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Entitled to Trust? Philosophical Frameworks and Evidence from Children

Abstract: How do children acquire beliefs from testimony? In this chapter, we discuss children's trust in testimony, their sensitivity to and use of defeaters, and their appeals to positive reasons for trusting what other people tell them. Empirical evidence shows that, from an early age, children have a tendency to trust testimony. However, this tendency to trust is accompanied by sensitivity to cues that suggest unreliability, including inaccuracy of the message and characteristics of the speaker. Not only are children sensitive to evidence of unreliability, but they are also sensitive to the positive reasons a speaker may have for the reliability of their testimony. This evidence is discussed in relation to reductivist and non-reductivist viewpoints.

1. Introduction

One of the things that makes human beings special is that we can tell others what we believe. This seemingly simple practice of transmitting information by telling others what we believe lies at the heart of an enormous amount of knowledge that we have about the world and our place in it. However, there is as yet little understanding of or agreement about how this simple practice works, raising a suite of questions that lie at the intersection of psychological science and analytic philosophy. What makes it reasonable for anyone, adult or child, to accept a piece of testimony? What makes testimony a distinct source of knowledge and in what ways might it function similarly to other sources, like memory and perception? How do children learn from what others tell them and how sensitive are they to the unreliability of someone's testimony? How and when does a person's testimony guide further inferences? Why are some types of testimony more satisfying than others? What leads us to accept testimony about the names of objects and what someone had for breakfast as well as claims about the origin of species and the afterlife? By addressing questions like these, the study of testimony provides a valuable window into foundational aspects of cognition and cognitive development, and has important ties to issues in epistemology, as well as implications for education.

2. What Is Testimony?

For philosophers and psychologists alike, testimony is a way of acquiring beliefs (i.e., memory, perception and reasoning are other ways). Testimony consists of those statements that present their contents as true; theatrical or joking utterances, in contrast, do not count as testimony (Moran). As we'll discuss below, our testimony can be mistaken and we can attempt to deceive others by what we say; nevertheless, insofar as both mistaken and deceptive testimony present their contents as true, they both count as testimony (Burge). Testimony can be written or gestured; it need not be spoken. And testimony need not be intended for any listener in particular—for example, a person's private diary counts as testimony when it is read illicitly by a third party.

In this chapter, we'll focus on how children acquire beliefs from testimony. As a starting point, we will discuss the acquisition of testimonial beliefs in the context of two current epistemological treatments—the Non-Reductive Theory (Reid) and the Reductive theory (Hume). In a second section, we will review evidence revealing that children appeal to interrelated heuristics that enable them to interpret testimony flexibly in different contexts and situations. Some of the heuristics fit well with assumptions of Non-Reductive theories and some fit well with assumptions made by Reductive accounts. We will end by raising a set of unresolved issues or limits that do not fit neatly in any extant theoretical framework and await further investigation.

3. Non-reductive Accounts: Entitled to Trust

In the epistemological literature dating back to Thomas Reid, one kind of account of how testimony serves to transmit knowledge is called 'non-reductive' in nature. On this type of account, testimony is treated as epistemically similar to perception and memory in two main senses. First, just as perception is a primary and distinct source of knowledge in its own right, so is testimony. Perception and testimony are both ways of acquiring new knowledge and both transmit a unique source of warrant that does not rest on induction, further evidence or past experience. If my belief that there's a cup on the table comes from my perception of the cup, it's justified by being based on that perception alone. Similarly, if my belief that there's a cup comes from someone telling me so, it amounts to knowledge merely by being based on that testimony. Second, as with perception, all that matters is that the recipient has no reason to believe that the testimony is false. In this way, on non-reductive accounts, it is said that we are generally entitled to believe what we are told (Burge 2003).

Non-reductive theorists argue that we adopt an essentially credulous attitude toward testimony and go further by saying that we are entitled to do so. Reid went so far as to label our entitlement to trust testimony "a principle of credulity" and argued for our entitlement on the grounds that it is required to block skepticism toward testimony. Because people's reasons are so impoverished for "believing the thousandth part of what is told them", the fact that we

do believe much of what we're told even when we have nothing to weigh in its favor or disfavor must mean that our tendency toward credulity is warranted (Reid 1997[1764]). More modern theorists in the non-reductive tradition wish to avoid an unchecked epistemic sanction of credulity and so for them, the hypothesis that we possess an entitlement to believe testimony comes with certain provisions. For Goldberg (2007), entitlement requires that a listener exhibit an ability to monitor testimony for possible falsehoods. This monitoring simply requires some kind of "counterfactual sensitivity" to cues or evidence that things might be otherwise. For Burge (1998), unless there is some reason to think that a source is not rational or that a rational source is "rationally disunified" (e.g., lying), then a listener is entitled to assume that what a speaker presents as true is true. For McDowell (1994), listeners are entitled to take testimony at 'face value' as long as they are sensitive to the considerations that bear in favor of a statement's truth or falsity. In these ways, to the extent that we are credulous by nature, as long as we carry a capacity for monitoring speakers, statements and testimonial situations, our knowledge from testimony is in good standing.

4. Reductive Accounts: Trust Testimony When There Are Reasons to Do So

In contrast to the non-Reductive tradition is an epistemology of testimony commonly credited to David Hume, known as the Reductive account. For this group of theorists, testimony is not a unique or irreducible source of knowledge; rather, it is an ordinary species of evidence that speakers appeal to in acquiring knowledge about the world. On this view, there is nothing about the features of testimony itself (i.e., the social nature of testimony; the giving and receiving of information; the transmission chain; the cooperation required) that serve to justify a listener's knowledge based on testimony. Instead, our justification in knowing based on testimony is explained in terms of other capacities for knowing that we have, especially inductive inference.

