

# Personality and Social Psychology Bulletin

<http://psp.sagepub.com/>

---

## Eye Gaze as Relational Evaluation: Averted Eye Gaze Leads to Feelings of Ostracism and Relational Devaluation

James H. Wirth, Donald F. Sacco, Kurt Hugenberg and Kipling D. Williams  
*Pers Soc Psychol Bull* 2010 36: 869 originally published online 26 May 2010  
DOI: 10.1177/0146167210370032

The online version of this article can be found at:  
<http://psp.sagepub.com/content/36/7/869>

---

Published by:



<http://www.sagepublications.com>

On behalf of:



Society for Personality and Social Psychology

Additional services and information for *Personality and Social Psychology Bulletin* can be found at:

**Email Alerts:** <http://psp.sagepub.com/cgi/alerts>

**Subscriptions:** <http://psp.sagepub.com/subscriptions>

**Reprints:** <http://www.sagepub.com/journalsReprints.nav>

**Permissions:** <http://www.sagepub.com/journalsPermissions.nav>

**Citations:** <http://psp.sagepub.com/content/36/7/869.refs.html>


>> [Version of Record](#) - Jun 24, 2010

[OnlineFirst Version of Record](#) - May 26, 2010

[What is This?](#)

# Eye Gaze as Relational Evaluation: Averted Eye Gaze Leads to Feelings of Ostracism and Relational Devaluation

James H. Wirth<sup>1</sup>, Donald F. Sacco<sup>2</sup>,  
Kurt Hugenberg<sup>2</sup>, and Kipling D. Williams<sup>1</sup>

Personality and Social  
Psychology Bulletin  
36(7) 869–882  
© 2010 by the Society for Personality and  
Social Psychology, Inc  
Reprints and permission:  
sagepub.com/journalsPermissions.nav  
DOI: 10.1177/0146167210370032  
http://pspb.sagepub.com  


## Abstract

Eye gaze is often a signal of interest and, when noticed by others, leads to mutual and directional gaze. However, averting one's eye gaze toward an individual has the potential to convey a strong interpersonal evaluation. The averting of eye gaze is the most frequently used nonverbal cue to indicate the silent treatment, a form of ostracism. The authors argue that eye gaze can signal the relational value felt toward another person. In three studies, participants visualized interacting with an individual displaying averted or direct eye gaze. Compared to receiving direct eye contact, participants receiving averted eye gaze felt ostracized, signaled by thwarted basic need satisfaction, reduced explicit and implicit self-esteem, lowered relational value, and increased temptations to act aggressively toward the interaction partner.

## Keywords

eye gaze, ostracism, social exclusion, sociometer, aggression

Received July 29, 2009; revision accepted November 20, 2009

The eyes have it. When we look at the faces of others, we tend to look first and most frequently at their eyes (see Frischen, Bayliss, & Tipper, 2007, for a review). Indeed, attending to others' eyes appears to be a hardwired human trait and appears highly functional in developing social cognition (e.g., Baron-Cohen, 1995; Striano & Reid, 2006). Individuals who do not preferentially attend to or understand eye gaze typically experience serious social and developmental deficits (e.g., autism; see Dalton et al., 2005). Attending to others' eyes is so critical because of the wealth of information that eyes convey. Others' eyes can signal their facial identities (Schwarzer, Huber, & Dummler, 2005), their emotions (Smith, Cottrell, Gosselin, & Schyns, 2005), and their intentions and evaluations (Frischen et al., 2007) and assist in making social interactions go smoothly (Nummenmaa, Hyönä, & Hietanen, in press).

When others' eyes attend to a stimulus, we not only know that they are likely to act on that stimulus (Kanwisher & Wojculik, 2000) but also may imbue that stimulus with positivity. For example, Corneille, Mauduit, Holland, and Strick (2009) had participants view a computer screen in which a dog's head and consumer products were displayed. The dog's head looked either toward the consumer products or away from them. The longer the dog's gaze was leveled at a product, the more

positively participants evaluated the product. Similarly, Bayliss, Paul, Cannon, and Tipper (2006) found that objects that others have been seen gazing at are liked more than are objects they had not previously gazed at. Importantly, this is not simply because of the orienting function of another's gaze; specifically, the same individual's gaze does not imbue positivity if arrows replace the target's eyes as the orienting stimuli. Collectively, these findings suggest that others' eye gaze can imbue a target with an evaluation; more gaze tends to elicit more positivity.

Not surprisingly, this evaluative function of eye gaze makes it invaluable in regulating social interaction (e.g., Argyle & Cook, 1976; Frischen et al., 2007; Kleinke, 1986). We like those who gaze at us, relative to those who gaze away (Mason, Tatlow, & Macrae, 2005). During an interaction, eye gaze signals not only interest in what a person is saying (Richmond, McCroskey, & Hickson, 2007) but also helps to regulate the ongoing interaction (Hietanen, Leppänen,

<sup>1</sup>Purdue University, West Lafayette, IN, USA

<sup>2</sup>Miami University, Oxford, OH, USA

## Corresponding Author:

James Wirth, Purdue University, Psychological Sciences,  
703 Third Street, West Lafayette, IN 47907  
Email: jwirth@psych.purdue.edu

Peltola, Linna-aho, & Ruuhiala, 2008). We spontaneously infer that those who gaze at us may be interested in interacting with us, relative to those who gaze away. Indeed, receiving direct eye gaze alone prompts activation of the approach-related motivational brain systems (Hietanen et al., 2008). As Kleinke (1986) argues, eye gaze is essential to social regulation, including facilitating communication goals, expressing intimacy, and establishing social control.

