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Interpersonal trust in children's testimonial learning

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Within the growing developmental literature on children's testimonial learning, the emphasis placed on children's evaluations of testimonial evidence has shielded from view some of the more collaborative dimensions of testimonial learning. Drawing on recent philosophical work on testimony and interpersonal trust, we argue for an alternative way of conceptualizing the social nature of testimonial learning. On this alternative, some testimonial learning is the result of a jointly collaborative epistemic activity, an activity that aims at the epistemic goal of true belief, but that does so by means of an irreducibly social process.

KEYWORDS
epistemic trust, interpersonal trust, shared intentionality, social learning, testimony

1 | INTRODUCTION

It is hard to overestimate the extent to which the pursuit of our everyday individual and joint endeavors is dependent upon knowledge that is acquired from the testimony of others. The majority of our knowledge concerning who is doing what, where, and when, not to mention most of our knowledge concerning history, science, and current events, is based on having been told of these things by others who we believe and trust concerning these matters. From this perspective, just as the cooperative activities of other social organisms greatly expand their own individual powers and enhance their chances of survival, so the cognitive collaboration involved in the practices of human communication have enabled human beings to disseminate hard-won knowledge and enhance social cohesion and organization in ways that have been integral to the success of the species (Sterelny, 2012). Nevertheless, the extent of our epistemic dependence on other persons can seem worrying and regrettable. Others can lie, deceive, and otherwise prove inaccurate in what they say, and so it is natural to think that epistemic reliance

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on others can be little more than a second-best option when we do not have the time, resources, or opportunity to figure things out for ourselves (Hume, 1975; Locke, 1975). From this perspective, our primary task when confronted with testimony is to manage the risk that it represents.

In the end, each of these two perspectives captures an important truth about human testimony. Testimony is both a potential source of risk and a potential source of benefit. Nevertheless, it is easy to focus on one of these perspectives at the expense of the other. While much work in developmental psychology has focused on children's capacities for managing testimonial risk, in this paper we seek to draw attention to some of the collaborative social dynamics involved in testimonial transactions that have been less studied in the developmental literature.

Developmentalists commonly point out that testimonial learning is both an epistemic and a social affair. While the evidentiary value of testimony tends to dominate the learning literature with much attention given to children's estimates of speakers' reliability or good will, many researchers recognize that there are other processes at work. For example, Mascaro and Sperber (2009) claim that, "even when selecting the testimony of informants who have previously been accurate, young children may, at least in part, be driven by moral and affective preferences" (p. 377). Tong, Wang, and Danovitch (2019) review the selective learning literature and state that children rely heavily on both epistemic and social cues to decide whom to trust. Likewise, Harris (2007) speculates that information about an informant's past inaccuracy, ignorance and uncertainty is likely fed into a kind of global profile that aggregates an individual's emotional availability with their epistemic reliability (p. 138). Thus, researchers appreciate that the task of gathering information from social sources is likely to have important affective, interpersonal, and moral dimensions.

Nevertheless, in the developmental literature the epistemic and the social are typically theorized as two different types of information, serving distinct goals, and guided by distinct motivations (Jaswal & Kondrad, 2016; Sobel & Finiasz, 2020; Tong et al., 2019). The mechanisms that support these distinct goals and motivations are often theorized to be distinct. Epistemic mechanisms influence belief via inferences from evidence, and while some such evidence might be provided by the communicative behavior of others, these mechanisms of inference are not themselves social. Conversely, social mechanisms are often theorized to exert their influence via imitative, affiliative, and conformist processes that might have been evolutionarily selected in part for their epistemic benefits but that are not in themselves epistemic. These social processes are sometimes conceptualized to result in the endorsement of testimony, but not in the acquisition or revision of beliefs. In other words, developmental psychologists often contend that interpersonal or social goals lead children to succumb to social pressure (Corriveau & Harris, 2009), or stimulate children's emotional and affective responses (Sobel & Finiasz, 2020), neither of which treat children as "rational" or truth-oriented in processing communicated information.

Since these epistemic and social goals, motivations, and mechanisms are treated as distinct, they can potentially conflict. The social goals of affiliating or conforming with a speaker can potentially conflict with the epistemic goals of believing the true and avoiding the false. A common research strategy has thus been to pit these two goals against one another, for example, examining whether children prefer speakers with positive epistemic characteristics and negative social characteristics over speakers with negative epistemic characteristics and positive social characteristics (Corriveau & Harris, 2009; Elashi & Mills, 2014; Johnston, Mills, & Landrum, 2015; Landrum, Mills, & Johnston, 2013; McDonald, Schug, Chase, & Barth, 2013).

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We do not wish to deny that testimonial learning can be subject to distinct and sometimes conflicting epistemic and social goals and processes. In this paper, however, we draw upon recent philosophical work on interpersonal trust in testimony in order to pave an alternative way of conceptualizing the interpersonal nature of at least some testimonial learning, an alternative that we contend merits further empirical study and that has the potential to open up new avenues of research. On the alternative we offer, some testimonial learning is the unique result of *a joint collaborative epistemic activity*, an activity that aims at the epistemic goal of *true belief* but that does so by means of *an irreducibly social process*. Such testimonial learning is thus similar to joint action that aims at a particular end by means of a social process that requires shared understanding between the parties concerning their individual responsibilities in the joint activity. While this form of testimonial learning draws on the general shared intentionality infrastructure so integral to early childhood development (Tomasello, 2019), we contend that it does so in unique ways that have yet to be sufficiently understood and investigated.

Our goal in this paper is explanatory. We aim to explain a way of conceptualizing the developmental task facing young testimonial learners that differs from that typically found in the developmental literature. Section 2 introduces a simple evidential model of testimonial learning that we will use as a conceptual foil with which to contrast the interpersonal dimensions of testimonial transactions that we wish to highlight. Section 3 draws on some recent philosophical literature in order to introduce several conceptual distinctions that are neglected by this simple evidential model. These distinctions point to a new way of conceptualizing some aspects of the developmental task facing young testimonial learners. Section 4 discusses existing empirical work that supports this alternative conceptual framework, articulates some methodological implications of this alternative framework, and identifies new opportunities for the empirical investigation of certain interpersonal features of early testimonial learning.

