

## (Why) Do I Think What You Think? Epistemic Social Tuning and Implicit Prejudice

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This research examines whether people who experience epistemic motivation (i.e., a desire to acquire knowledge) came to have implicit attitudes consistent with the apparent beliefs of another person. People had lower implicit prejudice when they experienced epistemic motivation and interacted with a person who ostensibly held egalitarian beliefs (Experiments 1 and 2). Implicit prejudice was not affected when people did not experience epistemic motivation. Further evidence shows that this tuning of implicit attitudes occurs when beliefs are endorsed by another person, but not when they are brought to mind via means that do not imply that person's endorsement (Experiment 3). Results suggest that implicit attitudes of epistemically motivated people tune to the apparent beliefs of others to achieve shared reality.

*Keywords:* epistemic motivation, implicit prejudice, shared reality, uncertainty, social tuning

Classic and contemporary theorists have argued that individuals' attitudes at a given moment are at least partially derived from the opinions perceived in their immediate social context (Festinger, 1950; Hardin & Higgins, 1996; Prislin & Wood, 2005; Sherif, 1936). In much of this work, social consensus is thought to be an important source of knowledge (e.g., Grieve & Hogg, 1999; Hogg, 2001; Kruglanski, Pierro, Mannetti, & Grada, 2006; Stangor, Sechrist, & Jost, 2001); therefore, when individuals experience epistemic motivation (i.e., the desire to acquire knowledge),<sup>1</sup> their beliefs align with those apparently held by other social interactants (e.g., Baron, Vandello, & Brunzman, 1996; Sherif, 1936). Although research has convincingly demonstrated the influence of epistemic motivation on explicit attitudes (e.g., Darke et al., 1998; Deutsch & Gerard, 1955; Ford & Kruglanski, 1995; Kelman, 1961; Kruglanski, 1989; Prislin & Wood, 2005), it remains unclear whether implicit attitudes, in particular implicit prejudice, are also influenced by epistemic motivation and whether this influence can operate without conscious awareness. The present research examines these questions.

Some of the most striking classic social psychology experiments illustrate that individuals who experience a motivation to acquire knowledge, elicited by being in a state of uncertainty, use the opinions apparently held in their immediate social context to form

judgments. For example, in an often-cited experiment examining informational social influence (Sherif, 1936), participants in a dark room were asked to estimate how far a spot of light moved. Remarkably, although the apparent movement of the lights was not predictable or consistent, participants came to consensus on how far the light had shifted; moreover, they internalized and held onto this consensual judgment weeks later. Another classic experiment (Schachter & Singer, 1962) demonstrated that people who were uncertain of the cause of their affective state were more likely to label this state on the basis of the emotional cues displayed by another person. These timeless experiments point to the conclusion that beliefs and judgments are formed in part by relying on the social context, particularly when people are motivated to acquire knowledge because they are uncertain of their own (e.g., Festinger, 1950, 1954; Gross, Holzf, & Miller, 1995; Latané & Darley, 1968).

As social psychological research on attitudes shifted its focus toward intraindividual means of attitude change (e.g., Chaiken, Liberman, & Eagly, 1989; Petty & Cacioppo, 1981, 1986) and the structure and functions of attitudes (Pratkanis, Breckler, & Greenwald, 1989; see McGuire, 1986, for a review), the classic focus on the social basis of attitudes dwindled. However, the social nature

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This research was supported by National Institute of Mental Health Grant K01-MH069419 to Stacey Sinclair. We thank Jeff Huntsinger, Robyn Mallett, Patrick Seder, Jeanine Skorinko, Bobbie Spellman, and Tim Wilson for comments on earlier versions of the article. We also thank Danielle Larkin, Jessica McHie, Rosalie Morton, Lisa Strade, Robyn Walsh, and Andreea Utupan for assistance with data collection.

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<sup>1</sup> In this work, we define *epistemic motivation* as the need to acquire knowledge. Other researchers have used the term *epistemic motivation* to capture a motivational state stemming from, for example, individual differences in the need for cognitive closure, time pressure (e.g., Kruglanski, 1989; Kruglanski & Webster, 1996), and the desire to be accurate (e.g., Darke et al., 1998; Lundgren & Prislin, 1998). Although these characterizations all include the need to acquire knowledge, this need is conflated with the purposes of acquiring knowledge. For example, epistemic motivation arising from the desire to be accurate implies that people seek knowledge to reach the most accurate answer, but epistemic motivation stemming from the need for cognitive closure suggests that people seek, and hold onto, accessible knowledge to reach a firm decision. Our conceptualization of epistemic motivation embraces the former part of these characterizations, the need to acquire knowledge, but is agnostic regarding how one intends to use the knowledge.

of explicit attitudes has recently begun to enjoy renewed interest among modern theorists and researchers (e.g., Hogg, 2001; Kruglanski & Webster, 1996; Prislin & Wood, 2005; Terry & Hogg, 2000; Visser & Mirabile, 2004). Moreover, these theorists seem to concur with classic perspectives by noting that when people are subject to epistemic motivation they tend to align their beliefs with the opinions of those around them. For example, Kruglanski, Webster, and Klem (1993) found that participants who were epistemically motivated while making a decision in a mock legal case were more likely to be persuaded by a confederate and exhibited a greater shift from their initial verdict than those who were not so motivated. Research has also demonstrated that epistemically motivated individuals show greater agreement with the opinions of in-group members than do nonmotivated individuals (Grieve & Hogg, 1999; Shah, Kruglanski & Thompson, 1998). This research not only reenergizes the notion that individuals' attitudes are shaped by social contexts, but also clearly recognizes the role of epistemic motivation in these processes.

The influence of epistemic motivation and the process by which people come to believe what others believe is captured by shared reality theory (Hardin & Conley, 2001; Hardin & Higgins, 1996). This theory contends that people's affiliative and epistemic needs are fulfilled when they are able to see the world as others in the immediate interpersonal context do. Integrating this notion with modern communication research (e.g., Higgins, 1992), shared reality theory suggests that when individuals experience epistemic or affiliative motivation, their views should tune toward those of social interactants in the immediate context to achieve a sense of social consensus (i.e., shared reality), thereby fulfilling epistemic needs or achieving social affiliation. Conversely, when people are not subject to epistemic or affiliative motivation, they should not be motivated to tune their views. Although previous research has demonstrated the role of affiliative motivation in social tuning (e.g., Sinclair & Huntsinger, 2006; Sinclair, Huntsinger, Skorinko, & Hardin, 2005; Sinclair, Lowery, Hardin, & Colangelo, 2005), the role of epistemic motivation in social tuning has not yet been explicitly examined. We term the postulated relationship between epistemic motivation and social tuning the *epistemic social tuning hypothesis*.

This hypothesis is generally consistent with other modern perspectives suggesting that epistemic motivation leads to attitude change (e.g., Darke et al., 1998; Kruglanski, 1989), as well as a connectionist perspective on attitude shift as a function of contextual and motivational influence (Smith, 1996; Smith & DeCoster, 1998). However, this hypothesis is distinct in that it specifically emphasizes the power of one's immediate interpersonal context and associated social cues in attitude change and alleviation of epistemic needs. In contrast, other perspectives emphasize the role of broad social consensus (Darke et al., 1998; Kruglanski et al., 2006) and one's in-group (Grieve & Hogg, 1999; Shah et al., 1998) in these outcomes or do not specify the nature of the social relationship between the source of influence and the person who is being influenced (e.g., Chaiken et al., 1989; Petty & Cacioppo, 1981, 1986; but see Mackie & Queller, 2000). Thus, the epistemic social tuning view is somewhat different from, for example, the recent theoretical argument that people satisfy their epistemic needs by seizing and upholding consensual beliefs of their social groups (Kruglanski et al., 2006). Rather, the epistemic social tuning hypothesis suggests that people should be more influenced

by the views of those in their immediate interpersonal context, particularly when they are uncertain of their own.

