

How Young Children Learn from Others

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Existing accounts of teaching and the teacher-learner relationship stand in the tradition of epistemic individualism: The teacher produces signals or utterances that the learner uses as evidence to form beliefs. In this article, I argue for an alternative, second-personal, account of teaching in which teacher and learner mutually recognise their participation in a joint enterprise to get the learner to acquire knowledge and capacities that she does not yet possess. A particular version of this account is defended which regards children as 'self-conscious learners' who place their epistemic trust in teachers and recognise them as providing the standards of evaluation against which their behaviour is measured. Empirical work is cited to support these ideas.

INTRODUCTION

In the past two decades, scholars of cognitive development have shown a growing interest in teaching and testimony as sources of children's knowledge. The appreciation of knowledge that is gleaned from others, rather than first-hand, is evidenced by several active research programmes and recent theoretical approaches to teaching. One example is Gergely Csibra and Gyorgi Gergeley's (2009, 2011) 'natural pedagogy', according to which humans have evolved a species-unique, universal communication system to transmit knowledge from one generation to the next. Another is Paul Harris's work on children's adoption of beliefs through testimonial reports. He aims to show that even though children are epistemically dependent on others, they are nonetheless rational beings who critically evaluate others' statements for their truth (Harris, 2012; Harris and Corriveau, 2011).

The surge of interest in teaching and testimony is a timely recognition of the social origin of children's knowledge. Most of what children know, they learnt from others in one way or other; be it by deliberate instruction, by example, or imitation (e.g. Boyd *et al.*, 2011; Tomasello *et al.*, 1993). Finding out more about how knowledge gets passed on from adults to children would greatly improve our understanding of the human condition, because our epistemic dependency is an essential feature of our lives. And yet, the mentioned theories and research programmes have not shed enough light on the puzzle of human learning. One major limitation is that they do not explain *why* children are such avid learners. How is it that humans in the

most formative of years of their lives learn in ways no other animal does? The extant accounts also do not appropriately *describe* human learning because they paint problematic pictures of the relationship between teacher and learner and of how the learner conceives of this relationship. In the tradition of epistemic individualism, these accounts portray the child as a mere recipient or processor of information. Correspondingly, the teacher is represented as a delivery mechanism or supplier of information. For example, Gergely and colleagues state that ‘ostensive cues act as an interpretation switch’ (Gergely *et al.*, 2007, p. 144) and ‘trigger’ (p. 145) in the child built-in assumptions about relevance and generalisability. A thorough critique of these accounts would do justice to their complexity, their merits, and the differences between them. All I can do here is point out one common flaw: they fail to recognise the essentially second-personal and cooperative character of human learning. These accounts make it seem as if human children learn from others by extracting useful information from them. But in fact, children’s epistemic relationship to other people is special; they relate to others as second persons from whom they need to learn and with whom they cooperate in a joint mission to make this learning happen. The child’s acquisition of knowledge from others is expected and worked toward, both by the child and by those who teach her. It is this, second-personal, way of thinking about learning that I explore in this article.

The distinctively second-personal character of learning has been discussed by philosophers, but mainly with respect to cases where one adult comes to believe something based on a peer’s say-so. Being told something by someone, so it is argued, constitutes a unique reason for believing it—a reason that cannot be reduced to the reason one might have for believing something based on observing others or the world (Anscombe, 1979; McMyler, 2011; Moran, 2018). A few scholars have begun to apply the second-personal account to teaching, i.e. to knowledge exchanges between participants who differ in epistemic authority (Bakhurst, 2013; Small, 2014; Rödl, 2014). But to my knowledge, no one has applied this account to early learning and cognitive development. The purpose of this article is to do just that.

The article has three sections. In the first section I say a little more about the two variants of the individualist account mentioned above; Gergely and Csibra’s natural pedagogy theory and Paul Harris’s ideas about knowledge acquisition by testimony. This section will bring into sharper relief how learning from teaching has been conceptualised in psychology and the cognitive sciences and why this way of looking at learning is not entirely accurate.

