

Did I really do well? Young children are sensitive to the informativeness of others' praise and use it to evaluate their own work

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Abstract

Young children constantly receive praise about their abilities, skills, and products. While much work has been devoted to how praise influences children's motivation and self-esteem, an open question is how children evaluate praise from others and use it to assess their own work. Given young children's ability to track informant's accuracy and selectively trust those who are more reliable, we examine their ability to monitor the informativeness of others' praise. In particular, this work investigates whether young children weight evaluations from a teacher who provides praise with respect to the quality of a piece of work higher than evaluations from a teacher who always provide praise. We show that adults (Experiment 1) and even 4-5 year-olds (Experiment 2) show sensitivity to the difference in informativeness between these two teachers, even when controlling for the frequency of praise (Experiment 3). These findings provide evidence that from a young age, children can selectively use others' praise to evaluate their own work.

Keywords: praise, theory of mind, uncertainty

One of the challenges of early childhood is learning about one's abilities, traits, skills, and weaknesses, and an important source of information is others' evaluations. Performance praise – positive evaluations of a person's performances or attributes (see Kanouse, Gumpert, & Canavan-Gumpert, 1981) – has become ubiquitous in parenting and education practices in Western societies. In order to make appropriate inferences about their abilities and products, children must learn to figure out when praise is meaningful and when it should be discounted. Here, we examine children's sensitivity to the *informativeness* of praise and if so, whether children are strategic in how they use praise to assess their own work.

However, while much work has been devoted to how praise influences children's self-esteem (e.g., Brummelman, Thomaes, Orobio de Castro, Overbeek, & Bushman, 2014), intrinsic motivation (see Henderlong & Lepper, 2002 for a review), and learning behaviors (e.g., Mueller & Dweck, 1998), one open question is how young children might evaluate the *informational value* of praise depending on who it comes from. As adults, we intuitively understand that not all praise carries equal weight: people may vary in their competence, expertise, or communicative goals (Yoon, Tessler, Goodman, & Frank, 2016) and we should take these factors into consideration when interpreting praise.

For instance, imagine that you are trying out different cookie recipes and you ask two of your friends, Anne and Sally, what they think. You remember that Anne usually tries to be nice and says that everything tastes good, but Sally tends to provide more helpful, honest feedback and only says that something tastes good if she really believes it tastes good. Given this, you might interpret each friend's praise differently: if Anne says she likes the cookies, then you might not

learn that much about the quality of the cookie itself, but if Sally says she likes it, then you might infer that the cookie is really good. In the current work, we examine whether young children share these intuitions, in particular whether they can (1) track the informativeness of others' praise from prior observations and (2) how they use might others' informativeness to appropriately evaluate their own work.

Some prior work has argued that children may perceive praise as insincere when it is overly general or inconsistent with how the child views herself, especially when the child can think of counterexamples to the evaluation (see Henderlong & Lepper, 2002). While the consistency between the child's and informant's evaluation of a product the child created could provide cues to sincerity, children can also observe whether the contingency of an informant's praise on quality to determine who to trust for evaluative information.

In fact, young children are quite savvy in judging the information that others provide, at least when it comes to information about the physical world (e.g., the names or locations of objects, or how a toy works). By the preschool years, children can track the accuracy of others' testimony (e.g., whether they provide correct or incorrect labels of common household objects), prefer to learn from those who previously provided accurate labels (Koenig, Clement, & Harris, 2004, Birch, Vauthier, & Bloom (2008), Harris & Corriveau (2011)), and can continually update their evaluations of others' trustworthiness across multiple interactions (Ronfard & Lane, 2017). Furthermore, children are not only able to make evaluations based on the accuracy of others' verbal testimony, but also the informativeness of others' pedagogical demonstrations. Even 4 year-old children negatively evaluate teachers who leave out relevant information (Gweon & Asaba, 2017) or provide unnecessary information (Gweon, Shafto, & Schulz, 2014).

