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The Collaborative Nature of Testimonial Learning

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Abstract

Children's testimonial learning often occurs in epistemic collaborations with others. In this paper, we will discuss ways in which cultural learning emerges in social and interpersonal contexts, and is intrinsically supported and guided by children's collaborative capacities. Much work in cultural learning has focused on children's examination of speaker and model characteristics, but more recent research has investigated the interactive aspects of testimonial exchanges. We will review evidence that children (1) participate in the interpersonal commitments that are shared in testimonial transactions by way of direct address and epistemic buck passing, (2) participate in social groups that affect their selective learning in nuanced ways, and (3) may detect epistemic harms by listeners who refuse to believe sincere and accurate speakers. Implications for conceptualizing children's testimonial learning as an interactive mechanism of collaboration will be discussed.

Keywords: Interpersonal trust; Collaboration; Direct address; Social groups; Epistemic harms

Young children rely a great deal on other people when they learn about the world. To acquire knowledge about the past (where they were born), the present (what country they live in), and many unobservable beings and events (God and the afterlife), young children depend

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upon information from others. Equally, to acquire linguistic (how things are called) and social norms (what is forbidden, obligatory, permissible), children learn from others. Much research examines children's ability to estimate another person's knowledge, prior reliability, or expertise when evaluating their testimony (for reviews, see Brosseau-Liard, 2017; Harris, Koenig, Corriveau & Jaswal, 2018; Sobel & Finiasz, 2020). Here, we focus on children's ability to participate in a range of social interactions that involve estimating a person's interpersonal commitments, abilities to hold both speakers and listeners accountable, and deciding how much to trust speakers who make such commitments (Pesch & Koenig, 2018; Koenig, Li & McMyler, 2022).

As we discuss here, learning from what others say involves two distinct types of decisions, often made together. First, children make evidential decisions that aim to settle questions like, "How competent is the speaker who made this claim?," "Is this claim consistent with other things I believe?," "Should I believe it in light of the evidence I have about the world and the speaker?" This type of decision rests upon children's ability to estimate evidence that pertains to a speaker's knowledge, access, or expertise. Such estimates can be made across a broad range of contexts, including impersonal ones that do not involve human speakers at all (Girouard-Hallam & Danovitch, 2022). Work on "selective learning" (e.g., Kuzyk, Grossman & Poulin-Dubois, 2020; Tong, Wang & Danovitch, 2020) has received a good deal of attention in developmental science, and most of it centers on the kinds of information and mechanisms that support children's evaluations of evidence about claims. In contrast, children also make a second type of decision, collaborative decisions that aim to settle questions like, "Are you asking me to take you at your word?," "Can I hold you responsible for your words and actions?," "If I mistrust your testimony, how will you feel in return?" When children make the first type of decisions, they are concerned with whether a speaker possesses sufficient knowledge or competence to make a given claim and whether these claims are sufficiently supported (e.g., do they have appropriate access to evidence; see Koenig, Tiberius & Hamlin, 2019). However, when they make the second type of decision, children are concerned with whether to take a person at their word in the context of an epistemic collaboration in which a speaker simply asks for a listener's trust, trust that can be given or withheld by the listener (for a larger discussion of the distinction between evidential learning and interpersonal trust, see Koenig, Li & McMyler, 2022; Koenig & McMyler, 2019). In cases of epistemic collaboration, testimonial learning is similar to joint action, as both involve working toward a shared goal through a social process that necessitates a mutual understanding of individual responsibilities within the collaborative activity.

Much of the research on children's testimonial learning examines children's ability to evaluate evidence that speakers provide in making the first type of decision (Shafto, Goodman & Griffiths, 2014; Sobel & Kushnir, 2013), but overlooks the collaborative dynamics and epistemic responsibilities that are jointly shared by speakers and listeners in making the second type of decision. While trust in testimony often involves both types of decisions, here we will focus on cases where trusting others' testimony is intrinsically interactive, and epistemic collaboration features centrally in the testimonial exchange. By raising the possibility that there are collaborative reasons to trust speakers that are distinct from the evidential bases for believing their testimony, we hope to shed light on a greater range of factors that influence children's trust in testimony. In the first section that follows, we begin by discussing the learn-

ing decisions that depend upon the way children are addressed in conversation. In the second section, we suggest that the epistemic responsibilities to which children hold others likely depend upon the social groups they participate in. And in the final section, we discuss the ethical implications involved when listeners refuse to believe the speakers who address them.