2 | EPISTEMIC TRUST: TESTIMONY AS EVIDENCE

In order to illustrate some of the cooperative features of testimonial learning that are easily missed given a too exclusive focus on the observation of evidence, it will be helpful to have in view as a foil a simple evidential model of testimonial learning. While we do not contend that any empirical researchers accept this overly simplistic model, appreciating what such a model leaves out will be helpful for illustrating our alternative.

It is uncontroversial that a speaker's telling a hearer that p is capable of providing the hearer with an epistemic reason for believing that p.[1] Depending on the circumstances, the speaker's testimony might not be a good epistemic reason for believing that p. If p is very improbable given the hearer's other beliefs, if the hearer has reason to believe that the speaker is not competent or well-positioned to pronounce on whether p is the case, or if the hearer has reason to believe that the speaker is not speaking sincerely, then the speaker's testimony might not provide the hearer with an epistemic reason that is sufficient to justify her in believing that p.

[1]In the developmental literature, talk of epistemic reason-giving in communication is sometimes restricted to cases of argument, to cases in which a speaker gives a hearer a reason for believing a proposition the probative force of which is independent of the speaker's act of giving the reason to the hearer (Mercier & Sperber, 2011; Tomasello, 2019). Nevertheless, all would accept that, in a broader sense, in telling a hearer that p, a speaker provides the hearer with a reason for believing that p. We here use talk of reason-giving in this broader sense. In Section 3, we argue that testimonial reason-giving differs from the reason-giving involved in cases of argument, demonstration, or explanation in several crucial respects.

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Nevertheless, a speaker's testimony is often broadly consistent with a hearer's other beliefs, a hearer often does have good reason to believe (or at least no reason to doubt) that a speaker is competent concerning that to which she testifies, and a hearer often does have good reason to believe (or at least no reason to doubt) that a speaker is sincerely expressing her own beliefs. In such cases, a speaker's testimony can provide a hearer with an excellent reason for believing that *p*.

In these respects, testimony is very much like other forms of inductive evidence on which knowledge and justified belief can be based. Just as a fingerprint left at the scene of a crime can, in the right circumstances, give one a very good reason for believing that so-and-so was the perpetrator, so a speaker's testimony that so-and-so committed the crime can, in the right circumstances, give one a very good reason for believing that this is the case. The epistemic task for the hearer is one of determining whether the circumstances are right; whether, in conjunction with the other available evidence, the fingerprint or the testimony is sufficient reason to believe that this person committed the crime. It is thus very natural to construe the epistemic task facing testimonial learners as just one instance of the more general task of determining the reliability of inductive evidence.

On such a simple evidential model of testimonial learning, the fact that testimony is a social act in which one person actively purports to give an epistemic reason to another is largely inconsequential. The hearer's task is to determine whether the evidence she confronts is reliable, and while the fact that this particular evidence takes the form of an interpersonal communicative act might matter for how one goes about determining its reliability, the hearer's reasoning about this evidence is not different in kind from her reasoning about other nontestimonial forms of evidence. The hearer must simply be attuned to the particular kinds of considerations of competence and sincerity that are relevant to assessing the reliability of such social acts.

If one thinks about the epistemic import of testimony along these evidential lines, then it will be natural to think of the developmental task facing young children as one of developing the appropriate vigilance to conditions of competence and sincerity that is required for assessing the reliability of testimonial evidence. Again, this might be more difficult than learning to assess the reliability of other kinds of impersonal evidence in that it requires learning to identify dimensions of competence in speakers and social cues of sincerity, but the learning problem itself is not different in kind from that pertaining to other kinds of evidence. On such an evidential account, children evaluate testimony in much the same way that they evaluate considerations like footprints in the snow. They learn to distinguish the circumstances in which such considerations amount to reliable evidence for believing a proposition by, for example, monitoring the reliability of informants, their various arguments and reasons for belief, their expertise, the extent to which they agree with others, their expressions of confidence or certainty, and their access to relevant information (for recent reviews, see Harris, Koenig, Corriveau, & Jaswal, 2018; Mills, 2013; Poulin-Dubois & Brosseau-Liard, 2016).

Recent efforts to frame wide-ranging findings like these have appealed to a notion of *epistemic trust*—a probabilistic inference or estimate that a source of information provides reliable evidence about the world. Within the context of this empirical work, "epistemic trust" is used to refer to inferences about the likely truth of a statement given the available evidence, or to the beliefs gained by appraising the evidence in favor of a given piece of testimony. Children estimate the reliability of sources as varied as books or texts; experimental environments; indexical signals; computers; puppets; putative experts; unfamiliar strangers; and teachers and parents. Children's evidential judgments can be made spontaneously, can be based on small amounts of

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probabilistic evidence, and appear as early as 14 months of age. Moreover, children integrate numerous sources of evidence with their prior knowledge to make these inferences, from characteristics of the speaker (e.g., expertise, age, and group membership) to the nature of her claims, arguments and actions, to the objects that she comments or acts upon (for reviews, see Harris, 2012; Mills, 2013; Robinson & Einav, 2014; Sobel & Kushnir, 2013; Stephens, Suarez, & Koenig, 2015).

While testimonial learning may often be based on the various forms of evidence we have to reach certain conclusions about claims and speakers, in the next section we argue that speakers can perform a variety of different acts aimed at communicating information, and while some of these acts clearly do involve the production of evidence, it is not clear that the basic act of *telling an addressee that p* can be adequately understood as the mere production of evidence (McMyler, 2011; Moran, 2018). Our hope is that by clarifying the distinctions between telling an addressee that *p*, and other speech acts, such as explanations and arguments, we will illustrate some of the cooperative, interpersonal dimensions of testimonial learning.