Because previous research has shown social tuning of implicit attitudes (Lowery, Hardin & Sinclair, 2001; Sinclair, Lowery, et al., 2005), we sought to examine the epistemic social tuning hypothesis with respect to this type of attitude. Recent research on attitudes has been characterized by a keen and growing interest in implicit attitudes (Bassili & Brown, 2005; Fazio & Olson, 2003; Greenwald & Banaji, 1995). Implicit attitudes are thought to be traces of associations that people acquire from early experience, cultural knowledge, or extended reinforcement, which may influence behavior and judgments outside of individuals' conscious awareness or control (e.g., Bargh, 1994; Devine, 1989; Dovidio, Kawakami, & Gaertner, 2002; Greenwald & Banaji, 1995; Rudman, 2004; Wilson, Lindsey, & Schooler, 2000). Although individuals have limited conscious awareness or control of these attitudes, a growing body of research has begun to show that they are responsive to the apparent beliefs of individuals in one's social context (Blair, 2002; Devine, 2001; Lowery et al., 2001). For example, people who were led to believe that the majority of their peers had relatively egalitarian attitudes showed less activation of African American stereotypes than those not exposed to this belief about their peers (Sechrist & Stangor, 2001). In addition, as postulated by shared reality theory, affiliative motivation has been shown to moderate the degree to which implicit attitudes are shaped by the apparent views of others (Sinclair, Lowery, et al., 2005). Because implicit attitudes can be shaped by the social context and relevant motivations, it stands to reason that epistemic motivation may also moderate the degree to which one's implicit attitudes correspond to the apparent beliefs of those around them as predicted by the epistemic social tuning hypothesis.

It is also notable that we chose to focus our examination of epistemic social tuning of implicit attitudes on implicit prejudice. This type of implicit attitude is thought to be pervasive (Nosek, Banaji, & Greenwald, 2002) and related to the social outcomes of African Americans (e.g., Dovidio et al., 2002; McConnell & Leibold, 2001; for a review, see Fazio & Olson, 2003). In addition, prominent strategies to reduce this form of prejudice have relied heavily on exposure to counterstereotypic exemplars (e.g., Blair & Banaji, 1996; Blair, Ma, & Lenton, 2001; Dasgupta & Asgari, 2004), the motivation to control prejudice (Devine, Plant, Amodio, Harmon-Jones, & Vance, 2002; Moskowitz, Gollwitzer, Wasel, & Schaal, 1999; Moskowitz, Salomon, & Taylor, 2000), and repeated contradictory associations (e.g., Kawakami, Dovidio, Moll, Hermesen, & Russin, 2000) to diminish prejudicial responses. Thus, we hope the current research will contribute to articulating important new considerations regarding the development of strategies to reduce this form of prejudice.

## Overview of Experiments

In a series of experiments, we sought to demonstrate that epistemic motivation moderated the degree to which participants' implicit prejudice corresponded to the apparent views of another person. In Experiment 1, we captured epistemic motivation by assessing the accessibility of relevant beliefs and attitudes. This conceptualization of epistemic motivation stems from past research in which people are motivated to acquire knowledge from others around them because they lack accessible knowledge about

the situation or judgment at hand (e.g., Festinger, 1950; Kruglanski, 1989; Sherif, 1936). The epistemic social tuning hypothesis predicts that when individuals are motivated to seek knowledge as their relevant attitudes are less accessible, they will exhibit lower implicit prejudice when encountering an experimenter who appears to hold egalitarian beliefs (i.e., social tune). In contrast, those with more accessible attitudes should be less motivated to engage in social tuning and should not show similar shifts in their implicit prejudice as a function of the experimenter's beliefs.

In Experiment 2, we sought to conceptually replicate the findings in Experiment 1 by priming participants with concepts related to uncertainty versus neutral concepts. The use of priming not only allows us to directly examine the role of epistemic motivation arising from being uncertain, it also allows us to examine whether epistemic motivation can be automatically activated. A substantial body of research has shown that goals and motivations can be activated automatically and guide cognitive processing and behavior in ways that are not subject to conscious awareness (Aarts & Dijksterhuis, 2000; Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001; Chartrand & Bargh, 1996; Gollwitzer & Bargh, 2005; Moskowitz, 2001; Shah, 2003, 2005). We believe that epistemic motivation arising from being uncertain may also be activated automatically and implicitly stimulate social tuning as a means to achieve a sense of shared understanding among social interactants, which renders shifts in implicit attitudes.

Finally, in a third experiment, we tested the prediction that epistemic social tuning of implicit attitudes is responsive to the apparent views of an interacting other but not to the same views bearing no relevance to the immediate social interaction. This is because epistemically motivated individuals should tune their implicit attitudes toward the views of another person to achieve shared reality; however, when views are merely brought to mind via means that are unrelated to the interacting partner, social tuning should not occur because the opportunity for achieving shared reality is not present.

### Experiment 1

According to the epistemic social tuning hypothesis, individuals who experience epistemic motivation should be inclined to adopt the views of others to achieve a sense of shared reality. In classic and modern research, this motivation is often characterized by being uncertain about what one should think or do because one lacks firm knowledge or information about the judgment at hand (e.g., Darke et al., 1998; Kruglanski et al., 1993; Sherif, 1936). Thus, we believe that attitude accessibility is a reasonable proxy for epistemic motivation because it captures the idea of being unsure of how one feels about an attitude object or social category. Consistent with this interpretation, previous research has shown that attitude accessibility is related to how certain people feel about their attitudes (Bassili, 1996; Holland, Verplanken, & Knippenberg, 2003) or the extent to which people have accessible knowledge about what they like and dislike (Fazio & Powell, 1997).

Given this understanding of attitude accessibility, we predict that people are motivated to engage in social tuning in their interpersonal interaction when they experience epistemic motivation stemming from having less accessible attitudes and beliefs. In other words, people who have less accessible attitudes may be more likely to consider the views of their interaction partner on

those issues, thereby shifting their views to be more consistent with their partner's. In the current experiment, this means that participants with less accessible attitudes should experience lower implicit prejudice when they interact with an experimenter who appeared to hold egalitarian views. Participants whose attitudes are more accessible should not experience the need to tune their views toward those of the experimenter; as a result, their implicit prejudice should not differ according to the experimenter's views.

To illustrate that the shift in implicit prejudice is motivated by a general motivation to acquire knowledge, we examined our hypothesis with accessibility of ethnic attitudes directly related to the apparent beliefs of the experimenter and the implicit prejudice measure, as well as accessibility of general egalitarian attitudes that do not specifically pertain to ethnic groups. If the effect of the experimenter's views on implicit prejudice is motivated by a general motivational state rather than having weak ethnic attitudes that are susceptible to contextual influence, we should find implicit prejudice shifts as a function of accessibility of ethnic attitudes *and* general egalitarian attitudes. Moreover, we do not expect people's actual ethnic and egalitarian attitudes to influence these results if a general motivational state is at work.

### Method

#### Participants

Seventy-five White undergraduates (38 men and 37 women) at the University of Virginia participated for partial fulfillment of a class requirement.

#### Procedure

Participants arrived at the laboratory one at a time. A White female experimenter greeted them and then told them that they would participate in two separate experiments. As part of the ostensible first experiment, participants were told that they would complete a computerized measure assessing students' attitudes on various topics. After participants gave informed consent, the experimenter told them that attitude statements and corresponding scales would be presented one at a time on the computer. They were asked to read each statement carefully and respond as quickly as they could once they decided on an answer to each statement. This task was our measure of attitude accessibility, which is described more fully below. After participants completed this task, the experimenter told them that the first experiment was over and gave them a partial debriefing. She then escorted the participants to a different room, ostensibly for the second experiment.

At the new room, one of two White female experimenters wearing either a t-shirt with the word *eracism* printed on it or a plain t-shirt of the same color greeted the participants. The experimenter then explained that this experiment examined people's attitudes toward different social groups and participants would complete a computer task and a questionnaire. After participants provided informed consent, the experimenter thanked them for participating in the experiment by offering candy as a token. Past research has shown that participants are more likely to engage in social tuning toward a friendly experimenter than a rude experimenter (Sinclair, Lowery, et al., 2005, Experiment 2). The offer of the candy was to ensure that the experimenter seemed equally

friendly across different experimental conditions, thus providing leverage against unanticipated differences in apparent friendliness as an alternative explanation of our findings.

Next, the experimenter told participants that they would need to perform a visual acuity test before the computer task. If the experimenter was wearing the eracism t-shirt, she asked the participant to read the word (i.e., *eracism*) on her t-shirt from three distances, each a little farther away from the participant. This procedure was used to ensure that participants noticed the word *eracism* on the experimenter's t-shirt. In the control condition in which the experimenter wore a plain t-shirt, participants were asked to read a nonsense string of letters (e.g., *RXJQTM*) printed on a piece of paper that was held in front of the experimenter at the same point at which the word *eracism* would fall in the eracism t-shirt condition and at the same three distances.

