Changing Minds: The Effect of Stimulated Attention to Another's Different Point of View on Visual Perspective-Taking

Debby Damen (d.j.damen@uvt.nl), Marije van Amelsvoort (m.a.a.vanamelsvoort@uvt.nl), Per van der Wijst (per.vanderwijst@uvt.nl), Emiel Krahmer (e.j.krahmer@uvt.nl)
Tilburg center for Cognition and Communication, Tilburg University, PO Box 90153, 5000 LE, The Netherlands

Abstract

Two experiments examined whether an explicit attention to another's perspective fosters perspective-taking. The first experiment attempted to replicate Todd et al.'s (2010) findings that a mind-set focusing on self-other differences incites respondents to adopt another person's perspective in a subsequent task. Results showed that perceivers focusing on self-other differences were just as likely to describe an object's location from their egocentric perspective as perceivers focusing on self-other similarities. The second experiment intensified perceivers' awareness of self-other differences by allocating them to one of the perspective-settings (none, self-focus, other-focus). Participants in the perspective-settings received explicit instructions to regard their own (self-focus) or another person's (other-focus) viewpoint during the perspective-taking task. Findings revealed that other-focused respondents were more likely to adopt another person's perspective than self-focused respondents. Compared to the baseline, however, an explicit self- or other-focus did not foster perspective-taking. Our findings indicate the robustness of respondents' egocentric bias.

Keywords: perspective-taking; self-other differences; egocentricity bias; replication study

Introduction

Our ability to imaging ourselves in another person's shoes is one of the most central components for successful social functioning (Davis, 1983). Ample research shows, however, that perceivers often fail to put themselves in another person's position even when the social context requires them to do so (e.g., Wardlow Lane et al., 2006). These failed perspective-taking attempts are said to be the result of perceivers' bias to judge social situations from their egocentric viewpoint (e.g., Keysar et al., 1998). The ease by which perceivers have access to their own perspective - in contrast to the impermeable nature of the other's mind - makes perceivers likely to project (e.g., Ames, 2005) their own perspective onto others. It seems that without conscious effort of the perceiver (e.g., Epley et al., 2004), perspective-taking occurs relatively infrequently. Considering that perspective-taking is central in social interaction, it is important to explore what is needed to overcome an egocentric approach and to engage in perspective-taking.

Research by Todd and his colleagues (2010) has shown that perceivers are likely to adjust away from an egocentric interpretation if they see themselves and others as being unique and distinct. Their research showed that visually priming perceivers with a mind-set that focuses on visual differences between pictures translated to acknowledging differences in perspectives in a subsequent spatial perspective-taking task. That is, those primed with a cognitive orientation to acknowledge self-other differences rather than self-other similarities were more inclined to adopt another person's perspective.

The question that is raised here, however, is whether perceivers' awareness of self-other differences can also be activated without the manipulation of obvious, visible differences, and whether this awareness can be raised during perceivers' communicative interaction. This question is extremely relevant when you think of the common situations in which perspective-taking between not-so-different others, such as friends, family members or co-workers, is crucial for relationship well-being and conflict resolution (e.g., Gehlback, 2004). In the absence of visible differential cues, can a general awareness of differences in perspectives be activated in the mind of the perceiver?

Third-party interventions, such as family therapists and mediators, regularly employ interpersonal perception questions (Tomm, 1985), such as "*What does your partner see/think/believe?",* that explicitly and repeatedly force receivers of such questions to read the mind of their interlocutor. These explicit perception questions are said to stimulate interlocutors to engage in perspective-taking behavior and to result in interlocutors' general awareness that differences in perspectives do exist (Tomm, 1985). To our knowledge, however, no research has yet examined whether explicit perception instructions actually contribute to perceivers' general awareness of self-other differences in perspectives. This research aims at providing a first step in investigating the influence of explicit perception instructions on perceivers' subsequent propensity to regard self-other perspective differences. In particular, we aim to explore the extent to which these explicit instructions might reduce perceivers' tendency to judge situations from their egocentric viewpoint.