Although children appear to be competent in evaluating informants in the physical domain, there are a few reasons that they might struggle with evaluating others' praise for the self. First, children may hold strong beliefs about their own competence, which may interfere with their ability to integrate social information into their self-perceptions. Young children tend to overestimate their performance, predicting that they will perform better in the future than they are able to (Schneider, 1998), and judging that they have performed well when they have not (Hembacher & Ghetti, 2014). This positivity bias or "wishful thinking" towards their own abilities may undermine their ability to evaluate the informativity of feedback and use it to understand their own performance.

Second, recent work has revealed that young children are biased to trust testimony from more positive sources, irre-

spective of the informativeness of the evaluation. Preschool children trust novel information from more physically attractive (Bascandziev & Harris, 2014) and nicer informants (Johnston, Mills, & Landrum, 2015), even when these informants lack expertise or perceptual access (Lane, Wellman, & Gelman, 2013). Young children are also more likely to endorse reliable speakers who make positive attributions (e.g., remarking that a character is “nice” versus “mean”; Boseovski, 2012). Further, even 6-8 year-olds are more willing to endorse and learn from informants who make positive evaluations of a student’s product (describing a painting or piece of music as “very good” versus “very bad”) independently of the speaker’s expertise in that domain (describing a painting Boseovski, Marble, & Hughes, 2017).

This work on children’s positivity bias in the selective trust literature has largely pitted an informant’s valence (positive qualities or positive information) against her expertise or the consensus of a group. In these studies, children did not have access to information about the target agent or agent’s product so they were unable to evaluate whether the speaker’s evaluation was appropriate or not. However, even infants make appropriate social evaluations (e.g., Hamlin, Wynn, & Bloom, 2007) and preschool-aged children can differentiate amongst qualities of others’ products to make inferences about their own abilities (seeing that others have created better or worse tracings than their own; Magid & Schulz, 2015). So, to the extent that children themselves can evaluate a product, they might be sensitive to the contingency of a speaker’s evaluation on the subjective quality of the product and use this to judge the informational value of a speaker’s praise.

The present work asks whether young children can track the informativeness of others’ praise by observing others’ evaluations of another child, and if so, whether they can then use others’ informativeness to appropriately evaluate their own work. We chose a task that preschool-aged children are familiar with but motivated to improve on: tracing shapes with a pen. Experiment 1 confirms that adults can differentiate between a teacher who always provides praise (Overpraise Teacher) and teacher who only praises the better tracings (Contingent Praise Teacher); they can use teachers’ prior informativeness to appropriately evaluate which of two hidden tracings is better. In a similar, first-person paradigm, experiment 2 demonstrates that even 4- and 5-year-olds can differentiate between these two types of teachers and endorse the Contingent Praise Teacher’s praise. Experiment 3 controls for the frequency of praise provided by each teacher by pitting the Contingent Praise Teacher against a teacher who only provides praise to the worse tracings (Inaccurate Praise Teacher).

Experiment 1: Adults

Methods

Participants 86 adults (38 female, $M_{Age}(SD) = 36.55$ (11.87, Range = 21 - 71)) were recruited from Amazon Mechanical Turk. An additional 14 subjects were recruited but

excluded due to failure on one or both memory check questions (see Procedures below).

Stimuli For the warm-up evaluation question, subjects first saw one really good tracing and one really bad tracing of simple shapes made with a blue marker. Subjects watched two videos: the Contingent Praise Teacher video and the Overpraise Teacher video.

