Journal of Experimental Psychology: General

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Online First Publication, April 16, 2012. doi: 10.1037/a0028232

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0096-3445/12/$12.00 DOI: 10.1037/a0028232

Anchoring and Adjustment During Social Inferences

Diana I. Tamir and Jason P. Mitchell
Harvard University

Simulation theories of social cognition suggest that people use their own mental states to understand those of others—particularly similar others. However, perceivers cannot rely solely on self-knowledge to understand another person; they must also correct for differences between the self and others. Here we investigated serial adjustment as a mechanism for correction from self-knowledge anchors during social inferences. In 3 studies, participants judged the attitudes of a similar or dissimilar person and reported their own attitudes. For each item, we calculated the discrepancy between responses for the self and other. The adjustment process unfolds serially, so to the extent that individuals indeed anchor on self-knowledge and then adjust away, trials with a large amount of self–other discrepancy should be associated with longer response times, whereas small self–other discrepancy should correspond to shorter response times. Analyses consistently revealed this positive linear relationship between reaction time and self–other discrepancy, evidence of anchoring-and-adjustment, but only during judgments of similar targets. These results suggest that perceivers mentalize about similar others using the cognitive process of anchoring-and-adjustment.

Keywords: mentalizing, anchoring-and-adjustment, social cognition, simulation, self

Everyday social interaction requires humans to infer the thoughts, feelings, or preferences of other people. Despite a lack of direct access to others' minds, humans have a unique capacity to infer the mental states of other people. Explaining how humans so fluently perceive others' thoughts and feelings poses a persistent challenge to social psychology. Luckily, perceivers have privileged access to a mental system that is highly representative of those that they are trying to understand: their own minds. Indeed, simulation theories of social cognition capitalize on the possibility that one's own mental experiences can serve as a model for the experiences of others. The simulation strategy of mentalizing suggests that perceivers use their own characteristics or likely choices as a source of relevant information when inferring another person's personality, preferences, or perspective. Although humans cannot ever directly access the goings-on of others' minds, we can gain insight into the ways that others think or feel by simulating their experience in our own mind. For example, to infer another's mental state, one might first mentally imagine experiencing that person's situation, read off the evoked mental state, and then assume that the other person would feel similarly.

However, indiscriminately projecting self-knowledge onto others will not result in successful or efficient social inferences. For simulation strategies to work properly, a perceiver must have experiences that are relevant to those of the social inference target. If this is not the case, a perceiver's self-knowledge likely will not apply to the target and so cannot provide an informative starting point for understanding the target's experience. At the same time, the perceiver must acknowledge that she is not identical to the social target. The perceiver must correct away from self-knowledge to account for residual dissimilarities between self and other. Before simulation theories can claim a complete understanding of how people make social inferences, both of these conditions must first be understood. To that end, this article will investigate (a) factors that influence the relevance of self-knowledge in social inferences and (b) the cognitive mechanisms by which people accomplish correction.

Self and Social Inferences

Previous social psychology research supports the notion that people use what they know about their own mind to infer the thoughts and feelings of others. For example, people tend to overestimate the extent to which others hold the same opinions (Krueger & Clement, 1994; Ross, Greene, & House, 1977) or engage in the same activities (Allport, 1924; Nickerson, 1999) as oneself, a bias known as the *false consensus effect*. Furthermore, people find it especially difficult to accurately represent the mental states of someone who lacks knowledge that they themselves hold. For example, research on *hindsight bias* (Fischhoff, 1975; Fischhoff & Beyth, 1975), *curse of knowledge* effects (Camerer, Loewenstein, & Weber, 1989; Keysar & Bly, 1995; Keysar, Ginzel, & Bazerman, 1995), and *false belief* tasks (Wellman, Cross, & Watson, 2001) illustrate that people consistently overestimate the extent to which others can access information to which they alone are privy (Epley, Keysar, Van Boven, & Gilovich, 2004). The salience of self-knowledge also causes people to consistently overestimate the extent to which others can access their own internal-

Diana I. Tamir and Jason P. Mitchell, Department of Psychology, Harvard University.

Diana I. Tamir was supported by a graduate research fellowship from the National Science Foundation. We thank Bay McCulloch, Emma Templeton, and Adam Waytz for their helpful advice and assistance.

Correspondence concerning this article should be addressed to Diana I. Tamir, Department of Psychology, Harvard University, Northwest Science Building, 52 Oxford Street, Cambridge, MA 02138. E-mail: dtamir@fas.harvard.edu

ized thoughts, feelings, and experiences (Gilovich, Medvec, & Savitsky, 2000; Gilovich, Savitsky, & Medvec, 1998; Vorauer & Claude, 1998), and to inaccurately assess their own strengths and weaknesses relative to the comparable strengths and weaknesses of others (Krueger & Clement, 1994).

Recent neuroimaging studies also suggest that perceivers use their own introspection to understand the minds of others. The same neural region—the medial prefrontal cortex (MPFC)—supports both introspection about the self (Kelley et al., 2002; Northoff et al., 2006) and inferences about the mental states of others (Frith & Frith, 1999; Gallagher et al., 2000; Gallagher, Jack, Roepstorff, & Frith, 2002). A meta-analysis demonstrated considerable overlap for thinking about both self and other in this particular region of the MPFC (Amodio & Frith, 2006). Furthermore, studies that directly compared thinking about the self and thinking about another target also suggest that these two processes share a common neural basis (Jenkins, Macrae, & Mitchell, 2008; Mitchell, Banaji, & Macrae, 2005; Mitchell, Macrae, & Banaji, 2006). To the extent that shared neural activations reflect shared cognitive functions, these results suggest that perceivers may recruit similar processes or content when thinking about their own thoughts or feelings and inferring those of others.

Similarity

Recent research has identified circumstances in which self-knowledge is especially likely to influence social inference. According to the similarity contingency model of mentalizing (Ames, 2004b), perceivers use one of two strategies to make social inferences, depending on the perceived similarity of the target. Perceivers rely more on self-knowledge when a target is similar to the self because of shared group membership, attitudes, or beliefs (Ames, 2004a, 2004b); in contrast, perceivers rely more on stereotypes when a target is dissimilar from the self.

Recent neuroimaging studies have also investigated how people mentalize about similar and dissimilar others. These studies have shown that mentalizing about people similar to oneself recruits regions associated with self-referential processing, in the ventral aspect of the medial prefrontal cortex (vMPFC; Jenkins et al., 2008; Mitchell et al., 2006), suggesting that mentalizing about similar others recruits the same cognitive processes as self-referential thought. In contrast, mentalizing about dissimilar others recruits a different region from the one used for thinking about the self and similar others (Mitchell et al., 2006). These results suggest that, whereas mentalizing about similar others recruits self-referential thought, mentalizing about dissimilar others recruits a different cognitive process.

Anchoring and Adjustment

As described earlier, both behavioral and neuroimaging research suggests that people often recruit self-knowledge when solving social inference problems—particularly about similar others. However, to successfully infer another person's thoughts or feelings, a perceiver must recognize that the other person's experiences are not identical to her own. Thus, in addition to relying on self-knowledge during a social inference, perceivers must also correct for differences between the self and other; that is, they must account for idiosyncrasies of the social target. In other words, although the self may serve as a relevant starting point for a social inference, perceivers must also correct away from this starting point, granting each individual her own unique experiences. Simulation accounts of social inferences must therefore also provide a mechanism for how people correct away from the egocentric anchor point.

Research by Tversky and Kahneman (1974) suggested one possible mechanism for correction: "anchoring-and-adjustment." To make judgments with underdetermined answers, individuals will first recruit a relevant piece of information to serve as an anchor, or starting point, away from which they then adjust when searching for the correct answer. For example, if asked to estimate the number of U.S. states in 1880, a person might first recruit a relevant piece of information, such as 50, the current number of states, or 13, the number of original colonies. The number 50 or 13 in this example anchors subsequent responses. Importantly, these anchors are self-generated, relevant to the inference, and close—but not equal—to the correct answer. Because neither 13 nor 50 represents the actual number of states in 1880, people will subsequently adjust away from these anchors to the eventual response. Insufficient adjustment often results in responses biased toward the anchor. For example, people who respond after first thinking about the current number of states (50) tend to overestimate the actual value, whereas those individuals who first think about the number of original colonies (13) tend to underestimate the actual value (Epley & Gilovich, 2004).

