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Lifting the Curse of Knowing: How Feedback Improves Readers' Perspective-Taking

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Abstract

Previous studies have shown that readers often overestimate the similarity between their perspective and the perspective of protagonists in a story. This egocentric projection is argued to originate from readers' tendency to use their own knowledge as a frame of reference from which they (insufficiently) adjust away to account for protagonists' less informed perspective. This experimental study demonstrated that readers use feedback about protagonists' knowledge status to draw inferences that are more accurate on future perspective-taking trials. Readers who were given the opportunity to learn through feedback not only *adjusted* their perspective-judgment more than those who did not receive feedback, these readers also showed less egocentric projection on future assessments.

Keywords: perspective-taking; egocentricity bias; anchoring and adjustment; privileged information; feedback

Introduction

Communication processes rely on our ability to successfully reason about others' mental states. Research examining this perspective-taking, however, paints a contradictory picture with regard to communicators' tendency to be accurate perspective-takers. On the one hand, a large body of research suggests that communicators rapidly and accurately assess perspective (Brown-schmidt, Gunlogson, & others' Tanenhaus, 2008; Nadig & Sedivy, 2002). In contrast to this view, studies have shown that rapid (and automatic) judgments of others' mental state are often influenced by communicators' own knowledge and attentional status (Apperly et al., 2010; Keysar, Barr, Balin, & Brauner, 2000). These studies argue that perspective-taking activities follow an egocentric anchoring and adjustment process (Epley, Keysar, Van Boven, & Gilovich, 2004). During this perspective-taking process, communicators adopt another's perspective by using their own perceptions as a frame of reference and adjust this frame to take into account possible informational differences between their own and others' perceptions. These *perspective-adjustments*, however, are often insufficient due to the immediate accessibility or saliency of one's own perceptions. The accessibility and, hence, saliency of one's own knowledge in contrast to the seemingly impermeable nature of the other's mind makes it hard for perceivers to ignore or suppress their own perception as a possible estimate of others' perspective. The failures to inhibit one's own perspective during perspective-taking may result in egocentric projection (Ames, 2004), during which perceivers wrongly assume that their private perspective is shared by others.

Studies have shown that egocentric projection might also occur during reading when readers try to take story characters' perspective (e.g., Keysar, 1994; Weingartner & Klin, 2005, 2009). In these studies, readers overestimated the extent to which their knowledge was accessible to uninformed protagonists. That is, readers read stories in which a speaker protagonist sent an ambiguous message (e.g., "About that dancing class: I can't think of better ways to spend my Tuesday evenings") to a friend. Readers learned how to interpret the speaker's message by the clarifying event information they received beforehand. When this disambiguating information suggested counterfactual (e.g., "The dance class had been dull") rather than factual (e.g., "The dance class had been interesting) information, readers interpreted the speaker's message to be sarcastic. This disambiguating information was not accessible to the recipient of the speaker's message and, for each story, this addressee protagonist had no reason to believe that the speaker was being sarcastic. Studies showed, however, that readers were very likely to use their own interpretation of the speaker's communicative intention to judge that the uninformed addressees would perceive the speaker's message in a similar way. That is, when privileged information suggested that the speaker was being sarcastic, readers assumed addressees would also perceive this sarcasm. In these instances, readers' own knowledge about the speaker's experience "cursed" (Birch & Bloom, 2007; Keysar, 1994) their ability to suppress their own interpretation of the speaker's communicative intention while imaging the perspective of the uninformed protagonists.