1. Interpersonal commitments in testimonial transactions

If testimonial learning can be considered as a form of joint collaborative epistemic activity as we propose, then one key question concerns what marks the epistemic cooperation of trusting a speaker versus the appraisal of the testimonial evidence? Here, we think the *manner of address* gives us one way to draw the distinction between decisions to trust and individual evidential decisions to learn. Imagine a child watching a science teacher demonstrate that buoyant objects float and dense objects sink. In this case, the teacher is presenting demonstrations for all the students in a class to see, thus providing them with independently available reasons that support their own inferences and conclusions. By contrast, if a person directly addresses a child without offering any supplementary evidence (e.g., "Amy, dense objects always sink."), the testimony is less about showing the child evidence for them to appreciate themselves, and more about making a commitment to the child for the truth of that claim, extending an invitation to the child to trust her, and to put their belief in her hands (McMyler, 2013; Moran, 2005). Do children treat invitations to trust differently than demonstrations of evidence or argument?

Previous work has shown that children can learn new information at similar rates in both direct and indirect contexts (Akhtar, 2005; Floor & Akhtar, 2010; Vredenburgh, Kushnir, & Casasola, 2015; for a review, see Shneidman & Woodward, 2016), but only the direct address context encourages the listener to engage in epistemic collaboration and trust the speaker and her claim. For example, Li and Koenig (2020) randomly assigned 4-year-old children to two conditions, a *child-directed* condition in which children were directly addressed by a speaker, and an *overheard* condition in which children overheard a speaker talking on the phone with someone else. In both conditions, the speaker tried to convince the child (or the person on the phone) about a counterintuitive categorization of an animal (e.g., that what the child had previously decided was a rabbit was actually a squirrel). While children were able to remember the speaker's claims equally well in both conditions, they were significantly more likely to update their beliefs about the animal labels based on the speaker's testimony when they were directly addressed compared to when they overheard the same claims made by a speaker talking on the phone with somebody else. Not only were children more likely to accept surprising claims when directly addressed, they also engaged in more spontaneous protest (e.g., "But it's brown."; "No it's not.") in the *child-directed* condition (56%) than they did in the *overheard* condition (16%). Thus, one interesting possibility is that children appreciated the interpersonal or collaborative commitment that was made to them when assertions were directly addressed to them, and this led to greater rates of challenging the speaker. Specifically, it is possible that when directly addressed by a live human agent, child listeners received that speaker's interpersonal bid or commitment, and often completed the joint transaction by trusting and accepting the speaker's countervailing claims. When the speaker's claim conflicted

with children's own judgments, the same interpersonal commitment gave children grounds or the right to protest as a means of asking for clarification, holding the speaker interpersonally accountable (Hinchman, 2005; Koenig & McMyler, 2019; McMyler, 2011), and to make their own commitment to a new claim.

Direct address not only affects children's word learning choices and classification decisions (Akhtar, Jipson, & Callanan, 2001; Li & Koenig, 2020), but it also influences their acceptance of negative messages about social groups. Lane, Conder, and Rottman (2020) presented 4- to 9-year-old children with a finding game, where children were either directly told or overheard an experimenter's negative message about a novel social group (e.g., "Those Gearoos are really bad people."). When children's implicit and explicit intergroup judgments were assessed, researchers found that children had significantly lower goodness ratings (i.e., "Do you think that Gearoos are good people?") after hearing direct messages compared to overheard messages. There is also some indication that direct address exerted a stronger effect with age: Older children drew greater distance between themselves and a novel group member in the Direct condition than the Overheard condition, again indicating that when the speaker communicated with children through direct address, it signals normative or relevant knowledge for the child listener, inviting children to take a collaborative attitude toward the speaker (Darwall, 2006; Holton, 1994; McMyler, 2011; Tomasello, 2019). One implication is that claims that are difficult to believe or even harmful may become more readily believed when responsibility for the belief is shared between the child listener and the speaker who addressed them.