The second and third sections constitute the positive part of my account and concern children’s understanding of teaching and learning. In the second section, I show that even preschool children have an understanding of what teaching is and how it differs from non-pedagogical knowledge transmission. I will provide evidence that by age 4, children apprehend the difference between statements expressing general facts (taught facts) and statements expressing particular facts (told facts). They understand that teaching implies an invitation to take or carry what one has learned

further—where ‘carrying further’ has both of the following two senses: (1) that of transferring knowledge to new objects and situations (knowledge transfer), and (2) that of ‘spreading the word’ and sharing one’s knowledge with others (knowledge transmission). The upshot is that preschool children grasp that knowledge acquisition entails and further encourages knowledge expansion—both in the dimension of the object and the subject of knowledge.

In the third and final section, I discuss children’s awareness of their need to learn. I present evidence that even very young children are aware of their need for others to help them develop their knowledge. The major point which my colleagues and I develop in more detail elsewhere (Moll and Kern, 2020) is that human learning is unique in the animal world because in humans alone, learning has a form that is second-personal and self-conscious: it is second-personal because the child’s cognitive development depends on the cooperative efforts of her and others who step into the role of teachers; and it is self-conscious because the child knows that she needs other persons in order to expand her knowledge and capacities. In the present article, I will not lay out arguments for this position but instead will demonstrate that children express in their behaviour an understanding of their own status as learners and of their epistemic dependency. On the whole, this article is meant to provide empirical support for the second-personal account of learning sketched above. The particular version of this account that I endorse brings to the fore children’s self-awareness as learners who need others in order to expand their knowledge and capacities.

INDIVIDUALIST ACCOUNTS OF SOCIAL LEARNING

Gergely and Csibra’s Natural Pedagogy

Natural pedagogy states that human infants are evolutionarily endowed with cognitive ‘mechanisms’ that make them receptive to culturally transmitted knowledge. These mechanisms are (in the temporal order of their operation when information is exchanged) (1) a sensitivity to ostensive signals (such as eye gaze, infant-directed speech, being called by name); (2) an expectation of a referential act (e.g., a deictic gesture) following these signals; and (3) a bias to interpret whatever they are subsequently shown or told as generic and objective knowledge. The authors claim that these mechanisms are the products of a specific adaptation for communication that evolved in hominins around 2.5MYA, with the advent of tool craft, fire making and food cooking. Due to the complexity and temporal extendedness of these practices, their performance is what Csibra and Gergely (2009, p. 148) call ‘cognitively opaque’: simply seeing a fire burning or stone flakes chipping off from a stone core does not yield sufficient insight into how and why these practices are performed. The learning of these practices must be guided by a teacher who signals her pedagogical intent with ostensive-communication. Because of the proposed timing of the evolutionary emergence of this communicative device, Gergely and Csibra are committed to regard teaching as (1) uniquely human (because *Homo* split

from *Pan* before teaching evolved); (2) universal among humans; and (3) independent of and prior to language (which evolved later).

Natural pedagogy rightly points out that teaching is a human-unique form of social learning, with teachers deliberately presenting to children things to attend to and learn. Ethnographies support the theory's claim that teaching is a human universal (*pace* Lancy, 2016, who thinks that teaching is absent in some societies). But the claim that pedagogical exchanges are independent of language is implausible. Gergely and Csibra divorce teaching from language because they want to reserve a specialised 'module' for the purpose of pedagogy. While it is true that not every pedagogical instance involves speech, it is hard to imagine that teaching is possible without teachers and learners sharing a faculty for language—even if this faculty is not yet, in the case of infants, actualised in multi-word utterances. The independence of teaching from language is even more implausible considering the authors' own claim that adults use language to create ostensive-communicative contexts and that learners are biased to interpret what they are taught as generic information (Csibra and Gergely, 2009). It seems that universal or general claims can only be made with linguistic expressions (Bennett, 1989).

From a learning-theoretical perspective, the greater problem is that natural pedagogy breaks teaching down into a mechanical sequence of signals emitted by an adult and the responses they 'trigger' in the child. Unlike in a behaviourist model, these responses are for the most part psychological (see Csibra, 2010): the learner decodes the ostensive signal by first attributing a (second-order) communicative intention to the teacher ('She wants to make something manifest to me . . .') and then recovering the informative intention embedded therein (e.g. ' . . . namely that she wants me to know that lead is toxic'). In Ryle's (1949) terms, we might say that natural pedagogy is a 'paramechanical' account of knowledge transmission. The teacher produces signals that kick off specific processes in the child's mind, including assumptions about the generalisability and relevance of the received information (see Sperber and Wilson, 1995). With this sender-receiver model, natural pedagogy positions itself within the individualistic and mechanistic tradition of the science of learning.