Epley and his colleagues (2004) showed that this "curse of knowledge" (Keysar, 1994) effect on perspective-taking originates from an egocentric anchoring and insufficient adjustment process. In their "Sarcastic Messages" experiment, Epley et al. (2004) asked readers to read similar stories in which a speaker protagonist left ambiguous voicemail messages on the answering machine of his friends. Subsequently, readers indicated either the speaker's intention with his voicemail or how they thought the recipient of the voicemail would interpret the message. Following egocentric anchoring, Epley et al. (2004) expected readers to interpret the addressee's perception of the voicemail based on information that was accessible to themselves. Findings indeed showed that readers were more likely to indicate that addressees would perceive the speaker's sarcasm when readers' privileged information suggested the speaker was being sarcastic rather than sincere. Epley et al. (2004) further

showed that this perception of sarcasm was more moderate when readers only judged addressees' interpretation of the message rather than only their own perception of sarcasm. The more moderate perception of the speaker's sarcasm in the perspective-taking condition showed that readers acknowledged that the messages sounded more ambiguous to the uninformed addressees than to themselves. However, since readers still believed that addressees perceived the speaker's sarcasm, readers' perspective-judgments still reflected their own knowledge about the speaker's communicative intention. Even though readers adjusted their egocentric interpretation into a more moderate judgment, these adjustments were not sufficient in order to reflect addressees' true perspective.

Inhibiting Egocentric Information

Perceivers learning to inhibit their own cognitions during mental state reasoning can perhaps counter insufficient perspective-adjustments. For instance, recent perspectiveswitching research (Samuel, Roehr-Brackin, Jelbert, & Clayton, 2018) showed that communicators found it difficult to switch back to an egocentric judgment once they had learned to adopt another frame of reference. In addition to this, it is argued that the more cues perceivers receive about the knowledge status of others, the less likely they are expected to engage in egocentric projection (Eyal, Steffel, & Epley, 2018; Keysar, Barr, & Horton, 1998; West, 1996). However, studies have shown that directing perceivers' attention to focus on other people's knowledge and attentional status does not always improve perspective-taking accuracy (Damen, Van der Wijst, Van Amelsvoort, & Krahmer, 2018; Eyal et al., 2018). For instance, in a direct replication and extension of Epley et al.'s (2004) "Sarcastic Messages" study, Damen et al. (2018c)¹ examined whether explicit and repeated instructions to focus on addressee protagonists' uninformed perspective helps readers to acknowledge that their privileged information was not accessible to these addressees. However, not only did Damen et al. (2018c) replicate readers' egocentric anchoring and insufficient adjustment during perspective-taking, their findings also showed that explicit perspective-focus instructions did not stimulate the adjustment phase. Regardless of an explicit focus on addressees' uninformed perspective, readers still overestimated the extent to which the uninformed protagonists shared their interpretation of the voicemail.

Gaining Interpersonal Insight

Readers in Epley et al. (2004) and Damen et al. (2018c) were more likely to rely on privileged rather than common-ground information while interpreting protagonists' perspective. Interesting to note here is that readers' perspective-taking appertained to a "top-down process" (Eyal et al., 2018), whereby readers *selected* perspective-information that, according to them, was the most relevant to use. In turn, highlighting or enhancing the accessibility of more reliable information (i.e., protagonists' perspective) did not make readers more likely to *use* this information during mental state reasoning. This finding raises the question whether, during this top-down inferencing, readers did not see the need to *adjust* their judgment because they were unaware of its inaccuracy. In this case, increasing readers' awareness of the inaccuracy of their judgments might make them better future perspective-takers.

West (1996) found some support for this line of reasoning by showing that an awareness of inaccurate (egocentric) predictions allowed perceivers to learn from their mistake and to improve their perspective-taking skills. In West (1996), participants learned to predict a target's preference for quilt patterns through the feedback they received from the target. In each trial, agents made a prediction of the target's preference for the pattern (rated from "1 = dislike very much" to "7 = like very much"). Subsequently, the target responded by showing his actual preference (rating) for the pattern, after which agents rated their own preference. Findings showed that the agents' first predictions of the target's preferences showed egocentric projection. That is, if agents liked the pattern, they assumed the target did too. Interestingly, this egocentric projection decreased on subsequent trials due to the target's feedback. The more agents learned about the target's preferences, the less likely they were to project their egocentric preferences onto the target on subsequent perspective-taking trials. Apparently, feedback about their perspective-judgments allowed agents to disregard their own preferences and to select perspective-information that more reliably predicted the target's true perspective.