3 | INTERPERSONAL TRUST: BEYOND A PURELY EVIDENTIAL MODEL OF TESTIMONY

Before we consider the act of telling, it will be helpful to consider some other speech acts that are commonly performed in order to communicate information to hearers. If a speaker wants to influence a hearer to believe that *p*, and if the speaker decides to attempt to do this by means of providing the hearer with an epistemic reason for believing that *p*,[2] the speaker might choose to provide the hearer with *an argument* for believing that *p*, *a demonstration* of the truth of *p*, or *an explanation* of why *p* is the case. All of these speech acts involve presenting the audience with epistemic reasons for believing that *p*, and the reasons for belief provided by these speech acts all have three important features in common.

First, their probative force is independent of the speaker's act of presenting them to the addressee. While the speaker intends that the hearer recognizes the probative force of these reasons, their probative force does not depend on the speaker's intentions in presenting the reasons to the hearer. These reasons would have their probative force however the audience happened to come across them. If the hearer had come across the considerations presented in a speaker's argument in some other way, or if she had reasoned on her own to the explanation provided by the speaker, the hearer would have the very same reasons for believing that *p* that she acquired from the speaker's argument or explanation. In performing these speech acts, the speaker's role is thus one of, as it were, putting the reasons in front of the hearer.

Second, and relatedly, the reasons for belief provided by these speech acts are equally available to anyone who might hear and understand what the speaker says, not just to the addressee

[2]There are many ways in which a speaker might attempt to influence a hearer to believe that p that do not involve providing the hearer with epistemic reasons for believing that p, with considerations that the hearer is meant to take to bear on the question whether *p*. Rhetorical devices employed in advertising or political propaganda, for example, often involve emotional appeals or appeals to group membership that do not function for their audience as considerations that they actually take to bear on the question whether *p*. Instead, such techniques exploit non-rational social-psychological mechanisms. While the relationship between such techniques and straightforward epistemic reason-giving is complex and often difficult to unravel, we here focus narrowly on forms of social influence on belief that involve openly providing an audience with genuinely epistemic reasons.

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of the speaker's speech act. While there will likely be an intended addressee of the speaker's argument, demonstration, or explanation, the probative force for the addressee of the reasons provided by such speech acts does not depend on her being the intended addressee. If a third-party non-addressee happens to overhear a speaker's argument, demonstration, or explanation, and if the non-addressee is in an epistemic position to understand the reasons being offered, the non-addressee can believe on the basis of these reasons in just the same way as can the addressee.[3] This is connected to the first feature described above. Insofar as the reasons provided by these speech acts have their probative force independent of the speaker's act of presenting them to an audience, the speaker's act of presenting them to a particular addressee has no bearing on the probative force of the reasons presented.

Third, and most importantly, the reasons for belief provided by these speech acts all call for the hearer to "come to her own conclusion" or "make up her own mind" about what is argued, demonstrated, or explained. These speech acts are meant to assist the hearer in "seeing things for herself," and this accounts for a large part of their value (Locke, 1996). Such means of communicating information are valuable because they facilitate the acquisition of not only justified belief and knowledge but also understanding. Understanding is often taken by epistemologists to require more than justified belief or propositional knowledge (Kvanvig, 2003). For example, while I might reasonably believe and even know that a scientific claim or mathematical theorem is true because a scientist or a mathematician told me so, this is insufficient for understanding the claim or theorem. Understanding the claim or theorem requires grasping for myself *why* the claim or theorem is true, and this requires appreciating how independently available, non-testimonial reasons show it to be true. The speech acts of arguing, demonstrating, and explaining are tailor-made to provide just such independently available reasons on the basis of which a hearer can grasp things for herself.

In contrast, we contend that the reason for belief provided by a speaker's *telling an addressee* that *p* differs from the reasons for belief provided by argument, demonstration, and explanation in all of the above three respects. To begin to see how this is so, consider again the cases of believing in the truth of a scientific claim or mathematical theorem on the basis of the testimony of a scientist or mathematician. If a well-regarded climate scientist tells me (or a child) that the Earth's climate is warming largely as the result of human activity, this might give us excellent reason to believe that this proposition is true. It might even allow us to know that the proposition is true. But as we have seen, the scientist's simply telling us this does not help us to understand how or why this is the case. If the scientist wished to cultivate understanding, she would have to do more than simply tell us that anthropogenic climate change is occurring. To the extent that this is possible, she would have to argue or explain in a way that allowed us to grasp certain rational or evidential connections for ourselves. Acts of mere telling do not do this. Despite the fact that they can give us excellent reasons for believing what is told, tellings do not aim to put us in a position to come to our own conclusion or make up our own minds about the content of the telling. Instead, when we believe on the basis of the

[3]The arguments or explanations provided by speakers are often tailored to the epistemic position of their addressees. A scientist's explanation to a group of other scientists will likely differ from her explanation to a group of laypeople. Nevertheless, an overhearer of a speaker's argument or explanation who is in as good an epistemic position as the addressee to understand the argument or explanation will be equally able to avail herself of the reasons provided by the speech act as will the addressee. As we argue below, this is not true of a speaker's tellings.