When the visual test was over, participants were seated in front of a computer and told that they would now complete a computer task that measured automatic prejudice, thereby explicitly making ethnic attitudes relevant to the task and replicating the procedures of past research (Sinclair, Lowery, et al., 2005). The experimenter told them that the word *Good* or *Bad* would appear in the middle of the screen, and participants were to as quickly as they could press the *g* key labeled *G* when they saw the word *Good* and the *j* key labeled *B* when they saw the word *Bad*. The experimenter stayed with the participants as they went through the practice trials. She then asked whether participants had any questions regarding the task and subsequently went into the adjacent room, leaving participants alone to complete the test trials. Participants were instructed to notify the experimenter when they finished the task. Finally, participants completed a confidential questionnaire and placed the completed questionnaire in an envelope. The experimenter then debriefed and thanked the participants.

## Materials

*Attitudes and attitude accessibility.* Participants completed a battery of measures of their explicit attitudes as part of the "first" experiment, which included measures of participants' explicit attitudes toward African Americans and general egalitarian attitudes that were not explicitly about African Americans per se. We examined these two types of attitudes separately to determine whether subsequent effects of accessibility were specific to ethnic attitudes or generalized to general egalitarian beliefs. The computerized questionnaire consisted of 10 statements assessing participants' attitudes toward neutral objects (e.g., "The color red represents power"), the Modern Racism Scale (McConahay, Hardee, & Batts, 1981), the New Symbolic Racism Scale (Henry & Sears, 2002), the Social Dominance Scale (Pratto, Sidanius, Stallworth, & Malle, 1994), items adopted from the Political Orientation Scale (Hepburn & Napier, 1980), and the Ambivalent Sexism Scale (Glick & Fiske, 1996). The Modern Racism and New Symbolic Racism Scales constituted our measures of explicit ethnic attitudes, or explicit prejudice, and the rest of the scales constituted general egalitarian attitudes. Participants always began with questions about neutral objects to familiarize themselves with the keys and program. The order of subsequent scales was randomized for each participant. Participants responded to all items using a 7-point Likert-type scale ranging from 1 (*strongly disagree/not at all*) to 7 (*strongly agree/very much*).

Responses to these items were later recoded such that higher numbers indicated greater endorsement of the specific ideology. The item responses were then averaged to compose a single score for each scale, which resulted in five scales: Modern Racism, Symbolic Racism, Ambivalent Sexism, Conservatism, and Social Dominance. We then created an explicit prejudice score by averaging the Modern Racism and Symbolic Racism scales' scores,  $r(70) = .72, p < .001$ . We also submitted summary scores for the rest of the general egalitarian attitude scales to a factor analysis; the results yielded a one-factor model that accounted for 66% of the total variance (with factor loadings ranging from .76 to .85). Thus, we averaged these summary scores to form an overall general egalitarian attitudes score (Cronbach's  $\alpha = .73$ ); higher numbers indicated greater anti-egalitarian attitudes to be consistent with the prejudice measures.

While participants were answering questions on the attitude scales, we recorded the time participants took to answer each question. Reaction time (in milliseconds) in response to each statement served as our measure of attitude accessibility (Bassili, 1996; Fazio, 1995; Holland et al., 2003; Powell & Fazio, 1984). People whose attitudes are more accessible should respond faster to these attitude statements than those whose attitudes are less accessible. Response latencies were treated with the following procedures for trimming outliers and normalizing the distribution. Latencies that were less than 1,000 ms and 3 standard deviations above the average response time with respect to a specific item were excluded (1.2% for ethnic attitude scales and 1.6% for general egalitarian attitude scales). Then the response latencies were transformed with a natural logarithm to normalize the distribution. Higher numbers indicated less accessible attitudes (i.e., slower).

These transformed latencies were then averaged by scale in the same way in which we computed the ethnic attitude and general egalitarian attitude scores. There were five attitude accessibility indicators, each representing the accessibility of a specific type of attitude: modern racism, symbolic racism, ambivalent sexism, political orientation, and social dominance. We then averaged the mean response time for the Modern Racism and Symbolic Racism scales to form an accessibility score of ethnic attitudes,  $r(70) = .76, p < .001$ . We also submitted the mean response time for the other three general egalitarian attitude scales into a factor analysis; the result suggested a one-factor model with the factor accounting for 84% of the total variance (factor loadings ranging from .90 to .93). Thus, we averaged these latency means to form an accessibility score of general egalitarian attitudes (Cronbach's  $\alpha = .89$ ). See Tables 1 and 2 for descriptive statistics and correlations among these measures. Participants' explicit attitudes and accessibility of these attitudes did not differ between the two t-shirt conditions,  $t(69) < 1.36, ps > .17$ .

*Implicit prejudice computer task.* Implicit prejudice was measured using a sequential subliminal priming task (Lowery et al., 2001; Sinclair, Lowery, et al., 2005). During the task, pictures of Black and White male and female faces were displayed subliminally before the word *Good* or *Bad*. These pictures were taken from high school photographs found online or from yearbooks and converted into black-and-white photos. There were a total of 128 pictures, 64 Black faces (32 male, 32 female) and 64 White faces (32 male, 32 female). Sixteen Black (8 male, 8 female) and 16

Table 1  
Means (and Standard Deviations) of Attitudes and Attitude Accessibility: Experiment 1

Measure	Explicit attitudes		Attitude accessibility <sup>a</sup>	
	Blank t-shirt	Eracism t-shirt	Blank t-shirt	Eracism t-shirt
Ethnic attitudes				
Modern racism	2.67 (0.79)	2.72 (0.78)	8.59 (0.17)	8.64 (0.26)
Symbolic racism	3.72 (0.90)	3.63 (0.83)	8.79 (0.21)	9.78 (0.26)
Composite of explicit prejudice	3.04 (0.77)	3.06 (0.73)	8.67 (0.17)	8.70 (0.25)
General egalitarian attitudes				
Ambivalent sexism	3.77 (0.57)	3.79 (0.54)	5.82 (1.31)	5.95 (1.23)
Social dominance	2.92 (0.91)	2.72 (0.70)	4.81 (0.95)	4.93 (1.43)
Political conservatism	4.14 (0.61)	3.92 (0.66)	6.77 (1.27)	6.86 (1.55)
Composite of general egalitarian attitudes <sup>b</sup>	3.61 (0.60)	3.48 (0.50)	6.45 (1.21)	6.56 (1.38)

<sup>a</sup> Raw means and standard deviation in seconds. <sup>b</sup> Lower number indicates greater egalitarian attitudes.

White (8 male, 8 female) pictures appeared in each corner of the computer screen.

Each of the 128 trials began with a dot in the center of the screen along with a black-and-white sunflower in the corner of the screen in which the faces would appear. This screen was shown for about 187 ms. Then a Black or a White face flashed in place of the sunflower picture for 17 ms, which was a sufficiently short enough time for participants to process the face without consciously seeing the picture (Bargh & Chartrand, 2000). Immediately following the face, the sunflower was presented again as a backward mask for 187 ms. After this, the word *Good* or *Bad* appeared in red in place of the dot. Participants then responded by pressing the appropriate key on the keyboard. If they pressed the wrong key, the computer would not move onto the next trial until they pressed the right key. Before the actual test trials, participants completed four practice trials to familiarize themselves with the response keys. All practice trials were presented in the same order for all participants and were identical to the test trials except that there was no subliminal presentation of faces (i.e., there was only the sunflower picture). The order of the 128 experimental trials was randomized for each participant.

*Questionnaire.* Participants reported whether they saw any writing on the experimenter's t-shirt and if so what the writing said. We also asked participants whether they saw any pictures other than the picture of the sunflower and whether they saw any faces during the computer task that measured implicit prejudice. All participants in the eracism t-shirt condition reported seeing writing on the experimenter's t-shirt, and 92% of them correctly reported the word *eracism*. Five participants reported seeing pictures of faces flashed in the sunflower mask; these participants were not included in the analyses, leaving 70 participants in total.