Aside from assessing whether children can discern the distinct interpersonal or collaborative reasons they have for belief when they are directly addressed, children's understanding of the collaborative reasons to trust can also be explored by providing children with types of testimony that focus on providing evidence and that call for children to evaluate that evidence for themselves (e.g., arguments, demonstrations, and explanations) versus situations in which speakers present simple tellings that invite child listeners to trust the speaker who addressed them, and assess whether children's tendency to update their beliefs would differ. One interesting possibility is that children would be more likely to accept a speaker's counterintuitive judgments in the context of direct acts of telling (without providing any supplemental evidence), but their beliefs formed through the collaborative route might be more open to challenges than beliefs that are formed on the evidential route. Alternatively, it is also possible that interpersonal trust might lead to more strongly held beliefs if children utilize their developing capacities to mine information and contribute to the interaction.

When a speaker makes direct commitments to a child listener, are there specific ways that children hold them epistemically accountable? As reviewed, under conditions of direct address, young children often detect, interrupt, and engage in interpersonal protest upon hearing counterintuitive information or difficult requests (Grassmann & Tomasello, 2010; Jaswal, 2004; Koenig & Echols, 2003; Li, & Koenig, 2020; Wellman, Song, & Peskin-Shepherd, 2017). Aside from holding the speaker accountable by protest, another interesting measure of epistemic responsibility that has received less empirical attention is known as "epistemic buck passing" in contemporary philosophy, meaning that whenever listeners form a belief by trusting a speaker and taking her "at her word," they are entitled to pass responsibility back to the speaker if their newly acquired belief is challenged (Brandom, 1983; Goldberg, 2006).

Again, buck passing entails that the listener participated in an epistemic collaboration and accepted a speaker's assurance by believing them, resulting in shared responsibility between the two parties. Specifically, if a child listener accepts the bid to trust the speaker, she does not need to assess independent grounds or evidence for belief because they have let the speaker settle the question for her, making the process of justifying a belief "a social rather than an individual achievement" (Baker & Clark, 2018, p. 12). For example, if an adult tells the child that the earth is round, or that a drinking glass was broken by a nearby chair (Lee, Cameron, Doucette & Talwar, 2002), the child listener does not need to have any independent reasons for believing this fact, or marshall independent evidence to justify this belief. Moreover, if someone asks the child, "Why is the earth round?" or "Did a chair really break the glass?," she does not need to defend the answers independently, but could instead "pass the buck" and defer the challenge back to the original speaker by saying something like "so-and-so told me so" (McMyler, 2011). The significance of buck-passing is that it captures another interactive aspect of epistemic collaboration, and serves as a unique indicator of interpersonal trust. While some might think that not having independent or inductive reasons for belief is epistemically irresponsible or dangerous (McMyler, 2007), children, and many times adults, need not shoulder the responsibility of assessing grounds for beliefs themselves. This makes epistemic cooperation an essential way to acquire the vast areas of knowledge and relieve listeners from the epistemic burden of independently evaluating the strength of the evidence to determine what is the case and justifying their beliefs.

