PART III

Self-perceptions

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LEARNING ABOUT OTHERS TO LEARN ABOUT THE SELF

Early reasoning about the informativeness of others' praise

Mika Asaba and Hyowon Gweon

How do we learn about who we are? Learning about the self is an inherently interactive, social process; rather than relying solely on our own experiences with the external world, we learn about the self by interacting with others. We often receive others' opinions and evaluations about our performances, qualities, and even personality traits, and sometimes, we deliberately seek out feedback from others to learn about ourselves. The influence of others' feedback may be especially powerful early in life; as children begin to develop abstract, sophisticated self-concepts (Cimpian, Hammond, Mazza, & Corry, 2017), feedback from others can shape the ways children learn about the self, interact and communicate with others, and learn about the world.

Prior work has shown the power of specific kinds of praise, suggesting how different contents of praise can influence children's motivation and achievement, for better or for worse (e.g., *process vs. person praise*, Mueller & Dweck, 1998; *inflated praise*, Brummelman, Thomaes, Orobio de Castro, Overbeek, & Bushman, 2014; *generic praise*, Cimpian, Arce, Markman, & Dweck, 2007; for a review, see Henderlong & Lepper, 2002). This work has highlighted young children's early abilities to differentiate praise depending on its content, such as the target of evaluation (e.g., whether *effort* or *ability* is being evaluated; Mueller & Dweck, 1998). Importantly, praise may signal what qualities or traits are valued by others, thereby shaping what children themselves value. When they receive praise targeted at their effort, they may learn to value persistence and the process of trying hard in the face of a challenging task; when children receive praise targeted at their ability, however, they may be learning that their ability or performance is what really matters (Mueller & Dweck, 1998). Broadly, this literature has provided compelling evidence that the contents of praise can have both immediate and long-term consequences for young children's learning, motivation, and even self-evaluations (e.g., Cimpian et al., 2007).

As adults, however, we know that even the exact same praise can have very different meanings depending on the social context. Imagine that you just gave a presentation and someone told you, "That was a great talk!" If this praise came from a colleague who compliments everyone and everything (irrespective of quality), then you might discount the praise and remain uncertain about your performance. However, if you received the exact same praise from a colleague known for their stinginess in providing praise, then you might infer that your talk went quite well. Furthermore, the meaning of praise may also depend on the speaker's goal; one may praise others' work to provide honest feedback or to provide encouragements. Thus, the meaning of praise and its informativeness is modulated by who is providing it and why. The meaning of praise can also depend on cultural norms. In some societies, parents, caregivers, and educators routinely praise children's actions and performances and rarely provide criticisms, whereas in other cultures, children rarely receive praise. This might reflect cultural differences in beliefs about the functions of feedback and praise (i.e., whether they are considered as evaluations or encouragements) and their consequence (e.g., motivating vs. "spoiling").

The context-dependency in the meaning of praise can make it particularly challenging for young children to use others' feedback as a source of information for learning about the self. In order to use praise effectively to learn about the self, children must consider others' goals, standards, and even cultural norms to infer its meaning. This raises an important question: Do young children take all praise to be equally meaningful, or do they evaluate and interpret it flexibly depending on the context?

Parallels in learning about the world and learning about the self

Recent research suggests that young children engage in rich mental-state reasoning when deciding whom to trust (for a review, see Harris, Koenig, Corriveau, & Jaswal, 2018). Young children draw different inferences about the same content of testimony or instruction depending on a speaker's goals and knowledge (for a review, see Sobel & Kushnir, 2013). This work has characterized children as vigilant learners, selectively seeking out and trusting information from those who are more informative, rather than accepting all testimony at face value. However, this literature has focused on cases where children's primary goal is to learn from others about the external world (e.g., object labels, functions of objects).

Learning about the world, however, is often intertwined with learning about the self. Parents often provide information about the world ("That is a ball!") and the self ("You are good at kicking the ball!") in the same setting, allowing children to learn about both the referent of the word "ball" and their own competence for kicking. While it is possible that there are two distinct mechanisms that support learning about the world and learning about the self, perhaps a more parsimonious explanation exists: The ways in which children interpret and learn from others' feedback (e.g., praise) about the self may be akin to the process by

which children learn and interpret others' testimony about the world. Below we discuss the social-cognitive capacities that support reasoning about the informativeness of others' testimony (e.g., sensitivity to others' goals and epistemic states, as well as statistical patterns of data) and explore the possibility that these capacities may also support reasoning about the informativeness of others' feedback about the self.

Sensitivity to others' communicative goals

Understanding a speaker's goals is critical to interpreting their testimony. A speaker may not only have a goal to help a learner acquire accurate knowledge (i.e., an *epistemic* goal) but also have a goal to save the listener's face or prevent the learner from feeling bad (i.e., a *social* goal; Brown & Levinson, 1987). Recent computational work has formalized adults' inferences about others' feedback as inferences about the speaker's epistemic or social goals (Yoon, Tessler, Goodman, & Frank, 2016); if a speaker has a social goal to be nice and provides praise ("That is amazing!"), adults infer that the quality of the product is lower than if the speaker had an epistemic goal to be honest.