Harris's Sceptical Child Witnesses

Paul Harris stresses the importance of learning via testimony in early childhood. He argues against Rousseau and Piaget in this regard, who thought that to become autonomous agents, children should study the world directly by exploration and observation rather than relying on second-hand knowledge from others. Harris (2012) notices that human beings live in a cultural world replete with tools, practices, symbols and institutions that cannot be comprehended without having their meaning unlocked by others. Hence, learning from the say-so of others is indispensable. But in his empirical work, Harris sets out to show something else. He wants to prove that despite their epistemic dependence children are not gullible creatures who believe everything they're told. They are 'healthy sceptics', ready to dismiss what another said as invalid. In support of this claim he

cites studies showing that toddlers reject someone's judgement when they have an inkling that this person is an unreliable source of information. The 'data' by which children evaluate another's reliability are the content or form of the other's speech or her group membership. Young children tend to discount the utterances of those who previously made false statements (Corriveau and Harris, 2009), make grammatical errors or do not belong to their cultural group (Harris and Corriveau, 2011).

In Harris's account, the child treats the adult speaker like a mere *delivery mechanism* of information, whose outputs the child scrutinises for their plausibility. The adult is nothing more than a (more or less reliable) supplier of information. When faced with someone's testimony, the child decides whether she should believe or dismiss what was stated. Harris compares children to 'vigilant sociologists' (Harris, 2012, p. 104) and to ethnographers who study a foreign people (p. 210). This analogy is problematic for multiple reasons, the main one being that the ethnographer learns *about* others, not, like the child, *from* others. Even if the ethnographer adopts the 'native's point of view' (Geertz, 1974), the purpose of her cultural immersion is to record and theorise about cultural performances. Her engagement with her object of study is mostly third-personal, not second-personal. Whatever relationship Harris might be describing here, it is not the relationship that binds an adult and a child in teaching. What is first and foremost missing is the crucial point that teaching and learning are the dual perspectives of a cooperative endeavour undertaken by two mutually engaged persons, whose shared goal it is to increase the child's knowledge and understanding. The child stands in a relation of *trust* to the teacher—not in a relation of suspicion about her credibility.

Harris falsely assumes that two facts about young children stand in conflict with one another: that young children are heavily dependent on others in epistemic matters and that they are intelligent, rational beings. Harris believes he needs to give up the second fact, unless he can show that children are 'epistemically vigilant' and ready to detect when the words of others cannot be trusted. That way, children can be both epistemically dependent (as shown by their need to learn from others) and at the same time rational (as shown by their critical evaluations of others). What Harris does not realise is that children's dependence on others in no way threatens their rational nature. On the contrary, children's rational nature manifests itself in the way they place their epistemic trust in others for the sake of their own intellectual growth (see Rödl, 2016). The child's rationality does not conflict with her epistemic dependence; rather, its maturation affords that the child join her will with that of another to bring her rationality to full bloom.

What is exemplified in both Gergely and Csibra's natural pedagogy and Harris's account of knowledge acquisition is what philosophers call the 'evidentialist' or 'reliabilist' doctrine (see Moran, 2018). On this view, what the teacher says or does is nothing more than empirical material that the child can use to form her own judgements or draw her own inferences (McMyler, 2011). The teacher is only relevant insofar her verbal and gestural outputs are valuable data because they indicate the truth or some culturally

relevant belief, practice or custom. Social epistemologists have critiqued this doctrine because it misrepresents the relationship between teacher and learner. They offer an opposing, second-personal, account that stresses that teaching is a cooperative undertaking between teacher and learner who relate to one another as ‘you’ and together strive for the expansion of the child’s knowledge (Bakhurst, 2013; Small, 2014; Wanderer, 2013). As McMyler points out ‘Learning from testimony is irreducibly social in that the very exercise of the capacity is somehow interactive or cooperative and so couldn’t take place without intercourse with other intelligent beings’ (McMyler, 2011, p. 42). Learning from testimony, he says, is a ‘second personal epistemic capacity’ (p. 43) that cannot be reduced to the sort of learning that occurs when we form beliefs based on perception and inference. Philosophers of education and epistemology have thus offered key critiques of the evidentialist doctrine, but developmental scholars have yet to take note of this work from which their own theoretical and empirical work would greatly benefit.