The Present Research

Two experiments investigated the influence of perceivers' awareness of self-other perspective differences on visual perspective-taking. The ability to represent how objects appear to others is argued to be an important skill that perceivers need to acquire in order to engage in higher levels of perspective-taking, such as psychological perspective-taking (e.g., Taylor, 1988). Research even argues that inciting perceivers to regard visual perspectives also helps them to accurately represent the other's psychological perspective (Erle & Topolinsky, 2017). The first experiment aimed to replicate Todd et al. (2010) findings that a picture-

comparison task can activate a difference-mind-set that subsequently stimulates perceivers to adopt another person's spatial perspective. A second experiment examined whether explicit perception instructions can also activate perceivers' awareness of self-other perspective differences, and whether this awareness increases perceivers' tendency to adopt another person's viewpoint. In this way, these two studies further our understanding of the mechanisms that underlie the perspective-taking process (i.e., regarding self-other differences) and the extent to which explicit instructions to attend to another's divergent vantage point promotes perspective-taking.

Experiment 1

The first experiment investigated the influence of a difference-mind-set on participants' tendency to adopt the visual perspective of another person. For this, we fully replicated the experimental design of Todd et al. (2010) first experiment, and asked respondents to take part in a spatial perspective-taking task (e.g., Tversky & Hard, 2009). During this task, respondents described the location of an object that could be located from their own spatial perspective or from the perspective of another person. As in Todd et al., we predicted that the respondents primed with a difference mind-set would be less influenced by their egocentric perspective and thus more likely to adopt an other-oriented perspective than respondents primed with a similarity mind-set or participants in the baseline.

Method

Participants and Design

128 participants (46 more than in the original study) were recruited from Tilburg university and randomly assigned to one of the three conditions (difference-mind-set, similarity-mind-set, or control). The data of four participants were excluded from the analysis, due to an error in the experimental procedure (N = 2), or due to their knowledge about the actual purpose of the experiment (N = 2). This resulted in 43 participants in the difference-mind-set condition, 39 in the similarity-mind-set condition and 42 in the control condition. The age of the participants ranged from 17 to 36 years (M = 21.55; SD = 3.28), and the majority of participants (72%) was female.

Procedure and Materials

Difference or Similarity Mind-Set The priming materials were requested from Todd et al. (2010) and translated into Dutch. On entering the lab, participants were told that they were participating in a study investigating the effectiveness of several experimental stimuli. To prime participants with either a difference- or similarity-mind-set, we replicated the picture-comparison task from Todd et al. (2010). In this task, participants compared four pairs of pictures of drawn houses and listed either three differences (difference-mind-set) or three similarities (similarity-mind-set) between each presented pair. Participants in the control condition were only confronted with four singular pictures of drawn houses for which they were asked to describe them by listing three attributes for each picture.

Spatial Perspective-Taking After the priming task, participants completed a spatial perspective-taking task in which they were shown a photographed scene of a man seated behind a table facing the participants (figure 1). We re-enacted Todd et al. (2010) visual scene, because we wanted to use different versions of this scene in experiment 2. On the table, a book and bottle were placed using a clear left and right distinction. Among several filler questions, participants answered the critical question "*On what side of the table is the book?*". Answers that located the book from participants' own viewpoint *("right side"*) were scored as (0) self-oriented responses, whereas answers that located the book from the man's viewpoint (*"left side"*) were scored as (1) other-oriented responses. Descriptions that fit in neither category (e.g., "*at the top*" or "*in the middle*") were excluded ($N_{difference\text{-}mind\text{-}set}$ = 6; $N_{control}$ = 4).

Figure 1: The photographed scene in the spatial perspective-taking task.

On top of replicating the experimental procedure of Todd et al. (2010), we administered three subsequent tasks that measured respondents' self-reported perspective-taking tendency and their abilities to engage in perspective-taking. This way, we were able to account for possible underlying mechanisms that could influence perceivers' spatial perspective-taking, without harming the replication study.

Self-reported Perspective-Taking We assessed participants' tendency to regard the man's perspective by six items. Participants indicated how much they agreed with the declarative sentences (e.g., "*I generally tried to imagine how the man in the picture looked at the situation"*) on a 7-point scale (1 = *strongly disagree*; 7 = *strongly agree*). The scale had a high reliability (α = .77), and the items represented a one-dimensional scale with all factors loading above .40.

Mental Rotation Ability To account for the possible influence of participants' mental rotation ability on their propensity to regard the spatial perspective of another person, participants took take part in a shortened version of Cooper and Shepard's (1973) mental rotation task. Participants indicated for 24 experimental trials whether a visual display

was presented canonically or reflected. The visual displays were presented in different orientation degrees (i.e., from 0 to 360 degrees). Participants' mental rotation proficiency was estimated by calculating their overall error rate (in proportions).