## Results

### *Implicit Prejudice*

*Data reduction.* Participants' response latencies for the implicit prejudice measure that were shorter than 300 ms or longer than 3,000 ms (4.8%) were excluded. In this experiment, the subliminal priming program did not provide error feedback or record error trials, which was done in subsequent experiments;

Table 2  
Correlations Among Explicit Attitudes and Attitude Accessibility: Experiment 1

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Explicit attitudes														
1. Modern racism	—													
2. Symbolic racism	.72	—												
3. Composite of explicit prejudice	.96	.89	—											
4. Ambivalent sexism	.49	.41	.49	—										
5. Social dominance	.63	.58	.66	.47	—									
6. Political conservatism	.54	.56	.59	.41	.57	—								
7. Composite of general egalitarian attitudes	.68	.65	.72	.73	.88	.81	—							
Accessibility														
8. Modern racism	.31	.22	.30	.28	.06	.09	.16	—						
9. Symbolic racism	-.01	.06	.02	.00	-.16	-.02	-.09	.76	—					
10. Composite of explicit prejudice	.22	.18	.22	.20	-.01	.07	.09	.97	.89	—				
11. Ambivalent sexism	.03	.03	.03	.15	.02	.00	.06	.71	.69	.74	—			
12. Social dominance	.17	.07	.14	.21	.20	.13	.22	.72	.60	.72	.71	—		
13. Political conservatism	-.05	-.08	-.06	.09	-.05	-.02	.00	.71	.73	.77	.76	.80	—	
14. Composite of general egalitarian attitudes	.07	.01	.05	.17	.07	.05	.11	.78	.73	.81	.89	.93	.93	—

therefore, we did not have the information to exclude error trials in this experiment. To simplify the results of the implicit prejudice measure, we computed a score that captured individual differences in the degree to which participants held anti-Black/pro-White implicit attitudes (Sinclair, Lowery, et al., 2005). The average response time to the word *Good* when primed with a White face ( $W_g$ ) was subtracted from the average response time to the same word when primed with a Black face ( $B_g$ ). This resulted in a difference score ( $B_g - W_g$ ) in which a higher number indicated greater positivity toward Whites. Second, the average response time to the word *Bad* when primed with a Black face ( $B_b$ ) was subtracted from the average response time to the same word when primed with a Black face ( $W_b$ ). This resulted in a difference score ( $W_b - B_b$ ) in which a higher number indicated greater negativity toward Blacks. Finally, positivity toward Whites ( $B_g - W_g$ ) was added to negativity toward Blacks ( $W_b - B_b$ ) to determine participants' implicit prejudice, with higher numbers indicating greater anti-Black/pro-White bias. This computation controlled for individual differences in response time and normalized the distribution of the raw latencies. We also computed the overall implicit prejudice score with log-transformed latencies and repeated the analyses. The results were essentially the same. For ease of interpretation, we report the results of the overall implicit prejudice score with raw latencies. Results using log-transformed latencies may be obtained from Janetta Lun.

**Main analysis.** According to the epistemic social tuning hypothesis, we expected to find that people whose attitudes were less accessible would show lower implicit prejudice after interacting with an experimenter who wore the eracism t-shirt versus a plain t-shirt. To test this hypothesis, we regressed individual implicit prejudice scores on attitude accessibility, experimenters' perceived views (i.e., 1 = eracism t-shirt, -1 = blank t-shirt), explicit attitudes, and all relevant interaction terms simultaneously. We added explicit attitudes to the model to examine whether the tuning of implicit prejudice is moderated by people's self-reported prej-

udice level or general egalitarian orientation. All independent variables were first centered at the mean before computing the interaction terms and analyses. Standardized regression coefficients are reported.

We first conducted the aforementioned regression analysis with ethnic attitudes, accessibility of these attitudes, experimenter's perceived views, and all relevant interaction terms as predictors. As expected, there was only an interaction between participant's accessibility of ethnic attitudes and experimenter's perceived views ( $\beta = -0.32$ ),  $t(62) = 2.44$ ,  $p = .02$  (see Figure 1). No other predictors or interaction terms were significant ( $ps > .30$ ). Participants who had less accessible ethnic attitudes (i.e., 1 standard deviation above the mean response latency) had lower implicit prejudice after interacting with the experimenter in the eracism t-shirt versus the plain t-shirt ( $\beta = -0.39$ ),  $t(62) = 2.11$ ,  $p = .04$ . In contrast, those who had more accessible ethnic attitudes (i.e., 1 standard deviation below the mean response latency) showed a trend of experiencing greater implicit prejudice after interacting with the egalitarian experimenter, but this relationship was not reliable ( $\beta = .30$ ),  $t(62) = 1.70$ ,  $p = .095$ .

The same regression analysis was then conducted with general egalitarian attitudes, accessibility of these attitudes, experimenter's perceived views, and all relevant interaction terms as predictors. Again, only the same interaction between attitude accessibility and experimenter's perceived views was found ( $\beta = -0.32$ ),  $t(60) = -2.43$ ,  $p = .02$ , although the simple slopes effects were slightly weaker. Participants who had less accessible egalitarian attitudes (i.e., +1 SD) tended to show lower implicit prejudice after interacting with the experimenter in the eracism t-shirt versus the plain t-shirt ( $\beta = -0.32$ ),  $t(60) = -1.82$ ,  $p = .07$ . Those who had greater accessibility of their general egalitarian attitudes (i.e., -1 SD) were not significantly affected by the experimenter's perceived views ( $\beta = 0.27$ ,  $p > .13$ ). No other predictors or interaction terms were significant ( $ps > .16$ ).

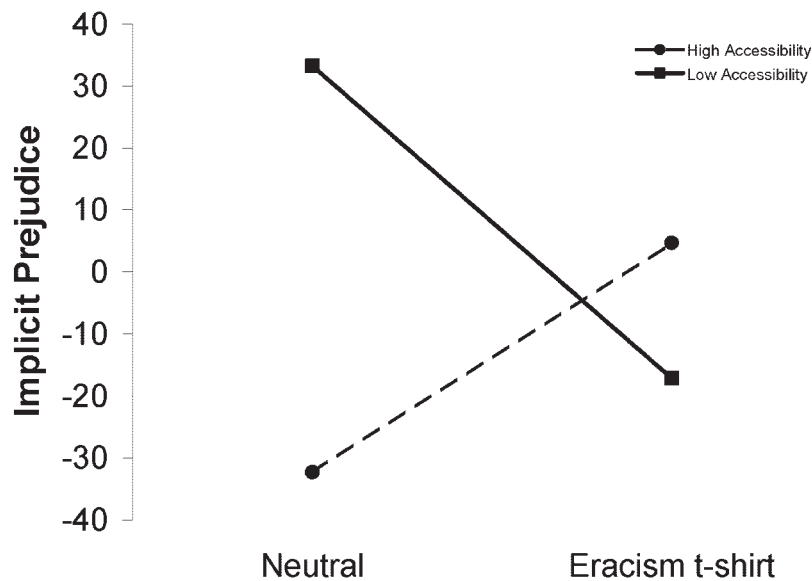


Figure 1. Implicit prejudice as a function of ethnic attitude accessibility and perceived experimenter's views in Experiment 1.

### Discussion

Consistent with the epistemic social tuning hypothesis, individuals who had less accessible attitudes had lower implicit prejudice after interacting with an experimenter who ostensibly held egalitarian views. This pattern of findings held with respect to the accessibility of attitudes that were directly related to ethnic prejudice, as well as attitudes broadly related to egalitarianism but not directly about ethnic prejudice. In contrast, implicit prejudice of those who had more accessible attitudes was not similarly affected by the experimenter's ostensible views, as they were not motivated to engage in social tuning.

Although these results are consistent with our expectations, critics may interpret them with a nonmotivational account whereby individuals who have weak or less accessible attitudes are simply more likely to be buffeted around by the experimenter's views. With respect to this critique, we seek refuge in two aspects of the findings. First, having less accessible explicit ethnic attitudes does not necessarily mean that one's implicit ethnic attitudes are weak. Extant research and theory suggest that implicit and explicit attitudes are related but distinct constructs (Cunningham, Preacher, & Banaji, 2001; Nosek, 2005; Nosek & Smyth, 2007). Thus, it is not evident that accessibility of one's explicit ethnic attitudes is equivalent to the strength of one's implicit ethnic attitudes.

The second reason our findings cannot be simply accounted for by having weak attitudes is that the observed implicit prejudice shift was associated with accessibility of ethnic as well as general egalitarian attitudes, although somewhat more weakly in the latter case. This aspect of the findings suggests that the attitude accessibility measures captured a general sense of uncertainty rather than nonmotivational, attitudinal features of one's ethnic attitudes per se. In fact, we subsequently conducted regression analyses identical to the main analyses reported above but replaced attitude accessibility with attitude extremity, a related indicator of attitude strength. The results of the subsequent analyses did not correspond to the results reported above; attitude extremity did not interact with the experimenter's perceived views to influence implicit prejudice.<sup>2</sup>

In sum, the results of this experiment cannot be fully and parsimoniously explained by the weak attitude account. Nevertheless, it is still possible that our measure of attitude accessibility is capturing attitude strength-related constructs such as centrality and importance. Given this concern, we conducted Experiments 2 and 3 to ascertain the role of epistemic motivation arising from general uncertainty, thereby providing converging evidence for the epistemic social tuning hypothesis.