In each video, the teacher (Jane or Susan; actor counterbalanced) was facing the camera on one side of the table and “Johnny”, a child actor, was sitting with his back facing the camera. There were six tracings on the table in a row (three really good tracings and three really bad tracings); the good and bad tracings were equivalent in quality to the good and bad tracings shown in the warm-up evaluation question. At the start of the video, Johnny told the teacher that he made the tracings on the table and that he wants to know which tracings are good because he’s going to enter one of them into a contest. The teachers evaluated the tracings one at a time from right to left: in the Overpraise Teacher video, the teacher provided positive, undifferentiated feedback (“Wow, that’s great!”) for all six tracings and put a sticker on each tracing. In the Contingent Praise Teacher video, the teacher provided positive feedback (“Wow, that’s great!”) and put stickers on the three good tracings and neutral feedback (“Hm, this one’s okay!”, said in a positive tone) for the three bad tracings. The quality of tracings alternated from right to left (good, bad, etc.).

Procedure Adults were first shown two tracings that differed in quality (see Stimuli section) and were asked to evaluate which of two tracings is better; only subjects who chose the better tracing were included in analyses.

Next, subjects were introduced to a student, Johnny, who really wants to know which of his tracings are good because he’s going to enter one of them into a contest. Then, subjects watched videos of the Contingent Praise Teacher and Overpraise Teacher (video order counterbalanced) providing feedback to Johnny about his tracings; each teacher provided feedback on a different set of six tracings. After each video, subjects were asked a memory check about how many tracings the teacher said were great and only subjects who answered this correctly (“3” for the Contingent Praise Teacher and “6” for the Overpraise Teacher) were included in analyses.

After watching the videos, subjects were introduced to Kristen, another student who was working on two tracings and wants to enter one of them into a contest. Kristen received praise on one tracing (“Teacher Jane said this is great”) from the Contingent Praise Teacher and praise on another tracing (“Teacher Susan said this is great”) from the Overpraise Teacher. Subjects were not given access to the tracings themselves but only saw an envelope (presumably holding a tracing) with Teacher Jane’s green star and an envelope with Teacher Susan’s red star.

Finally, subjects were asked the critical question: “Now Kristen is going to bring one of her tracings to a contest.

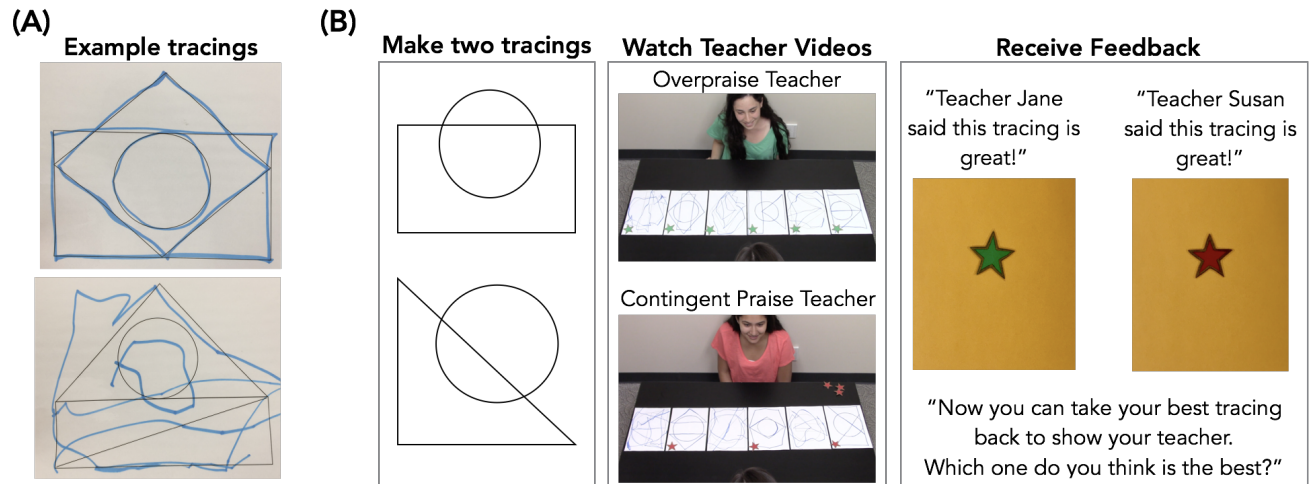


Figure 1: (A) Examples of good and bad tracings that subjects saw in the warm-up evaluation questions and teacher videos for Experiments 1-3. (B) Procedures in Experiment 2. Experiment 3 Procedures were identical, except the Overpraise Teacher was replaced with the Inaccurate Praise Teacher.