Autism-Spectrum Quotient Scale Previous research indicated that people vary in their social and cognitive ability to engage in perspective-taking (e.g., Baron-Cohen et al., 2001). We asked participants to respond to an abridged, validated and Dutch version of the Autism-Spectrum Quotient Scale (AQ) (original by Baron-Cohen et al., Dutch version Hoekstra et al., 2011). This allowed us to account for the differences in participants' perspective-taking ability. The abridged version consisted out of 28 declarative sentences (e.g., *"I find it difficult to work out peoples' intentions"*) that were measured on a 5-point scale (1= *strongly disagree*; 5 = *strongly agree*). Higher values indicated that participants had a low social and cognitive ability to engage in perspective-taking. The AQ had a very good internal consistency ($\alpha = .89$). After filling out the AQ-Short, we collected participants' demographics, debriefed and thanked them, and rewarded them with course credits.

Results

In table 1, the mean proportions of other-oriented location descriptions in the original Todd et al. (2010) study and in our replication study are presented.

Table 1: Mean Proportions of Other-Oriented Location Descriptions as a Function of Condition.

Condition	Other-Oriented Responses	
	Todd et al. (2010)	Experiment 1
Control	.34 (.48)	.39 (.50)
Similarity	.27 (.45)	.31 (.47)
Difference	.62 (.50)	.27 (.45)

Note. Standard deviations are presented in parentheses.

The proportions of other-oriented responses did not differ much between the control ($M = .39$, $SD = .50$), similarity-mind-set ($M = .31$, $SD = .47$) and difference-mind-set ($M = .27$, $SD = .45$) conditions. The participants in the difference-mind-set condition in our replication study were two times less likely to produce an other-oriented response, than those participants in the original study ($M = .62$, $SD = .50$).

Todd and his colleagues (2010) performed a one-way analysis of variance (ANOVA) with planned comparisons to investigate the influence of the primed mind-sets on the probability of an other-oriented location description to occur. We replicated this method of analysis and did not find a significant main effect of condition, $F(2, 111) = 0.69$, $p = .503$. Participants with a difference-mind-set were just as likely to provide a location description that was oriented from the perspective of the man in the photograph as the participants with a similarity-mind-set, $t(111) = 0.35$, $p = .365$, and the participants in the control condition, $t(111) = 1.14$, $p = .128$. Participants' propensity to provide an other-oriented location description also did not differ between the control and similarity-mind-set condition, $t(111) = 0.81$, $p = .210$.

Moderation Analysis We construed a conceptual model (PROCESS model 2; Hayes, 2013) that investigated the relationship between the primed mind-set and the generated other-oriented responses, while controlling for participants' mental rotation (MR) and perspective-taking (AQ) abilities. We dummy coded our predictors and construed two models: difference- vs. similarity-mind-set (D_i), and difference-mind-set vs. control (D_j). We corrected for multiple tests by employing the Bonferroni correction ($\alpha \leq .025$; Hayes & Preacher, 2014). The bootstrapped confidence intervals were obtained over 10.000 iterations, and predictors were centered before the analysis.

The results of the one-way ANOVA were reflected in the PROCESS analyses as condition did not have a direct effect on other-oriented responses ($b_i = 0.15$, $SE = 0.52$, $z = 0.29$, $p = .770$, 95% BCa CI [-0.86, 1.16]; $b_j = -0.42$, $SE = 0.52$, $z = -0.81$, $p = .420$, 95% BCa CI [-1.44, 0.60]). Participants' AQ-score did not moderate the relationship between the primed mind-set and other-oriented responses ($b_i = -0.28$, $SE = 1.47$, $z = -0.19$, $p = .848$, 95% BCa CI [-3.17, 2.61]; $b_j = 0.18$, $SE = 1.25$, $z = 0.14$, $p = .887$, 95% BCa CI [-2.27, 2.63]), nor did their mental rotation ability ($b_i = 1.55$, $SE = 4.21$, $z = 0.37$, $p = .713$, 95% BCa CI [-6.70, 9.79]; $b_j = 3.03$, $SE = 4.59$, $z = 0.66$, $p = .510$, 95% BCa CI [-5.97, 12.02]).