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telling, we take the speaker's word for it. We believe it on the authority of the speaker, trusting her for the truth.[4]

To believe that *p* on the authority of a speaker is to believe that *p* deferentially. When I believe the climate scientist deferentially, my belief might be based on an excellent reason (the scientist's testimony) that justifies me in believing that *p*, and this justification might even enable me to know that anthropogenic climate change is occurring. Nevertheless, insofar as the scientist's testimony does not provide me with the kinds of considerations that help me to understand this truth for myself, as an explanation might do, her testimony does not put me in the same kind of position to justify or defend my belief in the face of challenges. If someone were to present me with evidence that appears to tell against the claim that the earth's climate is warming, I would not be able to rebut this counter-evidence myself. Still, this would not necessarily mean that I would have to give up my belief in the face of such a challenge. Insofar as I believe deferentially, I am entitled to maintain my belief while "passing the epistemic buck" and referring certain challenges to my belief back to the scientist (Brandom, 1983; Goldberg, 2006; McMyler, 2011). The viability of such buck-passing with respect to the epistemic justification of my belief shows that deferential belief involves a distinctive parceling out of epistemic responsibility between speaker and addressee. In telling an addressee that *p*, a speaker is assuming a degree of epistemic responsibility for the addressee's belief, a responsibility the speaker is *not* assuming when she puts the hearer in a position to make up her own mind (by, for example, giving an argument or explanation). And in believing a speaker deferentially, the addressee is ceding partial epistemic responsibility for her belief to the speaker, making her belief rationally dependent on the speaker's judgment.

The reasons for belief provided by tellings thus lack the third characteristic of the reasons for belief provided by arguments, demonstrations, and explanations. The tellings do not place the addressee in a position to come to her own conclusion about what is the case. If children appreciate this aspect of tellings, we would expect that children would be able to cede some epistemic responsibility back to the speaker and hold the speaker accountable for the responsibilities associated with her role in the joint transaction. The reasons provided by tellings lack the first two features of arguments and explanations as well. First, the reasons for belief provided by tellings do not have their probative force independent of the speaker's act of presenting them to the audience. The speech act of telling does not present a piece of evidence or consideration in favor of a belief; the telling is itself the reason. If children appreciate this aspect of testimony, their justifications for beliefs based on tellings should cite the speaker who told them while their justifications for beliefs based on explanations or demonstrations, in contrast, should cite the considerations given by the explanation or demonstration. Second, the reasons for belief provided by tellings do not appear to be equally available to anyone who might hear the speakers' tellings. While anyone who hears and understands a speaker's telling that *p* might

[4]This can be illustrated by a practical analogue, an analog in the realm of reasons for action. Practical tellings (telling an addressee to Φ, where Φ stands for some action like going to the store) are like theoretical or epistemic tellings (telling an addressee that *p*, where *p* stands for a proposition) in that they aim to provide addressees with reasons for action that do not put the addressee in a position to come to her own conclusion or make up her own mind about whether to Φ (Raz, 1986). In telling an addressee to Φ (ordering or commanding her to Φ), a speaker aims to decide for the addressee what to do, to settle this question for her, and if the addressee acts for this reason, the addressee then acts on the authority of the speaker—she obeys. Such obedience is the practical analogue of believing on the authority of the speaker (McMyler, 2016; Zagzebski, 2012). Just as obeying a speaker's command requires allowing the speaker to settle for you the practical question whether to Φ, so believing on the authority of the speaker requires allowing the speaker to settle for you the theoretical question whether *p*.

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take it to be good inductive evidence for believing that *p* herself, only addressees count as having been told that *p*. As such, only addressees are in a position to take a speaker's word that *p*, because it is only to addressees that the speaker's word has been given. For non-addressees, the speaker has not taken on the responsibility of settling the question whether *p*, and so non-addressees do not appear to be in a position to pass the epistemic buck back to the speaker (Hinchman, 2005; McMyler, 2011, 2013).[5] If children appreciate this characteristic, they should more often hold speakers who directly address them as accountable for the truth than speakers who they overhear conveying the same content.

On a purely evidential model of testimonial learning, the speech act of telling an addressee that p is an act that is itself evidence for *p* and that expresses psychological states (the belief that *p*, the intention to inform the addressee that *p*, etc.) that are evidence for *p*. This is not wrong, of course. A speaker's telling an addressee that *p*, along with the psychological states expressed therein, can be evidence for *p*, and addressees are capable of treating them as such (Koenig & McMyler, 2019). The problem is that construing the speech act of telling an addressee that *p* solely on the model of the presentation of evidence mischaracterizes the speech act of telling by neglecting the responsibilities that speakers assume and that listeners discharge, and thereby neglecting the interpersonal reasons we have to believe what we are told.[6]

In order to capture the way in which tellings provide a distinctive kind of reason for belief, some philosophers have recently begun to appeal to the concept of "interpersonal trust" in explaining the epistemology of testimony (Faulkner, 2011; Hieronymi, 2008; Hinchman, 2005; Marušić, 2015; McMyler, 2011; Zagzebski, 2012). This recent epistemological literature takes "trusting a speaker for the truth" to be a distinctive kind of attitude that addressees adopt in response to a speaker's testimony, an attitude that is opposed to treating the speaker's testimony as evidence on the basis of which one might make up one's own mind about something. Trust is here taken to be opposed to mere evidence-based belief or reliance (Baier, 1986; Hollis, 1998; Holton, 1994; Jones, 1996), and the appeal to interpersonal trust is meant to contrast with a purely evidential model of testimony (McMyler & Ogungbure, 2018; Pesch & Koenig, 2018).[7]

[5]For discussion of some of the difficulties involved in determining who, from an epistemic perspective, counts as an addressee of a speaker's telling, see McMyler (2013).

[6]This is not necessarily to deny that testimony can be construed as a kind of evidence, depending on how broadly we construe the category of evidence. Interpersonal theorists of testimony contend that there is a categorical difference between the kind of reason for belief that a speaker's tellings aim to provide and the kind of reason for belief provided by ordinary inductive evidence such as fingerprints and footprints. Interpersonal theorists thus commonly deny that tellings amount to evidence (Marušić, 2015; Moran, 2005), but this is to identify the category of evidence with the category of ordinary inductive evidence. Alternatively, one might mark the same distinction by distinguishing between different kinds of evidence, for instance, impersonal versus personal evidence.