Which tracing should she bring?" Then, subjects were asked which teacher wanted to be nice: "One of the teachers wanted to be nice. Who was trying to be nice?"

Results and Discussion

Our main question was whether subjects would use the teachers' prior feedback to evaluate their feedback on the hidden tracings. Even though each teacher provided identical evaluations on the tracings, subjects overwhelmingly chose the tracing praised by the Contingent Praise Teacher (87.21%, $p < .001$, Binomial Test). Further, subjects agreed that the Overpraise Teacher was *trying* to be nice (93.02%, $p < .001$, Binomial Test), suggesting that subjects did not have an overall preference for the Contingent Praise Teacher.

Adults can distinguish between a teacher who always provides positive feedback (Overpraise Teacher) versus a teacher who provides feedback contingent on the quality of work (Contingent Praise Teacher). These results suggest that adults are sensitive to the informativeness of others' feedback: given observations of others' prior feedback, they can differentially evaluate subsequent, identical feedback. Moreover, this capacity to differentiate between teachers based on their prior informativeness lead subjects to then judge which of two tracings were better (without actually having seen the tracing).

Experiment 2

In Experiment 2, children themselves completed two tracings, and then watched the same videos as in Experiment 1. Children were then told that one of their own tracings had been praised by the Contingent Praise Teacher, and one had been praised by the Overpraise Teacher. Children were asked to decide which of their tracings was better based on the feedback from the teachers. We predicted that if children were sensitive to the informativeness of praise based on each teacher's history, children should weight the Contingent

Praise Teacher's praise more heavily, and select the tracing praised by her. On the other hand, if children prefer to accept information from agents they perceive as positive or friendly, they might prefer the Overpraise Teacher. Finally, if children are not sensitive to the relative informativeness of praise, they might choose a tracing at random.

This experiment was preregistered in October 2017; the form can be found here: <https://aspredicted.org/4r9dh.pdf>.

Methods

Participants 38 four- and five-year-olds (17 female, $M_{Age}(SD) = 4.91(0.42)$, Range = 4.1 - 5.91) were recruited from a local preschool. An additional 5 subjects were tested but excluded due to failure on one or two memory check questions or a warm-up question (see Procedures below).

Stimuli Children traced two templates (each had a circle and either an overlapping triangle or square) on an 8.5 x 11" sheet of paper with a thick blue marker. The tracings that children evaluated during the warm-up phase were presented on laminated sheets of paper. Children were presented with the same videos as in Experiment 1 on a 13" Macbook Pro laptop. Pictures of the teachers (Susan and Jane) and the student (Johnny) were 3" x 5" respectively.

Procedure Children were tested in a private room inside of the preschool. The experimenter first told children that the goal of tracing was to stay as close to the lines as possible and demonstrated tracing a rectangle for the child. Then, the child traced two line drawings, and the experimenter put each tracing away into a manila envelope so the child could not see the tracing for the remainder of the session.

Next, children were asked to evaluate two pairs of tracings to verify that they could tell the difference between good and bad tracings. In each pair, one tracing was obviously very

good and the other tracing was obviously very bad. Children were asked to judge which tracing was better; only children who chose the better tracing in each pair were included in analyses.

Children were then shown a picture of a student, Johnny. The experimenter told children that Johnny was working on his tracings earlier and wanted help figuring out which of his tracings were good because he wanted to show them to his class later. Children then watched the videos of Johnny receiving praise from the Overpraise Teacher and the Contingent Praise Teacher (the same videos used in Experiment 1; the teachers were referred to as Teacher Jane and Teacher Susan). After watching each video, to verify that children understood and remembered each teacher's pattern of praise, children were shown a still frame of the video (with no stars on the drawings) and were asked which tracings the teacher said were great. Children responded by pointing to the tracings. If children incorrectly pointed to a tracing or missed a tracing, then the video was replayed and the memory check question was asked again. Only children who passed the memory check question by the second attempt were included in analyses.