In addition, recent research by Eyal and colleagues (2018) showed that receiving accurate perspective-information rather than relying on existing knowledge improved communicators' perspective-taking accuracy. In Eyal et al. (2018), romantic partners who had the opportunity to discuss each other's preferences on a range of topics were able to use this gained insight on future assessments of their partner's preferences. This in contrast to the partners in the perspective-taking conditions who were not given this discourse opportunity, but who had to rely solely on their imagination of their partner's preferences. According to Eyal et al. (2018), the act of trying to take others' perspective does not necessarily lead to a more accurate insight into these imagined mental states, because perceivers are very likely to select the wrong information to base their inferences on. In this sense, providing communicators with the opportunity to gain reliable perspective-information of which they are also aware of its appropriateness should improve perspectivetaking accuracy.

¹Damen et al.'s (2018c) preregistration, materials and data are available in the Open Science Framework (doi: 10.17605/osf.io/kv5mu).

Current Study

This study investigates the role of feedback as a strategy to gain accurate insight into others' perspective. In particular, we examine whether confronting readers with the accuracy of their perspective-judgment (i.e., feedback) allows them to accurately assess protagonists' perspective on subsequent perspective-taking trials. Additionally, we aim to explore whether readers adjust their perspective differently depending on how they gain this perspective-insight. In this study, we contrast two approaches. For the first approach, we rely on perceivers' "bottom-up inferencing" (e.g., Eyal et al., 2018), through which perceives gain interpersonal insight by perceiving others' thoughts and actions. Since this strategy indirectly communicates to perceivers whether their first assessment had been correct, we will term this approach as indirect feedback. We contrast this approach against a strategy through which perceivers gain insight by receiving explicit feedback about the accuracy of their assessment (e.g., West, 1996). We will term this type of information as *direct* feedback and we will use this term to refer to the situation in which readers are made explicitly aware that they have made an error and why their judgment was inaccurate (e.g., Ellis, Loewen, & Erlam, 2019).

This study replicates Damen et al.'s (2018c) study in which readers judge addressees' interpretation of voicemails sent by a speaker protagonist. We extend the experimental design by adding a feedback manipulation and a subsequent second measurement of readers' judgment of addressees' interpretation of the voicemail. In line with previous egocentric anchoring findings (Epley et al., 2004; Damen et al., 2018c), we expect readers to overestimate the extent to which uninformed addressee protagonists will also perceive a speaker's sarcasm. We expect that this egocentric projection occurs more at readers' first than at their second prediction of addressees' perspective. In addition, we expect that this relationship is qualified by whether readers receive feedback about the accuracy of their first prediction. In particular, compared to a baseline in which readers do not receive feedback, we expect that both feedback types will help readers to adjust their first prediction into a perspectivejudgment that more accurately reflects addressees' sincere interpretation of the message. Finally, we expect that readers' second predictions will be more accurate after they had been explicitly told their judgment had been wrong (direct feedback), than when readers need to infer the accuracy of their judgment from a description of addressees' response to the message (indirect feedback). This study is preregistered the Open Science Framework (doi in 10.17605/osf.io/kpw6u).

Method

Participants

A total of 149 undergraduates were invited to participate in the study. Seven participants were excluded because they recognized the voice-actor (N = 5) or because they were nonnative speakers of the language of the experiment (N = 2). The remaining participants were randomly allocated to the control (N = 48), direct feedback (N = 47), and indirect feedback (N = 47) conditions (105 women, 37 men, $M_{age} = 21.57$, age-range 18-38).

Design

In each condition, participants read 12 scenarios in which a speaker protagonist (Tom) left a voicemail-message on the answering machine of an addressee protagonist. After hearing this voicemail, participants judged the addressee's perception of the speaker's sarcasm both before (time 1) and after (time 2) they received feedback about their first perspective-judgment. This resulted in a 3 (*Condition*: control, direct feedback, indirect feedback) x 2 (*Time*: time 1, time 2) design in which *Condition* was treated as a between-subjects factor and *Time* as a within-subjects factor.