[7]In the philosophical literature, one common strategy for defending a purely evidential account of the epistemology of testimony is to attempt to strictly distinguish the epistemology of testimonial learning (the account of how it is that testimonial beliefs are epistemically justified) from its social psychology (the account of the process by which testimonial beliefs are formed). See, for example, Lackey (2008). While we find this move unsatisfying on several fronts, we cannot argue for this here. Our concern in this paper is to outline an alternative conceptual framework for theorizing about the developmental task facing young testimonial learners. This developmental task is a social psychological one, and so our concern is with theorizing about the development of this social psychological process. If one wishes to isolate the epistemology from the psychology, then a purely evidential account of the epistemology of testimony, narrowly construed, might in fact be consistent with our proposed account of the developmental task facing young testimonial learners. Thanks to an anonymous referee for encouraging us to clarify this point.

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On all such views, believing what a speaker says, even for the reason that the speaker says it, is insufficient for trusting the speaker for the truth (Anscombe, 2008). If I treat a speaker's testimony as mere inductive evidence, like a fingerprint left at the scene of a crime, then I am not accepting the speaker's testimony as it is given. I am not allowing the speaker to settle for me the question of what is the case, and I am instead making up my own mind, though on the basis of the evidential value of her communicative behavior. I am opting out of the cooperative epistemic transaction that, in virtue of performing the speech act of telling, the speaker is purporting to enact. This cooperative transaction is one in which the speaker does some of the epistemic work of determining for me what is the case, thereby assuming partial epistemic responsibility for my belief and entitling me to defer certain epistemic challenges to my belief back to her. Importantly, this cooperative transaction is not simply an instance of the cooperative activity involved in acts of communication generally (Grice, 1989). Not only are a testimonial speaker and addressee being cooperative in communicating with one another, but the speaker is assuming partial epistemic responsibility for the addressee's belief, entitling the addressee to pass the epistemic buck back to her, and the addressee is accepting the speaker's assumption of epistemic responsibility, believing that *p* deferentially. The cognitively cooperative nature of testimonial beliefs that involve trusting a speaker for the truth distinguishes such beliefs from beliefs based on other forms of cooperative communicative activity, such as argument and explanation, as well as from beliefs that are based on treating a speaker's testimony as mere inductive evidence. Beliefs resulting from these other forms of communicative activity do not exhibit the sharing out of epistemic responsibility characteristic of beliefs that involve trusting a speaker for the truth.

4 | IMPLICATIONS FOR DEVELOPMENTAL RESEARCH

If one considers the study of testimonial learning in the way we are proposing, then the developmental task facing children expands beyond the problems involved in learning to appreciate or assess the validity of the evidence in favor, or against, a piece of testimony. The developmental task also involves learning how to participate in the interpersonal testimonial practices of those around us, appreciating the distinct roles and responsibilities involved. This includes discriminating cases of direct address from non-address, identifying the various devices used by speakers to commit themselves to the truth of what they say, and appreciating the shared nature of epistemic responsibility between speakers and hearers. Here we hope to sketch a picture that shows that children bring a sense of obligation to their testimonial exchanges, for themselves and for others, much like the one they bring to other collaborative activities with a partner (Tomasello, 2019). Far from starting with a simple or "primitive" trust, children are instead developing an increasingly sophisticated collaborative understanding that is modulated as they become members of a culture and users of a language throughout childhood and into adulthood.

Next, we review developmental research that suggests that children's appreciation of interpersonal trust in testimonial exchanges is manifest in (a) the significance of direct address, (b) children's normative protest in response to failures, and (c) children's recognition of the shared responsibilities of the speaker and the addressee. Our hope is that by appreciating characteristics of interpersonal trust, the field opens to new questions, questions that allow researchers to investigate the distinct ways in which we trust speakers and the distinct reasons we have for not trusting them.

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4.1 | The significance of address

On our proposed account, one key feature of testimonial exchange concerns whether listeners are directly addressed by a speaker. Much cross-cultural and developmental research has acknowledged the significance of direct address in interpersonal transactions. By their first birthday, young infants prefer faces with direct gaze over averted gaze (Farroni, Mansfield, Lai, & Johnson, 2003; Hood, Willen, & Driver, 1998). Thus responsiveness to signs of interpersonal interaction is evident early (Hobson, 2002; Rochat, Querido, & Striano, 1999; Trevarthen, 1979). Infants' entry into communication is marked by the exchange of gestures, points, emotional displays and "showing" behaviors (Goldin-Meadow, 2005; Tomasello, 2014). By 12 months, infants expect receivers to give speakers the objects they indicate (Martin, Onishi, & Vouloumanos, 2012), and to execute indicated actions (Vouloumanos, Onishi, & Pogue, 2012). Thus before they can even monitor testimony for accuracy, infants evaluate communicative exchanges for the presence of direct address and mutual responsiveness.

More recently, researchers have explored the epistemic significance of direct address by presenting children with a speaker who directly interacts with them, or a speaker who addresses a third-party or remains noninteractive (for a review, see Shneidman & Woodward, 2016). For example, Li and Koenig (2020) presented 4-year-old children with an adult speaker who either directly told children counter-intuitive information about animals, or communicated the same information to a third party over the phone. Although children remembered the surprising claims at similar rates across the two contexts, and accepted new information in both contexts significantly above chance, they were more likely to accept the claims when the information was communicated to them directly than when it was overheard (see also Akhtar, 2005; Hoehl, Zettersten, Schleihauf, Grätz, & Pauen, 2014; Vredenburgh, Kushnir, & Casasola, 2015). Not only were children more likely to believe surprising claims when directly addressed, they also protested more often in the directed condition than they did in the overheard condition. Higher rates of protest coupled with higher rates of endorsement suggest that children are not treating claims delivered by way of direct address as superior evidence to claims that were overheard. Furthermore, high rates of protest speaks against the idea that direct address was received by children as a form of social pressure. Rather, it suggests that direct address invited the child to engage the speaker collaboratively and provided the child with an interpersonal reason to trust the speaker for the truth, and to hold her interpersonally accountable for it.

