in the face of more salient epistemic concerns.

Interestingly, we did not find any systematic changes in children's in-group and out-group liking ratings based on exclusion conditions. One potential explanation for this invariant pattern in the ostracism conditions might be related to children's conflicting feelings about the group that excluded them. On the one hand, children might decrease liking for the group that left them out; on the other hand, children might want to increase liking of a novel member of the group as a way of reaffiliation. An alternative possibility is that young children may have difficulty in taking the act of exclusion into account when making explicit preference judgments. As illustrated in a recent study (Hwang & Markson, 2020), there might be a dissociation between children's awareness of exclusion and their tendency to dislike excluding agents, possibly because children cannot base their social preference judgments of one group member on a single exclusionary act by other group members.

There were also age-related differences in children's in-group biases. Specifically, with age, children were more likely to selectively learn from the in-group member, had higher proximity scores for their own group, and had lower proximity scores for the out-group. This stronger in-group bias in older children is consistent with prior evidence showing that children's in-group favoritism became robust in both social evaluation measures (Dunham et al., 2011; Dunham & Emory, 2014) and testimonial learning measures (Reyes-Jaquez & Echols, 2013) between 5 and 6 years of age.

We also found that children were more likely to trust an in-group member over the out-group member when learning new information about object functions compared with object labels. Although this finding warrants further exploration, one possibility is that children rely more heavily on their own group to learn culturally relevant and group-defining prescriptive norms (Roberts, 2021) and may appreciate the conventionality of object functions more than they did for word labels. Another possibility that might explain the difference in children's in-group selectivity is that in the object function trials the informants not only told children about the functions but also did quick motor demonstrations on the object after their claims (e.g., using an object for stacking). Because behavioral mimicry is thought to be particularly important in facilitating group-based interactions (Chartrand & Lakin, 2013; Over & Carpenter, 2012), it is possible that the demonstration made the group specificity of the information stronger and more salient to children, resulting in a higher likelihood for them to learn from the in-group member for learning and affiliative purposes. Additional research is needed to assess whether the effects of group membership and ostracism will be more salient when children learn from other conventional domains (e.g., social rules) compared with factual domains (e.g., scientific or historical facts).

In conclusion, the current study represents one of the first developmental studies to directly examine the effects of social exclusion and group membership in testimonial learning contexts, showing that ostracism affected children's in-group bias when making selective learning decisions about new information, but only group membership moved children's acceptance of counterintuitive claims. Taken together, these results demonstrate that children differentially weigh various social considerations depending on their learning decisions, providing novel insight into the social motivations of testimonial learning during early childhood.

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Data availability

The data that support the findings of this study are openly available on the Open Science Framework (https://osf.io/4wu7a/).

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