Researchers have defined adjustment as a serial process (Epley & Gilovich, 2001, 2004). That is, people start at their anchor point and then, with time and cognitive effort, they can adjust farther and farther away from this value. When response time is restricted or cognitive capacity is depleted, people instead adjust shorter distances away from their starting anchor point (Epley et al., 2004). Such findings, showing that adjustment takes time and cognitive effort to unfold from start to completion, provide evidence that adjustment proceeds serially. Additional evidence for adjustment as serial comes from research that manipulates the likelihood that individuals will choose to cease correction at different stages of adjustment. Specifically, nodding the head encourages agreement, whereas shaking the head encourages disagreement (Förster & Strack, 1996; Wells & Petty, 1980). Accordingly, nodding encourages people to agree with values earlier during serial adjustment, whereas shaking the head makes one more likely to disagree with early values and continue to adjust further. As a result, people adjust less when nodding their head than when shaking their head (Epley & Gilovich, 2001).

Social inferences share a number of key features with the nonsocial judgments for which researchers originally identified the process of anchoring-and-adjustment. First, social inferences recruit self-knowledge as a relevant, accessible, and self-generated anchor point. Second, social inferences have underdetermined answers, since one can never know the contents of another person's mind with full certainty. Third, social inferences require cognitive effort to correct away from automatically generated anchors (Gilbert, 1989). This high degree of congruence between social and nonsocial judgments suggests that the process of anchoring-and-adjustment may play a role in social as well as nonsocial inferences. If self-knowledge anchors social inferences, then adjustment provides a plausible mechanism for how perceiv-

ers correct away from such anchors to account for dissimilarities between self and other.

A few studies on the spotlight effect and the illusion of transparency already provide evidence that people may invoke adjustment to correct from self-knowledge anchors during social inferences (Gilovich et al., 2000; Gilovich et al., 1998). In one study, participants reported the responses they considered before giving their final estimate of another person's mental state. These responses most often fell between the final response and the self-knowledge anchor (Gilovich et al., 2000). Because adjustment is a serial process, this intermediate response provides indirect evidence that participants used adjustment to correct away from the anchor, through the intermediate response, and onwards toward the final response. Recent neuroimaging research suggests that people may use a process of anchoring-and-adjustment during social inferences by demonstrating that neural responses in the MPFC, a region involved in both self-knowledge and social inferences, correlates with the magnitude of adjustment away from a self-anchor when inferring others' mental states (Tamir & Mitchell, 2010). Finally, a study by Epley et al. (2004) supports the role of egocentric anchoring-and-adjustment in social inferences. When participants in this study had less time or motivation to respond about another person's knowledge state, their estimates were closer to the self-knowledge anchor. Because serial adjustment requires both time and effort to unfold, this finding provides further evidence that participants used adjustment to correct away from their anchor. Interestingly, these authors speculated that individuals may invoke an anchoring-and-adjustment strategy only for similar but not dissimilar targets (Epley et al., 2004), though this hypothesis has yet to be tested.

The Current Study

The current study aims to integrate and extend research on three aspects of social inferences: (a) the role of the self in social inferences, (b) the effects of target similarity on social inference strategies, and (c) serial adjustment as a potential cognitive mechanism for correcting away from a self-knowledge anchor. Here we test two specific hypotheses about the cognitive mechanism underlying social inferences. First, we hypothesize that anchoring on self-knowledge underlies social inferences for similar but not dissimilar others. Second, we hypothesize that serial adjustment characterizes the mechanism for correcting away from such an anchor during social inferences.

Because anchoring and adjustment co-occur, we can test these hypotheses concurrently. In two sets of studies, we tested for the presence or absence of adjustment from self anchors during social inferences in the following way: Participants in each study reported their own attitudes and opinions and inferred the attitudes and opinions of a target individual. Importantly, participants judged each of the opinion items once for the self and once for another target, allowing us to calculate the discrepancy between responses for self and other on each item. If perceivers automatically invoke their own opinions when judging the opinions of others, then this self–other discrepancy magnitude represents the extent of correction away from this anchor point on each trial. On the other hand, if the self is not invoked as an anchor, then self–other discrepancy represents a psychologically meaningless construct.

If perceivers then correct away from this self anchor using serial adjustment, then self–other discrepancy provides a measure of the extent of adjustment on each trial. Because adjustment unfolds serially over time, we can look for evidence of anchoring-and-adjustment by taking advantage of this fact that correction will unfold gradually: Large amounts of adjustment should take longer amounts of time; small amounts of adjustment should take short amounts of time. Thus, if participants invoke serial adjustment away from a self anchor, then self–other discrepancy should be smallest on trials with the shortest response times and largest on trials with the longest response times. As such, a positive linear relation between self–other discrepancy and reaction time served as evidence of adjustment in these studies. Specifically, we tested for this positive linear relation between self–other discrepancy and reaction time using hierarchical linear modeling, nested within subject.

To test whether anchoring-and-adjustment occurs for inferences about similar but not dissimilar others, participants in these studies judged both similar and dissimilar targets. To the extent that egocentric anchoring and serial adjustment is recruited during inferences about similar others, we expected to find evidence of a positive linear relation between self–other discrepancy and reaction time only for similar others and not for dissimilar others.

Study 1

In this study, participants with liberal social and political attitudes first completed a block of trials in which they answered questions about their own opinions and attitudes. Subsequently, participants were introduced to two targets, one of whom was manipulated to be similar to the participant and the other to be dissimilar. Participants then completed a block of trials in which they answered questions about the opinions and attitudes of these two targets. Importantly, participants made a judgment on each item once about themselves and then a second time about one of the targets, which allowed us to calculate the discrepancy between the responses for self and for other on each item. We expected that participants would anchor on their own opinion during judgments about the similar but not the dissimilar target. We also expected that participants who invoke a self-knowledge anchor will then correct away from it using serial adjustment, such that the magnitude of self–other discrepancy increases with increasing reaction time. Thus, a positive linear relation between reaction time and self–other discrepancy should only exist for similar targets.

Method

Participants. Participants ($n = 25$) were recruited via the Harvard University study pool. Participants were eligible to participate only if they indicated in a prescreening form that they were between the ages of 18 and 24, native English speakers, and politically liberal (assessed with the questions "How would you describe your political party preference?"; "In terms of economic issues, how would you describe your political attitudes and beliefs?"; and "In terms of social issues, how would you describe your political attitudes and beliefs?"). Informed consent was obtained from all participants in a manner approved by the Committee on the Use of Human Subjects at Harvard University.

Procedure. In the first part of this study, participants answered questions about their own likes, dislikes, and habits. On

each of 240 trials, participants saw a brief statement (e.g., "enjoy winter sports such as skiing or snowboarding," "fear speaking in public") and then judged how well the statement applied to them. Participants indicated their response by clicking with a computer mouse on a line at the bottom half of the screen. The extreme left end of this line was labeled "extremely unlikely" and the extreme right end was labeled "extremely likely." We used this linear scale to allow adjustment to proceed continuously, uninterrupted by discrete numerical response categories. This continuous scale provided a fine-grained assessment of self–other discrepancy, allowing for a nuanced assessment of its predicted relationship with reaction time. However, participants reported that the task of recording answers by clicking on a line was difficult, so subsequent studies adopted a discrete response scale (see Table 1 for specifics about the design features of each study).

For each trial, we recorded reaction time and the *x* (horizontal) and *y* (vertical) coordinates of the mouse click in pixels. The *x* coordinate of the response reflected the evaluation of the statement along the scale provided. The *y* coordinate was used to exclude stray responses. In this and all subsequent studies, participants were given as much time as they needed to respond to questions about themselves, within a response window of 15 s.