These distinctions concerning direct address are likely to carry methodological implications for contemporary research on children's selective trust. In the experimental paradigm of Koenig and Harris (2005), for example, children encounter two speakers presented on video who are asked by a third-party confederate to name a series of common objects. One speaker responds accurately to the confederate's questions, and the other speaker responds inaccurately. The fact that the confederate agent poses the questions (not the child), and that questions are posed to the two speakers (not to the child), places children in the position of observing testimonial exchanges as third-party listeners, not as addressees. However, some elements of direct address are present in these paradigms as well. For example, in the paradigm described above involving two speakers who each answer a confederate's question, the speakers use their gaze and line of regard to direct their answers to the child listener who is seated off-camera. Moreover, the claims of the two speakers, often presented on video,[8] take

[8]Use of video arguably places children in the position of observing the evidence. Young children (under 30 months) typically learn better from socially contingent, interactive agents than agents presented on video, see Roseberry, Hirsh-Pasek, Parish-Morris, and Golinkoff (2009).

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the form of simple acts of telling (e.g., "That's a dax," "That's a mido"). As we discussed above, these acts of telling and signs of direct address present children with equally compelling reasons to consider both speakers' claims. The presence of both direct and indirect address mixed together in a single design makes it difficult to clearly interpret the nature of children's judgments. Did children reason about the evidence that they observed or did they take the speakers at their word, or some combination of both judgments? Did children reason evidentially when asked explicit questions about both speakers after familiarization, and did they feel compelled to trust both speakers when they were directly addressed during the test phase? If we accept the conceptual distinctions between the reasons we are given as non-addressees from those we are given when directly addressed, then empirical work that measures children's "trust" but fails to distinguish the interpersonal forms of trust from the evidential basis for belief raises questions about what is being measured in these paradigms. Future studies in testimonial learning could avoid presenting mixed cues of address and be mindful of the form of address that is used in any given study. Recording children's responses to claims across such contexts will advance our understanding of the belief-forming practices that support children's learning, and help to distinguish interpersonal decisions to trust from decisions to believe based on the evidence.

Furthermore, distinguishing interpersonal trust from evidential reasons opens up opportunities to better understand a range of phenomena that go unexplained in the extant literature. For instance, one interesting and common finding in this literature is that children are often better able to answer descriptive questions about the two speakers (*explicit judgment questions*, e.g., "who was better at naming things?" or "who was a nice person?") than they are in deciding which of two claims to endorse (*endorse questions*, e.g., "Is that a blicket or a mido?") (e.g., Doebel & Koenig, 2013; Landrum et al., 2013; Koenig, Clément, & Harris, 2004; Pasquini, Corriveau, Koenig, & Harris, 2007; for a recent review, see Sobel & Finiasz, 2020). In addition, while children's performance on the *explicit judgment questions* improves from 2 to 6 years of age, children's tendency to choose the more positive speaker's claim in the *Endorse questions* remains stable (Sobel & Finiasz, 2020). On a purely evidential model, it is difficult to explain such differences since the available evidence seems equally relevant to both types of question—that is, how to explicitly describe the speakers and whose claim to accept. However, on accounts that distinguish decisions to trust from evaluating inductive evidence, one explanation for such differences is that explicit judgment questions ask children to appraise the agents based on the evidence (e.g., their observed behavior, appearance, track record, etc.), whereas endorse questions ask children to believe one of two claims—or acts of telling—that were both directly presented to them ("That's a blicket", "That's a mido"). Children's lower and more variable answers to the Endorse questions may be explained by the fact that both speakers directly addressed the child addressee, offering the same compelling interpersonal reasons to trust them and take them at their word.

There are several paradigms that have examined children's learning decisions in the context of direct interactions (e.g., Birch, Vauthier, & Bloom, 2008; Brooker & Poulin-Dubois, 2013; Couillard & Woodward, 1999; Heyman, Sritanyaratana, & Vanderbilt, 2013; Jaswal, Croft, Setia, & Cole, 2010; Krogh-Jespersen & Echols, 2012; Palmquist & Jaswal, 2012; Wellman, Song, & Peskin-Shepherd, 2017). In these paradigms, children are given direct verbal or gestural testimony from a live human agent or puppet; and the testimony might be transparently false, or later shown to be false (e.g., when the bids of "tricky" experimenters are revealed). On a purely evidential model, such deliberately false statements constitute evidence against a speaker's reliability.

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However, when children are directly addressed by deceptive or "tricky" informants, they often *fail to reject* information from speakers who deceived them on previous occasions (e.g., Couillard & Woodward, 1999; Jaswal et al., 2010; Peskin, 1992; Sher, Koenig, & Rustichini, 2014; Vanderbilt, Liu, & Heyman, 2011). Heyman et al. (2013) aptly argue that children find it especially difficult to reject information when they perceive it to be *intentionally and directly offered* to them, much like advice that is directly offered to one addressee over another. We agree with their explanation, and would add that when children are directly addressed, and choose to trust a speaker "against the evidence of unreliability" in these paradigms, a purely evidential model of testimony is unable to appreciate the reasons for belief that direct acts of telling—even false or deceptive ones—provided to addressees. Instead, a purely evidential model of testimony has no choice but to emphasize the listener's *failure* to promptly register "evidence" of deception into their judgments. More generally, this is why listeners are characterized as "surprisingly credulous" when they accept claims from overtly deceptive agents. On evidential views, the listener is at fault for trusting a deceptive agent precisely because such models place priority on forming beliefs that are in line with the evidence. In contrast, our aim is to call attention to two distinct possibilities. By distinguishing interpersonal reasons to trust as distinct from evidential bases for believing what they say, we can distinguish our vigilance toward deceptive speakers who directly invited our trust but betrayed it (as in Michaelson & Munakata, 2016, Pesch & Koenig, 2018) from cases where we observe evidence provided by third-parties that a given speaker has been deceptive in the past (as in Carlson, Moses, & Hix, 1998; Couillard & Woodward, 1999; Jaswal, 2010; Russell, Mauthner, Sharpe, & Tidswell, 1991).