The merits of this view can be illustrated with any situation that presents a listener with a choice as to whether or not to trust what a speaker tells them. Take, for example, a nervous buyer on the used car market who is told by the seller that a given car has had only one previous female owner who left it in the garage most of the time. In a situation like this, if the buyer is to believe what the seller says, he needs to believe—for whatever reason—that the seller is telling the truth. For the reductive theorist, the buyer must have some independently available reasons for believing the word of this seller, reasons that typically consist of beliefs regarding the sincerity and/or competence of the speaker or of the kind of testimony that's given in these kinds of situations, more generally. To extend the example, if the buyer has independent prior knowledge that the seller is competent, earnest and acts in sincere ways, this knowledge is stored and recalled through memory, and it then functions as a premise in an inference to the conclusion that what this seller says is most likely true. What the reductive theorist underscores is that this inference (and the memory that supported it)

is the source of the justification we have when we come to know things based on someone's testimony. In this sense, testimonial knowledge reduces to the operation of other epistemic faculties of the cognitive system.

5. Status of Testimony under Typical Conditions

With these two viewpoints as backdrop, we begin by asking whether children display a credulous attitude toward testimony. What is the epistemological status of testimony under typical circumstances? Barring any evidence that the speaker or the message should not be trusted, do children believe the testimony of others? Studies with children suggest that, beginning early in life and indeed continuing into adulthood, there is a tendency to trust testimony and an expectation that testimony will be accurate.

The expectation that testimony will be accurate develops as early as the beginning of the second year of life. Evidence for an early receptivity toward testimony comes in plain view from studies of infant word learning (e.g., Bloom 2000; Carey/Bartlett 1978; Markson/Bloom 1997; Woodward/Markman/Fitzsimmons 1994; Waxman/Markow 1995; Waxman/Braun 2005). In such studies, infants aged 12 to 13 months learn and remember names for novel objects after hearing an unfamiliar adult experimenter label the objects a handful of times. Since infants are not given any evidence of the experimenter's prior reliability, their willingness to learn new information suggests a default openness to the words of others. Furthermore, infants seem to expect adult testimony to be consistent with what they already know (Gliga/Csibra 2009; Koenig/Echols 2003). Gliga and Csibra (2009) presented 13-month-olds with a video in which an adult gave verbal testimony about a familiar object behind a screen, visible to the adult but hidden from the infants' view (e.g., "Look, a duck!"). Additionally, the adult gazed and pointed in one direction. When the screen was lifted, the infants either saw an outcome that was consistent with the adult's testimony (there was a duck on the side of the table that the adult had gazed and pointed toward and a banana on the other side of the table) or they saw an outcome inconsistent with her testimony (there was a banana on the side of the table that the adult had gazed and pointed toward, and the duck was on the opposite side of the table). Infants stared longer at the video screen when the outcome was inconsistent, indicating surprise or confusion at that outcome. This result indicates that infants as young as 13 months of age expect referential cues (verbal testimony, eye gaze, and pointing) from adults to be consistent with each other, and they expect these cues together to accurately represent the state of the world.

Work with toddlers further demonstrates early use of adult testimony to inform existing episodic representations about the world. Ganea, Shutts, Spelke, and DeLoache (2007) investigated toddlers' ability to update their representation of an absent object on the basis of adult testimony. They first introduced 19- and 22-month-olds to a stuffed 'target' frog named Lucy, an identical distracter frog, and a stuffed pig. After children were familiarized to each of the three animals, the child and the experimenter left the room. Shortly thereafter, another

experimenter came into the room and said that she had accidentally spilled water on Lucy and Lucy was now all wet. When the experimenters showed children all three stuffed animals (wet target frog, identical dry distracter frog, and distracter pig) and asked for Lucy, most 22-month-olds correctly chose the wet frog, while 19-month-olds did not consistently choose either frog. When a different group of 19-month-olds could see both frogs when they heard the experimenter's testimony that Lucy had gotten wet, they were then successful at choosing the wet frog when asked for Lucy. The results of these studies show that children as young as 19 months of age use adult testimony to update their knowledge about an object they can see, and by 22 months of age toddlers can use testimony to update their mental representations of objects that are not physically present. Thus, before the age of two, toddlers treat testimony as an accurate reflection of the current state of the world, and are willing to update their own beliefs about objects on the basis of testimony alone.

Work by Bonawitz and colleagues (2010) demonstrates not only that young children expect adult testimony to be reliable and informative, but also that this expectation constrains or guides their subsequent information-seeking behavior. Preschoolers in this study were allowed to explore and play with a complex novel toy, which afforded four functions. In a pedagogical condition, the experimenter told children that she knew how the toy worked and then demonstrated one of the four functions. In a naïve condition, the experimenter accidentally performed one of the four functions as she was moving the toy. In both conditions, the experimenter then left the room and children were allowed to play with the toy on their own. Interestingly, children in the naïve condition who had not heard explicit testimony explored the toy much more broadly than children in the pedagogical condition, who tended to focus on the single function demonstrated by the experimenter who offered testimony. These findings indicate that children expected the experimenter's testimony to be accurate and complete. She demonstrated a single function, so the children concluded that that was the toy's sole function. An adult offering testimony about a toy's function is expected to be knowledgeable about the toy's function, and if she knows that it has more than one function, even young children expect her to testify to all of its functions. Thus, young children have an expectation that testimony offered by adults can be trusted, and their reliance on their own exploration and perception is influenced by this testimony.