Procedure and Materials

We replicated and extended the experimental materials and procedure of Damen et al.'s (2018c) "interpretation" condition. On a computer, participants read 12 stories describing an event in the life of Tom. For instance, in the story "The Dance Class", participants read the following:

Tom was on his way to the first night of his ballroom dancing class when he saw Eileen, an old friend from his dorm last year. When he told her that he was on his way to a ballroom dancing class, she excitedly replied, "I'm thinking of taking that class, but I can't make it to tonight's class--I am having dinner with friends. Could you call me when you get back and tell me how it is?"

Subsequently, participants learned that Tom's experience had been either negative (e.g., "(...) the instructor spent the entire time taking attendance and filling out lengthy forms and questionnaires.") or positive (e.g., "(...) the instructor spent the entire time teaching the class fun, new dances."). Both experiences followed with Tom leaving a voicemail on the answering machine of his friend. In "The Dance Class" story, Tom left the following message:

Eileen, this is Tom. Hope you enjoyed your dinner. About that ballroom dancing class: Judging from tonight's class, I can't think of better ways to spend my Tuesday evenings. Anyways, give me back a call and I'll fill you in on the details. Bye.

We re-used the 12 voicemails from Damen et al. (2019b) who demonstrated the validity of the voicemails. In a separate rating experiment, Damen et al. (2019b) asked listeners to rate the voicemails in the absence of clarifying (positive, negative) event information (1 = as very sincere, 7 = as very sarcastic). This rating experiment showed that the voicemails sounded truly ambiguous to the uninformed listeners. That is, participants rated the voicemails to sound neither as very sarcastic or as very sincere (M = 3.73, SD = 0.83).

We followed the experimental procedure described in Damen et al. (2019b), and asked participants to indicate immediately after listening to Tom's voicemail - how the addressee protagonist (Tom's friend) would perceive the voicemail message (1 = definitely as sincere, 7 = definitelyas sarcastic). For this study, this constituted the first measurement of participants' judgment of the addressee's perception of sarcasm (time 1). All stories were presented to participants in digital booklets, and half the stories in these booklets described a positive event, whereas the other half described a negative event. We created four versions of these booklets: The first booklet contained a random order of negative versus positive events (booklet 1), and another one contained its mirror image (booklet 2). Additionally, for each booklet, we created a version that contained a reversed order of the events. In contrast to Damen et al. (2019b), we chose to focus on participants' judgments of the addressee protagonist's perspective only for those stories in which participants' privileged information suggested that Tom was being sarcastic (negative events). We thereby treated the stories that suggested Tom was being sincere (positive event) as fillers.

Additionally to our replication procedure, we manipulated the extent to which participants received feedback about their first judgment of the addressee's perception of sarcasm. This feedback was automated in the sense that the computer provided participants with either direct or indirect feedback. In the direct feedback condition, participants' received explicit feedback about the accuracy (i.e., ranging from "You are completely right!" to "You are completely wrong!") of their judgment based on the answer they provided on the 7point scale (see Table 1).

Table 1: Example of the direct feedback participants received after judging Eileen's perception of sarcasm (1 = definitely as sincere, 7 = definitely as sarcastic)

Answer	Direct Feedback
1	"You are completely right! Eileen thinks that
	Tom liked the class."
2/3	"You are almost right! Eileen thinks that Tom
	liked the class."
4	"You are not right! Eileen thinks that Tom
	liked the class."
5 / 6	"You are wrong! Eileen thinks that Tom liked
	the dance class."
7	"You are completely wrong! Eileen thinks
	that Tom liked the class."

Participants in the indirect feedback condition received feedback about the accuracy of their perspective-judgement regardless of their choice on the 7-point scale. This feedback constituted a follow-up text that described addressees' sincere interpretation of Tom's voicemail. For instance in "The Dance Class" story, participants could derive from Eileen's thoughts and actions in response to Tom's voicemail that she thought that Tom had enjoyed attending the class: After saying goodbye to her friends, Eileen cycled home. She decided she was going to search for her dancing shoes the minute she would arrive at home. She could hardly wait to join Tom in the dance class. If Tom had liked the dance class, she definitely would like it too.