We propose that one of the social functions of eye gaze (direct or averted) is as a signal of *relational evaluation* in social interactions, or “the degree to which others regard their relationship with the individual as valuable, important, or close” (Leary, 1999a, p. 33). Others directing their attention to you can be a positive experience signaling social inclusion, whereas being subjected to averted eye gaze can convey negative relational evaluations, serving as a means of social exclusion. In the current research, we hypothesize that being subjected to others’ averted eye gaze signals a negative relational evaluation, relative to direct eye gaze. In short, we predict that an averted eye gaze is experienced as a signal of social exclusion (i.e., the “silent treatment”).

### ***Aversive Reactions to Ostracism***

Ostracism, whether it is because of the silent treatment or from more explicit exclusion, is a painful experience (Williams, 2009). Indeed, the social pain associated with being ostracized activates the dorsal anterior cingulate cortex of the brain, the same region associated with experiencing physical pain (Eisenberger, Lieberman, & Williams, 2003). Furthermore, being ostracized lowers one’s experience of having four fundamental human needs met (belonging, control, self-esteem, meaningful existence) while engendering negative mood (Williams, 1997, 2009). Surprisingly, the initial flash of negativity created by ostracism tends to be unmoderated by individual differences factors, participant gender, and situational factors, such as the source of the ostracism (ingroup vs. outgroup; see Williams, 2009, for a review). In short, ostracism hurts, regardless of the circumstances.

Beyond drops in need fulfillment and mood, social exclusion can lead to numerous behavioral consequences as well. First, ostracized individuals become more likely to harm others. For example, participants gave less desired foods to players who ostracized them during a computerized ball-toss game (i.e., who were not passed the ball for an extended period) compared to players who included them (Chow, Tiedens, & Govan, 2008). This may be because sources of ostracism are evaluated more negatively than sources of inclusion (Williams et al., 2002; Zadro, Boland, & Richardson, 2006). However, ostracism also makes individuals more likely to harm even innocent bystanders who did not cause the ostracism experience to occur. Specifically, Warburton, Williams, and Cairns (2006) found that ostracized participants gave more hot sauce to a confederate who disliked spicy food than did participants who were included.

Because human well-being powerfully benefits from social relationships, multiple theorists have proposed that humans evolved a strong and universal need to belong (see Baumeister & Leary, 1995). As part of this need, humans have also developed monitoring systems that are highly sensitive to cues indicative of rejection or ostracism (Leary, 1999a, 1999b; Pickett & Gardner, 2005). Leary’s well-known sociometer model (Leary, 1999a, 1999b; Leary & Baumeister, 2000; Leary & Downs, 1995) posits an evolved mechanism—the sociometer—that continuously monitors the social environment for cues regarding current levels of acceptance and rejection. The sociometer is particularly attuned to changes in relational evaluation (Leary, 1999a). Cues conveying high relational evaluation raise state self-esteem, whereas cues conveying low relational evaluation lower state self-esteem. Perceptions that one’s relational value is lower than desired results in negative feelings (e.g., Buckley, Winkel, & Leary, 2004; Leary, Cottrell, & Phillips, 2001). Moreover, the lowered fulfillment of basic human needs (i.e., belonging, control, self-esteem, meaningful existence) caused by ostracism may signal a need to address the low relational value that results from exclusion. Specifically, perceived esteem, or how positively one is viewed by others (Hermann, Lucas, & Friedrich, 2008), may also capture how individuals feel on a moment-by-moment basis in a given relationship context.

If an individual detects his or her relational value is below the ideal set-point, he or she may make efforts to improve the relational value with others. These efforts begin with cognitive changes that facilitate reinclusion efforts. An individual’s level of need to belong and loneliness are correlated to the accuracy of recalling positive and negative social cues (e.g., facial expressions and vocal tones; Gardner, Pickett, Jeffries, & Knowles, 2005; Pickett, Gardner, & Knowles, 2004). Individuals who are socially excluded have an enhanced memory for information that could be used to attain social acceptance or minimize further social exclusion (Gardner, Pickett, & Brewer, 2000) and become attuned to genuine signals of social inclusion (Bernstein, Young, Brown, Sacco, & Claypool, 2008). Using more overt measures, individuals who believe they will be excluded express greater interest in making new friends and working with others, form more positive impressions of novel social targets, and reward new interaction partners to a greater extent (Maner, DeWall, Baumeister, & Schaller, 2007). Thus, via the sociometer, rejection may perceptually and behaviorally guide excluded individuals toward sources of inclusion, causing an increase in attunement to positive, inclusive social targets (DeWall, Maner, & Rouby, 2009).