I will now provide findings from experimental and observational psychology that speak against the evidentialist and in favour of the second-personal account. This research highlights *the child’s own view of* learning and teaching. What do young children think it means to teach another? And what do they think it means to learn? What do they take themselves to be doing as they learn from others? In line with the evidentialist doctrine, developmental inquiries have neglected these questions by focusing on children as merely receiving (or rejecting) information. What I hope to show in addressing these new questions is that children do not, as some cognitive scientists proclaim, ‘drink in information’ (Heyes, 2019, p. 11) but are actively and second-personally involved in knowledge exchanges. They request and seek it, pass it on to others, proudly claim to possess it (‘I already knew this!’ ‘I know how this works!’) or admit lacking it (‘I’ve never done this before’, ‘I don’t know this’). Children communicate their epistemic standing to a ‘you’ whom they know to hold the standard of evaluation of their performances. With the exception of Vygotsky (1962) and some of his followers (e.g. Rogoff, 2003), this aspect of human learning has been vastly ignored in the psychology of learning.

CHILDREN’S UNDERSTANDING OF TEACHING: GENERAL KNOWLEDGE OUGHT TO BE TAUGHT AND TAUGHT KNOWLEDGE IS GENERAL

In their exposition of the difference between teaching and ordinary telling, Sebastian Rödl (2014) and Will Small (2014) mark out the *expansion* of knowledge as an ambition characteristic of teaching. Taught knowledge is general knowledge, which strives to expand in two dimensions: the subjective and the objective. Teaching entails the realisation and encouragement to enlarge the body of subjects who ‘are in the know’. It also entails the realisation and encouragement to apply and expand what one knows by seeking opportunities to test, refine and further one’s knowledge. What I

hope to demonstrate is that even young children have a sense that this is the goal of teaching and of being taught.

Children Teach General Facts

In a recent study we examined children's understanding of teaching (Moll *et al.*, submitted). More specifically, we asked if young children understand that teaching involves the exchange of general knowledge. To this end, we placed 4-year-old children in the role of teachers. The experimental procedure consisted of two phases: a learning phase followed immediately by a teaching phase. In the learning phase, children were told facts about animals. There were two kinds of fact that children learned about each animal: one in which properties or capacities were predicated to the animal kind (general facts), and one in which properties or capacities were predicated to particular individuals (particular facts). A book with images depicting the animals and their activities was used for illustration. Take the examples of giraffes and hummingbirds. As general facts, children learned 'Giraffes have black tongues' and 'Hummingbirds can fly backwards'. As particular facts, they were told 'These giraffes are rubbing their necks' and 'These hummingbirds are feeding at flowers'. A within-subjects design was used, so that every child was presented with both facts about a given animal. In the subsequent teaching phase, the same children were asked to teach what they learnt to a pretend classroom. For example, the experimenter said: 'Giraffes—what is one thing you can teach these students about giraffes?' or 'Hummingbirds—what is one thing you can teach them about hummingbirds?' The dependent measure was which fact from the learning phase children chose to teach. The results were clear. The majority of 4-year-olds taught generic, not particular facts. The same was true in a follow-up experiment in which fictional instead of real animals were used in order to avoid that pre-existing knowledge biases children's answers.

We also analysed the linguistic forms children used when teaching. This analysis showed that regardless of content, children almost invariably used a format that is conventional for teaching and the expression of generic truths. They combined a bare plural noun-phrase (e.g. 'hummingbirds') with a verb phrase in simple present tense ('fly backwards'). Only occasionally did a child report- particular events by combining personal pronouns with a verb in past or present progressive (e.g. 'They are/were rubbing their necks' with reference to giraffes). It might be objected that children used language appropriate to teaching because they copied the experimenter's speech from the learning phase. But this cannot be right. Note that a substantial number of children recounted facts they had been told episodically. However, with rare exceptions, children *reframed* the contents into a linguistic format that is typical for teaching and generic knowledge transmission. For example, they taught that 'giraffes rub their necks', though they had been told about particular giraffes rubbing their necks. Children thus transformed non-generic facts into generic ones. As teachers, children speak abstractly and generally about animals and their behavioural and physical traits, thus introducing others to scientific knowledge about them.