### Experiment 2

In this experiment we manipulated epistemic motivation by priming participants with concepts related to being uncertain versus neutral concepts (Bargh & Chartrand, 2000; Gollwitzer & Bargh, 2005) and examined whether participants primed with uncertainty would show lower implicit prejudice after interacting with an experimenter who ostensibly endorsed egalitarian views, conceptually replicating the results in Experiment 1. On the basis of the epistemic social tuning hypothesis and Experiment 1, we did not expect the experimenter's apparent views to influence people's implicit prejudice when they were primed with neutral concepts.

### Method

#### Participants

Fifty-two White undergraduates (28 men, 23 women, and 1 unspecified) participated for partial fulfillment of a psychology class requirement.

#### Procedure

Participants arrived at the laboratory individually and were greeted by one of two White female experimenters who wore either the eracism t-shirt or a plain t-shirt of the same color. The participants were then told that the experiment examined people's thoughts and feelings in specific situations and their attitudes toward different people and that they would complete a computer task and a questionnaire. After the experimenter obtained informed consent from the participants, she asked them whether they would mind helping the researcher complete a pilot task involving the construction of sentences with sets of words. All participants agreed. The experimenter then gave them the task, left them alone to complete it, and asked them to notify her when they were done. After participants completed the sentence unscrambling task, the experimenter told participants that they would need to complete a visual acuity test before the computer task. As in Experiment 1, if the experimenter was wearing the eracism t-shirt, she asked the participant to read the word (i.e., *eracism*) on her t-shirt from three distances, each a little farther away from the participant. In the control condition in which the experimenter wore a plain t-shirt, participants were asked to read a nonsense string of letters (e.g., *RXJQTM*) printed on a piece of paper that was held in front of the experimenter at the same point at which the word *eracism* would fall in the eracism condition and at the same three distances.

When the visual test was over, participants were seated in front of a computer and told that they would complete a computer task. Unlike in Experiment 1, there was no mention of what the computer task was measuring nor did the experimenter give participants any candy to ensure that affiliative motivation was high in all conditions (Sinclair, Lowery, et al., 2005). We excluded these procedures because we wanted to see whether epistemic social tuning would still occur in the absence of experimentally induced high affiliative motivation and without knowing the relevance of the computer task to measuring ethnic attitudes. The experimenter simply told the participants that they were to determine when the word *Good* or *Bad* appeared on the screen and that their task was to press the corresponding key as quickly and accurately as they could when this occurred. The experimenter stayed with participants as they went through the practice trials and subsequently left them alone to complete the test trials. Participants were instructed to notify the experimenter when they finished the task.

<sup>2</sup> Attitude extremity was computed by averaging the absolute differences between participants' ratings and the midpoint (4) on the attitude scales. We repeated the regression analyses, replacing the attitude accessibility measure with the attitude extremity measure of ethnic and general egalitarian attitudes. Unlike the findings with attitude accessibility, the interaction between perceived experimenter's view and attitude extremity was not significant ( $ps > .70$  and  $.67$  for ethnic attitudes and general egalitarian attitudes, respectively). No other reliable effects were found ( $ps > .11$  and  $.13$ , respectively).

After the computer task, participants completed a confidential questionnaire. Finally, the experimenter conducted a funneled debriefing to gauge whether participants were consciously aware of the theme in the sentence completion task and whether they thought it was related to other tasks (Bargh & Chartrand, 2000). One participant was able to identify the theme in the sentence completion task but did not think that it had an effect on the implicit prejudice measure; therefore, we included this participant in the analysis.

### Materials

**Sentence completion task.** Participants were presented with 20 sets of words. For each set of words, they were to make a grammatically correct sentence, leaving out one of the words. Participants were randomly assigned to receive one of the two versions of the sentence completion task that was used to prime uncertainty or neutral concepts (Bargh & Chartrand, 2000; Srull & Wyer, 1979). Half of the participants constructed sentences with words or phrases that were related to uncertainty (e.g., *uncertain*, *want to know*, *curious*, etc.), and the other half of them did the same task but with neutral words (see the Appendix).

To ensure that the target words or phrases were indeed more related to uncertainty than neutral words, we asked a separate group of undergraduate students ( $n = 26$ ) to rate the degree to which each of the uncertainty or neutral words or phrases was associated with being in a state of uncertainty on a 5-point Likert-type scale ranging from 0 (*not at all associated*) to 4 (*very closely associated*). We averaged the ratings for the two types of words or phrases (Cronbach's  $\alpha = .86$  and  $.66$  for uncertainty and neutral words, respectively) and submitted these two means into a paired-samples  $t$  test. As expected, uncertainty words and phrases were thought to be more closely associated with being uncertain ( $M = 2.91$ ,  $SD = 0.57$ ) than neutral words or phrases ( $M = 0.64$ ,  $SD = 0.35$ ),  $t(25) = 21.54$ ,  $p < .001$ .

**Implicit prejudice computer task.** The stimuli and instructions for the implicit prejudice task were the same as in Experiment 1, except participants received error feedback when they pressed the wrong key. A red  $x$  appeared in the middle of the screen when participants pressed the incorrect key, and they were required to press the correct key to move onto the next trial.

**Questionnaire.** Because we did not experimentally manipulate affiliative motivation in this experiment, we asked participants to answer six questions about their affiliative motivation toward the experimenter on a 7-point Likert-type scale ranging from 1 (*not at all*) to 7 (*very much*): "How much do you like the experimenter?" "How friendly was the experimenter?" "How nice was the experimenter?" "How much did you want to get along with the experimenter?" "How smooth was the interaction with the experimenter?" and "How pleasant was the interaction with the experimenter?" These six items were averaged to form an index of affiliative motivation (Cronbach's  $\alpha = .90$ ). Next, they reported whether they saw any pictures of faces during the computer task, whether they saw any writing on the experimenter's shirt, and what they thought the experiment was about. No participant reported seeing pictures other than the masks, and all participants saw the word *eracism* on the experimenter's t-shirt in the experimental condition. However, one person guessed the hypothesis, and this

individual's data were excluded from the analysis, leaving 51 participants.

## Results

### Implicit Prejudice

**Data reduction.** We first excluded response latencies for trials in which participants responded incorrectly (3.6% of the total), as well as any latency that was shorter than 300 ms or longer than 3,000 ms (3.2% of the remaining trials). We then computed an overall implicit prejudice score as in Experiment 1, with higher numbers indicating greater anti-Black/pro-White bias. As in Experiment 1, the overall score was normally distributed, and we reported the results in raw latencies for ease of interpretation.

**Analysis.** According to the epistemic social tuning hypothesis, we expected that only those participants who were primed with words related to uncertainty would have lower implicit prejudice after interacting with the experimenter who ostensibly endorsed egalitarian views versus neutral views. However, the experimenter's views should not affect the implicit prejudice of those who were primed with neutral concepts. To test this hypothesis, implicit prejudice scores were submitted to a 2 (prime: epistemic vs. neutral prime)  $\times$  2 (experimenter's perceived views: egalitarian vs. neutral) between-participants analysis of variance (ANOVA). The interaction between prime and experimenter's perceived views approached significance,  $F(1, 47) = 3.41$ ,  $p = .07$ ,  $\eta_p^2 = .07$ . The pattern of this interaction confirmed our expectation (see Figure 2). When participants were primed with uncertainty, they had lower implicit prejudice after interacting with an experimenter perceived to hold egalitarian views ( $M = -15.96$ ,  $SD = 31.79$ ) versus neutral views ( $M = 11.35$ ,  $SD = 22.00$ ),  $F(1, 47) = 5.10$ ,  $p = .03$ ,  $\eta_p^2 = .10$ . In contrast, when participants were primed with neutral concepts, their implicit prejudice was not affected by the experimenter's perceived views ( $M_s = 4.67$  and  $1.32$ ,  $SD_s = 34.83$  and  $27.82$ , for the eracism t-shirt vs. the blank t-shirt, respectively),  $F(1, 47) < 1$ ,  $ns$ .

### Liking and Affiliative Motivation Toward Experimenter

Because previous research demonstrated that people are more likely to engage in social tuning when they have affiliative motivation toward the interaction partner (Sinclair, Lowery, et al., 2005), the uncertainty manipulation might have affected implicit prejudice not because it increased uncertainty but because it affected participants' affiliative motivation toward the experimenter (Mills & Mintz, 1972; Schachter, 1959). To examine this possibility, we submitted the affiliative motivation composite to a 2 (prime: epistemic vs. neutral prime)  $\times$  2 (experimenter's perceived views: egalitarian vs. neutral) between-participants ANOVA. The experimental manipulations did not significantly affect participants' affiliative motivation toward the experimenter,  $F_s(1, 46) < 1.05$ ,  $p_s > .30$ . As such, the demonstrated difference in implicit prejudice cannot be easily attributed to affiliative motivation (Sinclair, Lowery, et al., 2005).