Participants' Perspective-Taking Tendency Participants in the control ($M = 3.92$, $SD = 1.23$), similarity- ($M = 3.85$, $SD = 0.99$) and difference-mind-set ($M = 3.85$, $SD = 1.16$) condition reported the same perspective-taking tendency, $F(2, 121) = .04$, $p = .958$. A follow-up logistic regression revealed that participants' self-reported perspective-taking tendency did, however, significantly predict their behavior during the spatial perspective-taking task ($b = .84$, $SE = .21$, $p < .001$, 95% CI [1.54, 3.47]), representing a positive association. As participants' perspective-taking increased, so did the likelihood of them providing an other-oriented response that located the book from the man's perspective.

Discussion

The first experiment investigated whether a mind-set focusing on self-other perspective differences rather than self-other similarities stimulates perceptual perspective-taking. Whereas Todd and his colleagues found that priming participants with a difference- rather than similarity-mind-set increased the likelihood of perceivers adopting another person's visual perspective, we did not replicate this finding. In our experiment, participants with a primed difference-mind-set were just as likely to provide a location description

that oriented the target object from another's visual perspective as participants without or with a primed similarity-mind-set. This suggests that visually priming respondents to acknowledge differences between picture-pairs does not translate to also acknowledge self-other differences in perspectives. This might explain why we did not replicate the effect of the visual priming method on spatial perspective-taking in this study. The results from participants' self-reported perspective-taking tendency and its positive correlation to actual perspective-taking behavior strengthen our findings. Participants who reported that they had regarded the man's perspective during the spatial perspective-taking task had also been more likely to locate the book from the man's perspective. Interestingly, regardless whether a self-other difference-, self-other similarity- or no mind-set was mentally activated, these self-reported tendencies did not differ between the three conditions. This strengthens the conclusion that the picture-comparison task did not influence participants' propensity to adopt another person's viewpoint.

This replication study further showed respondents' social and cognitive ability to regard others' perspectives (AQ-score) and their ability to mentally represent and rotate objects did not moderate the relationship between the primed mind-sets and visual perspective-taking.

Experiment 2

The second experiment examined whether explicit instructions to acknowledge another person's viewpoint might serve as a better stimulant to incite perceivers to adopt this person's perspective. Because an awareness of self-other differences should cue the inappropriateness of egocentric anchoring (e.g., Epley et al., 2004), we expected that explicit instructions to acknowledge another person's distinct perspective would reduce perceivers' egocentrism. In contrast, we expected perceivers' egocentrism to increase by explicit instructions to acknowledge their own perspective. To test these hypotheses, we replicated the previous experiment and intensified the perspective-awareness manipulation. Instead of visually priming self-other differences prior to the spatial perspective-taking, we raised perceivers' awareness of self-other differences by explicitly instructing them to regard another person's viewpoint during the spatial perspective-taking task. We explored the extent to which these explicit instructions stimulated perceivers to step in another person's shoes.

Method

Participants and Design

In a between-subjects design, we investigated the extent to which a perspective-focus (self-focus, other-focus, none) would influence participants' propensity to engage in perspective-taking. We recruited 80 participants from the university and randomly assigned them to one of the two perspective conditions (i.e., self-focus, other-focus). For the control condition, we used the data of the 42 participants that were recruited during experiment 1. The data of 2 participants were excluded, due to them having prior knowledge about the purpose of the experiment. The age of the 120 participants (32 males, 88 females, $N_{self\text{-}focus} = 38$, $N_{other\text{-}focus} = 40$, $N_{control} = 42$) ranged from 17 to 36 ($M = 21.39$; $SD = 3.01$).

Procedure and Materials

We replicated the complete procedure from the first experiment with only one important difference: instead of priming participants with a difference- or similarity-mind-set before the spatial perspective-taking task, we explicitly stimulated participants' self- versus other-focus during the task itself. At the start of the experiment, all participants filled out a control version of the picture-comparison task during which they described four singular pictures of drawn houses by listing three attributes for each picture. Hereafter, the spatial perspective-taking task was administered. However, before participants indicated the location of the book, they answered four explicit perception questions that were embedded among fillers. Participants were explicitly instructed to indicate how objects appeared to themselves (self-focus) or to the man in the photograph (other-focus) (table 2).