In contrast to the two feedback conditions, participants in the control condition did not receive feedback about their first assessment of addressees' perception of sarcasm. Subsequently to their first judgment, these participants read a follow-up text that described the addressee's thoughts and actions that did not target her interpretation of the voicemail:

After saying goodbye to her friends, Eileen cycled home. She and her friends had enjoyed dinner. They had known each other since high school and had built up a close friendship. Although they only saw each other a few times a year, it was always like they never had been apart.

In all three conditions, participants subsequently re-judged addressees' interpretation of the voicemail (1 = definitely assincere, 7 = definitely as sarcastic). After this second assessment, participants answered a comprehension question that encouraged participants to attend to the materials. These 12 questions did not target participants' privileged information. When participants answered the comprehension question incorrectly, they were informed to attend to the materials more carefully. Participants answered almost all questions correctly (M = 10.52, SD = 1.07), but the number of correct responses differed between conditions, H(3) =9.73, p < .01. Pairwise comparisons with adjusted p-values showed that participants answered more comprehension questions correctly in the indirect feedback condition (M =10.81, SD = 0.95) than in the direct feedback condition (M =10.13, SD = 1.15), (p < .01). The accuracy scores did not differ between the control and the two feedback conditions (p > .05). After reading 12 stories, participants filled out their demographics and were debriefed about the purpose of the experiment.

Results

We computed a mean sarcasm score of participants' first (time 1) and second (time 2) judgment of addressees' perception of the speaker's sarcasm for the scenarios in which participants' privileged information suggested that the speaker was being sarcastic (negative events). We submitted these mean scores to a mixed analysis of variance in which *Condition* (control, direct feedback, indirect feedback) was treated as a between-subjects factor and participants' judgment of addressees' perception of sarcasm (*Time*; time 1, time 2) as a within-subjects factor. The means of participants' judgment of addressees' perception of sarcasm as a function of *Time* and *Condition* are presented in Figure 1.



Figure 1: Mean scores of participants' judgment of addressees' perception of sarcasm (1 = definitely as sincere, 7 = definitely as sarcastic) as a function of *Time* (time 1, time 2) and *Condition* (control, direct feedback, indirect feedback).

In line with our first hypothesis, participants thought addressees would perceive the speaker's sarcasm more at their first ($M_{time l} = 3.68$, SD = 1.19) than at their second perspective-judgment ($M_{time 2} = 2.42$, SD = 1.29), F(1, 139) = 198.96, p < .001, $\eta_p^2 = .59^2$.

We expected that feedback (direct, indirect) would help participants to adjust their first prediction of addressees' perspective into a judgment that more accurately reflected addressees' sincere interpretation of the voicemail than when this feedback was absent (control). Results indeed showed that the main effect of Time was qualified by a significant interaction with *Condition*, F(2, 139) = 35.93, p < .001, $\eta_p^2 =$ $.34^2$. Pairwise comparisons that compared participants' perspective-taking accuracy of their second perspectivejudgment showed that participants had more successfully adjusted their first prediction after they had received both direct (M = 1.89, SD = 0.13) and indirect (M = 1.58, SD =0.13) feedback, compared to the control condition in which this feedback was absent (M = 3.75, SD = 0.12), p < .001. The accuracy of participants' second prediction did not differ between the two feedback types (p = .245).

Interestingly, results also showed that participants' perspective-taking accuracy of their first prediction differed as a function of *Condition*. Pairwise comparison revealed that participants in the control condition (M = 4.43, SD = 0.14) thought addressees would perceive sarcasm more at time 1 than the participants in both the direct (M = 2.67, SD = 0.14, p < .001) and indirect (M = 3.93, SD = 0.14, p < .05) feedback conditions. For their first prediction, participants in the indirect feedback condition also thought addressees would perceive sarcasm more than the participants in the direct feedback condition (p < .001).