## Discussion

Participants who were primed with words related to uncertainty, and therefore experienced an epistemic motivation, had less im-



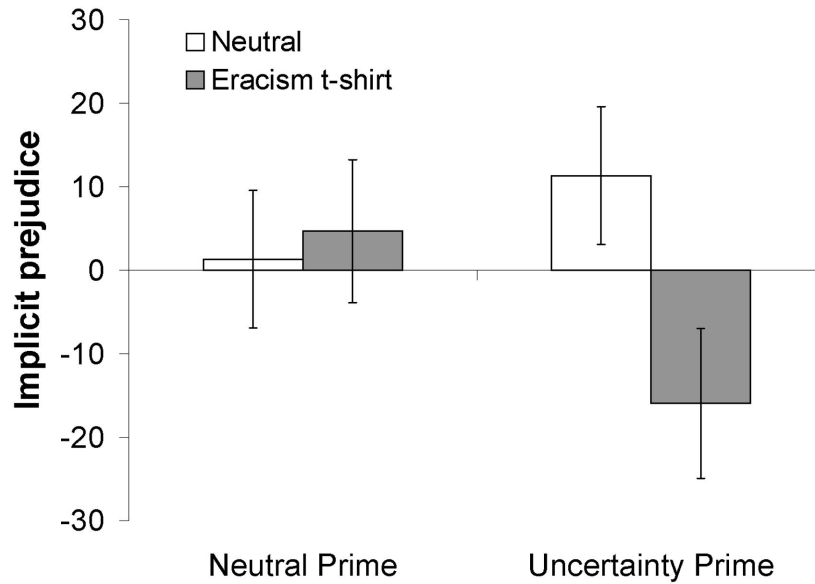


Figure 2. Mean implicit prejudice as a function of prime and perceived experimenter's views in Experiment 2. Vertical lines depict standard errors of the means.

implicit prejudice after interacting with an experimenter who ostensibly endorsed egalitarian views, whereas participants who were primed with neutral concepts were unruffled by the experimenter's views. It is notable that this occurred even though participants reported not being aware of a theme in the sentence completion task or of the relevance of the sentence completion task to the implicit prejudice measure. Furthermore, participants did not know that the subliminal priming task measured implicit prejudice or had any association with ethnic attitudes. Finally, these effects were not related to reported affiliative motivation toward the experimenter, as participants reported liking the experimenter and wanting to get along with her equally in all conditions. Thus, we are confident that these findings reflect epistemic social tuning.

### Experiment 3

According to the epistemic social tuning hypothesis, people tune their views toward those of others because shared beliefs can satisfy the epistemic motivation arising from being uncertain. In other words, the extent to which people can fulfill the epistemic motivation is predicated on the success of establishing shared views with others (Hardin & Conley, 2001). Although Experiment 2 successfully established the role of epistemic motivation in social tuning, it did not decisively demonstrate the interpersonal nature of epistemic social tuning. One may still explain the finding with a priming account such that uncertain people who were shown the eracism t-shirt simply had egalitarian thoughts in mind and thus reduced their implicit prejudice. From the theoretical standpoint of shared reality theory, it is the beliefs of an interacting partner that provide the basis for social tuning, not mere thought about the beliefs themselves. Therefore, thinking about the beliefs without attributing them to the current interaction partner should have less impact on people's implicit attitudes than the same beliefs clearly endorsed by the interacting other.

To examine the interpersonal nature of epistemic social tuning, we designed Experiment 3 to test whether uncertain people had lower implicit prejudice when they were presented with the egalitarian message via means that could not be attributed to the experimenter (i.e., an eracism poster vs. an eracism t-shirt) while they experienced epistemic motivation. If our hypothesis is supported, implicit prejudice should be affected more by egalitarian views that are thought to be endorsed by the experimenter (i.e., on the shirt) than by the same egalitarian message that does not appear to be endorsed by the experimenter (i.e., on the poster).

### Method

#### Participants

Seventy-eight White undergraduates (25 men, 48 women, and 5 unspecified) participated for partial fulfillment of a psychology class requirement or a payment of \$7.

#### Procedure

Participants arrived at the laboratory individually and were greeted by one of four White female experimenters who wore either the eracism t-shirt or a plain t-shirt of the same color. The participants were then told that the experiment examined people's thoughts and feelings in specific situations and their attitudes toward different people and that they would complete a computer task and a questionnaire. After the experimenter obtained the signed informed consent form from participants, as in Experiment 2, she asked them to complete a pilot sentence completion task; all participants agreed. The experimenter conducted the visual acuity test after the participants completed the sentence unscrambling task. The visual acuity test was slightly different from previous experiments. The experimenter explained that she left her eye chart

in another lab, and she would have to improvise. When the experimenter was wearing the eracism t-shirt, she asked the participant to read the word (i.e., *eracism*) on her t-shirt from three distances, each a little farther away from the participant as in Experiments 1 and 2. When the experimenter was wearing the plain t-shirt, half of the participants were directed to read the word *eracism* on a poster that happened to be on the wall in the room. Similarly, the participants were asked to read the word from three distances, each time moving a little farther away from the poster. In the control condition, participants were asked to read a nonsense string of letters (e.g., *RXJQTM*) printed on a piece of paper that was held in front of the experimenter at the point at which the word *eracism* would fall on the eracism t-shirt and at the same three distances.

When the visual test was over, participants were seated in front of a computer and told that they would now complete a computer task. The instruction and procedure from this point on was the same as in Experiment 2. On completing the computer task, participants completed a confidential questionnaire just as in Experiment 2. Finally, the experimenter conducted a funneled debriefing and thanked participants for their participation. All participants saw the word *eracism* on the experimenter's t-shirt in the t-shirt condition or on the poster in the poster condition. During funneled debriefing, 4 participants reported that they were somewhat aware of the theme of the sentence completion task and 1 of them reported thinking the sentence completion task was related to the computer task. We excluded this latter person's data from the analysis, leaving 77 participants in total.

### Materials

**Sentence completion task.** As in Experiment 2, participants were presented with 20 sets of words and asked to make a grammatically correct sentence, leaving out one of the words for each set (Bargh & Chartrand, 2000; Srull & Wyer, 1979). Participants were randomly assigned to receive one of the two versions of the sentence completion task. Half of the participants constructed sentences with words or phrases that were related to uncertainty (e.g., *uncertain, want to know, curious, etc.*), as in Experiment 2. In contrast, and different from Experiment 2, the other half of the participants were given the same task but with words or phrases that were related to certainty (e.g., *certain, don't want to know, not curious, etc.*). We primed certainty instead of neutral concepts in this experiment because it constituted a better control for the uncertainty primes, as our underlying assumption in Experiment 2 was that participants in the neutral condition were relatively certain. From our theoretical perspective, those who are certain should not be affected by the experimenter's views.

**Implicit prejudice computer task.** The stimuli and instructions for the implicit prejudice task were the same as in Experiment 2.

**Questionnaire.** Participants completed a computerized questionnaire that was similar to the questionnaire used in Experiment 2, which included questions about participants' affiliative motivation toward the experimenter and whether they saw any pictures of faces during the computer task. No participant reported seeing pictures aside from the masks. The affiliative motivation items were averaged in the same manner as in Experiment 2 to create an index of affiliative motivation (Cronbach's  $\alpha = .91$ ). In addition to these measures, participants also completed a measure of explicit

prejudice, the Modern Racism Scale (McConahay et al., 1981). The ratings of this scale were averaged to create a composite score with higher numbers indicating greater explicit prejudice. This measure allowed us to examine whether uncertainty and egalitarian beliefs would also influence participants' explicit prejudice in a manner similar to implicit prejudice. Because of computer error, 5 participants did not complete the explicit prejudice measure and 3 other participants were able to complete the explicit prejudice but not the affiliative motivation items.

## Results

### Implicit Prejudice

**Data reduction.** We first excluded any latencies associated with incorrect responses (3.7% of total trials), as well as latencies that were shorter than 300 ms or longer than 3,000 ms (3.7% of the remaining trials). Afterward, we computed an overall implicit prejudice score as in Experiments 1 and 2. Higher numbers indicated greater anti-Black/pro-White bias (i.e., implicit prejudice).