Since very little empirical work has directly assessed children's understanding of epistemic accountability, an important direction for future research is to investigate how children understand the responsibilities embedded in beliefs acquired under conditions of epistemic collaboration. Although some recent work has shown that child listeners can hold speakers accountable by selectively rewarding (Li, & Koenig, 2020; Ronfard et al., 2019) and informing (Dunfield, Kuhlmeier, & Murphy, 2013) more reliable speakers over unreliable speakers, and may have better source memory when their newly acquired beliefs were challenged (Mahr, Mascaro, Mercier, & Csibra, 2021), none of this work has examined children's judgments of the responsibilities shared between the speaker and listener in interpersonal or collaborative transactions. Thus, one line of interesting research could directly investigate epistemic buck passing by prompting children to acquire new beliefs, or update old beliefs through an interpersonal, collaborative route (i.e., a speaker making a commitment to the child listener about the truth of the belief), and expect to find different patterns of responses when children's beliefs are challenged. One possibility is that with age, children are more likely to "pass the epistemic buck," and cite the informant's authority ("because so-and-so told me") when their beliefs are acquired for interpersonal or collaborative reasons, and cite other considerations when their beliefs are acquired through an evidential route and the child listener overheard the speaker give an explanation, or saw the speaker's demonstration and came to their own conclusions (e.g., "because x is true"). It will also be interesting to examine whether children can attribute accountability as third-party observers by presenting them with a scenario in which a listener has acquired second-hand information through hearsay (Danovitch & Lane, 2020; Lane, Ronfard, & El-Sherif, 2018; Mahr, & Csibra, 2021). Children can then be asked to assign blame to either the speaker or listener if the belief is later found to be false.

Another interesting direction for future research is to explore whether children could engage in other practices of attributing epistemic responsibility, such as engaging in interpersonal blame, demanding an apology (Feinberg, 1970; Gilbert, 1992; Hinchman, 2005; McMyler, 2011, 2013), or displaying distinct reactive attitude and emotional patterns for failed beliefs gained interpersonally (e.g., feeling of betrayal and resentment).

2. Participation in social groups

When we examine the conditions that invite children to trust others, we see them as developing an increasingly sophisticated interpersonal and conceptual understanding that is modulated as they become members of a culture throughout childhood and into adulthood. Although much attention has focused on the epistemic cues that child listeners consider relevant to their learning decisions (e.g., prior accuracy, perceptual access, and expertise, see Harris et al., 2018; Koenig, Tiberius, & Hamlin, 2019; Mills, 2013), recent work has uncovered motivated reasoning, decisions based on desirability rather than accuracy resulting from children's participation in social groups, reasoning that influences their testimonial transactions.

One element of children's motivated reasoning about social groups are the biases that privilege information from other group members. Much literature has indicated that children as young as 4 develop a preferential bias toward members of their ingroup stretching across several domains ranging from race, gender, religion, nationality, minimal groups, and partisanship (Baron & Banaji, 2006; Chalik & Rhodes, 2018; Dunham, Baron, & Banaji, 2006; Halim et al., 2017; Heiphetz et al., 2013; Mia & Woolley, 2013). One study attempted to reduce children's group biases by either demonstrating the ingroup member's antisocial intentions, or the outgroup member's prosocial intentions, along with a baseline condition that presented no moral information about the agents (Hetherington, Hendrickson & Koenig, 2014). Of note, while several different measures were used to assess change in children's biases, the ingroup favoring biases that were expressed on social learning trials (e.g., that asked children to select information from one of two informants) were impervious to the intervention. Specifically, although an ingroup member's antisocial behavior reduced preschool-aged children's liking of and willingness to share with that person, children's decisions to seek new information from (Hetherington, Hendrickson, & Koenig, 2014) or imitate (Wilks, Kirby & Nielsen, 2019) the ingroup member were not attenuated. Understanding the role that group membership plays in testimonial learning remains an important question. Particularly do children treat group membership as an evidential cue that signals a speaker's ability to provide high-quality evidence, or do they treat shared group membership as a sign that can serve to invite epistemic collaborations? If both are true, does it depend upon the context and the type of information that is exchanged?

When children evaluate testimony from others, they not only examine various interpersonal and social features of potential informants, they also actively participate in testimonial exchanges and epistemic collaborations themselves. Previous work has illustrated how an informant from the child's own group can be perceived as having the competence to

transmit culturally relevant skills and knowledge to the child (e.g., Kinzler, Corriveau, & Harris, 2011). Recently, Li and Koenig (2022) also found that after experiencing social ostracism, 4- and 5-year-old children were more likely to selectively learn information from ingroup members, possibly as a way of signaling agreement, reducing anxiety and gaining social affiliation with their own group. We also found that children were more likely to accept counterintuitive claims made by ingroup over outgroup members (Li & Koenig, 2022). Thus, group membership likely functions as an important social and collaborative cue with potentially powerful epistemic implications.