Table 2: The objects, scenes and object-rotations used for the explicit perception instructions

Object		Rotation	Option 1	Option 2
Laptop		Front/Back		
Picture frame		Front/Back		
Lamp		Left/Right		
Mug		Left/Right		

For example, the first question presented participants with a scene in which a man looked at a laptop placed before him. Below this picture, participants saw two pictures of the laptop: one showing the laptop from the front (option 1) and one showing the laptop from the back (option 2). Participants in the self-focus condition answered the perception question: *"How does the laptop appear to you?"*, whereas participants in the other-focus condition answered: *"How does the laptop appear to the man in the picture?"*. Participants selected the option that depicted the laptop in the right rotation. To ensure the intrusiveness of this perspective-awareness training, we chose two different object rotations (back/front, left/right). If participants chose the wrong option, they had to answer the question again. To disallow routineness, we scrambled the options for the repeated questions. Afterwards, participants

indicated the location of the book. We excluded four responses ($N_{self\text{-}focus} = 1$, $N_{other\text{-}focus} = 3$, $N_{control} = 4$) that located the book *"in the middle"* or *"on the upper side"*.

The spatial perspective-taking task was followed by recording participants' self-reported perspective-taking tendency ($\alpha = .78$), and their mental rotation (MR) and perspective-taking (AQ, $\alpha = .91$) abilities. After collecting their demographics, participants were thanked, debriefed and given a small remuneration for their participation.

Results

Training Performance Perspective errors mainly occurred in the other-focused condition in which participants indicated how the objects appeared to the man in the picture ($N_{other\text{-}focus} = 4$, $N_{self\text{-}focus} = 1$). One participant in the self-focused condition made the same error twice, whereas the other participants only made the error once. Perspective errors mainly occurred for the objects with a left/right ($N_{lamp} = 3$, $N_{mug} = 1$) versus a front/back ($N_{picture\ frame} = 1$) rotation.

Moderation Analysis The least other-oriented responses were given in the self-focus condition ($M = .16$, $SD = .37$), followed by the control ($M = .39$, $SD = .50$) and other-focus ($M = .51$, $SD = .51$) conditions. We construed a conceptual model (PROCESS model 2) that investigated the relationship between the perspective-focus and the other-oriented responses, while controlling for participants' mental rotation (MR) and perspective-taking (AQ) abilities. We dummy coded our predictors and construed three models: control vs. self-focus (D_i), control vs. other-focus (D_j), self-focus vs. other-focus (D_k). We employed the Bonferroni correction ($\alpha \leq .017$) to correct for multiple tests.

Results showed that the direct effect of the explicit self- versus other-focus on oriented responses was significant ($b_k = 1.69$, $SE = .59$, $z = 2.84$, $p = .005$, 95% BCa CI [0.52, 2.85]). The direct effect of the control versus self-focus condition ($b_i = -1.56$, $SE = 0.82$, $z = -1.89$, $p = .0585$, 95% BCa CI [-3.17, 0.06]), and the control versus other-focus condition ($b_j = 0.11$, $SE = 0.71$, $z = 0.15$, $p = .880$, 95% BCa CI [-1.28, 1.49]) on other-oriented responses were both non-significant.

A follow-up analysis in which we compared the self-focus and other-focus conditions revealed that other-focused participants ($M = .51$, $SD = .51$) were 5.4 times more likely to provide a location description that oriented the book from the man's perspective, than self-focused participants ($M = .16$, $SD = .37$), $\chi^2(1) = 10.21$, $p = .001$, representing a medium association (*Cramer's V* = .37).

Participants' AQ-score did not moderate the relationship between the trained perspective-focus and the occurrence of other-oriented responses ($b_i = 0.23$, $SE = 1.17$, $z = 0.19$, $p = .847$, 95% BCa CI [-2.06, 2.51]; $b_j = 0.27$, $SE = 1.08$, $z = 0.25$, $p = .800$, 95% BCa CI [-1.84, 2.39]; $b_k = 0.05$, $SE = 1.47$, $z = 0.03$, $p = .973$, 95% BCa CI [-2.83, 2.93]), nor did their mental rotation ability ($b_i = 9.62$, $SE = 5.63$, $z = 1.71$, $p = .087$, 95% BCa CI [-1.41, 20.65]; $b_j = 4.87$, $SE = 4.11$, $z = 1.18$, $p = .237$, 95% BCa CI [-3.20, 12.93]; $b_k = -4.75$, $SE = 5.29$, $z = -0.90$, $p = .369$, 95% BCa CI [-15.13, 5.62]).