If the interpersonal bases for belief provided by direct acts of telling are treated as distinct from the reasons that inductive evidence provides, future research can more aptly characterize the role played by trust in children's learning decisions. For example, are children better able to resist misleading or counter-intuitive claims when they are put in the position of an observer as opposed to an addressee? Can children distinguish speech acts of argument, demonstration, and explanation (that provide independently-available reasons for the child to make up her own mind) from simple "tellings" that ask them to take the speaker's word and believe on her authority? Based on the great cultural variability in the extent to which children are invited, encouraged and expected to participate in conversations (e.g., Chavajay & Rogoff, 1999; Correa-Chávez & Rogoff, 2009; Rogoff, 2003; Rogoff, Correa-Chávez, & Silva, 2011), how do children come to understand the epistemic and interpersonal implications that come from direct address across wide cultural variations in communication? If reasons for belief function differently on the interpersonal and evidential routes, pursuing these questions would allow us to investigate two distinct types of abilities in children's testimonial learning, namely, their ability to evaluate relevant evidence and register signs of risks in speakers; as well as their ability to recognize the interpersonal invitations to trust in collaborative testimonial exchanges.

4.2 | Children's protest

When speakers fail in the claims that they directly address to someone, such failings are said to carry interpersonal significance for listeners, in ways that a purely evidential model does not appreciate. How else might psychologists measure the interpersonal significance of testimonial failures for child listeners? As mentioned above, epistemologists argue that certain rights of complaint feature uniquely in cases of beliefs based on trust (McMyler, 2013; Moran, 2005).

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That is, when an addressee takes a speaker at her word, she acquires a suite of rights: rights to hold the speaker accountable, rights to protest, rights to demand an apology, rights to forgive, rights to release the speaker from their obligations, and so on (Feinberg, 1970; Gilbert, 1992; McMyler, 2011, 2013). In fact, if an addressee does not consider a speaker's act of telling in the spirit in which it was given, and instead treats claims only as evidence, she gives up many of her rights to hold speakers accountable (Hinchman, 2005; Marušić, 2015).[9]

While more evidence is needed, there is research that suggests that children, even infants, possess certain means to hold speakers accountable. For example, infants and young children interrupt and correct those speakers who make mistakes under conditions of direct address (Koenig & Echols, 2003; Pea, 1982; Rakoczy & Tomasello, 2009; Wellman et al., 2017). In fact, some infants show signs of personal distress in response to false statements (Koenig & Echols, 2003), and here, we stress the possibility that children's distress and complaints occur, in part, as a response to the interpersonal harm that inaccurate speakers do to those they address. Children's distress in response to false statements directly addressed to them may reflect their own personal disappointment, and perhaps blame, toward a speaker who invited trust with direct acts of telling, but who failed to be truthful in their statements (Koenig, Tiberius, & Hamlin, 2019).

Children hold speakers accountable for a variety of claims quite early in development. Infants actively correct speakers who misname common objects (Begus & Southgate, 2012; Grassmann & Tomasello, 2010; Jaswal, 2004; Koenig & Echols, 2003; Pea, 1982), but they also object to speakers who present difficult or anomalous requests (e.g., "Can you bring me the refrigerator?"; Shwe & Markman, 1997; Wellman, Song, & Shephard, 2019). Furthermore, children not only direct objections at deviant speakers, they also actively protest against addressees who fail to fulfill the commands of a speaker (Rakoczy & Tomasello, 2009), demonstrating an early sensitivity to the responsibilities of not only speakers, but of both parties in testimonial exchanges.

In addition to signaling objections to anomalous claims or breaches of collaboration, protest can also be a sign of engagement. For example, Li and Koenig (2020) found that children who received surprising claims by means of direct address often protested and then went on to accept these claims when asked later. In fact, among the children who protested, 71% of children in the directed conditions subsequently accepted more than half of the counter-intuitive claims, but only 25% of children in the overheard conditions did so. Therefore, it is possible that direct address invites children to enter an active collaboration with the speaker, making them more likely to stop or interrupt the speaker, and ask for clarification both as a means of fulfilling their own responsibilities as a listening partner and as means of asking the speaker to answer for her claims.

Tomasello (2019) discusses children's ability to break commitments and repair those breaks as perhaps the strongest evidence that children appreciate the binding nature of joint commitments. When children are engaged in a joint task with someone but are tempted by another activity, they sometimes apologize or announce their departure before leaving, verbal reparations that are *not* seen outside of joint commitments (Graefenhain et al., 2009). More generally, children begin apologizing for harmful actions in toddlerhood (Kochanska, Casey, & Fukumoto, 1995), at rates that increase with age (Ely & Gleason, 2006). In testimonial

[9]Of course one has a right to complain and perhaps even demand an apology if someone else lies to a third party. The point here is that there are certain "rights of complaint," such as the right to pass the epistemic buck, that are only possessed by addressees (McMyler, 2013).

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exchanges, important questions concern whether children spontaneously apologize for their own miscommunications at all, and whether they distinguish those false statements that are intentionally made (such as lies or willful mistakes) from those false statements that are made out of ignorance or uncertainty (such as guesses). Also interesting is the question of whether children feel the need to retract their own previous testimony that they later learn to be false. If they do, then this would suggest that they hold themselves responsible as speakers as well as others, and conceive of their own acts of testifying as part of an ongoing collaborative endeavor.