After children watched the videos of the teachers and responded to the memory checks, the experimenter told the child that Teacher Jane and Teacher Susan were close by and they could give feedback on the subject's tracings from earlier. The experimenter left the room for 15 seconds with the envelopes containing the child's tracings and then returned. The experimenter said "Teacher Jane looked at this tracing and said that this one is great" and "Teacher Susan looked at this tracing and said that this one is great" (each envelope had the teacher's sticker on it). Finally, with the tracings still in the envelopes, the experimenter asked the child the critical question: "Now you can bring back your best tracing to show your teacher! Which one do you think is the best?" Children responded by pointing to one of the envelopes.

Results and Discussion

Only children who passed the initial evaluation questions and the memory check questions for each teacher video after the first or second attempt were included in the following analyses. Our main question was which tracing children thought was better: the tracing praised by the Overpraise Teacher or the tracing praised by the Contingent Teacher. Since children could not see which of their tracings was in each envelope, the teachers' praise was the only criteria available to children to evaluate which of their tracings was better.

We found that children were significantly more likely to choose the drawing that had been praised by the Contingent Praise Teacher (73.68%, $p = 0.005$). Children's age did not predict their preference for the Contingent Praise Teacher ($B = 0.009$, $z = 0.915$, $p = 0.992$).

Thus, even preschool-aged children appear to be sensitive to the informativity of praise based on whether the agent has a history of contingent praise or not. Importantly, this means that the majority of children were able to override any posi-

tivity bias and avoid selecting the drawing associated with the Overpraise teacher, who might have been perceived as more nice or likeable.

Notably, in this experiment, teachers patterns' of praise differed in two important ways. First, they differed in their contingency on *quality* — the Contingent Teacher only praised tracings that were objectively better, while the Overpraise teacher praised all tracings independent of quality. Secondly, they differed in the *quantity* of tracings praised — the Contingent teacher praised only three out of the six tracings present, while the Overpraise teacher praised all six. Are children sensitive to the informativity of praise when the total amount of praise is held constant, but the accuracy of the feedback differs? We addressed this question in Experiment 3.

Experiment 3

Methods

Participants 14 4-5 year-olds (10 female, $M_{Age}(SD) = 4.64(0.24)$, Range = 4.23 - 4.96) were recruited from a local preschool. An additional XX subjects were tested but excluded due to failure on one or two memory check questions or a warm-up question.

Stimuli and Design Stimuli were identical to Experiment 2 except the Overpraise Teacher's video was replaced with the Inaccurate Praise Teacher's video. In the Inaccurate Praise video, the layout and order of tracing were the same as in the Contingent and Overpraise Teacher's video, but the teacher praised and gave stars to the worse tracings and provided a neutral response to the better tracings.

Procedure The procedure was identical to Experiment 2. As in Experiment 2, the order of the Teacher videos and actor playing each type of teacher was counterbalanced.

Results and Discussion

Our main question was whether children are sensitive to the contingency of praise on products of better quality, controlling for the frequency of praise.

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General Discussion

In three experiments, we examined how children and adults evaluate the informativeness of others' praise and use it to determine the quality of their own or others' work. Experiment 1 confirms that adults differentiate between a teacher who *always* provides praise irrespective of the quality of the product and a teacher who provides praise contingent on the quality. Experiment 2 shows that 4-5 year-old children distinguish between these patterns of praise and weigh the Contingent Teacher's feedback more heavily in deciding which of their two tracings is better. Experiment 3 shows that when the amount of praise and contents of evaluation are held constant, 4 year-olds prefer evaluations from teachers who provide more accurate evaluations. These findings suggest that young children spontaneously evaluate the informativeness of



Figure 2: Results of Experiment 1, 2, and 3.

others' praise based on the contingency between praise and quality, and that when assessing their own work, children give more weight to praise from informative teachers.