Infants and children clearly have a tendency to treat testimony as a good source of information, and this tendency may be an adaptive one. Much of our information about the world comes from the testimony of others, as opposed to our own perception. A child who tends to distrust adult informants and ignore or reject their testimony will miss out on useful and potentially vital information about the world. If there is no reason not to trust an informant, it is often more efficient, and even safer, to learn from testimony than to attempt to learn from direct experience. Csibra and Gergeley (2009) argue that in the presence of certain social cues (e.g., eye gaze, joint attention) humans have what they call "natural pedagogy"—a predisposition in infants to be receptive to testimony and to treat testimony as both relevant to the current situation and generalizable to

other similar situations. This tendency to learn from testimony is argued to be adaptive in that it allows for rapid transmission of information from person to person, without each individual having to experience or witness everything for himself in order to know it. That being said, the rapid and unreflective transmission of testimony could come at a cost—if infants and children trust testimony unreflectively, then they quickly become at risk for accepting testimony that is problematic in some way (i.e., mistaken, inconsistent, deceptive). In the next section, we turn to recent examinations of potentially unreliable testimony and children’s sensitivity to potential defeaters.

6. Status of Children’s Selectivity: Mistrust of Testimony When Given Reason to Doubt

6.1 Defeat

Non-reductive theories of testimony hold that testimony operates to transmit knowledge and warrant. To borrow from Jennifer Lackey (1999), transmission works like a bucket brigade where “each must have a bucket of water to pass it on to the next person” (471). On this view, because testimonial knowledge is knowledge one gets by believing another knowledgeable speaker, testimonial knowledge becomes subject to certain types of defeat. That is, if a speaker lied or was incompetent, then the transmission of knowledge is defeated. A large and growing body of research has investigated the sensitivity of infants and children to a variety of defeaters about informants and their testimony, including prior inaccuracy, ignorance, availability of perceptual access, expertise, etc.

Very early in life, infants’ expectation that testimony will be accurate, as discussed above, is paired with an ability to detect testimony that conflicts with what they know. Chow, Poulin-Dubois, and Lewis (2008) examined 14-month-old infants’ sensitivity to misleading testimony and their subsequent use of gaze cues from the previously misleading informant. Infants in this study were assigned to one of two conditions: in the Reliable Looker condition, infants watched as an adult looked into a box, smiled, and said “Wow!” Infants were then allowed to look into the box themselves to see that the box contained a toy. In the Unreliable Looker condition, the procedure was identical except that infants were allowed to search and see that the box was empty. Thus, while the reliable looker’s excitement was explained by the presence of the box’s contents, the unreliable looker’s excitement was unmotivated or unexplained given an empty box. Then, infants in both conditions participated in a gaze-following task, during which the same adult informant gazed toward a location behind a barrier, hidden from the infants’ view. Infants in the Reliable Looker condition followed the reliable adult’s gaze toward the hidden location, suggesting that they expected that she was looking at a hidden object, On the other hand, infants in the Unreliable Looker condition were much less likely to follow the unreliable adult’s gaze, suggesting that they did not trust her as an informant. Based on her history of unreliability, infants did not expect her gaze to accurately

indicate a hidden location. Already by early in the second year of life, infants are sensitive to cues of unreliability, or potential defeaters, and they appear to keep information about an informant's unreliability in mind and use it to guide their joint attention with that informant.

Infants also demonstrate an ability to use their own knowledge to check the accuracy of adults' testimony. To examine infants' responses to accurate and inaccurate verbal testimony, Koenig and Echols (2003) measured 16-month-olds' looking time as they viewed a speaker who either correctly or incorrectly labeled common objects, objects for which the infants knew the correct names. For instance, an inaccurate speaker looked at a shoe and said, "That's a ball". Infants looked longer at a speaker who labeled objects incorrectly than a speaker who labeled objects correctly, suggesting that 16-month-olds recognized that the speaker's testimony was inaccurate and were surprised by this fact. Furthermore, the majority of infants who heard inaccurate testimony corrected the speaker by correctly naming the object. As early as the first half of the second year, infants demonstrate an ability to use their own prior knowledge not only to detect, but also to correct erroneous testimony from adults.

At the end of the second year of life, toddlers' detection of errors in adult testimony guides their future learning from previously inaccurate adults. In a study by Koenig and Woodward (2010), 24-month-olds watched an adult accurately or inaccurately label a series of common objects, for which the children knew the names. Then, in each condition, the accurate or inaccurate adult would label two unfamiliar objects, for which the children did not know the name (e.g., a novel tool labeled "blicket"). Results across 3 experiments suggests that while children did indeed encode the word-object links trained by the inaccurate speaker and could often correctly respond to her immediate requests for the target objects, the representations that were supporting these responses were weak or temporary. When children in the inaccurate condition were tested after a 2-minute delay or by a second speaker who was absent at the time of training, their target selections dropped to chance levels. By 24 months of age, children not only detect inaccuracies in testimony, but the inaccuracies of a given individual shape children's subsequent learning from that individual.

6.2 Inaccuracy

As suggested above, the ability to monitor testimony for its accuracy develops early in life. In a study by Clément, Koenig, and Harris (2004), 3- and 4-year-olds heard testimony from a reliable puppet and an unreliable puppet. The reliable puppet consistently supplied accurate labels for familiar objects and colors, while the unreliable puppet was consistently inaccurate. Then, children were asked to make predictions about future testimony from each puppet. Both 3- and 4-year-olds predicted that the previously reliable informant would provide accurate testimony again, and 4-year-olds consistently predicted inaccurate testimony from the previously unreliable informant, while 3-year-olds did not make consistent predictions about the unreliable informant's future testimony. However, Koenig, Clément, and Harris (2004) found that 3-year-olds

who could correctly identify an unreliable informant as “not very good at naming things” subsequently chose to endorse the testimony of a previously reliable informant over that of the unreliable informant, as did 4-year-olds (see also Scofield/Behrend 2008; Birch/Vauthier/Bloom 2008). These findings illustrate that young children are sensitive to prior inaccuracies in testimony and when they are successful in identifying an informant as unreliable, they use that information to guide their trust in subsequent testimony, selectively trusting the testimony of a reliable source over that of an unreliable source.