**Analysis.** We expected that only those participants who were primed with words related to uncertainty and interacting with the experimenter who ostensibly endorsed egalitarian views would have lower implicit prejudice. To test this specific prediction, we conducted a planned contrast comparison. We assigned a weight of  $-5$  to the uncertain-eracism t-shirt cell and a weight of  $1$  to the other five cells. The contrast test confirmed our expectation that only those who were primed with uncertainty and exposed to the experimenter's egalitarian beliefs experienced lower implicit prejudice (for uncertainty prime:  $M_{t-shirt} = -14.25$ ,  $SD_{t-shirt} = 36.89$ ;  $M_{poster} = 4.13$ ,  $SD_{poster} = 33.04$ ; and  $M_{neutral} = 6.02$ ,  $SD_{neutral} = 40.89$ ; for certainty prime:  $M_{t-shirt} = 10.57$ ,  $SD_{t-shirt} = 33.73$ ;  $M_{poster} = 4.69$ ,  $SD_{poster} = 34.30$ ; and  $M_{neutral} = 5.28$ ,  $SD_{neutral} = 27.84$ ),  $t(72) = 2.10$ ,  $p = .04$  (see Figure 3).

### Liking and Affiliative Motivation Toward Experimenter

To examine whether the effect on implicit prejudice could be accounted for by affiliative motivation rather than epistemic motivation (Sinclair, Lowery, et al., 2005), we conducted the above planned contrast comparison test on the affiliative motivation composite. If the results for implicit prejudice described above were driven by affiliative motivation (e.g., uncertainty increased motivation to affiliate with the experimenter), we should find the same pattern of results on this measure. However, the analysis showed that the a priori pattern did not fit the data,  $t(64) < 1$ ,  $ps > .50$ . Thus, the current findings of implicit prejudice did not seem to be a function of affiliative motivation.

### Explicit Prejudice

Finally, we examined whether the manipulations had a similar impact on participants' explicit prejudice. We submitted participants' explicit prejudice score to the same planned contrast comparison mentioned above, and the predicted pattern did not emerge,  $t(67) = 1.04$ ,  $p > .30$ . Because we did not have a specific prediction regarding explicit prejudice, we also conducted a  $2 \times 3$  between-participants ANOVA to examine whether there were other effects. Interestingly, there was a main effect of prime such

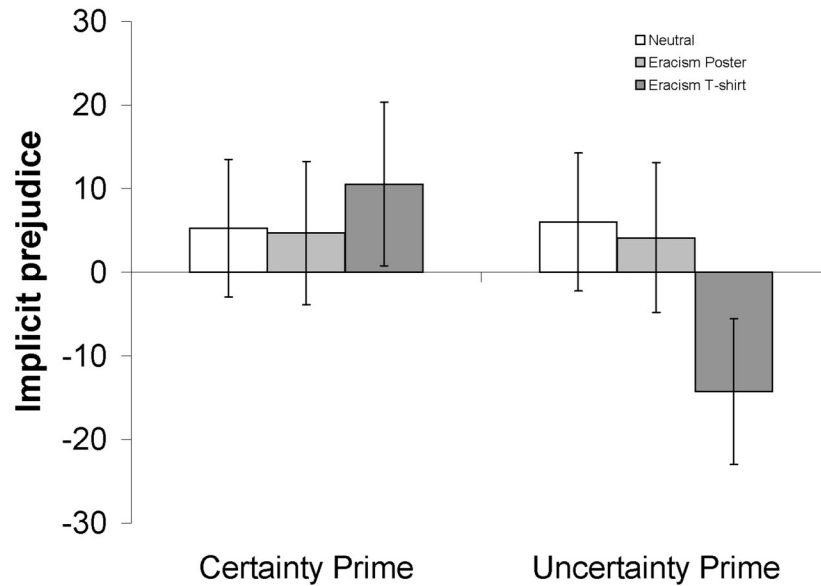


Figure 3. Mean implicit prejudice as a function of prime and perceived experimenter's views in Experiment 3. Vertical lines depict standard errors of the means.

that participants who were primed with uncertainty reported more explicit prejudice ( $M = 2.69$ ,  $SD = 0.71$ ) than those who were primed with certainty ( $M = 2.35$ ,  $SD = 0.70$ ),  $F(1, 67) = 4.15$ ,  $p = .05$ ,  $\eta_p^2 = .06$ . However, there was no effect of the experimenter's beliefs or an interaction between prime and experimenter's beliefs ( $F_s < 1$ ).

### Discussion

In support of the interpersonal nature of the epistemic social tuning hypothesis, uncertain participants experienced lower implicit prejudice only when they were exposed to the egalitarian views of the experimenter, not when the beliefs were merely brought to mind in a manner that was not explicitly endorsed by the experimenter (i.e., on a poster). This finding provides strong evidence that the shift in implicit prejudice is a result of tuning one's views toward those of the experimenter instead of simply being primed with the beliefs. Individuals' implicit attitudes did not respond to the message that was not purportedly endorsed by the experimenter even though the belief was made accessible in their minds. This is because the egalitarian message on the poster does not present an opportunity for social tuning to establish shared reality in the immediate social interaction. It is interesting that we did not find parallel results for explicit prejudice, and we discuss this finding in more detail in the General Discussion.

It is important to take caution in generalizing the current finding. The result does not suggest that messages presented in a noninterpersonal manner are always ineffective in changing people's implicit attitudes. In this experiment, we put great effort into ensuring that participants did not link the poster to the experimenter's beliefs to tease apart the interpersonal specificity of epistemic social tuning from a mere priming effect. However, in everyday life contextual cues such as posters or bumper stickers are likely to inform others about the personality or beliefs of the person who

inhabits the context (e.g., Gosling, Ko, Mannarelli, & Morris, 2002). Thus, beliefs represented by these contextual cues may also influence individuals' attitudes when it is clear that interacting others endorse them.

### General Discussion

The present research examined whether the desire to acquire knowledge (i.e., epistemic motivation) motivated people to tune their implicit prejudice toward the beliefs purportedly held by another person. Across three experiments, we found consistent evidence supporting the epistemic social tuning hypothesis. Individuals who had less accessible attitudes (Experiment 1) or who were nonconsciously primed with uncertainty (Experiments 2 and 3) showed lower implicit prejudice after interacting with an experimenter presumed to endorse egalitarian views (i.e., wearing an eracism t-shirt) versus neutral views (i.e., a plain t-shirt). In addition, this effect of uncertainty on implicit prejudice was replicated only when the egalitarian beliefs appeared to be endorsed by the experimenter but not when the beliefs were conveyed in a manner that did not imply the experimenter's endorsement (i.e., an eracism poster; Experiment 3). The present findings are consistent with the epistemic social tuning hypothesis, which states that epistemic motivation propels social tuning as a means to achieve shared reality with others.

It is interesting to note that individuals may experience shifts in attitudes of which they have limited conscious awareness (i.e., implicit attitudes) under the influence of epistemic motivation that they are also not consciously aware of. Participants in Experiment 1 were not aware that we measured their response latency to the explicit attitude scales, nor were participants in Experiments 2 and 3 consciously aware of the manipulation of epistemic motivation. Nevertheless, all experiments showed conceptually consistent effects on implicit prejudice. Moreover, participants did not show

correspondent fluctuations in explicit attitudes in Experiment 3, further suggesting that people are not strategically manipulating their responses to please the experimenter. This is the first experiment that we are aware of to examine the implications of any form of epistemic motivation on implicit attitude shifts, and these results suggest that epistemic motivation can influence implicit attitudes even without individuals' conscious awareness of either.

We captured epistemic motivation in the current research by measuring attitude accessibility or eliciting a state of uncertainty. These choices represent an underlying conceptualization of epistemic motivation that is somewhat different from the conceptualizations used in past research. In past research, conceptualizations of epistemic motivation often conflate a desire to acquire knowledge with suppositions about how this knowledge will be used after its acquisition (e.g., reaching an accurate or firm decision; Kruglanski, 1989; Lundgren & Prislun, 1998). We believe that attitude accessibility and uncertainty capture the desire to acquire knowledge in a manner that is consistent with extant constructs, but unlike them, our conception of this motivation is agnostic with respect to how an individual will use that knowledge. From our theoretical perspective, people may engage in epistemic social tuning to serve different purposes, and distinguishing the ramifications of these purposes is not a focus of the current research.

However, in light of the potential distinction between an initial desire to acquire knowledge and the purposes to which this knowledge will then be used, further research is encouraged to determine whether specific instantiations of epistemic motivation have different ramifications regarding short-term and long-term attitude change. On the one hand, epistemic motivation that is free from a downstream purpose suggests that it will motivate implicit attitude shifts in ways that are specific to a given interpersonal context and may fluidly change as the context changes (Weisbuch, Sinclair, Skorinko, & Eccleston, 2007). On the other hand, epistemic motivation that is associated with a definite purpose, such as fulfilling the need for cognitive closure, suggests that once individuals establish a given attitude via social consensus, they cling to it (Kruglanski & Webster, 1996).