Children Understand Being Taught

In what follows, I present a study that involves 4-year-old children as learners (Moll, 2018). The study shows that young children recognise others' acts of teaching as teaching. It is this recognition that explains the unparalleled effectiveness of teaching compared to the giving of hints or cues that involve no teaching. The study revolves around a problem-solving task. Children individually had to figure out how to retrieve a buoyant object (e.g. an unshelled peanut or a light-weight toy) from a transparent tube. The tube was too narrow and deep to manually retrieve the object. There were no tools or solid objects such as sticks etc. for children to use. The only accessible and effective 'tool' was water. Prior investigation has shown that 4-year-olds generally cannot solve this problem on their own (Hanus *et al.*, 2011). They do not think of water as instrumental in this context. We replicated this negative finding with 4-year-olds in a baseline condition (Moll, 2018). In two other experimental conditions, children, prior to receiving the task, watched a video in which a puppet used water to solve a similar problem. The puppet and another character rolled a ball back and forth via a narrow channel until the ball got stuck mid-way, outside of their reach. The puppet left and returned with a cup of water. He poured the water into the channel, thereby releasing the ball. The two conditions varied only with respect to how this video was introduced. In the *Incidental Condition*, the experimenter and child came upon this video by happenstance and watched it. The experimenter narrated the video by stating 'He's using water to get the ball out' when the puppet poured the water into the channel. In the *Pedagogical Condition*, by contrast, the experimenter introduced the video as didactic material. She declared 'I want to show you something' before starting the video and summarised it with the generic sentence 'Water can be used as a tool'. In two successive experiments, most 4-year-olds in the Pedagogical Condition successfully solved the retrieval problem. They poured water into the tube to make the object float to the top. In the *Incidental Condition*, by contrast, performance was low and did not exceed baseline.

These results indicate that young children recognise when another person addresses them as a teacher, or, we might say, in the name of science. They understand that knowledge so expressed is general and seeks application outside of the context in which it was acquired. Teaching is successful only when the learner looks for and recognises opportunities to apply, adapt, or expand what she has learned. Will Small (2014, p. 382) calls this the 'motivational or inspirational dimension' of teaching. In our retrieval task, teaching was successful in this sense because children carried what they learned over to a situation that differed from the learning episode. In the video, a puppet used water to horizontally flush out a ball that was stuck in a channel—not to make an object vertically float within reach (Moll, 2018). Having been taught about the instrumentality of water allowed them to find a problem's solution that they otherwise would not have found.

What these experiments reveal is that children have a sense of what it means to teach and be taught. They understand that teaching entails the

transmission of general facts, i.e. facts that are worthwhile to share with others. Astonishingly, they understand this fundamental aspect of teaching from both perspectives, that of the learner and of the teacher. When addressed by someone who speaks to them in the voice of a teacher, children assume that what they learn is knowledge of a general character. Correspondingly, when teaching others, children mainly pass on general, as opposed to particular, knowledge. For example, they teach others that giraffes have black tongues rather than informing them about some particular giraffes.

This is relevant because it shows that children benefit uniquely from teaching not because they can pick up useful information from their environment. Teaching is as effective as it is because children know what it means to teach and what it means to learn from teaching. As we argue elsewhere (Moll and Kern, 2020), this results from the fact that learning in humans is self-conscious: Children learn the way they do because they know that what they are doing is learning, and that it takes another person, a teacher, for their learning to get off the ground.

In the next and final section, I will provide empirical support for the thesis that children are aware of their epistemic dependency on others and of their status as learners. One crucial implication of this is that children know that the knowledge they possess is acquired. They value the advancements they make in their learning and display their progress for teachers and other learners by cultivating and ‘broadcasting’ their knowledge.

CHILDREN AS SELF-AWARE SOCIAL LEARNERS

Many non-human animals acquire important information from their environment by observing the behaviour of other agents and incorporating it into their own actions (Heyes, 2018). Social learning, if defined as any learning that is influenced by the presence or products of a species member, is not unique to humans but has been identified in a vast number of animals, even outside of the mammalian order (see Huber, 2012 for an overview). And yet, research in developmental and comparative psychology suggests that the mode of knowledge acquisition in human infants and children is unique (Tomasello *et al.*, 1993). Our proposal is that the uniqueness of human learning lies in the fact that only humans relate to those from whom they learn in a way that shows that they view themselves as learners. When imitating others or learning from their demonstrations, human children do so with a consciousness of themselves as learning from someone who is more competent than they are. They understand their own capacity as being shared with and guided by the example and assistance of second persons. In what follows, I will draw on experimental and observational findings that support this position. Some of these findings stem from a pilot project using participant-observation to study the behaviour of 3- to 5-year-olds in a preschool (hereafter pseudo-anonymously referred to as ‘Elfgarden Preschool’). The preschool is located in a small town in Southern California.