Preschoolers’ use of speaker reliability as a cue extends beyond the domain of word-learning. Preschoolers have been shown to prefer more reliable informants when learning new words (Koenig/Harris 2005; Scofield/Behrend 2008; Jaswal/Neely 2006); object functions (Birch et al. 2008), number estimates (Einav/Robinson 2010), classifications of ambiguous objects (Jaswal/Markman 2007), object properties (Clément et al. 2004; Robinson/Whitcombe 2003), hidden object locations (Ganea/Koenig/Millett 2011), and causal mechanisms (Kushnir/Wellman/Gelman 2008). In addition to factual information, preschoolers also use reliability as a cue when making normative judgments. In one study, 4-year-olds were presented with conflicting rules for a novel game by both a previously reliable and a previously unreliable informant. Children imitated the rules of the reliable informant and corrected the actions of the unreliable informant, indicating that children made normative judgments about the informants’ behavior based on prior reliability (Rakoczy/Warneken/Tomasello 2009).

It is clear that children distinguish between accurate and inaccurate informants when the two are pitted against each other. This could be the result of children tracking information about both accuracy and inaccuracy, or they could be tracking just one and taking the other for granted. That is, children could take accuracy for granted and monitor only for inaccuracy, or vice versa. To test these possibilities, Corriveau, Meints, and Harris (2009) presented children with either an accurate source paired with an inaccurate source, an accurate source paired with a neutral source, or an inaccurate source paired with a neutral source. The accurate speaker labeled objects correctly, the inaccurate speaker labeled objects incorrectly, and the neutral speaker attended to the objects while making statements that contained neither accurate nor inaccurate information (e.g., “Look at that!”). Four-year-olds monitored for both accuracy and inaccuracy of testimony; they trusted both the accurate source and the neutral source over the inaccurate source, and they also trusted the accurate source over the neutral source. In contrast, 3-year-olds monitored only for inaccuracy; they trusted both the accurate and neutral sources over the inaccurate source, but they did not show selectivity between the accurate source and the neutral source. Thus, initially children are especially sensitive to inaccuracy and increasingly attend to and use accuracy as relevant to a speaker’s trustworthiness slightly later, at age 4. The findings that 2- and 3-year-olds show mistrust toward inaccurate speakers suggests that a sophisticated understanding of false beliefs may not be required for resisting the claims of previously inaccurate speakers. Two- to three-year-old children typically fail standard false belief tasks and are nevertheless able to mistrust mistaken speakers. On the other hand, the finding that 4-year-olds

augment their trust in previously accurate speakers raises the possibility that an appreciation of the fallibility of human speakers and the beliefs they form may indeed support children's magnified trust in previously accurate informants.

Testimony that conflicts with the child's own knowledge seems to be flagged as inaccurate, and the source of inaccurate testimony is less likely to be trusted in the future. Preschoolers' preference for a reliable over an unreliable informant is evident immediately after hearing just a few pieces of testimony from each person. Indeed, by age 7, children generate expectations of accuracy from only one piece of evidence (Fitneva/Dunfield 2010). This preference for the more accurate source is robust across time, with selective trust of a reliable source over an unreliable source still evident one week after the testimony was given (Corriveau/Harris 2009a). Moreover, by 4 years of age children are able to track the relative accuracy of two informants even when neither one was perfectly accurate nor perfectly inaccurate. Pasquini, Corriveau, Koenig, and Harris (2007) found that 4-year-olds trusted testimony from an informant who had previously labeled three objects out of four correctly, over an informant who had labeled only one object out of four correctly. Rather than making binary judgments of informants as accurate or inaccurate, children are able to keep track of the number of errors an individual makes and use their record of relative accuracy to predict and judge their future testimony. This system of checking the content of testimony against their own knowledge and tracking relative accuracy allows children to choose the more reliable source when faced with two conflicting sources of testimony, even if neither source is perfect.

Young children also seem to generalize broadly when given evidence that a particular speaker may be incompetent. Koenig and Jaswal (2011) presented 3- and 4-year-olds with testimony from a dog expert and a neutral informant. The dog expert was described as knowing a lot about dogs and demonstrated her expertise by labeling a series of photographs of dogs with their breed names (e.g., "That's a Basenji dog"). The neutral informant simply described the physical features of each dog (e.g., "That's a furry dog"). In subsequent novel labeling trials, children selectively trusted the dog expert over the neutral informant on names of dog breeds, but they did not extend this trust to an unrelated domain, novel artifact labels. A second group of 3- and 4-year-olds received testimony from an informant who was inexperienced about dogs as well as a neutral informant. The inexperienced source was described as "not knowing anything about dogs" and she demonstrated her incompetence by labeling photographs of dogs using the wrong basic level terms (e.g., "That's a Basenji cat"). In this condition, children selectively mistrusted the dog inexperienced on both dog breed names and novel artifact labels. These findings suggest that children recognize that an informant's expertise in a given domain is likely to make their testimony reliable in that domain, but they do not treat someone who has knowledge in a given domain as generally knowledgeable in every domain. Interestingly for our purposes, young children's sensitivity to incompetence as a defeater was also evident: when an informant demonstrated incompetence in a single domain, children generalized their mistrust of that informant to other domains.