After the first block, participants were told that the purpose of the study was to investigate factors that made people particularly good at inferring the likes, dislikes, and habits of other individuals on the basis of minimal information. Participants were then introduced to two people who they were told had provided information about themselves on an Internet dating website. The two targets, depicted by photographs, were each described with a short seven-sentence paragraph. One paragraph described a target similar to the participant. Because our participants were preselected to be college-aged students with liberal social attitudes, this paragraph described the intended similar target as a socially and politically liberal college student who attended a Northeast college and participated in activities typical of a college student. The other paragraph described a target dissimilar from the participant. This intended dissimilar target was described as a fundamentalist Christian from a Midwest college who was politically active in Republican-sponsored organizations on campus and who endorsed socially conservative attitudes. Participants were given as much time as they needed to read the full descriptions of the two targets and get a sense of each. Targets matched the sex of the participant; photographs were assigned similarity roles randomly for each participant. This manipulation of similarity was modeled on previous research (Mitchell et al., 2006)

Participants then made a series of judgments about the likes, dislikes, and habits of the two people about whom they had just read (see Figure 1). On each of 240 trials, participants saw a picture at the top of the screen that indicated the target of the judgment (the similar or dissimilar target) and a brief statement (e.g., "enjoy winter sports such as skiing or snowboarding," "fear speaking in public"). Participants then judged how strongly they thought the target individual would endorse the statement. Participants responded in the same manner as in Block 1 by clicking with the computer mouse on a line in the bottom half of the screen, ranging from "extremely unlikely" to "extremely likely." Reaction time and the coordinates of the response were recorded for each trial.

All of the statements judged in this block had also been judged in the previous block, when self was the target of judgment, which allowed us to calculate self–other discrepancy for each social inference trial. Self–other discrepancy was calculated as the absolute difference between the participants' response for themselves and for the other target for each statement. If participants anchored on their own attitudes when judging the target, then self–other discrepancy provides a measure of how much participants corrected away from this anchor. Furthermore, if participants corrected away from this anchor using serial adjustment, then this self–other discrepancy value should change as a function reaction time. That is, if participants anchored on the self and then serially adjusted away, self–other discrepancy should be smallest on trials with short reaction times and largest on trials with long reaction times. Analyses thus tested for this positive linear relationship between self–other discrepancy and reaction time.

If participants failed to respond within the allotted response window on any trial, the experiment would skip to the following trial and that item would be removed from all analyses, because without a response for both self and other, it was impossible to calculate a self–other discrepancy score.

Finally, as a manipulation check, at the end of the experiment participants explicitly reported how similar they perceived themselves to be to each of the two targets using a 7-point scale anchored on "very dissimilar" and "exactly the same."

Analysis. Because adjustment from a self-knowledge anchor proceeds serially, a positive linear relationship between reaction time and self–other discrepancy would provide evidence consistent with the hypothesis that people invoke anchoring-and-adjustment during social inferences. Thus, to assess whether participants anchored on self-knowledge and then serially adjusted during inferences about the two targets, we conducted a hierarchical linear model to look for this positive linear relation between self–other discrepancy and reaction time. Self–other discrepancy served as the dependent variable and was calculated as the absolute difference between the response made for the self in Block 1 and the response made for the target in Block 2, for each of the 240 statements for each of the participants. Reaction time was entered as a predictive factor in the model to assess whether increases in reaction time corresponded to increases in self–other discrepancy. In addition, to test whether egocentric anchoring-and-adjustment was recruited differentially for the similar and the dissimilar tar-

Table 1
Design Features of Studies 1, 2a, and 2b

Study	Block order	Response window: Other trials	Response scale	Number of trials
1	(1) self (2) others	2.5 s, 4 s, & 15 s	Continuous line	240
2a	(1) self (2) other (3) self	15 s	9-point Likert	180
2b	(1) other (2) self (3) other	4 s	8-point Likert	150 (n = 21) 100 (n = 32)

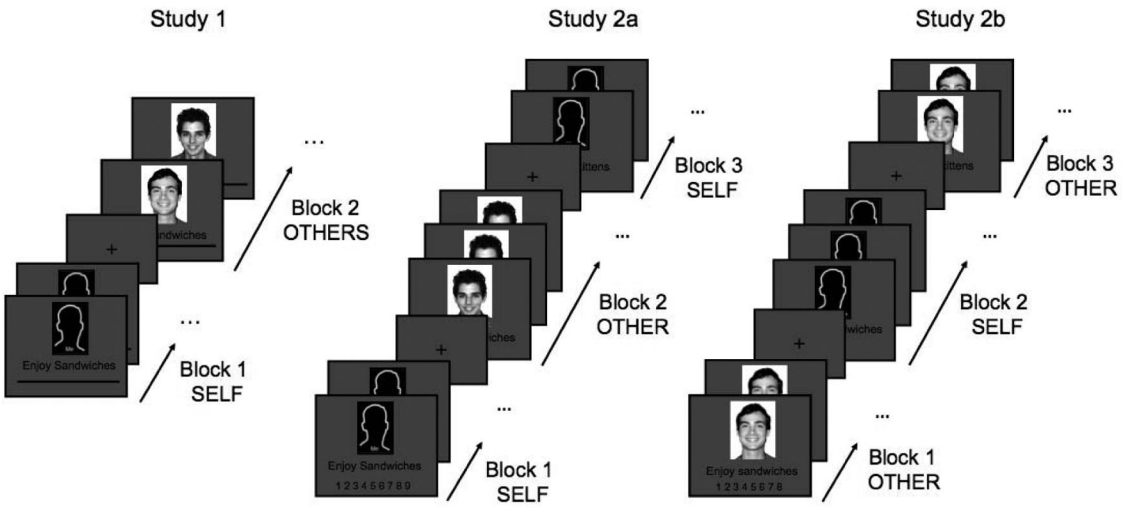

Figure 1. Experimental designs of Studies 1 and 2. In Study 1, participants answered questions about the self in Block 1 and then about two social targets in Block 2. In Study 2a, participants answered questions about the self in Block 1, then about one social target in Block 2, and finally about the self again in Block 3. In Study 2b, participants answered questions about one social target in Block 1, then about the self in Block 2, and finally about the social target again in Block 3. Both individuals whose faces appear here gave permission for their likenesses to be published in this article.

gets, we included similarity and the interaction between similarity and reaction time as predictive factors in the model. Similarity in this study was a binary variable determined by the target of judgment (i.e., the similar or dissimilar target). Finally, subject number was included as a nested variable in the model to account for repeated observations from the same participant.

As such, this analysis looked for the positive linear relationship between self–other discrepancy and reaction time within each subject. Analyses resulted in beta weights for each predictive factor in the model, which provide a measure of the strength of the effect of each factor on self–other discrepancy. Results are presented graphically, to illustrate how reaction time (standardized) relates to self–other discrepancy for each of the two targets. To the extent that participants invoke egocentric anchoring-and-adjustment during judgments of either of the two targets, we expect this positive linear relation to be displayed as a positively sloped line. To the extent that participants do not invoke egocentric anchoring-and-adjustment, this line should be flat.

Results

To control relative similarity in this study, participants were prescreened to participate only if they were the same age and political orientation as the similar target and sociopolitically quite different from the intended dissimilar target. To check whether this manipulation of similarity was successful, at the conclusion of the experiment participants were asked to rate their perceived similarity to the similar and dissimilar target on a scale from 1 to 7. Nineteen participants indeed reported feeling both similar to the similar target and dissimilar to the dissimilar target. These participants had a mean rating of 4.7 out of 7 ($SD = 0.5$) for the similar target, and a mean rating of 1.9 out of 7 ($SD = 0.8$) for the dissimilar target. Participants who failed the manipulation check, with ratings below or above 3 for the similar and dissimilar target, respectively, were excluded from all analyses ($n = 6$).