Turning to the Teacher

One of the first indicators that children are aware of themselves as learners can be observed in the second year of life. At this time, children begin to show ‘social referencing’ (e.g. Feinman, 1982). Social referencing occurs when infants encounter an object or situation with which they are unfamiliar and that they hesitate to approach. What they do in such moments is to seek eye contact with their caregiver (Zarbatany and Lamb, 1985), as if to request advice or guidance as to how to deal with the situation. Depending on whether the adult makes encouraging or discouraging gestures and uses encouraging or discouraging speech, the infant will either approach the object or withdraw from it. The child asks for her behaviour to be guided by those whom she knows to be more experienced than her.

In her studies of help-seeking, Nelson-LeGall (1981, 1985) found that children commonly seek others’ help not in the hope of having their problems solved for them, but to improve *their own mastery*. She observed that preschoolers often address others for guidance when they are facing a challenging task. They lean on others whom they know can provide superior examples or performances of what they themselves are trying to do. Children’s tendency to turn to others as teachers also became evident in our object retrieval study (Moll, 2018). Although children were repeatedly asked to complete the task on their own, around 40% of them nevertheless addressed the adult for her knowledge and expertise. When children were unable to get the object out of the tube, they often expressed frustration and disappointment. However, the source of their frustration was not their failure to access the peanut itself. They were upset because they recognised the peanut as a symbol of success and as a trophy testifying their competence. Not being able to reach the object reflected their incompetence. Hence, children would not have been happier had adults solved the problem for them. Their motive for engaging the adult was mastery-oriented, not reward-oriented. The children addressed the adult as a teacher, not as a tool.

Observations at the Elfgarden preschool point in the same direction. When children performed tasks such as matching words to pictures, spelling, or basic arithmetic operations, they often spontaneously addressed the teacher for assistance. They pulled the teacher by her arm, ran to her or called her to have her check their results. Children admitted being ‘stuck’ on a task, asked what they should do next, lamented that the task was ‘too hard’ etc. Sometimes they requested specific bits of knowledge. For example, in the midst of spelling a word with foam letters, 4-year-old Audrey raised a letter in front of the adult, asking ‘Is this a p?’ and ‘Is this what I need?’ She then remarked that when the p is flipped, it looks like a b. These were no exceptions; all children at one time or another addressed the teacher to request being evaluated.

These observations conflict with the mechanistic and individualistic accounts we introduced at the beginning of this chapter. Learning is neither ‘triggered’ by specific ostensive cues and signals, as natural pedagogy posits; nor is learning the result of children’s critical observations of others’ behavioural outputs, as Harris propounds. Children are not, as he suggests,

like anthropologists who carefully study the behaviour of those around them (Harris, 2012, p. 210). Instead, the findings support the second-personal account of learning because they demonstrate that children summon adults to guide their cognitive development. They hold their learning activities and performances to a standard of evaluation (Rogoff, 2003); and they know that this standard lies outside themselves, in the teacher. We might say that the idea of social learning governs the child's behaviour whenever she performs an activity—even when the activity is solitary (Kern and Moll, 2017). The child regards the teacher (whether this is a parent, a preschool instructor, an older sibling etc.) as *primus inter pares*: an agent of the same kind as she herself, but one whose skills and knowledge are advanced compared to her own, and whose example is to be requested and followed.

Children Value Knowledge

Besides engaging others as teachers, young children also advance their own learning by practising, reciting and rehearsing what they know. An early manifestation of this is so-called 'crib-talk' (Nelson, 2006). After having been taken to bed, infants often loudly articulate words they recently added to their vocabulary. They repeat words over and over, sometimes with deliberate variation in sound. Toddlers might recite simple stories or narrate events in their crib-speech. One possible purpose of this talk is the practice of speech production and narration. Modifications of the correct speech pattern are playful diversions from what children know to be the correct pronunciation. There is a strong resemblance between this playful form of speech and pretend play, which also involves intentional digressions from known reality. Both in playful speech with deliberate departures from correct pronunciation and in pretend play, children display their knowledge of the norms of proper speech and object use and take delight in the conscious separation between these norms and what they are doing (see Rödl, 2016, p. 95).