Prior work has shown that children draw strong inferences from demonstrations or testimony from people with epistemic goals, especially when they have uncertainty about the world. When an adult claims that she is knowledgeable and wants to show how a novel toy works, it is clear in the context that her goal is an epistemic one. For instance, when a teacher pedagogically demonstrates one function of a novel toy, children infer that it is the *only* function (Bonawitz et al., 2011; see Shneidman, Gweon, Schulz, & Woodward, 2016, for a cross-cultural replication in toddlers).

Importantly, when children are already knowledgeable about the world, they can also use others' testimony to learn about their informativeness. For instance, when two teachers provide different labels for a novel object, children endorse the testimony of a teacher who had previously provided correct labels of well-known objects over a teacher who had provided incorrect labels (e.g., Koenig, Clement, & Harris, 2004; see Harris et al., 2018, for a review). Children are also sensitive to more nuanced forms of misinformation, such as under-informative testimony. For instance, when a teacher demonstrates only one function of a toy of a four-function toy, children are sensitive to these omissions and penalize the teacher (Gweon & Asaba, 2018; Gweon, Pelton, Konopka, & Schulz, 2014). Collectively, this research suggests that children are sensitive to information communicated with an epistemic goal and use such information flexibly depending on their own knowledge, either for learning about the world or for learning about others' informativeness.

Just as children use others' testimony and demonstrations to go beyond the evidence and draw strong inferences about the world, children may also rely heavily on others' feedback to learn about their own performance or abilities, especially when they are uncertain about how well they did; for instance, if a child made

two drawings, and a teacher praises one of the drawings by saying, "this one is great", children may infer that *only* that drawing is great and the other one is not great. On the other hand, when children are already certain about the quality of their own work, they might also recognize when people provide praise that they do not deserve. Interestingly, however, while someone who has an epistemic goal but provides inaccurate or incomplete testimony about the world is clearly unreliable as a teacher, someone who praises poor-quality work may not always be considered wrong; as shown in the work of Yoon et al. (2016), adults might infer that this person has a *social goal* to make the listener feel good, rather than an *epistemic goal* to tell the truth.

Indeed, prior work suggests that older children (7–11 year-olds) may be sensitive to others' social goals in evaluating their communicative actions. They evaluate white lies more positively (e.g., saying that one likes an undesirable gift) and blunt truths more negatively in politeness contexts (Heyman, Sweet, & Lee, 2009); furthermore, when asked to explain others' white lies, the majority of children referred to the potential benefits for the recipient (i.e., making the gift-giver feel good). Thus, one hypothesis is that just as they interpret others' white lies with respect to a social goal of being nice, children also understand that others' praise may stem from a social goal, especially when they are already certain about the quality of their work.

Sensitivity to others' epistemic states

Understanding the informativeness of testimony critically requires the ability to represent and reason about others' knowledge about the world. Prior work has suggested that children use others' knowledge to figure out whether to learn from them; for example, when a speaker has claimed knowledge about novel toys, children are more likely to endorse that speaker's labels for the toys than when the speaker has claimed ignorance (Sabbagh & Baldwin, 2001). Others' knowledge also guides who children approach for information; children appropriately choose whether to approach a doctor or a car mechanic depending on what they want to know (Danovitch & Keil, 2004). Furthermore, though children negatively evaluate a teacher whose demonstration was incomplete (Gweon & Asaba, 2018; Gweon et al., 2014), children exonerate these omissions when the teacher was ignorant to these other functions (i.e., they could not have been more informative; Bass, Bonawitz, & Gweon, 2017). Collectively, these studies suggest that others' knowledge guides whose information children endorse, who they seek out for information, and how they evaluate the speakers' informativeness.

The ways we endorse or dismiss others' praise may also critically depend on what we think others know. Just as children prefer testimony from knowledgeable informants, children may also value feedback when it comes from someone who is knowledgeable or skilled; for instance, when children receive praise about their drawing skills, they may take it more seriously if it came from an art teacher than one of their peers who is clearly a novice. Furthermore, just as children seek

out information about the world from knowledgeable others, they may also do so for information about the self; if a child is uncertain about their drawing skills and wants to know how they are doing, they may seek out feedback from more knowledgeable and competent others.