To examine whether the degree to which participants adjusted their perspective differed as a function of *Condition*, we computed a mean difference score between participants' first and second judgment of addressees' perception of the speaker's sarcasm and submitted this difference-score to an one-way analysis of variance. This follow-up analysis showed that participants' perspective-adjustments differed between conditions, F(2, 139) = 35.93, p < .001. Simple contrasts revealed that participants had adjusted their perspective more in both the direct ($M_{difference} = 0.78$, SE = 0.16) and indirect ($M_{difference} = 2.34$, SE = 0.16) feedback conditions compared to the control condition ($M_{difference} = 0.68$, SE = 0.15), t(139) = -4.63, p < .001. In addition, participants who had received indirect feedback had adjusted their perspective more than those who had received direct feedback, t(139) = 7.10, p < .001.

Discussion

This study examined the influence of feedback on readers' perspective-taking. In an extension study of Damen et al. (2018c), we have shown that readers learned from the feedback they received to make better perspective-taking judgments immediately after the feedback (within the same trial) and on subsequent trials. The extent to which readers improved their perspective-taking accuracy depended on the type of feedback they received. In contrast to our expectation, we found that readers' predictions were more accurate immediately after indirect rather than direct feedback. This could have been due to the benefit these readers had from having to exert more cognitive effort to calculate addressees' interpretation. That is, readers who received the feedback indirectly not only had to infer addressees' interpretation of the voicemail from the description of addressees' actions and thoughts, these readers also had translate this information to a reliable score (i.e., 1 = definitely as sincere, 7 = definitelyas sarcastic). This in contrast to the readers who were explicitly informed about the extent to which their judgment deviated from addressees' actual interpretation (direct feedback) and who, therefore, could have converted this feedback to a rating more easily.

Interestingly, the accuracy of readers' first predictions also differed due to the type of feedback they had received on previous trials. Although readers receiving indirect feedback made better adjustment within the same perspective-taking trial, their first predictions on new trials showed more egocentric projection errors than those who received direct feedback³. This finding needs to be interpreted with caution, because it could have been the result of task characteristics. That is, for each trial, readers receiving direct feedback could have learned that a sincere interpretation (i.e., a score of 1) was the correct response for all experimental trials, reducing egocentric projection on first predictions. This in contrast to the indirect feedback condition in which readers could have been more cautious to assume the addressees' sincere interpretation until they had actually received addressees' reaction to the voicemail. However, in all experimental conditions and for each experimental trial, the correct

² The findings remained unchanged when we controlled for the presentation order of the scenarios.

³ This finding could also be an explanation as to why we see bigger adjustments in the indirect than the direct feedback condition.

response always reflected addressees' sincere interpretation of the messages. Therefore, this possible confound cannot explain why there are still significant differences within experimental trials and adjustment differences across conditions.

Although readers in the control condition did not receive feedback about the accuracy of their interpretation, these readers also adjusted their first prediction to a more accurate second prediction of the addressees' perspective. This 'positive' adjustment could have been the result of readers reflecting on their earlier assessment and subsequently coming to a more accurate conclusion (e.g., Epley et al., 2004). However, important to note is that these adjustments were still less accurate than when readers were provided with reliable information (feedback) to base their re-assessment on.

In line with findings of both West (1996) and Eval and colleagues (2018), this study showed that providing readers with reliable perspective-information ("perspective-getting") allows them to disregard their own knowledge and to use this new information to more accurately predict others' perspective. It should be noted that readers in this experiment paid attention to the feedback they received and, therefore, could have been more aware that they could or should use this information to adjust their predictions appropriately. In addition, in Eyal et al. (2018), the discourse through which partners gained relevant perspective-information was demarcated with regard to the topics partners had to discuss. Therefore, an interesting question for future research is whether this "perspective-getting" effect generalizes to situations in which reliable perspective-information (and its appropriateness) is not been made explicit.

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