Children's preference for the Contingent Praise Teacher is relatively weak compared with adults' preference. There are a few possible explanations for this discrepancy: (1) young children have relatively minimal experience evaluating products they have created, (2) they also have minimal experience in receiving neutral or negative feedback so they might have difficulty reasoning about its informational value, and (3) they might have a more difficult time inhibiting a desire to interact or agree with positively valenced agents. Since children gain more experience with receiving performance feedback and evaluating their own work in elementary school, older children may show a stronger preference for learning from teachers who provide accurate, contingent praise.

In this study, we intentionally provided a *contrast* between two teachers who vary in their informativeness and accuracy. However, when learning novel words, preschool-aged children have been observed to trust even inaccurate, unreliable informants in the absence of an accurate or informative adult (Jaswal, Croft, Setia, & Cole, 2010, Vanderbilt, Heyman, & Liu (2014)). Recent work has suggested that young children need access to relevant alternatives to compute pragmatic implicatures (Barner, Brooks, & Bale, 2011, Skordos & Papafragou (2016)) or evaluate the informativeness of pedagogical demonstrations (Gweon & Asaba, 2017). Thus, without the alternative of an accurate, contingent praiser, young children might be willing to trust a teacher who provides inaccurate or overpraise. It might be important for young children to witness multiple informants to most effectively evaluate them (by better understanding what the teachers *could* have said); future work should explore these possibilities.

Further, children were asked to evaluate two tracings endorsed by each teacher. One open question is whether young children might differentially weight praise based on their own goals in relation to the task. Here, the learner's goal in the video demonstration ("Johnny wants help figuring out which tracings are good because he wants to show them to his class later") and the subject's goal ("Now you can bring back your best tracing to show your teacher") was made explicit by the experimenter. However, learners may have diverse goals in approaching adults or teachers for help – they could want

honest evaluations of the quality of their work and suggestions on how to improve, or they might seek affirmation of their efforts and attempts without any evaluations on the work, and so on.

These goals could depend on children's sense of their competence in a task or domain; children who are just learning a new task might want more affirmation and positivity while children who are fine-tuning their abilities might want more constructive feedback. Children's need for accurate feedback might also depend on their interpretation of the activity; if they perceive the activity to be just for fun, it may not be important to get accurate feedback, but if they believe the objective quality of their work matters, for example, because it will be entered in a contest or receive a grade, they might place more weight on informative feedback. Future research that manipulates children's task-related goals will be needed to address these possibilities.

When evaluating their tracings in this task, children did not have visual access to each tracing, so they could only use the teacher's evaluation and prior observations of the teacher to make the judgment. How do children integrate their own beliefs about the quality of a piece of work with a teacher's evaluation? One possibility is that children might put more weight on their own beliefs when they are more certain about how well they are doing; this certainty could rely jointly on task characteristics (e.g., the product having an objective measure for quality such that the "true" state is more obvious) and the child's metacognitive awareness of their own skill or performance in the given domain. Furthermore, we plan to investigate how others' feedback might differentially influence not only product evaluations but also subsequent learning efforts and persistence on various tasks. Recent work has shown that infants' and young children's observations of others' attempts influences their effort and persistence (Leonard, Lee, & Schulz, 2017, Magid & Schulz (2015)).

Overall, the present work demonstrates that young children monitor the contingency of others' praise with the quality of the work they are evaluating, and use this information to interpret the informational value of subsequent praise. This is likely a critical skill, as both children and adults constantly receive praise that might be motivated by different goals and levels of competence. Accurately representing the informational value of this praise should allow children to gain in-

sights into their personal strengths and weaknesses and guide their learning accordingly.

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