When information about the quality of the content of a speaker's message is not available, children rely on other cues as indicators of the reliability of testimony. The degree to which a speaker is confident about his claims, as opposed to being unsure or expressing ignorance, is one such cue. Sabbagh and Baldwin (2001) found that 3- and 4-year-olds showed better word learning from a knowledgeable informant than from an ignorant informant. Furthermore, Koenig and Harris (2005) showed that 3- and 4-year-olds selectively learned novel object labels and functions from an informant who had previously provided correct labels for common objects over an informant who had previously said that she did not know what the common objects were called and did not attempt to label them. These studies demonstrate that young children are sensitive to speaker cues to lack of knowledge or lack of confidence in their knowledge. Even when children are unable to check testimony against their own knowledge, they seem to use confidence as a proxy for accuracy—a speaker who expresses confidence in her knowledge is more likely to be trusted than a speaker who expresses insecurity about her knowledge.

Tenney and colleagues (2011) asked whether 5- and 6-year-olds would differentiate between speakers who differed according to their confidence-accuracy correspondence, also known as their 'calibration'. In this study, children learned about an incident in which a ball was thrown through a window during recess. Two child informants provided testimony about the details of the incident. Both informants were confident and accurate about one piece of information (the weather on the day of the incident) and inaccurate about the other (the color of the ball). One informant expressed uncertainty when she was inaccurate while the other informant was confident in both pieces of testimony even though one of her statements had been inaccurate. Thus, one informant was well-calibrated in that she was appropriately uncertain about what she didn't know, while the other informant was poorly calibrated, expressing confidence even when she was wrong. Then, each informant confidently attested to the identity of the child who threw the ball, and participants were asked which informant they believed. Children tended to trust the confident informant rather than the uncertain but well-calibrated informant. Because both informants were accurate 50 percent of the time in this study, children could not rely on accuracy alone to determine who to trust. Up to the ages of 5 and 6, children do not yet integrate these two pieces of information and instead rely on confidence as a cue to reliability.

7. Speaker Characteristics: Familiarity, Age and Malevolence

Thus far, we have described children's abilities to filter the communications of people unknown to them when given direct information about the speaker's prior reliability. However, more common to the child's experience will be their encounters with speakers who are well-known to them and with whom they have a socio-emotional connection. In a study by Corriveau and Harris (2009b), a speaker's familiarity was pitted against their recent accuracy. During pre-

test trials, 3-, 4-, and 5-year-olds initially preferred to learn from a familiar adult (their preschool teacher) over an unfamiliar adult (a teacher from another preschool). Then the two adults labeled common objects. In one condition, the familiar adult was accurate and the unfamiliar adult was inaccurate, and in another condition their roles were reversed. Then in the post-test trials the adults presented novel information and children were asked to endorse the testimony of one of the informants. When the familiar teacher was inaccurate during the labeling phase, 4- and 5-year-olds chose to learn instead from the unfamiliar but accurate teacher during the test trials. Thus, familiarity is a cue that children use when it is the key distinguishing factor between two informants, but when informants also differ on their accuracy, then accuracy trumps familiarity as a cue.

Relatedly, young children assess the age of the people around them. The fact that children modify their speech styles to suit the age of the listener (Shatz/Gelman 1973) suggests that children are aware of knowledge differences between children and adults. In addition, children implicitly express their sensitivity to the epistemic status of older informants by engaging in more sustained questioning of parents than siblings (Tizard/Hughes 1984). Furthermore, children as young as 3 years of age treat age as an index of how reliable or credible an information source is (Lampinen/Smith 1995) and to a 4-year-old, even a 7-year-old holds some kind of credibility advantage (Ceci/Ross/Toglia 1987). Jaswal and Neely (2006) pitted the prior accuracy of a speaker against their age. Consistent with prior research, when presented with two accurate informants, one of whom was an adult and one of whom was a child, 3- and 4-year-olds preferred to learn new information from the adult informant over the child informant. However, when an adult informant had a history of inaccuracy and a child informant had a history of accuracy, children then preferred to learn from the reliable child over the unreliable adult (Jaswal/Neely 2006). It appears that young children expect that adults will be more knowledgeable than children, and that their testimony will be more accurate, if they have no reason to doubt the adult's reliability. However, when an adult provides evidence of unreliability it is safer to learn from a previously accurate child.

Finally, another central way that testimony can be in error is when it is produced with the deliberate intention to deceive. Deceptive or harmful intentions on the part of the speaker amount to a fundamental defeater of that person's testimony. Recent evidence supports the general claim that children become increasingly likely to use evidence of malevolence as a cue to a speaker's unreliability. In one study, 3- to 5-year-old children were presented with an informant with good intentions (was eager to give correct advice) and an informant with malevolent motives (was eager to mislead others) (Vanderbilt/Liu/Heyman 2011). By age 5, children preferred the advice of the benevolent informant more than the malevolent one. When speakers' intentions were explicitly identified or overtly demonstrated, 3-year-olds did not differentiate between benevolent and malevolent informants but by age 4, children preferred the testimony of a benevolent over a malevolent speaker (Mascaro/Sperber 2009). Thus, when children have knowledge of a speaker's malevolent or deceptive intentions, they use that

knowledge to avoid accepting new information from that speaker. This leaves open many questions concerning the basis of children's 'epistemic vigilance' toward communicators who show deviant behavior and the sources of information children use when they mistrust a deviant source.