Ostensibly, group membership likely influences children's testimonial learning and decisions to trust in more than one respect (Elashi & Mills, 2014; Hetherington et al., 2014; Montrey & Shultz, 2022). Research also indicates that group membership may function as a lens through which we interpret others' testimony due to the fact that we likely have a robust and early emerging tendency to perceive ingroup behavior more positively than outgroup behavior (Aboud, 2003; Dunham & Emory, 2014; Dunham, Baron, Carey, 2011). Just as preschoolers seem to demonstrate greater moral obligation to ingroup members than outgroup members (Birch & Billman, 1986; Chalik & Rhodes, 2018; Moore, 2009; Rhodes & Chalik, 2013), children's appeal to ingroup members in testimonial learning tasks may similarly reflect an appreciation that epistemic obligations are sensitive to group boundaries. To illustrate children's sensitivity to ingroup obligation, Chalik and Rhodes (2018) introduced 3- to 4-year-old children to two novel groups (i.e., the Flurps in blue shirts and the Zazzes in red). They presented stories about both groups interacting with each other in the context of harmful, prosocial, and saving behaviors and found that children expected that ingroup members would preferentially befriend, protect, and not hurt one another. Taken together, much like Chalik and Rhodes found that children expected friendship and condemned physical harm between ingroup members, we would also expect children to expect learning and to condemn misinformation between two ingroup members. This would confirm that children use group membership to guide their predictions of not only who is likely to learn from whom and who is obligated to trust each other, but also when misinformation is especially deserving of reproach.

Using the minimal group paradigm, to divide participants into novel social groups through random assignment, Chalik, Over, and Dunham (2022) examined how group membership interacts with accuracy, pitting children's group bias against their knowledge of reliability. In their study, children were asked who they wanted to hear tell a story and preferred the more reliable agent over an unreliable agent. Likewise, they also preferred to hear a story favoring their ingroup over an outgroup member. But when children had to track both reliability and group membership, children were often conflicted, with some children choosing accuracy over their ingroup or vice versa. Similarly, using a sample of children between the ages of 3–7, Elashi and Mills (2014) split children into two novel groups (i.e., red group, blue group) to examine how group membership influences children's trust of accurate and inaccurate informants. Across all ages, children opted to trust their ingroup members when they showcased accuracy, yet when ingroup members displayed inaccuracy, children reduced their trust in the ingroup member but not significantly enough for that trust to shift to the accurate outgroup member. Interestingly, only 6- to 7-year-old children significantly reduced

their trust in the ingroup member when inaccurate highlighting key developmental differences in children's evaluations of group membership and accuracy. While prior accuracy is likely to always serve as positive evidence in favor of a speaker's reliability, we suspect that group membership functions as both an epistemic and a social influence, depending on the situation and the type of testimony being offered. For example, Roberts (2021) has argued that children rely more heavily on their own group to learn culturally relevant and group-defining prescriptive norms. Future studies should continue to disentangle the epistemic and social bases underlying children's testimonial learning by directly assessing the purely social or affective circumstances that support children's motivations to affiliate.

At the level of the message, testimony has also been shown to influence children's attitudes, behaviors, and participation in social groups. This work is important, given the power of testimony as a tool that can improve or degrade children's attitudes about social groups. For example, Chalik and colleagues (2022) found that when children chose to listen to a story that favored their ingroup, it made them more biased against the outgroup—indicating that the messages children receive about social groups can further deepen and perpetuate the biases they bring to their interactions. Conversely, in a study by Gonzalez and colleagues (2017), testimony was used to showcase the positive qualities of a black protagonist (e.g., "This is James…James is an excellent fire fighter and is working hard to become fire chief") via a set of four vignettes and found that it effectively reduced Anti-Black bias among White and Asian children between ages 8 –12 years in the short term (testimony did not affect younger children around 5–8 years old; Gonzalez, Steele, & Baron, 2017). Conder and Lane (2021) also found that negative messages can have long-lasting effects on children's intergroup attitudes. In this study, 4- to 9-year-old children overheard negative messages about novel social groups over a video call (e.g., "Those Gearoos are really bad people. They eat disgusting food, and wear such weird clothes. The Gearoos language sounds so ugly"). Both immediately upon hearing the message and after a 2-week delay, 7- to 9-year-old children who heard these negative messages rated that novel group more negatively, were less willing to affiliate with a member of the group, and were less likely to engage with the group's cultural activities, thus showing evidence that negative claims about a social group may have long-term adverse consequences.