Participants failed to respond within the allotted response window on either a self or other trial on a total of 239 statements (5.2%). These trials were excluded from the analysis, as it is impossible to calculate a self–other discrepancy score without a response for both self and other. Participants responded in an average of 2.6 s ($SD = 1.2$) on remaining trials. Because reaction times were significantly right-skewed, data were log-transformed prior to inferential statistical analysis.

Results of the hierarchical linear model revealed that a number of the factors in the model played a significant role in determining the self–other discrepancy on an item-by-item basis for each subject. First, the similarity of the target (similar vs. dissimilar) influenced how participants judged the target: There was a significant effect of target similarity on self–other discrepancy, $b = -48.7$, $t(4299) = -14.7$, $p < .0001$, such that participants rated the attitudes of the similar target as significantly closer to their own attitudes than the attitudes of the dissimilar target (see Figure 2).

Second, this same analysis also examined the hypothesized positive linear relation between reaction time and self–other discrepancy. This analysis revealed a significant effect of reaction time on self–other discrepancy scores, $b = 53.6$, $t(4299) = 2.5$, $p < .05$, suggesting that increases in reaction time do correspond to increases in the magnitude of correction away from a self-generated anchor—evidence of serial adjustment.

Finally, this analysis tested the primary hypothesis that serial adjustment from a self-knowledge anchor occurs only when the target is similar to the self but not when it is considered to be dissimilar. In terms of the model, this analysis examined whether the relation identified above—between reaction time and self–other discrepancy—depended on the similarity between self and

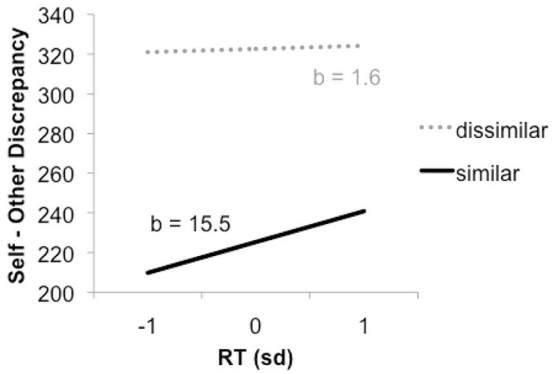

Figure 2. Results of a hierarchical linear model of self–other discrepancy scores and reaction time (RT) from Study 1. Self–other discrepancy is plotted as a function of reaction time, one standard deviation below and above the mean, for both the similar (black) and dissimilar (grey) targets. As reaction time increased, discrepancy scores also increased, providing evidence for serial adjustment. This positive linear relation between reaction time and discrepancy occurred only for similar—but not dissimilar—others, suggesting that the process of anchoring on self-knowledge followed by serial adjustment is specific to mentalizing about targets similar to the self.

target. As expected, this analysis revealed a significant interaction between target similarity and reaction time, $b = 43.6$, $t(4299) = 2.1$, $p < .05$. That is, self–other discrepancy increases linearly with increases in reaction time only when the target was similar to the participant; there was no such relationship between self–other discrepancy and reaction time when the target was dissimilar from the participant (see Figure 2). Such results are consistent with the hypothesis that after anchoring on self-knowledge, people correct away from this anchor using serial adjustment—but only when making inferences about similar others and not dissimilar others.

Discussion

The results of Study 1 were consistent with our hypotheses. Using hierarchical linear modeling, we found evidence that participants adjusted away from a self-knowledge anchor during social inferences. The longer it took participants to make their inferences, the farther away their judgment was from their own personal attitude or opinion. Importantly, participants recruited this strategy differentially depending on the similarity of the target. We found evidence for a positive linear relation between reaction time and self–other discrepancy only when participants judged a target with similar social and political attitudes. Participants treated dissimilar others quite differently. We found no evidence of such anchoring-and-adjustment when participants judged a dissimilar target.

Study 2

Study 1 demonstrated that participants inferred the attitudes of similar others by anchoring on their own attitudes and then serially adjusting away. In contrast, participants did not evidence this egocentric anchoring-and-adjustment when judging the attitudes of a dissimilar other. However, the design of Study 1 was somewhat artificial in that participants answered all social inference questions after reporting their own attitudes and opinions. In everyday life, perceivers do not explicitly answer questions about themselves before making inferences about others. By requiring participants to report their own attitudes first, Study 1 may have made knowledge about the self highly accessible to the participant. Research on priming suggests that highly accessible information can bias judgments of others (Higgins, 1996; Higgins & Brendl, 1995). Thus, by artificially heightening the accessibility of knowledge about the self, we may have unduly biased participants to invoke self-knowledge as an anchor during social inferences when they might not have otherwise done so naturally (Higgins, 1996; Higgins & Brendl, 1995). Although this priming effect cannot explain why participants failed to invoke self-knowledge during inferences about dissimilar others, we designed Studies 2a and 2b to examine the extent to which perceivers spontaneously recruit self-knowledge when thinking about similar others. In Study 2a, participants first reported their own attitudes or opinions for only half of the statements, then judged a target on all of the statements, and finally reported their own attitudes for the remaining half of the statements. In this way, we could compare how participants make social judgments about statements that they had already explicitly answered about themselves to how they make judgments about statements that had not yet been answered about the self. That is, we could compare participants' social inference strategy during the trials with a specifically primed anchor to trials with no primed anchor. In Study 2b, participants made social inferences both before reporting any of their own attitudes and after doing so. In this way, we could compare directly how participants make social judgments about statements before and after explicit priming of any self-knowledge.

For both studies, we expected that participants would recruit the self naturally during a social judgment about a similar other, regardless of whether they had just explicitly expressed, and thus primed, any of their own attitudes. Importantly, because egocentric anchoring-and-adjustment should occur regardless of accessibility of one's own attitude, we continued to expect that it would occur only for similar targets and not for dissimilar targets.

Study 2a

Method.

Participants. Participants ($n = 25$) were recruited via the Harvard University study pool. Participants were recruited to participate only if they indicated in a prescreening form that they were between the ages of 18 and 24 and native English speakers. Participation was no longer restricted to people who reported holding liberal sociopolitical views on a prescreening form. Informed consent was obtained from all participants in a manner approved by the Committee on the Use of Human Subjects at Harvard University.

Procedure. The design of this study was similar to that of Study 1, except that Study 2a manipulated the accessibility of the self-knowledge anchor during the social inference trials by changing the order of the blocks (see Figure 1). The primary task was identical: Participants made judgments about how likely it was that an attitude or opinion statement would apply to themselves and to a target other. In the first block of trials, participants reported their own attitudes for half of the total statements. In the second block, they inferred the target's attitudes on all of the statements. In the

final block, participants reported their own attitudes for the remaining half of the statements. Thus, for half of the social inference trials, participants had previously reported their own attitude. On these trials, participants had a highly accessible anchor. For the other half of the social inference trials, participants had not yet explicitly reported their own attitude. On these trials, participants invoking self-knowledge as an anchor would have to do so spontaneously, without priming. By comparing these two types of trials, we could assess whether participants anchor on self-knowledge spontaneously during social inferences or whether anchoring on self-knowledge requires explicit priming of that specific piece of information.