Participants' Perspective-Taking Tendency Participants' self-reported perspective-taking tendency significantly differed between the three conditions, *Welch's* $F(2, 75.92) = 49.79$, $p < .001$. Bonferroni post-hoc comparisons revealed that self-focused participants ($M = 3.37$, $SD = .68$) reported a significant lower perspective-taking tendency than the other-focused participants ($M = 5.15$, $SD = .88$), $p < .001$, and the participants in the control condition ($M = 3.92$, $SD = 1.23$), $p = .04$ Participants in the control condition also reported a lower perspective-taking tendency than the other-focused participants, $p < .001$.

A follow-up logistics regression analysis revealed a significant positive relation between participants' perspective-taking tendency and other-oriented location descriptions ($b = 1.05$, $SE = 0.28$, $p < .001$, 95% CI [1.66, 4.90]).

General Discussion

The second experiment investigated the influence of explicit perception instructions on visual perspective-taking. Results showed that perceivers who were explicitly instructed to acknowledge another person's perspective were more likely to adopt this person's perspective than those stimulated to be self-focused. Other-focused participants also reported a higher perspective-taking tendency than self-focused and control participants, and this tendency was positively correlated to actual perspective-taking behavior. Those with a higher self-reported perspective-taking tendency had also been more likely to adopt another person's viewpoint.

Interestingly, in the control condition in which perceivers did not receive explicit self- or other-perception instructions, the majority located the object on the basis of their own spatial perspective. Explicit other-focus instructions did not decrease this egocentric anchoring tendency. That is, other-focused participants were just as likely to provide a self-oriented response and locate the object on the basis of their own spatial position as the participants in the baseline. This supports previous findings that the ease by which one's egocentric perspective is accessible makes perspective-judgments likely to be egocentrically biased (e.g., Ames, 2005; Epley et al., 2004).

Important to note is that even though the majority of respondents used their egocentric perspective as a spatial anchor point to describe the object's location, this does not imply that these perceivers did not recognize that the object, from another person's perspective, was located on the other side of the table. The low error rate of the perspective-awareness training in the second experiment clearly indicates that respondents were able to regard the situation from the other person's vantage point. The explicit other-focus instructions during the perspective-awareness training thus helped perceivers to acknowledge the other person's different spatial perspective. It appears, however, that this recognition of differences in perspectives does not influence how respondents actually describe the situation that is presented before them. In the second experiment, explicit instructions

to perceive the spatial situation from an allocentric vantage point did not stimulate respondents to describe the object's location from an allocentric perspective when we compared these responses to the baseline.

The question that arises here is whether perceivers' explicit awareness of self-other perspective differences encourages spontaneous perspective-taking when the communicative setting really demands perceivers to regard differences in perspectives. The experiments presented in this paper do not represent truly communicative situations in which the perceiver and the target interact and in which accurate perspective-judgments are beneficial to the interaction. Previous research has shown that perspective-taking does occur spontaneously when perceivers have a reason to suspect the target will react on perceivers' perspective-taking behavior (e.g., Tversky & Hard, 2009). On the other hand, studies have also shown that highlighting the importance of perspective-taking in communicative settings can, ironically, boost perceivers' egocentrism (Wardlow Lane et al., 2006). It thus remains to be investigated whether explicit self-other perspective differences stimulate respondents to adjust their initial egocentric response into an allocentric judgement when the setting requires perspective-taking to occur.

The two studies presented in this paper examined whether a difference-mind-set (experiment 1) or explicit perception instructions (experiment 2) raise perceivers' awareness of differences in perspectives and, as a result, makes them more likely to adopt another person's visual perspective. Findings of both studies support the existence of perceivers' egocentricity bias and its robustness. Compared to the baseline, neither a primed mind-set focusing on self-other differences (experiment 1) nor explicit and repeated instructions to acknowledge the visual perspective of another person (experiment 2) reduced participants' egocentric anchoring tendency. Respondents were very likely to interpret the situation from their own visual perspective, even though they were made aware of the other person's different point of view. Egocentric perspectives seem to come rather naturally and automatically, and adjusting away from these fast and rapid anchors– even with cues highlighting different possible anchor points– remains difficult.

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