Another way the current research diverges from previous work is its demonstrated interpersonal specificity. Individuals who experienced epistemic motivation in interpersonal contexts were more attuned to knowledge and beliefs that were held by other interactants than to those that were merely brought to mind (Experiment 3). This finding of interpersonal specificity suggests that social tuning will occur when it is conducive to creating shared reality in one's immediate interpersonal contexts. This is different from much of past work that focuses on achieving a sense of knowing from views that are shared among a group of individuals with whom people may not have direct contact (Darke et al., 1998; Grieve & Hogg, 1999; Hogg, 2001; Shah et al., 1998; Sherif, 1936; Stangor et al., 2001). Recent theoretical perspectives have also suggested that epistemic motivation underlies people's desire to form social groups because groups provide a shared belief system that satisfies their need to know (Kruglanski et al., 2006). The present research suggests that epistemic functions can also be served on an interpersonal level, regardless of mass consensus, and beliefs and attitudes are partly held in place by those with whom we have frequent contact (Visser & Mirabile, 2004). The distinction between group- versus interpersonal-level fulfillment of epis-

temic need should inspire future research to examine whether social consensus established among individuals in an immediate interpersonal context has different implications for attitude change compared with consensus derived from a group. It would also be interesting to examine how individuals will respond when consensus with a group and a given individual are in conflict.

The present research also extends work on social tuning of explicit (Sinclair, Huntsinger, et al., 2005) and implicit attitudes (Sinclair, Lowery, et al., 2005) by demonstrating that epistemic motivation can spur social tuning in addition to affiliative motivation (Hardin & Conley, 2001). Our findings cannot be accounted for by fluctuations in affiliative motivation because it was constant across conditions. However, in the current set of experiments, social tuning of implicit attitudes elicited by the desire to acquire knowledge occurred when participants had a reasonable level of desire to affiliate with the experimenter. It would be interesting for future research to examine the relative influence of these motivations in interpersonal contexts on explicit and implicit attitude changes (Sinclair, Huntsinger, et al., 2005; Sinclair, Lowery, et al., 2005). For example, it would be intriguing to examine whether people will tune toward a highly dislikable interaction partner when they are epistemically motivated.

Consistent with a growing body of research on the malleability of implicit attitudes, the present research underscores the power of one's social contexts, specifically interpersonal interaction, in shaping individuals' implicit attitudes. However, the cognitive mechanisms and processes that allow implicit attitudes to shift in response to social contexts remain an open question. One way to provide some clues as to how implicit attitudes shift in the current set of data is to examine which associations within the overall implicit prejudice measure (i.e., Black-positive, Black-negative, White-positive, White-negative) were responsive to the influence of epistemic motivation and the experimenter's perceived views. With the sequential priming task that we used, it is possible to examine each association separately. Although we did not find robust effects on separate components within each experiment, a combined analysis of the three experiments shows Black-negative and, to a lesser extent, White-positive components moving in the hypothesized direction and driving our findings.<sup>3</sup> Hence, the apparent egalitarian views of the experimenter decreased negative associations with Blacks among epistemically motivated participants, as well as dampened positive associations with Whites.

<sup>3</sup> We standardized the average response latencies of the Black-good, Black-bad, White-good, and White-bad trials in each experiment and combined the data across the three experiments. A median split was performed on the attitude accessibility measure in Experiment 1, and the poster condition in Experiment 3 was excluded from this analysis. We then submitted the four components to a full factorial analysis, with study, uncertainty, and perceived views of the experimenter as between-participants factors and ethnicity of faces and valence of words as within-participant factors. The full interaction was statistically significant,  $F(1, 663) = 5.92, p = .02$ . Simple effects tests showed that when participants interacted with the apparently egalitarian experimenter, those who were epistemically motivated responded more slowly to the word *Bad* after being primed with a Black face than those who were not so motivated,  $t(663) = 1.94, p = .05$ . A similar effect was found for the White-good trials, but it was only marginally significant,  $t(663) = 1.72, p = .09$ .

Although the examination of specific associations provides more detail about the process by which implicit attitudes shift, it does not fully explain the cognitive mechanisms that are responsible for these shifts. We believe that our findings are consistent with a connectionist conception of cognition (McClelland & Rumelhart, 1986; Smith, 1996; Smith & DeCoster, 1998). The connectionist framework suggests that an attitude is represented in memory as a pattern of activation in an individual's neural network, which includes activation elicited from relevant contextual cues (e.g., situations, goals, mood, etc.). Thus, an attitude is not retrieved from memory as a discrete cognitive representation of the attitude object alone; rather, it is an integrative and distributed activation of different representational units reflecting the specific configuration of various features during the experience. This idea is not far from the conception that people construct their attitudes online rather than retrieve them directly from memory free from the context (Wilson & Hodges, 1992). From these perspectives, social contexts are constituents of the experience of implicit attitudes. We believe that a connectionist understanding of implicit processing satisfyingly explicates the flexibility and contextual sensitivity of implicit attitudes demonstrated in the present research.

Finally, the current research also has important implications for the moderation of implicit prejudice. Although we chose to examine our hypothesis with respect to reduction of implicit prejudice, these findings also suggest that epistemic motivation may increase implicit prejudice when one's interaction partner expresses prejudicial views. This implication points to the importance of maintaining and upholding egalitarian beliefs in one's social milieu, not only as a group norm but also in one's interpersonal interactions. In terms of reducing implicit prejudice, the current findings illustrate that one does not only have to express one's egalitarian beliefs unequivocally, one may also need to consider whether others are motivated to adopt the beliefs. For example, when people from different backgrounds are brought together, in addition to setting up an egalitarian norm (e.g., Sechrist & Stangor, 2001) we should ensure that people are motivated to learn from each other. Perhaps in addition to making sure that we add an eracism t-shirt into our t-shirt collection, we should begin to think about ways to spark people's curiosity about what we think about different social groups.

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(Appendix follows)

## Appendix

## Scrambled Sentences Tests

Uncertain Condition Scrambled Sentences Task  
(Experiments 2 and 3)

*know* I want to heavy more  
 sky the seamless red is  
*believe* they look *don't* her  
 a smile what parrot great  
 about Jane the it felt *uncertain*  
 saw hammer the train he  
 Bob outcome is the *unsure* of seems  
 the push wash frequently clothes  
*questions* news Todd the throws  
*unstable* market admirable the is very  
*been* I have *there* seen *never*  
 Katie *doubts* drives promise his  
 have wing a butterfly I  
 what Amy eat *can't* to *decide* *seek*  
 the are results mountain *inconclusive*  
 she line leads the tracks  
*not* people *confident* valid are  
 answer Steve flies *guesses* the  
 salad She make green tasty  
 felt *unprepared* possessed Helen  
 helpless it hides there over  
 is the punctual *ambiguous* instruction  
*curious* I am it about look

Note. The italicized words indicate concepts related to uncertainty.

Certain Condition Scrambled Sentences Task  
(Experiment 3)

want I more *know* *don't* to heavy  
 sky the seamless red is  
 with some they *believe* her  
 a smile what parrot great  
*certain* felt Jane it the about  
 saw hammer the train he  
 Bob outcome is the *sure* of seems  
 the push wash frequently clothes  
*knew* Todd news about threw the  
*stable* market admirable the is very  
*been* I seen *have* *there*

Katie *trusts* drives promise his  
 have wing a butterfly I  
 eat *decided* Amy yet to  
 the are results mountain *predictable*  
 she line leads the tracks  
 people *confident* *valid* are  
*answer* Steve flies *offers* the  
 salad She make green tasty  
 felt *prepared* possessed Helen  
 helpless it hides there over  
 is the punctual *clear* instruction  
*lot* *know* a look about it I

Note. The italicized words indicate concepts related to certainty.

Neutral Condition Scrambled Sentences Task  
(Experiment 2)

ball throw toss silently the  
 he observes occasionally people watches  
 ate she it selfishly all  
 prepare the gift wrap neatly  
 the push wash frequently clothes  
 somewhat prepared I was refer  
 picked throw apples hardly the  
 they obedient him often know  
 helpless it hides there over  
 send I mail it over  
 a smile what parrot great  
 ball the hoop toss normally  
 saw hammer the train he  
 maintain she to composure try  
 the machine wash frequently clothes  
 sky the seamless red is  
 a have June holiday wedding  
 salad I make green tasty  
 she line leads the tracks  
 have wing a butterfly I

Received May 19, 2006  
 Revision received June 14, 2007  
 Accepted June 30, 2007 ■