Taken together, this emerging body of work helps to clarify that children's evaluations of testimony are influenced by social group information both at the speaker and the message level. Even more so, it speaks to the power of the language we use to describe people and how that can shape children's beliefs about social categories themselves. Specifically, our language or the explanations we give (e.g., "Blacks are criminals"; "Glerks are better at math") are linked with children's essentialist beliefs about those social groups (Moty & Rhodes, 2021; Rhodes, Leslie, & Tworek, 2012). Our beliefs about social groups (or social essentialism) operate whenever categories are viewed as having an essence that is inborn or intrinsic in nature (Gelman, 2004). Children's essentialist reasoning emerges early and has been shown to cover a variety of social categories ranging from gender, race, ethnicity, and language (Hirschfeld, 1998; Kinzler & Dautel, 2012; Segall, Birnbaum, Deeb, & Diesendruck, 2015; Taylor, Rhodes, & Gelman, 2009). This form of reasoning can lead to negative connotations and prejudiced attitudes toward marginalized groups (Diesendruck & Menahem, 2015; Mandalaywala, Amodio, & Rhodes, 2018). When listeners hold essentialist

views about a speaker due to their social group status, it can lead to harmful and distorted views of the testimony from the social group members themselves (e.g., prejudice, stereotyping, and epistemic harm; Dotson, 2012; Fricker, 2007; Vasilyeva & Ayala-López, 2019). We will discuss the broader implications of essentialist thinking as a mechanism for epistemic harm and potential solutions to disrupt this bias below.

3. Epistemic harm

As we have argued here, some forms of testimonial learning can be complex collaborative activities in which both parties (speaker and listener) hold shared epistemic responsibility for the success of the exchange. When both parties meet their responsibilities, the speaker aims to provide comprehensible, sincere, and credible information, while the listener is motivated to understand and accept what the speaker has to say. Yet, these responsibilities compel a degree of vulnerability, not only for the listener, but for the speaker. The success of the testimonial exchange is dependent on the listener comprehending and accepting the speaker's true and sincere claims with interest, especially a speaker's experiential reports. Unfortunately, there are many instances in which these epistemic collaborations fail the speaker, and the speaker's sincere and credible testimony is rejected, questioned, or left unheard. While in some cases it may be legitimate for a listener to reject a speaker's testimony (e.g., when it is likely to be inaccurate or deceptive; Koenig & Harris, 2005; Mascaro & Sperber, 2009), systematic social biases put speakers at risk for encountering instances of illegitimate, unethical testimonial rejection that cause harm to their identity as a credible knowledge source.

One form of epistemic injustice occurs when listeners fail to believe the testimony of sincere and accurate speakers, due to personal or systematic prejudice which are often linked to essentialist stereotypes of social groups discussed above (Fricker, 2007). Common examples include female and BIPOC speakers whose testimony is doubted and the speakers discredited due to their gender and/or race identity. These injustices can occur due to the personal prejudices of a listener or can result from systematic gaps in resources that put certain identities at an unfair disadvantage (i.e., hermeneutical injustice; Fricker, 2013). A historical example of hermeneutical injustice, prior to the coining of the term "sexual harassment" in 1975, was victims of sexual assault not having the necessary linguistic and epistemic resources (e.g., the proper terminology) to understand and convey their experiences to the broader community (Cohen, 2016). Furthermore, listeners are frequently unaware of how their own prejudices are impacting their testimonial decisions or credibility judgments of speakers, making epistemic injustice often hard to detect by the listener (Fricker, 2007). Yet, whether epistemic injustices are detected by listeners or not, such harms can have profound consequences for speakers. Literature on adults indicates that victims of persistent epistemic injustice demonstrate reduced confidence in intellectual abilities and self-worth, as well as other legal, economic, and political consequences (Sullivan, 2017; Pohlhaus, 2014). These consequences of epistemic injustice highlight how the virtue of sharing one's knowledge via testimony is dependent upon listeners taking responsibility for their epistemic commitments as addressees in these exchanges.