Building on these findings, more recent research has examined when and how children use moral information of different kinds to assess testimony. In research by Doebel and Koenig (in press), 3- to 5-year-old children were presented with target informants who behaved in ways consistent or inconsistent with socio-moral norms, such as helping a friend retrieve a toy, or deliberately tearing a friend's artwork. In order to make clear inferences about the relevance of moral and immoral behavior for children's trust, the Moral and Immoral conditions presented protagonists who were each contrasted with a neutral source (an agent who didn't engage in any prosocial or antisocial behaviors). Children were asked (a) to discriminate the two sources (by indicating, 'Who was nicer?') and (b) to indicate whose testimony they would trust in a new context (e.g., 'Who would you like to ask?'). Regarding the discrimination judgment, children in all age groups were best able to identify the more moral source (i.e., the neutral one) when one of the protagonists had behaved negatively toward another. However, when it came to their judgments of whom to trust, children in both the Moral and Immoral conditions were equally inclined to trust the person who they had judged to be 'nicer'. In recent work by Liu, Vanderbilt and Heyman (in press), 5- and 6-year-old children observed informants offering advice about the location of a hidden object either with good intentions or bad intentions, and they witnessed that the advice led to either positive or negative outcomes. Children treated both types of information as relevant to their decisions to trust: they trusted helpful informants more than deceptive ones, regardless of outcome, and they trusted successful advice-givers more than unsuccessful ones, regardless of their intention to help. One implication of this collection of findings is that children appeal to both positive and negative information when deciding whether to trust an informant and development relates not only to children's abilities to reason about intentions but also to their evaluation of when information determined a good versus bad outcome in a given situation.

8. Interim Summary

Thus far, the evidence reviewed suggests a portrait that is consistent with what the Non-Reductive theorists suggest: children prove appropriately sensitive to several sources of defeat. When a child has ample evidence that an object, such as a chair, is called a "chair", then knowing this fact gives the child reason to reject the claim of a speaker who calls it a "dog". When a child knows that a speaker, even a familiar one, has a recent track-record of falsehoods, these facts give her a reason to reject what that speaker tells her in the future. When a child encounters a speaker who seems intent on harming them or another person, this leads them to question information provided by such a source. So, in terms of the non-reductive theories discussed above, children do indeed monitor testimonial

situations for the ‘presence of defeaters’ and appear to be appropriately sensitive to reasons not to believe. Another tenet of the Non-Reductive view, however, is that in the absence of such defeaters, children are simply entitled to believe what they are told. In the section that follows, we review evidence that even in the absence of negative evidence or defeaters, children often appeal to positive reasons that weigh in a statement’s favor.

9. Status of Children’s Selectivity: Sensitivity to Reasons for Speaker Competence

When children are presented with conflicting claims by two informants, and they opt for the more reliable informant, it is plausible that that choice is primarily driven by mistrust or doubt about the less reliable of the two informants. In other words, experiments on selective trust do not necessarily tell us about how young children conceive of a competent speaker. In this section, we look more directly at this issue. More specifically, we ask how far preschoolers recognize that a speaker may or may not have good warrant for the claims that he or she makes.

Various factors can provide good warrant for a speaker’s claim. In the context of reports about local or non-recurrent episodes, observational access to the episode in question is an important warrant. Accordingly, we may ask how far children recognize that a speaker who has been observed to have the relevant observational access deserves greater credence—other things being equal—than a speaker who appears to lack such access.

The situation is different for what we may describe as non-local and recurrent knowledge. For example, knowing how to name an object, knowing how to use a tool, or having a body of expertise does not depend on observational access to a specific locale or episode. Even if the knowledge in question originated in a particular encounter, this is not pertinent to an appraisal of the speaker’s competence. Indeed, if anything it is the speaker’s ability to recruit and display his or her knowledge independent of any particular observational encounter that warrants our trust in their claims. For example, the speaker who names a rare bird thereby offers evidence of his or her ornithological expertise. The speaker who names that same bird after consulting a field-guide may be just as accurate but is not thereby offering evidence of expertise. Again, we may ask if children are sensitive to this important difference between accuracy per se and accuracy that is grounded in a speaker’s knowledge.

The plausibility of a speaker’s claim can also be signaled by the reactions of other potential informants. Suppose that a child hears a claim that is novel and which they cannot assess for themselves. Suppose further that that claim is met with non-verbal assent by onlookers—they nod in apparent agreement. Although such agreement is, of course, no guarantee that the claim is true, it is appropriate for listeners to lend it more credence than they otherwise might.

Finally, a speaker may provide good reasons for the trustworthiness of her testimony, either explicitly or implicitly. For example, she might offer an account of

how she acquired her knowledge. She might signal the *prima facie* implausibility of what she says—(“You’re not going to believe this. . .”) or include appropriate hedges (“So far as I know. . .”). Such warrants and disclaimers may be registered by the child and used to calibrate his or her confidence in what is claimed.

Below, we review relevant studies concerning each of these possibilities, beginning with studies of young children’s sensitivity to relevant observational access.

9.1 Observational Access

A considerable body of research has established that children aged 3-4 years realize that there is a causal connection between observational access and knowing. Someone who has been able to look inside a closed container will know what it contains unlike someone who has had no such access. We might expect therefore that children will use this insight to weigh the trustworthiness of a speaker’s claim especially when it runs counter to their own assumption. In a series of experiments, Robinson and her colleagues have documented exactly this competence.

For example, children were asked to guess the color of a hidden toy (e.g., “It’s the red one”), after having an opportunity to feel the toy but not see it (Robinson/Whitcombe 2003; Whitcombe/Robinson 2000). A speaker then offered a different suggestion (e.g., “It’s the blue one”). Children’s reactions to this alternative claim depended on the type of perceptual access the speaker had had. They accepted the speaker’s claim if she had seen the toy and was therefore better informed than they were. By contrast, they were as likely to reject as accept the speaker’s suggestion if she—like themselves—had only felt the toy. These studies show that children are sensitive to a speaker’s perceptual access in judging the credibility of what she says, as well as her past history, when deciding whether to believe what they are told.