To avoid possible interference effects of responding about multiple targets, participants made judgments about only one target: the liberal target from Study 1. In addition, we no longer restricted participation to self-reported liberals. Participants were thus no longer likely to be similar to our liberal target and dissimilar to the conservative target. Instead of treating similarity as a dichotomous variable based on the target of inference and presumed similarity, as we did in Study 1, we measured similarity in a more flexible manner in Studies 2a and 2b. This measure of similarity was based on participants' own perceived similarity to each of the targets. As in Study 1, upon conclusion of these studies, participants rated their perceived similarity to the target other, the liberal individual about whom they made inferences, on a scale from 1 (*very dissimilar*) to 7 (*exactly the same*). Participants also used this same scale to rate their perceived similarity to the conservative individual to whom they were introduced, though they never made judgments of that target. We calculated the similarity between the participants and the target they judged during the task as the difference between these ratings of similarity to the liberal target and the conservative other. That is, participants who rated themselves as more similar to the liberal target than to the conservative target had positive similarity scores; the greater the difference between similarity ratings for the two targets, the higher the similarity score. Alternatively, participants who rated themselves as equally similar to both targets had similarity scores of 0. Finally, participants who rated themselves as less similar to the liberal target than to the conservative target had negative similarity scores; the greater the difference between the similarity ratings for the two targets, the lower the similarity score. This measure of similarity accounts for individual differences in how participants used the similarity scale. For example, this measure treats participants who preferentially used the lower end of the scale and rated the similar and dissimilar targets as 4 and 1, respectively, the same as those who preferentially used the higher end of the scale and rated the targets 7 and 4, respectively; each participant would be assigned a similarity score of 3. Thus, similarity in this study was defined as relative similarity of the participant to the target individual compared to the conservative other. In addition to providing a more nuanced, continuous measure of similarity for each individual participant, this flexible measure of similarity allowed us to avoid excluding potential participants on the basis of political attitudes or excluding participants on the basis of unexpected dissimilarity to the intended similar target. (See Table 1 for additional design changes.)

Analysis. As in Study 1, self–other discrepancy was calculated for each statement as the absolute difference between the response made about the self and the response made about the target on each statement. A hierarchical linear model was used to examine the predicted relation between self–other discrepancy and reaction time. Specifically, we ran a model with self–other discrepancy as the dependent variable. Reaction time was included as a predictive variable in the model to test whether self–other discrepancy increased linearly with increasing reaction time. A positive linear relation between self–other discrepancy and reaction time would provide supporting evidence for the hypothesis that participants anchor on self-knowledge and then, with increasing time, serially adjust farther and farther away during social inferences. To assess whether egocentric anchoring-and-adjustment occurred only when the target was relatively similar, we included relative similarity scores and the interaction between similarity scores and reaction time as predictive factors in the model. Similarity in this study was a continuous variable, calculated as the relative similarity ratings made by the participant about the target individual and the conservative other. To assess whether egocentric anchoring-and-adjustment was recruited differentially depending on whether participants had a highly accessible self-knowledge anchor, we also included several other predictive variables in the model: block order, the interaction of Block × Reaction Time, the interaction of Block × Similarity, and the three-way interaction of Block × Reaction Time × Similarity. Finally, subject number was included as a nested variable in the model to account for repeated observations from the same participant.

Results. Participants failed to respond within the 15-s response window on either a self or other trial on a total of 19 statements (0.4%). These trials were excluded from the analysis, as it is impossible to calculate a self–other discrepancy score without a response for both self and other. Participants responded in an average of 2.5 s ($SD = 1.4$) on remaining trials.

Using a hierarchical linear model, we tested the hypothesis that serial adjustment from a self-knowledge anchor occurs only when that target is relatively similar to the self. To do so, this analysis examined whether serial adjustment—as evidenced by a positive linear relation between reaction time and self–other discrepancy—depended on the relative similarity between the participant and the target. Replicating the findings from Study 1, this analysis indeed revealed that the interaction between similarity and reaction time significantly predicted self–other discrepancy, $b = 0.34$, $t(4450) = 3.4$, $p < .001$, such that the participants who rated the target as most similar to themselves showed the predicted increase in self–other discrepancy scores with increasing reaction time. Participants who rated the target as relatively dissimilar did not show any evidence of a positive linear relation between reaction time and self–other discrepancy and failed to show any evidence of serial adjustment (Figure 3a).

This analysis also tested the extent to which participants naturally anchor on their own attitudes for similar others and not for dissimilar others by looking for changes in their social inference strategy before and after priming the self. That is, this analysis examined whether the positive linear relation between self–other discrepancy and reaction time that occurs for similar but not dissimilar others changes depending on whether the self-report block occurred before or after the block of social inferences. As expected, there was no effect of block order on the relation between reaction time and discrepancy score, $b = 0.14$, $t(4450) = 1.6$, $p = .11$. If anything, this analysis suggested a nonsignificant trend, such that priming self-knowledge actually weakens the

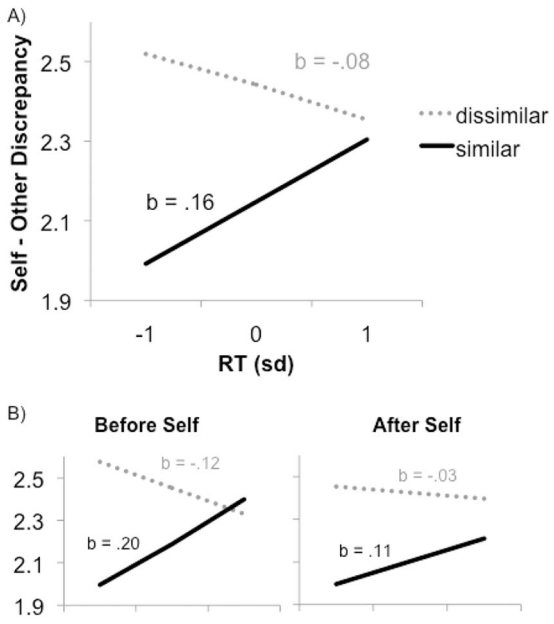

Figure 3. Results of a hierarchical linear model of self–other discrepancy scores and reaction time from Study 2a. Self–other discrepancy is plotted as a function of reaction time (RT), one standard deviation below and above the mean, for relative similarity scores one standard deviation below (grey) and above (black) the mean. This analysis provides evidence of serial adjustment away from a self-knowledge anchor during social inferences, such that as reaction time increased, discrepancy scores also increased. This positive linear relationship between reaction time and discrepancy held only for relatively similar targets and not relatively dissimilar ones, suggesting that the process of anchoring on self-knowledge followed by serial adjustment is specific to mentalizing about targets similar to the self. This pattern holds for all social inference trials, collapsed across block (A), but also for social inferences that participants made in the blocks both before and after reporting their own attitudes (B).

likelihood of egocentric anchoring and adjustment (Figure 3b). Together, these results suggest that participants anchored on their own attitudes for similar others but not dissimilar others regardless of the heightened accessibility of that specific anchor when judging others.

All other factors and interactions included in the model were nonsignificant (all $ps > .2$).

Study 2b

Method.

Participants. Participants ($n = 53$) were recruited via the Harvard University study pool. All participants were between the ages of 18 and 24 and were native English speakers. Informed consent was obtained from all participants in a manner approved by the Committee on the Use of Human Subjects at Harvard University.

Procedure. The design of this study was similar to that of Studies 1 and 2a, except that Study 2b manipulated the salience of the self and not just specific attitudes or opinions during social inference trials by altering block order once more (see Figure 1). The primary task in this study was identical to that of the earlier studies: Participants made judgments about how well an attitude statement applied to themselves and to a liberal target other. In Block 1, participants judged the target's attitudes for half of the statements. For the first half of the social inference trials, participants had not yet explicitly introspected about any of their own attitudes. On these trials, participants not only were not primed with specific self-knowledge anchors, they were also not primed to think about their personal attitudes or opinions at all. Thus, for these trials, we would expect to find evidence that personal attitude anchored social judgments only if participants naturally and spontaneously recruited the strategy of anchoring on self-knowledge during social inferences. In the second block, participants reported their own attitudes for all of the statements. In the final block, participants judged the target's attitudes for the remaining half of the statements (i.e., for those not appearing in Block 1). For the second half of the social inference trials, participants had just previously reported their own attitudes, thus making self-knowledge highly accessible. By comparing social inferences from Block 1 and Block 3, we could assess whether participants anchor and adjust spontaneously during social inferences about similar others, or whether this process requires heightened accessibility of the self.

As in the previous studies, we can also assess whether egocentric anchoring and adjustment occurs differentially for similar and dissimilar targets. In this study, similarity was calculated as in Study 2a—that is, as the relative similarity of the participant to the liberal target (compared to the conservative other to whom they were introduced but were never asked to judge). See Table 1 for additional design features.