Given the severity and widespread impact of epistemic injustice, we argue that an important area for empirical research is to investigate their developmental origins. This work will shed light on how children interpret abuses of power in testimonial exchanges (in this case, abuses of power committed by the listener). What epistemic responsibilities do children ascribe to listeners who are directly addressed? When do children attribute some degree of responsibility to the listener for attending to, understanding, and/or accepting the information that they receive in testimonial exchanges? Here, we pinpoint several open questions regarding the development of epistemic injustice that we believe should be addressed in future empirical work.

Developmental literature indicates that by 3 years of age, children identify and negatively evaluate various forms of physical and interpersonal harm (e.g., hitting, teasing, and social exclusion; Rhodes & Chalik, 2013; Smetana, 2006). As discussed above, even preschoolers recognize the moral injustice associated with these harms and demonstrate concern for the victim's welfare. However, group membership and broader social context play an invaluable role in children's judgments of harm. Three- to nine-year-old children have been found to judge certain interpersonal harms as more permissible (or even warranted) under certain circumstances, such as those that sanction members of outgroups and serve to maintain ingroup loyalty (Mulvey, 2016; Rhodes & Chalik, 2013). Thus, while children may understand the consequences of various harms, the broader social context influences how children judge these harms. This background evidence raises two primary questions in relation to epistemic injustice. (1) *When in development do children recognize epistemic injustice as a form of interpersonal harm?* Given that epistemic injustice is considered a pervasive yet subtle form of harm that is built upon conversational and epistemic norms (Fricker, 2007), it is unclear whether an understanding of the consequences associated with epistemic harm emerges at a similar developmental period as other forms of interpersonal harm. Thus, we predict that children's recognition of epistemic injustice may emerge later in development (i.e., later than 3 years of age) than an understanding of physical and other interpersonal harms. It is also unclear whether listeners are more likely to make deflated credibility judgments when invited to trust a speaker or when testimony is overheard or presented as evidence. It may be that children are more likely to recognize the consequences of deflated credibility judgments when the testimony is directly addressed to them, given the interpersonal commitments expected by active participants in these exchanges. (2) *How does social context influence the perception and evaluation of epistemic injustice?* As previously discussed, social categories have a powerful influence on children's evaluations of testimonial exchanges. Thus, it seems plausible that group membership and social context may influence whether and under what circumstances children judge epistemic injustice as more or less permissible. It is possible that children evaluate epistemic injustice more severely when social group biases (e.g., racism and sexism) are also present in the scenario. Another relevant question here is the role of children's social identities in their evaluation of this form of injustice. How might the detection of these epistemic harms relate to children's own social identity development? Does this detection relate to children's ability to identify how social identities define and shape people's experiences? We expect that the degree of children's own experiences with epistemic injustice may affect

how severely they evaluate scenarios of the harm, perhaps due to an increased awareness of the consequences of epistemic injustice.