4.3 | Shared epistemic responsibilities

As mentioned in the previous section, another aspect of the interpersonal dynamics lies in the epistemic responsibilities that are parceled out in the cooperative transactions between the speaker and the addressee. Specifically, in cases in which an addressee trusts a speaker and believes deferentially, she is entitled to cede partial epistemic responsibility for her belief to the speaker (Brandom, 1983; Goldberg, 2006; McMyler, 2011). In contrast, if the hearer is put in a position to make up her own mind, she is not in a position to pass the epistemic buck back to the speaker.

In this way, this interpersonal nature of testimonial exchange makes the speaker and the addressee co-participants in a joint epistemic activity that results in true belief. Outside of the testimonial learning domain, empirical evidence on children's joint collaboration revealed that children with a shared commitment understand the joint responsibilities between the two collaborative partners (e.g., Kachel, Svetlova, & Tomasello, 2018; Warneken, Lohse, Melis, & Tomasello, 2011). In line with the view discussed above that listeners who accept a speaker's claim on trust acquire rights to hold speakers accountable, Tomasello (2019) argues that the human sense of obligation to collaborative partners manifests in (a) reactive attitudes when the partner fails to play her role in a joint commitment; (b) leave-taking behavior when breaking a commitment; and (c) fairness and reciprocity among second-personal agents. Given our interest in the collaborative nature of testimonial exchange, it is interesting that each of these characteristics can be seen in testimonial exchange as well. First, as discussed in the previous section, morally reactive attitudes such as disappointment, protest or disapproval are apparent in children's objections to speaker's inaccurate and incredulous statements, as reviewed above (Begus & Southgate, 2012; Grassmann & Tomasello, 2010; Jaswal, 2004; Koenig & Echols, 2003; Pea, 1982). Second, as for children's "leave taking" behavior, recent evidence reveals that children may appreciate and trust speakers who acknowledge their ignorance, but reject information from overtly inaccurate speakers (Kushnir & Koenig, 2017). Future research is needed to address the possibility that for speakers who acknowledge their ignorant states of mind, children may think that they have taken responsibility toward them as a listening partner, by carefully distinguishing between what she knows from what she cannot claim to know. Third, when speakers are perceived to be deceptive and violate the mutual commitments inherent to interpersonal exchanges, listeners can subsequently engage in more punishment and less reciprocity. For example, Ronfard, Nelson, Dunham, and Blake (2019) found that 4–8-year-old children gave more rewards to an informant who provided correct information about the location of a sticker than to an informant who indicated an inaccurate location. Similarly, Dunfield, Kuhlmeier, and Murphy (2013) found that 3-year-old children were more likely to help a puppet who was informative compared to a puppet who intentionally withheld information when given the opportunity to provide the puppets with new information about a hidden picture.

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Such findings suggest that when speakers signal their unwillingness to share information, children see this withholding as interpersonally significant.

On the current account, testimony is a means of sharing information by way of a social and collaborative process. One important implication is that if either member of the exchange does not support the other in their shared obligations, the collaboration falls apart. These obligations to take seriously what others tell us are both epistemic and morally significant. There are many cases in which a speaker's testimony can be rejected, misunderstood or left unheard by a listener, and the speaker is harmed in the process. By refusing to trust a speaker because of prejudice or bias, for example, listeners unjustly deny the speaker the ability to exercise a kind of agency over them. Speakers become victims of epistemic injustice whenever failed testimonial collaborations cause damage to the speaker's agency and self-worth (Fricker, 2007; Medina, 2013; Dotson, 2014; for a review of the deflated credibility listeners often give to autistic speakers, see Jaswal & Akhtar, 2019). To better understand these harms and their remedies, it becomes important to investigate children's detection of, and contributions to, epistemic harm in testimonial exchanges.

While developmental work on epistemic injustice is sorely needed, there is research that suggests that children often mistrust speakers from marginalized social groups. Children are more likely to mistrust out-group members that speak with an accent (Corriveau, Kinzler, & Harris, 2013), and speakers of a different race (Chen, Corriveau, & Harris, 2013) or gender (Shutts, Banaji, & Spelke, 2010). When paired with an alternative informant, they are also more likely to discredit speakers that demonstrate a non-dominant status (Bernard et al., 2016), have less prestige (Chudek, Heller, Birch, & Henrich, 2012), or are less attractive (Bascandziev & Harris, 2016). This account highlights one possible explanation for such results, namely that child listeners' initial assessments of a speaker's trustworthiness influence how much credit they give to their testimony. Furthermore, if a child's initial assessment of a speaker is low, it may even lead them to look for signs of actual incompetence or irrationality, which might further reduce the credit they give to their testimony (Jones, 2018).

5 | CONCLUSION

If we abandon a purely evidential model of testimony, as we have proposed, then a nuanced picture emerges of child learners as engaged participants in increasingly complex epistemic practices. On this picture, the developmental task that children face is not simply one of learning to estimate the reliability of testimonial evidence. More fundamentally, it is one of learning to negotiate the complex interpersonal practices governing the giving and receiving of testimony. What is it that speakers are doing when they give their word, and when are they doing this as opposed to something else? When is it appropriate to take someone's word and trust her for the truth, and when is it not? Whom should we trust for the truth, about what, and to what extent? What is at stake in trusting others, and what is at stake in failing to trust?

By making a case for formulating and investigating questions that identify the different roles played by trust, we argue that scholars will be better positioned to directly study the range of beliefs gained on testimony. Traditionally in the social and behavioral sciences, we think of children as existing in a world of others that they come to know through "observation," "interaction," "immersion," and various "linguistic" and "communicative cues." Even "pedagogical cues" are generally treated as evidence that a speaker is knowledgeable with relevant information to share. If we begin to better distinguish the various compelling and legitimate

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ways in which we openly influence other's beliefs—across an array of claims, speakers, and interactions—we recast the task that pervades the epistemic lives of infants and young children as one of discerning the extent to which it is appropriate to take an interpersonal or an evidential view of another person and her communication.

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