Sensitivity to statistical patterns of evidence

Although knowing others' goals and knowledge helps us interpret their feedback, in many contexts, they are not explicitly stated and left for the learners to infer. The ability to detect statistical regularities in the environment emerges early in life (Gweon & Schulz, 2011; Saffran, Aslin, & Newport, 1996), allowing children to draw these inferences even from minimal data. In prior work on epistemic trust (e.g., Harris et al., 2018), children learned about others' informativeness through observations of others' testimony or instruction; specifically, they were often provided with events that suggested a dependence between a teacher and the accuracy of their testimony (i.e., Teacher A provides accurate statements, Teacher B provides inaccurate statements). Remarkably, with even just a few observations of each teacher, they are able to use these data as strong evidence for their general informativeness and evaluate others' subsequent testimony in light of these inferences.

Children may also be able to draw inferences about the informativeness of praise from the patterns in a speaker's past praise and the quality of the work they observed. If their praise on drawings is contingent on higher quality work, children may infer that the speaker is knowledgeable and/or has the goal of being informative with respect to quality; however, when children observe a speaker whose praise is unrelated to quality of drawings, they may infer that the speaker is either ignorant (e.g., if praise is unrelated or inversely related to quality) and/or that they have a social goal of "being nice" (e.g., if praise was provided indiscriminately). Thus, sensitivity to patterns of data may allow children to infer others' goals, epistemic states, and informativeness even when they are not explicitly provided in context.

Preliminary work

Drawing on work from early cognitive development and social learning, one recent study investigated whether children interpret others' feedback differently depending on their past informativeness (Asaba et al., 2018). Here, participants (4–5-year-olds; $N = 80$, preregistered) made two tracings that were put into envelopes. Then, they watched videos of teachers providing feedback on a student's six tracings (three clearly good tracings and three clearly bad tracings); Teacher Jane only praised the three good tracings, suggesting that her praise covaries with the tracings' quality (Selective Teacher), whereas Teacher Susan praised all six tracings, suggesting she praises indiscriminately (Overpraise Teacher). Then, the experimenter said,

> Teacher Jane looked at one of your tracings and she said it was great. Teacher Susan looked at the other tracing and said it was great. Now you can bring back your best tracing to show your teacher! Which one do you think is the best?

Because their tracings were still in the envelopes, children had to rely on how these teachers had previously praised other tracings to respond.

Children were more likely to choose the tracing praised by the Selective Teacher (Selective vs. Overpraise: 72.5% vs. 27.5%, $p = .006$, Binomial). When asked which teacher was trying to be nice, however, they were more likely to choose the Overpraise Teacher (Selective vs. Overpraise: 17.5% vs. 82.5%, $p < .001$). A follow-up experiment provided additional evidence that children specifically trust praise that is contingent on higher quality work, rather than only valuing the frequency of praise. Thus, given the exact same praise, preschool-aged children can determine whose praise is more trustworthy based on their prior patterns of praise.

These findings provide initial support for the parallel between learning about the world and learning about the self. Just as children decide from whom to learn based on others' past informativeness, they also decide whose praise to endorse based on others' prior patterns of praise.

Challenges in learning about the self

So far, we have proposed that the process by which we learn about the world and learn about the self are rooted in the same cognitive capacities. However, there may be specific challenges and biases that come with learning about the self. When learning about the world, children are motivated to acquire *accurate* information; they want to acquire true, relevant, and complete information about the meanings of words, causal relations, and how things work. In learning about the self, however, children may be additionally motivated to acquire *desirable* (i.e., positive) information. Though information about the self can be both accurate and desirable, these dimensions may not always align with one another. Children may prefer receiving desirable information regardless of accuracy if they want to feel good about themselves, but preferentially seek out accurate information when they genuinely want to learn about their performance and figure out how to improve. Some prior work suggests children generally trust positively valenced information; children judge positive assessments of others' work as more accurate than negative assessments of others' work (Boseovski, Marble, & Hughes, 2017).

On the one hand, this suggests that the tendency to prefer desirable information might make it more difficult for young children to learn from others' feedback; they might discount criticisms or selectively endorse positive feedback. Critically however, in these past studies, children never saw the actual quality of the work, so they could not assess the informativeness of others' feedback; instead, they had to rely on the positivity of the speakers' feedback to evaluate

their testimony. Additionally, the speakers' goals often remained ambiguous; if children assumed that the speaker had a social goal to be nice, then it would be reasonable to prefer someone who provides positive feedback. Thus, it remains an important question for future work to better understand the extent to which children's reasoning about praise and their learning about the self is colored by their preference for positive feedback.

Conclusion

As humans, we can acquire much knowledge about the self—our qualities, traits, and capacities—through our interactions with others. In particular, we do not simply take to heart the *content* of others' feedback; rather, we evaluate and interpret others' feedback about the self with respect to what we know about others and others' minds—their goals, beliefs, and knowledge. In turn, feedback from others about the self can also tell us a lot about others' goals, knowledge, and what they think of us. Our proposal is that the same inferential processes and representational capacities that allow children to effectively learn about the world from others may also help children learn about the self from others. We hope that future work bridges work in cognitive development and motivation to better understand the complex interactions of how children learn about others, learn about the self, and learn about the world.

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