Analysis. As in Studies 1 and 2a, self–other discrepancy was calculated for each statement as the absolute difference between the response made for the Self and the response made for the target on each statement. A hierarchical linear model was used to assess whether participants anchored on self-knowledge and then serially adjusted during inferences about the target. Specifically, we ran a model with self–other discrepancy as the dependent variable and reaction time as a predictive variable to look for the expected positive linear relation between self–other discrepancy and reaction time. If self–other discrepancy indeed increases linearly with increasing reaction times, this would provide evidence consistent with the hypothesis that individuals invoke serial adjustment away from a self-knowledge anchor during social inferences. To assess whether such anchoring-and-adjustment occurred only when the target was relatively similar, we also included relative similarity and the interaction between similarity and reaction time as predictive factors in the model. Similarity was defined in the same way as in Study 2a—that is, as a continuous variable determined by participants' self-reported ratings of similarity to the target. To assess whether anchoring-and-adjustment was recruited differentially depending on the accessibility of self-knowledge, we included several other predictive variables in the model: block order, the interaction of Block × Reaction Time, the interaction of Block × Similarity, and the three-way interaction of Block × Reaction Time × Similarity. Finally, subject number was included as a nested variable in the model to account for repeated observations from the same participant.

Results. Participants failed to respond within the 4-s response window on either a self or other trial on a total of 11% of statements. These trials were excluded from the analysis, as it is

impossible to calculate the self–other discrepancy score for a statement without a response for both self and other. Participants responded in an average of 2.5 s ($SD = 0.7$) on remaining trials.

Results of the hierarchical linear model revealed that the similarity of the target influenced how participants judged the target: Similarity significantly affected self–other discrepancy, $b = 0.139$, $t(51) = 5.0$, $p < .0001$, such that participants rated the attitudes of a similar target as significantly closer to their own attitudes than they did for the attitudes of a dissimilar target (see Figure 4).

This same hierarchical linear model tested the hypothesis that serial adjustment from a self-knowledge anchor only occurs when the target is relatively similar to the self. To do so, this analysis examined whether such serial adjustment—as evidenced by a positive linear relation between reaction time and self–other discrepancy—depended on the relative similarity between the participant and the target. Replicating the findings from Study 1 and Study 2a, this analysis indeed revealed that the interaction between similarity and reaction time significantly predicted self–other discrepancy, $b = 0.04$, $t(5574) = 2.2$, $p < .03$, such that the participants who rated the target as most similar to themselves showed the predicted increase in self–other discrepancy scores with increasing reaction time. Participants who rated the target as relatively dissimilar did not show any evidence of a positive linear relation between reaction time and self–other discrepancy and thus failed to show any evidence of serial adjustment (Figure 4a).

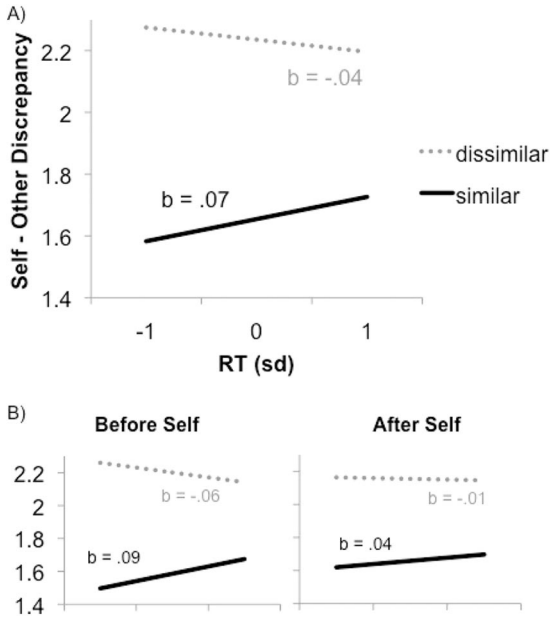

Figure 4. Results of a hierarchical linear model of self–other discrepancy scores and reaction time from Study 2b. Self–other discrepancy is plotted as a function of reaction time (RT), one standard deviation below and above the mean, for relative similarity scores one standard deviation below (grey) and above (black) the mean. This analysis provides evidence of serial adjustment away from a self-knowledge anchor during social inferences, such that as reaction time increased, discrepancy scores also increased. This positive linear relationship between reaction time and discrepancy holds only for relatively similar targets and not relatively dissimilar ones, suggesting that the process of anchoring on self-knowledge followed by serial adjustment is specific to mentalizing about targets similar to the self. This pattern held for all social inference trials, collapsed across block (A), but also for social inferences that participants made in the blocks both before and after reporting their own attitudes (B).

This analysis also tested whether participants naturally anchor on their own attitudes for similar others and not for dissimilar others by looking for changes in their social inference strategy before and after priming the self. That is, this analysis examined whether the positive linear relation between self–other discrepancy and reaction time that occurs for similar but not dissimilar others changes depending on whether the block of social inferences occurred before or after the self-report block. As expected, there was no interaction of block order on the relation between reaction time and discrepancy score, $b = 0.02$, $t(5574) = 1.3$, $p = .20$, evidence that the accessibility of self-knowledge does not change the likelihood that a participant will (or will not) recruit self-knowledge as an anchor during social inferences. These results suggest that individuals consistently used egocentric anchoring-and-adjustment when judging a similar target even when they did not have an accessible self-anchor; conversely, participants consistently did not use egocentric anchoring-and-adjustment when judging a dissimilar target, even when they did have a highly accessible self-anchor (Figure 4b).

All other factors and interactions included in this model were nonsignificant (all ps $> .20$).

Discussion. In Studies 2a and 2b, we found further support for the hypothesis that participants anchored on self-knowledge and then serially adjusted away when judging a similar target. In both studies, if the participant perceived the target of judgment as relatively similar, then egocentric anchoring-and-adjustment occurred even when the experimental design did not exogenously heighten the accessibility of a self-knowledge anchor. In contrast, if the participant perceived the target of judgment to be dissimilar, there was no evidence of anchoring-and-adjustment, regardless of how explicitly self-knowledge had been primed. That is, we found no evidence that participants differentially recruited anchoring-and-adjustment based on the accessibility of their own attitude or opinion; self-knowledge was just as likely to anchor a judgment of another person made before participants explicitly introspected about their own attitudes as it was to anchor responses following introspection. These results support our primary hypotheses that people naturally recruit information about the self to anchor social inferences only about similar others, but not dissimilar others, and that people then correct away from the self-knowledge anchor using serial adjustment.

General Discussion

How do people infer the thoughts and feelings of others? Simulation accounts of mentalizing suggest that knowledge about the self informs such social inferences. However, self-knowledge may only be relevant if the target of the social inference is a person similar to the self. Here we explored whether people anchor on self-knowledge during judgments of similar but not dissimilar others. When people anchor on self-knowledge, they must then correct for discontinuities between the self and other and account for the unique qualities of the other person. Thus, here we also explored whether people invoke the cognitive process of serial

adjustment as the mechanism for accomplishing correction away from a self anchor.

Three studies supported these hypotheses. We consistently found evidence that when participants inferred the attitude of a similar other, they did so by anchoring on self-knowledge and then serially adjusting away. For similar others, participants anchored on self-knowledge after explicitly reporting their own attitudes (Study 1), before explicitly reporting some of their own attitudes (Study 2a), and in the most extreme case, before explicitly reporting any of their own attitudes (Study 2b). Such results suggest that people spontaneously recruit self-knowledge to anchor inferences about similar others, even without primed self-knowledge, and then use serial adjustment to correct away from that anchor. In contrast, participants never showed evidence of egocentric anchoring and adjustment during inferences about dissimilar others. This was the case even when the experimental design particularly heightened the accessibility of self-knowledge as a potential anchor.

These findings remained consistent across several significant changes in experimental design over each of the three studies. In addition, across experiments we often made arbitrary or incidental decisions regarding response window, response scale, trial number, target number, and manipulations of similarity. Despite these changes in experimental design, each of the three studies consistently revealed the same pattern of results: a positive linear relationship between reaction time and self–other discrepancy for similar but not dissimilar others. The strength and consistency of these results suggests that individuals indeed naturally and spontaneously recruit self-knowledge during social inferences about similar others and then correct away from such anchors using serial adjustment but do not do so for dissimilar others.