9.2 Accuracy and Knowledge

Einav and Robinson (2011) introduced 3-, 4- and 5-year-olds to two puppets who were each invited to name a trio of familiar animals. One puppet did so correctly and without accepting any help from a third bystander puppet. The other puppet also named the animals correctly, but only after the bystander had audibly whispered the name of each animal. Subsequently, when shown an unfamiliar animal and invited to decide which of the two puppets could tell them what it was, the majority of 4- and 5-year-olds chose the puppet that had not needed help. Three-year-olds displayed no such preference. A follow-up experiment with 4-year-olds consolidated these results. Again, one puppet managed to name familiar animals without help whereas the other relied on help. Subsequently, when asked to indicate which of the unfamiliar animal pictures was a ‘tark’ the two puppets disagreed – each pointed to a different animal. When invited to say which puppet was right, most children opted for the puppet that had not needed help.

Taken together, these results offer an interesting contrast to those discussed in the preceding section, which showed that children lent more credence to an informant who had had relevant perceptual access to the color of the hidden object, i.e. had seen it rather than merely felt it. The findings reported by Einav and Robinson (2011) underline how attributions of competence are appropriately made when a speaker has not relied on what amounts to relevant perceptual access for accurate naming—i.e. hearing a whispered name. By implication, 4-year-olds have worked out a fundamental difference between episodic knowledge that is gained via a specific observational encounter and recurrent or ‘semantic’ knowledge that is not tied to a specific observational encounter but is retrieved from the knowledge base of an informant. Animal names belong to the category of semantic knowledge.

9.3 Consensus and Opinion Leaders

Children will often be presented with claims that they cannot check for themselves. Moreover, they may have little knowledge of, or acquaintance with, the speaker. This need not mean, however, that children lack all means to assess the plausibility of what has been claimed. They can take note of how other people react and use those reactions to bolster or temper their trust.

As an initial examination of this possibility, Fusaro and Harris (2008) presented 4-year-olds with two speakers who made conflicting claims about the names of novel objects. Alongside the two speakers, two bystanders offered a non-verbal ‘commentary’ on their claims. The bystanders consistently expressed assent (via smiles and head nods) toward the claims of one speaker and dissent (via frowns and head shakes) toward the claims of the other. This commentary produced a very strong reaction in the children. Asked whose claim they endorsed, they overwhelmingly favored those of the speaker who had elicited assent. Moreover, this preference continued on subsequent trials when additional novel objects were presented just as before but the bystanders no longer provided any commentary on the speakers’ conflicting claims. Apparently, children remembered which speaker had elicited agreement and continued to place their trust in her (see also Chudek/Heller/Birch/Henrich 2012).

A follow-up study established that this pattern persisted when all signs of approbation and disapprobation on the part of the bystanders were eliminated (Corriveau/Fusaro/Harris 2009). Rather than expressing their agreement and disagreement via facial expressions and head gestures, bystanders did so via pointing—they consistently indicated the same object as one of the informants but a different object from the other informant. Preschoolers tended to agree with whichever informant had elicited such indices of agreement and again, even when the bystanders stopped supplying their non-verbal ‘commentary’ children continued to favor that informant.

How early do children show this sensitivity to agreement and disagreement? Fusaro and Harris (2012) introduced toddlers aged 18 and 24 months to two adults who engaged in a series of simple interchanges. For example, one of the two adults indicated two novel objects in succession, saying of each: ‘This

is a wug'. The other adult effectively clarified which object actually was the wug by nodding her head in response to one claim and by shaking her head in response to the other. Subsequently, 24-month-olds but not 18-month-olds were able to pick out the wug correctly. A similar pattern emerged when one adult indicated two boxes in succession, saying of each: 'It's in here' and the other adult nodded her head in response to one claim and shook her head in response to the other. Again, 24-month-olds but not the 18-month-olds were able to pick out the box correctly. These findings offer a simple but powerful illustration of a fundamental point about the testimony that young children must navigate. Although it is sometimes the case that they interact with a lone informant and need to appraise his or her trustworthiness, a great deal of testimony is delivered in a more social or pluralistic setting. Children's sensitivity to agreement and disagreement among their interlocutors is a vital tool for deciding what and whom to believe.

10. Identifying Good Reasons

The research by Robinson and her colleagues, described above, suggests that children keep track of the way in which a speaker has arrived at a given claim and adjust their trust in that speaker's claims accordingly. But what if a speaker provides reasons for her claims—such as the fact that she has looked in a box? Will children accept such claims as good reasons even if they have not been able to track the basis for a speaker's claim? More generally, are young children sensitive to the way in which a speaker vouches for the claims that she makes by explaining how she arrived at them?

To examine this possibility, Koenig (2012) introduced 3-, 4-, and 5-year-olds to two speakers. One speaker offered well-founded reasons for her claim about the contents of a container (e.g., she explained that she had looked inside the container at an earlier point; or that someone had told her about its content; or that the external appearance of the container provided a helpful clue). The other speaker, by contrast, offered poor reasons for her claim (e.g., she explained that she wanted a particular object to be in the container; or that she was making a guess; or that she was just pretending that a particular object was in the container). Children were not shown what was actually in the box but they were asked to say which speaker had 'the best way of thinking' about its contents. Three-year-olds were less systematic in their replies than 4- and 5-year-olds. Nevertheless, all three age groups indicated the speaker who had provided good reasons had the best way of thinking.