Toddlers' self-talk is a precursor to preschoolers' private speech that was famously studied by Vygotsky (1962). He saw private speech as a tool for self-guidance and self-regulation, used by children in an 'essential transitional stage where the language that mediated interaction between individuals' begins to 'mediate cognitive activity within the individual' (Tan-Niam, 1999, p. 55). Preschoolers resort to this talk, according to Vygotsky, when faced with challenging tasks (rather than simple tasks or tasks that far exceed their competence level). By explicitly laying out the next steps of action, children guide themselves through the problem solving process (Vygotsky, 1962).

There has been some confirmation that private speech correlates with task difficulty (Berk and Garvin, 1984). But along with the work of others (Bono and Bizri, 2014; Tan-Niam, 1999), my observations at the Elfgarden preschool cast doubt on the view that private speech serves strictly a self-regulatory or guiding function. Children did not exclusively or even predominantly speak to themselves when working on hard problems. Rather, private speech was found across a large variety of circumstances.

Children spoke to themselves when they played (whether this was functional or pretend play), read books,¹ made drawings, or worked on tasks of various levels of difficulty. They articulated their thoughts when they were on their own, in the mere presence of others, and even when cooperating with others. Speech that does not have a particular other as addressee thus pervades young children's activities, solitary and collaborative.

One major function of children's private speech seems to be the practice of speech production (especially in the very early years), narration, and the ability to conceptually break down or give an account of what one is doing. Congruent with our view of children as 'self-conscious learners', these behaviours reflect children's awareness that the knowledge they possess is acquired and, consequently, in some sense fragile. They cultivate what they have learned by exercising their skills.

Further confirmation of this idea comes from the many repetitions children perform when they learn something new. This was particularly noticeable in children's production of certain linguistic constructions or new vocabulary. One day a 4-year-old girl at the Elfgarden preschool practised the pronouns 'nobody' and 'no one'. Throughout the morning, she uttered several prohibitions with these pronouns, even when her utterances seemed out of place. She declared that 'Nobody can talk to me' as she flipped through the pages of a book. Moments later she announced that 'Nobody can shout, or I'll put them in time-out'; although no one was shouting at the time. Still later, she declared 'No one can call my name'. This girl displayed, rather than functionally used, her power to voice interdictions. Her behaviour was not exceptional. A boy overtly tried out 'if-then' and 'when-then' constructions over the course of a few days. He created social situations just so he could apply these conditionals. Once he walked up to another child saying: 'Let's do this: When you give me [*some toy*], then I give you [*some other object*]', etc.

Children also performed rhymes, songs and acrobatic moves with striking repetitiveness. Not all repeated acts involved a single individual. Some spanned across two children, with one imitating the other. This sometimes led to sequences of mirrored dyadic interactions, with two children bouncing the same speech, gesture or motor skill back and forth. At times, children articulated their need for repetition or self-correction to get better at what they were doing, e.g. by encouraging themselves ('Try again' or 'I got to do this again').

But reducing the function of private speech to an individual training instrument would be a mistake. Unlike what the name suggests, 'private speech' also serves a social function. The preschoolers often talked out loud when others were near and even when they engaged in collaborative projects. In fact, experiments have shown that private speech is enhanced when others are present (Goudena, 1987). It seems that children 'broadcast' what they know to the community. In this way, they let others know where they stand epistemically. They inform potential teachers of their learning progress, perhaps with an implicit request for evaluation or 'scaffolding'. By sharing what they know, children foster more challenging collaborations and exchanges with peers or simply introduce them to this knowledge. What's

more, they self-consciously dwell in a normative space that they know to share with those around them.

I interpret these actions as signs that children value knowledge and its expansion in ways one values things one has not always possessed but had to make one's own. By engaging in self-initiated practice, children play their individual part in furthering their cognitive growth, thus supplementing the collaborative learning efforts from which their skills originate. But as we have seen, children's articulations, even when they have no discernible addressee, retain a communicative character. In their speech, children give voice to their knowledge because they understand that their cognitive growth is measured by such expressions of knowledge and because they understand that the knowledge they possess is for everyone to share.