Social cognition research had previously identified the self as an important source of knowledge during social inferences. The current studies bear on existing knowledge about the role of the self in social cognition in number of ways. First, this study provides further support for simulation-based mentalizing theories, augmenting previous studies on egocentric biases. The current analysis technique provides explicit evidence for the self as the primary anchor during social inferences. Our dependent variable, self–other discrepancy, could only provide a meaningful measure of cognitive correction during social inferences if participants recruited self-knowledge during these inferences. If the self did not anchor social inferences, then self–other discrepancy would represent a psychologically meaningless construct and would not correspond to any behavioral measures or experimental manipulations. Instead, reaction time significantly predicted self–other discrepancy for similar others, and self–other discrepancy varied significantly as a function of similarity, thus suggesting that self-knowledge played a clear role in these social judgments.

Second, this study supports the proposal that self-knowledge should be recruited only during social inferences about similar and not dissimilar targets. Research in social psychology has previously identified similarity as an important dimension in determining the strategy individuals will recruit when making social inferences (Ames, 2004a, 2004b). These previous studies showed that the relative contribution of self to an inference increases when the target is similar to the participant; in contrast, the relative contribution of stereotype-based strategies increases when the target is dissimilar from the participant (and stereotype knowledge applies). Such results speak convincingly to the relative contribution of the self over stereotypes to social inferences. The current studies build upon these findings in that they also speak to the absolute contribution of the self to social inferences. Participants in these studies answered questions about the attitudes and opinions of others, none of which could be reliably answered on the basis of stereotypes, as no clear stereotype exists about items such as how much conservatives or liberals "enjoy going to the movies" or "prefer chocolate over vanilla ice cream." Thus, perceivers could not avail themselves of a stereotype to make judgments about a dissimilar other. Nor was there a "correct" or "accurate" answer to any of these questions, as our targets were fictional. Thus, perceivers could not make use of individuating information or information about the true state of the world. In fact, participants did not have access to any reliable source of information that previous investigators have suggested people use during social inferences—except, of course, their own self-knowledge. In light of evidence that perceivers will invoke self-knowledge when other information is low (Ready, Clark, Watson, & Westerhouse, 2000), it is notable that in the current studies, participants did not judge dissimilar others on the basis of an egocentric anchor. Each of the three studies thus provides a strong demonstration of just how stridently individuals avoid using projection to judge dissimilar others, as the data consistently show an absolute absence of that strategy. As such, the current studies shed new light on the role of dissimilarity in inhibiting egocentrism in social inferences.

Here we also expand upon the cognitive process by which self-knowledge influences social judgments. Specifically, we show that individuals will correct away from self-knowledge during social inferences about similar others using the process of serial adjustment. Previous research in judgment and decision making has identified the process of anchoring-and-adjustment as well suited to inferences with underdetermined answers (Epley & Gilovich, 2001; Tversky & Kahneman, 1974). Indeed, previous behavioral research has used post hoc questions or explicit manipulations to suggest that anchoring-and-adjustment may underlie a number of social egocentric biases (Epley et al., 2004; Gilovich et al., 2000; Gilovich et al., 1998). The current studies build upon these findings in a number of ways. First, the social inferences in this study differ importantly from previous work on anchoring-and-adjustment, where perceivers clearly knew which direction to adjust. In earlier studies, the anchor was always at the upper or lower boundary of possible responses, such that there was only one direction to move away from the anchor. In addition, particularly for studies on anchoring-and-adjustment in the social domain, participants clearly knew which direction to adjust, either because they knew that the target lacked information to which they alone were privy, or because there was a correct answer out there. Thus, in all these cases, perceivers experienced both a clear push away from the anchor and a clear pull toward the new judgment. However, the current study does not allow for this simple strategy: Participants lack an egocentric anchor at the upper or lower end of the response scale, and participants lack any more obviously correct answer toward which to adjust. Nevertheless, perceivers still spontaneously adopted an anchoring-and-adjustment strategy when attempting to infer the attitudes and opinions of (similar) others. It seems as if the egocentric anchoring-and-adjustment strategy is indeed robust to circumstances where there is no right

answer toward which to adjust and where there is no extreme anchor from which to adjust.

Finally, these studies use a novel method of measuring anchoring-and-adjustment, and this method provides a more naturalistic measure of how the process of adjustment unfolds. Previous investigators have used a number of different manipulations to determine whether an individual was using anchoring-and-adjustment: They have asked participants to respond under time pressure, or to respond while nodding or shaking their head; they have offered participants monetary incentives for accuracy (Epley & Gilovich, 2001; Epley et al., 2004). All of these are clever means to see if inferences were accomplished via a serial process, as time pressure, nodding of the head, and low incentive for accuracy should all prematurely truncate the correction process. However, all of these manipulations, because they are indeed manipulations, alter the very process that they were designed to study. In contrast, the current studies avoided using any explicit manipulations of adjustment and instead captured the adjustment process as it unfolds in real time. Here, we tested for adjustment by looking for a linear relation between reaction time and self–other discrepancy. In tracking the process of serial adjustment as it transforms self-knowledge into an inference about others, here we find that this process is recruited only during inferences about similar and not dissimilar others.

However, because these data are correlational, and because our measure of adjustment did not involve any manipulation, these findings on the relation between reaction time and self–other discrepancy certainly are open to other potential interpretations. For example, it is possible that instead of adjustment causally driving the relation between reaction time and self–other discrepancy, as we predicted, perceived differences between self and other on individual trials may instead drive longer reaction times. Nevertheless, although there are a number of potential alternative explanations for these data, we maintain that the most parsimonious explanation for these data is the one offered in the current article. Our interpretation does not require any additional theorizing to seem plausible, as it is derived from extant theory. Indeed, these data provide convergent evidence for the role of anchoring-and-adjustment in social inferences. Here we bring together research on cognitive mechanisms of inferences with research from social psychology to show that the circumstances under which individuals are most likely to anchor on self-knowledge—for similar but not dissimilar others—likewise determine when individuals will, or will not, invoke anchoring-and-adjustment during social inferences.

The studies presented here consistently support the primary hypotheses that egocentric anchoring-and-adjustment underlies inferences about similar, but not dissimilar, others. However, these studies leave open many questions regarding the mechanisms for how people mentalize about dissimilar others, particularly when stereotypes provide no relevant information, as was the case in the current studies. These studies established the presence of anchoring-and-adjustment by only looking for evidence of adjustment, since adjustment from self implies the use of the self as an anchor. Thus, the lack of evidence here for adjustment from a self-knowledge anchor for dissimilar others could have resulted from one or more possible differences between the processes recruited to mentalize about similar and dissimilar others. For example, individuals may not recruit self-knowledge at all during inferences about dissimilar others. Alternatively, individuals may recruit self-knowledge but then immediately reject it as an invalid anchor, and thus the self does not anchor judgments. Finally, individuals may recruit self-knowledge, use self-knowledge to anchor judgments, but not use serial adjustment to correct away from this anchor. By design, the current studies tested specifically for the presence or absence of anchoring-and-adjustment and not for any of these more nuanced possibilities. In addition, they were not designed to test for numerous possible other mechanisms or anchors with which people may mentalize about dissimilar others. We can only conclude that people do not recruit the two-part process of egocentric anchoring followed by serial adjustment to make inferences about dissimilar others. Indeed, the mechanisms underlying inferences about dissimilar others, especially those for which stereotypes do not apply, remain underexplored. We look forward to future research that will help to identify the process by which people form inferences about dissimilar others.

The current findings demonstrate two important features about the way in which we mentalize about other people. First, perceivers invoke their own experiences as a guide for inferring the experiences of another person. Perceivers flexibly recruit this self-knowledge depending on the likelihood that this knowledge will apply to the person in question. Second, in those cases where self-knowledge anchors social inferences, perceivers subsequently recruit the process of serial adjustment to correct for residual dissimilarities between self and other. Together, these findings shed light on both the cognitive mechanism for carrying out simulation-based mentalizing and the conditions under which it occurs.