Another area of future research that we would like to address is how to mitigate the adverse impact of epistemic injustice. How can we help ensure that listeners follow through on their epistemic commitments by believing speakers when they are accurate and sincere? Philosophers have previously identified potential avenues for addressing these injustices, such as increasing cognitive awareness of how we rely on social biases when forming credibility judgments and dismantling broader socioepistemic inequities that sustain prejudice and discrimination (Dotson, 2012). Yet, these solutions would require a broad overhaul of our social and political structures. We propose that examining the developmental origins of epistemic injustice may serve as an important additional route for combating these issues as they emerge. By identifying when and how epistemic injustice emerges in childhood, we will gain greater insight into developmental strategies for reducing the adverse impact of these harms. For example, research in children's prejudice suggests that promoting diversity in 3- to 5-year-old children's social groups can be successful for reducing rates of prejudice and fostering stronger intergroup relationships (Cooley, Elenbaas & Killen, 2016; Rutland & Killen, 2015). There is also an emerging consensus that children's implicit biases are influenced more by what their parents do (e.g., interracial friendships) than what they say (see Loyd & Gaither, 2018). Creating comparable intervention techniques for educating children on the consequences of epistemic injustice may be similarly fruitful for reducing future instances of epistemic injustice.

One proposed strategy for combating epistemic injustice is highlighting structural explanations when considering the motivation behind epistemic injustice. Vasilyeva and Alaya-López (2019) propose that emphasizing how social inequities between speakers and listeners are driven by external, *structural constraints*, instead of internal characteristics (i.e., social essentialism), may restructure how prejudice is employed in credibility judgments because this provides a nondiscriminatory perspective for the inequities that people might observe. For example, recognizing that females are underrepresented in STEM fields because of structural barriers faced by females in these occupations, instead of the stereotype that females are less intelligent than males, provides a nonprejudiced view of why women are underrepresented (Vasilyeva & Alaya-López, 2019). Fostering structural reasoning in children may eventually lead to reduced social biases and fewer instances of speakers being discredited because of their social location. However, this is an open question that needs to be explored with empirical research, especially with young children. Other methods of cognitive reframing should also be considered when investigating solutions for mitigating epistemic injustice.

4. Conclusion

By considering children's understanding of different forms of epistemic collaboration as they function in everyday interactions, we learn much about a foundational human activity (Sterelney, 2012). Through testimony, we all contribute with our respective observations and reported experiences to much of the knowledge that we share, making knowledge

acquisition seem both difficult and easy. Focusing on the collaborative nature of testimonial exchange allows us to examine the ways in which interpersonal and social reasons to believe speakers are distinct from the evidential bases for believing their testimony. As discussed above, because children (and adults) cannot afford to shoulder the responsibility of assessing all the grounds for beliefs themselves, their epistemic collaborations with others enable distinct forms of trust to operate that grant them access to information about the world they would not otherwise have.

Children's conversational practices as they play out in direct and indirect address showcase the joint commitments that speakers and listeners make to each other. At the same time, the work on group membership shows us that children's judgments to learn from others can be directly influenced by the speakers who possess a range of personal and social characteristics that in turn, likely influence the commitments speakers and listeners make to each other. Finally, the work on epistemic injustice shows us how those commitments can fall apart when the listener is not upholding their responsibilities to respectfully consider the speaker and their claims. These practices show us how people use testimony to either forge or disrupt social contracts. By examining children's conversational practices, their group-based biases and assumptions, and their sensitivity to epistemic harms, we suggest that children evaluate speakers in terms of their epistemic credentials and social characteristics while at the same time holding them interpersonally responsible for their claims.

Across three different sections, we begin to see how both evidential as well as interpersonal and social factors feature in children's evaluations of speakers and their decisions to trust. Children's expectations for how they should be treated and how they should treat others inform their epistemic collaborations, in ways that can be seen in their learning decisions and judgments of others. When they enter into interpersonal interactions, believing a person's testimony when directly addressed might lead to more strongly held beliefs when children appreciate that responsibility for that belief is shared with another person. In the case of social groups, they may enter into different group contexts with distinct expectations about how much expertise or reliability ingroup and outgroup speakers possess, as well as different normative judgments about when to hold ingroup and outgroup members responsible. And as they participate in these interactions, children's testimonial collaborations showcase not only epistemic decisions about what to believe, but the ethical decisions that are at play when listeners' trust is at risk for betrayal, and when speakers' agency is at risk for being denied. Having highlighted some of the ways in which epistemic responsibilities operate in children's testimonial collaborations across different contexts, we hope to have done some justice to a range of epistemic and interpersonal considerations that feature in the complex terrain of children's social learning.

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