Knowing One's Epistemic Standing

If children are self-aware of their need and capacity to learn, then this would include having a sense of what they do and do not yet know or are capable of doing. In cognitive science, the ability to monitor one's epistemic standing and progress is regarded a meta-cognitive, and thus higher-order, capacity that develops much later than the capacity to acquire knowledge from others. It is second-order because it involves the mental representation of one's cognitive states. Studies in cognitive development have shown that meta-cognition does not emerge prior to school age (Rohwer *et al.*, 2012). In our account (Moll and Kern, 2020), knowing what one knows is not a separate capacity that is added to the capacity of knowledge acquisition. Rather, it is a feature of the form of children's capacity for learning and thus an inherent aspect of how they learn.

In line with this position, my observations of preschoolers suggest that children have a sense of what they do and do not know long before the dawn of meta-cognition. Let me give a few examples. Four-year-old Maggie was struggling with a task of simple arithmetic. She looked at her work sheet and expressed disappointment in herself: 'I messed up again! I messed this up a-gain! I keep messing up. I need to do this'. On another occasion when she struggled with a task she exclaimed 'Oh my god, this is hard. I don't see it'. By claiming not to see it, Maggie was expressing that the solution did not occur to her. On other occasions, children claimed 'I know what this is' or 'I don't know how to do this' etc., thereby making their knowledge or ignorance explicit to those around them. Once two girls excitedly played a memory game in which players have to collect pairs of matching tiles. Their game attracted curious bystanders and commentators. (Everyone could keep score of the competition because the players piled their collected tiles in two adjacent stacks for comparison.) One child wanted to help the player who fell far behind her opponent. As the losing player stared at the face-down tiles on the floor, wondering which tile matches the one in her hand, the helper said: 'I forget where exactly it was, but somewhere here', making a sweeping gesture over the area where she suspected the matching tile. With her utterance, the child did two things that are of relevance in the given context. She offered her knowledge to someone who needed it, while also

admitting partial ignorance, thus expressing insight into the limits of what she knew.

Children expressed not only their own knowledge and ignorance, but also that of others. If they noticed or believed that another child did not know something, they helped by hinting at the right answer or showing her how to go on. Once a child was struggling while trying to spell a word using physical letters. Another child overseeing her activity handed her the letter she needed next, thus ‘scaffolding’ the child’s spelling ability like a teacher. On another occasion, a boy and a girl were working on the same task in parallel. They each had to label various geometrical shapes on a sheet of paper in front of them. When the girl reached the last—and presumably hardest to identify—geometric shape on her sheet, the boy said to her ‘This one’s going to be difficult for you’. Another time, the same boy was reading books side-by-side with a classmate. As they were each reading along, the boy remarked ‘It’s so easy—so easy you don’t need to try. You know why? Because kids are better readers’. The interpretation of this puzzling statement may not be straightforward, but I surmise that the boy ascribed competence to children who practise reading because, unlike adults, they ‘train their reading muscles’ by exercising their newly acquired skill.

CONCLUSION

This chapter serves to show that young children do not take in knowledge like an organism takes in information from its environment. Unlike what we know from social learning in animals, human children learn from others not by way of incorporating useful behaviours or reproducing behavioural effects by happenstance. The other is not simply a factor in the child’s social environment whose presence and actions influence her learning. Against what natural pedagogy suggests, the other does not cause learning in children by emitting certain signals, such as raised eyebrows and child-directed speech. And against Harris’s theory of testimonial knowledge acquisition, children do not subject others to reliability checks before believing anything they say; nor do children study adults like ethnographers study a foreign people. Rather, learning from others’ demonstrations, instructions or feedback is mutually expected by the child and by the teacher. The child trusts the adult and seeks her guidance and assistance in a joint mission of learning. She is aware of her own need to act as part of an interpersonal enterprise that essentially involves a partner who demonstrates how things are done. Human learning involves the mutual recognition that what each of us does is shaped by our common understanding of what we are doing together: namely, that you provide me with an example that I regard as a paradigm for what I myself am doing. The upshot is that social learning takes a unique form in humans. It is a form that includes children’s awareness of themselves as social learners who epistemically depend on others and can also step into the role of teachers if they possess knowledge that others are lacking. Human-unique learning in the form of teaching and

being taught is present and shapes the child's cognitive development from very early on in ontogeny.²

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NOTES

1. The 3- to 4-year-olds I observed could not actually read. They imitated reading behaviour by looking at the book's pages, running their fingers underneath the print, and—with exaggerated stress and prolonged pauses between words—describing the activity depicted in the book. Some children seemed to have memorised parts of the content from having had the book read to them in the past. Others made up the words as they went along.
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