References

Allport, F. H. (1924). *Social psychology.* Cambridge, MA: Houghton Mifflin.

Ames, D. R. (2004a). Inside the mind reader's tool kit: Projection and stereotyping in mental state inference. *Journal of Personality and Social Psychology, 87,* 340–353.

Ames, D. R. (2004b). Strategies for social inference: A similarity contingency model of projection and stereotyping in attribute prevalence estimates. *Journal of Personality and Social Psychology, 87,* 573–585. doi:10.1037/0022-3514.87.5.573

Amodio, D. M., & Frith, C. D. (2006). Meeting of minds: The medial frontal cortex and social cognition. *Nature Reviews Neuroscience, 7,* 268–277. doi:10.1038/nrn1884

Camerer, C., Loewenstein, G., & Weber, M. (1989). The curse of knowledge in economic settings: An experimental analysis. *The Journal of Political Economy, 97,* 1232–1254. doi:10.1086/261651

Epley, N., & Gilovich, T. (2001). Putting adjustment back in the anchoring and adjustment heuristic: Differential processing of self-generated and experimenter-provided anchors. *Psychological Science, 12,* 391–396. doi:10.1111/1467-9280.00372

Epley, N., & Gilovich, T. (2004). Are adjustments insufficient? *Personality and Social Psychology Bulletin, 30,* 447–460. doi:10.1177/0146167203261889

Epley, N., Keysar, B., Van Boven, L., & Gilovich, T. (2004). Perspective taking as egocentric anchoring and adjustment. *Journal of Personality and Social Psychology, 87,* 327–339. doi:10.1037/0022-3514.87.3.327

Fischhoff, B. (1975). The silly certainty of hindsight. *Psychology Today, 8*(11), 71–76.

Fischhoff, B., & Beyth, R. (1975). I knew it would happen: Remembered probabilities of once-future things. *Organizational Behavior & Human Performance, 13,* 1–16. doi:10.1016/0030-5073(75)90002-1

Förster, J., & Strack, F. (1996). Influence of overt head movements on memory for valenced words: A case of conceptual-motor compatibility. *Journal of Personality and Social Psychology, 71,* 421–430. doi:10.1037/0022-3514.71.3.421

Frith, C. D., & Frith, U. (1999). Interacting minds: A biological basis. *Science, 286,* 1692–1695. doi:10.1126/science.286.5445.1692

Gallagher, H. L., Happe, F., Brunswick, N., Fletcher, P. C., Frith, U., & Frith, C. D. (2000). Reading the mind in cartoons and stories: An fMRI study of "theory of mind" in verbal and nonverbal tasks. *Neuropsychologia, 38,* 11–21. doi:10.1016/S0028-3932(99)00053-6

Gallagher, H. L., Jack, A. I., Roepstorff, A., & Frith, C. D. (2002). Imaging the intentional stance in a competitive game. *NeuroImage, 16*(3 Pt. A), 814–821. doi:10.1006/nimg.2002.1117

Gilbert, D. T. (1989). Thinking lightly about others: Automatic components of the social inference process. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 189–210). New York, NY: Guilford Press.

Gilovich, T., Medvec, V. H., & Savitsky, K. (2000). The spotlight effect in social judgment: An egocentric bias in estimates of the salience of one's own actions and appearance. *Journal of Personality and Social Psychology, 78,* 211–222. doi:10.1037/0022-3514.78.2.211

Gilovich, T., Savitsky, K., & Medvec, V. H. (1998). The illusion of transparency: Biased assessments of others' ability to read one's emotional states. *Journal of Personality and Social Psychology, 75,* 332–346. doi:10.1037/0022-3514.75.2.332

Higgins, E. T. (1996). Knowledge activation: Accessibility, applicability, and salience. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 133–168). New York, NY: Guilford Press.

Higgins, E. T., & Brendl, C. M. (1995). Accessibility and applicability: Some "activation rules" influencing judgment. *Journal of Experimental Social Psychology, 31,* 218–243. doi:10.1006/jesp.1995.1011

Jenkins, A. C., Macrae, C. N., & Mitchell, J. P. (2008). Repetition suppression of ventromedial prefrontal activity during judgments of self and others. *Proceedings of the National Academy of Sciences, USA, 105,* 4507–4512. doi:10.1073/pnas.0708785105

Kelley, W. M., Macrae, C. N., Wyland, C. L., Caglar, S., Inati, S., & Heatherton, T. F. (2002). Finding the self? An event-related fMRI study. *Journal of Cognitive Neuroscience, 14,* 785–794. doi:10.1162/08989290260138672

Keysar, B., & Bly, B. (1995). Intuitions of the transparency of idioms: Can one keep a secret by spilling the beans? *Journal of Memory and Language, 34,* 89–109. doi:10.1006/jmla.1995.1005

Keysar, B., Ginzel, L. E., & Bazerman, M. H. (1995). States of affairs and states of mind: The effect of knowledge of beliefs. *Organizational Behavior and Human Decision Processes, 64,* 283–293. doi:10.1006/obhd.1995.1106

Krueger, J., & Clement, R. W. (1994). The truly false consensus effect: An ineradicable and edocentric bias in social perception. *Journal of Personality and Social Psychology, 67,* 596–610. doi:10.1037/0022-3514.67.4.596

Mitchell, J. P., Banaji, M. R., & Macrae, C. N. (2005). The link between social cognition and self-referential thought in the medial prefrontal cortex. *Journal of Cognitive Neuroscience, 17,* 1306–1315. doi:10.1162/0898929055002418

Mitchell, J. P., Macrae, N. C., & Banaji, M. R. (2006). Dissociable medial prefrontal contributions to judgments of similar and dissimilar others. *Neuron, 50,* 655–663. doi:10.1016/j.neuron.2006.03.040

Nickerson, R. S. (1999). How we know—and sometimes misjudge—what others know: Imputing one's own knowledge to others. *Psychological Bulletin, 125,* 737–759. doi:10.1037/0033-2909.125.6.737

Northoff, G., Heinzel, A., de Greck, M., Bermpohl, F., Dobrowolny, H., & Panksepp, J. (2006). Self-referential processing in our brain: A meta-analysis of imaging studies on the self. *NeuroImage, 31*(1), 440–457. doi:10.1016/j.neuroimage.2005.12.002

Ready, R. E., Clark, L. A., Watson, D., & Westerhouse, K. (2000). Self- and peer-reported personality: Agreement, trait ratability, and the self-based heuristic. *Journal of Research in Personality, 34,* 208–224. doi:10.1006/jrpe.1999.2280

Ross, L., Greene, D., & House, P. (1977). The false consensus effect: An egocentric bias in social perception and attribution processes. *Journal of Experimental Social Psychology, 13,* 279–301. doi:10.1016/0022-1031(77)90049-X

Tamir, D. I., & Mitchell, J. P. (2010). Neural correlates of anchoring-and-adjustment during mentalizing. *Proceedings of the National Academy of Sciences, USA, 107,* 10827–10832. doi:10.1073/pnas.1003242107

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science, 185,* 1124–1131. doi:10.1126/science.185.4157.1124

Vorauer, J. D., & Claude, S. D. (1998). Perceived versus actual transparency of goals in negotiation. *Personality and Social Psychology Bulletin, 24,* 371–385. doi:10.1177/0146167298244004

Wellman, H. M., Cross, D., & Watson, J. (2001). Meta-analysis of theory-of-mind development: The truth about false belief. *Child Development, 72,* 655–684. doi:10.1111/1467-8624.00304

Wells, G. L., & Petty, R. E. (1980). The effects of overt head movements on persuasion: Compatibility and incompatibility of responses. *Basic and Applied Social Psychology, 1,* 219–230. doi:10.1207/s15324834basp0103_2

Received December 11, 2011
Revision received March 15, 2012
Accepted March 19, 2012 ■