These results raise the possibility that children can deploy their sensitivity to a speaker's stated reasons when subsequently seeking information. To examine this possibility, Koenig (2012) conducted a follow-up study in which she again introduced children to two speakers who offered the same types of good and bad reasons as in Study 1. Thus, across three familiarization trials one speaker consistently offered good reasons whereas the other offered poor reasons. In the ensuing test phase of the study children were prompted to seek information

about the content of four different containers. Both 3- and 4-year-olds preferred to ask the speaker who had previously offered good reasons. Moreover, they tended to claim that, of the two speakers, she was the one who knew what was in the container and they tended to endorse what she said.

Taken together, these results bolster the conclusion that preschoolers can not only keep track of a speaker's observable history of information-seeking (e.g., by noting whether or not she looked or felt inside a box or by noting whether or not she needed help to name an object), they can also keep track of a speaker's self-proclaimed history of information-seeking. In addition, when it comes to choosing informants they take such self-proclamations into account.

In the studies just described, the speakers provided explicit statements to indicate the credibility of their claims. Sometimes, however, speakers provide implicit statements that indicate the credibility of their claims less directly. In research by Jaswal (2004), 4-year-olds showed sensitivity to such implicit statements. He first demonstrated that 4-year-olds were reluctant to accept claims that did not jibe with their own perceptual appraisal. For example, if they were shown an illustration of a hybrid animal—looking mostly like a fish and only somewhat like a bird—and were told that it was a bird, they often resisted this unexpected claim: “No, this is a fish”. In a follow-up study, however, the speaker acknowledged that her claim was unexpected: “You’re not going to believe this, but this is actually a bird”. Under these circumstances, 4-year-olds were more willing to accept the speaker's claim. Why exactly they were more willing warrants further analysis but for the time being it appears that—paradoxically—the speaker's very acknowledgement of the unexpected nature of her claim bolstered its plausibility. Arguably, children grasped that she was inviting them to go beyond the creature's appearance and to accept her knowledge about its real identity. This would be consistent with the fact that 4-year-olds have some grasp of the fundamental distinction between appearance and reality (Flavell, 1986). More generally, these findings point to the possibility that children may be increasingly alert to the limits of their own knowledge and the alleged superiority of an informant's (Harris 2012).

11. The Philosophical Question Revisited: Problems with Entitlement

As discussed in the introduction, non-reductive theorists argue that children and adults possess an entitlement to accept and believe others' testimony. On one such account, proposed by Goldberg (2007), this entitlement holds by way of the fact that (1) we monitor speakers and the situation with a ‘counterfactual sensitivity’ and (2) our uptake of testimony, which uses counterfactual monitoring as a filter, is a reliable process. On this view, this two-part process describes how our testimonial beliefs come to be epistemically warranted, or in good standing. One problem with this view is that our testimonial knowledge is only ever as good as our monitoring capacities, which unfortunately, can be quite weak. Although we have provided a favorable review of children's monitoring capacities, adults

and children are not endowed with an infallible faculty for monitoring speakers. They often struggle to discriminate liars from truth-tellers (Ekman 1985; Ceci/Bruck 1993). Young children are not very good at monitoring the way they receive information about their environment (O'Neill/Chong 2001; Gopnik/Graf 1988) and are prone to mistakenly claiming a first-hand encounter on the basis of others' testimony (Principe/Kanaya/Ceci/Singh 2006). So, given these considerations, arguments for the reliability of testimonial knowledge that are based on our faculty for monitoring it are rendered vulnerable.

A second problem, one that seems common to all non-reductivist theories, is that they ignore the positive reasons that children and adults value, and ought to value, in their evaluations of testimony. As recently argued by Faulkner (2011), non-reductivist accounts fail "to recognize how giving and accepting testimony is a practical activity governed by considerations of practical rationality" (114). That is, testimonial exchanges always involve the interaction of people's practical interests. So while it's true that as a listener, your primary interest is in learning accurate information, my basic interest as a speaker is in being believed. Hypothetically, if my basic interest as a speaker were simply to convey reliable information and to be informative in my intent, a listener's entitlement might be less prone to error. But since speakers' are primarily interested in being believed and quite effective in persuading others (Mercier/Sperber 2011) as opposed to being truthful, the accuracy of their claims cannot be taken at 'face value'. Thus, given this juxtaposition of interests, listeners (including child listeners) take the right lead by appealing to the available positive reasons for accepting testimony.

Third and finally, by tying testimonial knowledge to our monitoring abilities, non-reductivist accounts fail to explain the testimonial knowledge we gain when we suspend our monitoring attitudes. That is, testimony is often taken 'on trust', which can indeed involve a willful anti-monitoring attitude (Faulkner 2011; Koenig/Harris 2007; Williams 2002). In fact, there are situations, many of which are likely to be encountered by children, where it is prescribed and expected that they be insensitive to defeaters. This insensitivity is evident in 3-year-olds' repeated acceptance of an adult experimenter's testimony about the location of a hidden sticker, even after discovering trial after trial that her testimony is misleading (Jaswal/Croft/Setia/Cole 2010). Thus, one final limit of many contemporary non-reductivist approaches is that they fail to explain when and how we often disable our counterfactual monitoring and acquiring beliefs by taking a speaker 'at her word'.

12. Summary

In this chapter, we discussed the status of testimony in light of evidence of children's acquisition of beliefs from testimony in a variety of circumstances. We began with a discussion of the non-reductive account and evidence for a default trust in testimony that appears early in development. We looked at the evidence that young children monitor testimony for defeaters and mark such testimony as unreliable. In the following sections, we turned to children's sensitivity to

positive reasons to accept testimony and the limits of non-reductivist approaches. In sum, we have presented evidence that young children are discerning when faced with adult testimony, monitoring for both potential defeaters that would lead them to reject testimony, as well as positive reasons to accept testimony.

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