From our perspective, given the sensitivity of such social monitoring systems, we propose that even the simple nonverbal cue of exclusion carried by averted eye gaze will be sufficient to signal low relational evaluation and perceived esteem. In short, because perceivers are so sensitive to cues that indicate social rejection, even brief experiences of averted eye gaze from others should elicit the sequelae of ostracism.

## Nonverbal Cues of Social Exclusion: The Silent Treatment

Until recently there has been surprisingly little experimental research on the topic of nonverbal signals of ostracism. In an Internet survey, Kerr (2007) investigated the signals that college students report looking for when trying to detect when another person might be rejecting them. Overall, participants listed 104 rejection cues, broken down into seven categories: hurting, avoiding, exploiting, deregulating (ignoring norms governing social interaction), differentiating (undermining one's claim to group or relationship membership), slandering, and disengaging. These cues were conveyed primarily through four modes: behavioral, verbal, paralinguistic (e.g., using an angry or sarcastic tone), and gesturing. Not surprisingly, many cues are direct verbal rejections (e.g., "insulting me"). However, of the self-reported nonverbal cues that signal rejection, eye gaze (e.g., "giving me a sideways look"; "rolling his or her eyes") and facial expressions (e.g., "scowling or frowning"; "angry/indignant expression") appeared rather important. Indeed, eye gaze can be used to indicate the termination of an interaction (an act of disengagement; Richmond et al., 2008), and in Kerr's survey the largest number of rejection acts involved disengaging.

The silent treatment (i.e., the "cold shoulder") involves disengaging oneself from another individual, often as a demonstration of contempt. Such social disengagement is ubiquitous; 75% of Americans report having received the silent treatment, and 67% admit to using the tactic on their loved one (Faulkner, Williams, Sherman, & Williams, 1997). Williams, Shore, and Grahe (1998) found that individuals report having a vast arsenal of ways to indicate disinterest and low relational evaluation (224 unique ways). However, Williams and colleagues found that the most powerful tool for conveying the silent treatment may have nothing to do with refraining from talking. Instead, not making eye contact was the most commonly reported behavior involved in both giving and receiving the silent treatment. Indeed, the list of the top five most frequent silent treatment behaviors was topped by not making eye contact (listed by 73% of the respondents), followed by not talking (54%), making a definite effort to ignore (42%), trying to avoid all contact (40%), and not responding to any questions or comments (40%). Thus, it seems that averted eye gaze may be a primary mechanism for signaling low relational evaluation.

## Overview of the Present Studies

Past research has reliably found others' eye gaze to be important in evaluating nonsocial stimuli (e.g., Bayliss et al., 2006; Corneille et al., 2009), communicating that we like those who gaze at us (e.g., Mason et al., 2005), as well as for terminating an interaction or when engaging in the silent treatment (e.g., Richmond et al., 2008; Williams et al., 1998). However, surprisingly little research has experimentally investigated the effects of nonverbal signals of rejection, and to the authors'

knowledge no research has experimentally shown that direct and averted eye gaze is alone sufficient to signal social inclusion and exclusion, respectively.

We argue that direct eye gaze may convey positive relational evaluation and thus serves as a signal of social inclusion, whereas averted eye gaze may convey low relational evaluation, which could engender feelings of ostracism. Moreover, given humans' sensitivity to nonverbal cues generally and to cues of social rejection specifically, we predict that even being briefly subjected to averted eye gaze (even by a computerized and clearly nonhuman "confederate"; also see Haley & Fessler, 2005) should be sufficient to elicit powerful reactions consistent with the experience of ostracism. Thus, humans' highly sensitive social monitoring systems (Leary, 1999a, 1999b; Pickett & Gardner, 2005) will result in even brief experiences of averted eye gaze being experienced as ostracism, leading to all of the expected sequelae of social exclusion (e.g., reduced basic need fulfillment, negative mood, enhanced aggression, etc.).

We provide novel evidence for these hypotheses across three experiments in which participants briefly watch a face on a computer screen that either directs its eye gaze at the participant or averts its eye gaze by looking left and right, but not at the participant. In Experiment 1, we find that even after experiencing a brief period of averted eye gaze, relative to direct eye gaze, participants feel both excluded and ignored and report lower feelings of belonging, lower self-esteem, and greater negative mood. Experiment 2 replicates these effects while also finding that averted eye gaze signals lowered relational evaluation, relative to direct eye gaze (i.e., that the relationship is less valuable, important, and close). In addition, Experiment 2 indicates that averted eye gaze leads participants to wish to aggress more against the gaze averter and leads participants to infer less positive personality traits about the gaze averter, relative to those providing direct eye gaze. Finally, Experiment 3 finds that averted eye gaze also leads to reductions in implicit self-esteem, relative to direct eye gaze, indicating that brief bouts of averted eye gaze can at least temporarily change self-related evaluative associations.

## Study 1

Past surveys indicate that people report using averted eyes to signal displeasure or rejection (e.g., Kerr, 2007; Williams et al., 1998). In Study 1, we attempted to empirically demonstrate that people actually *experience* others' averted eye gaze as ostracism. We investigated the effect of direct versus averted eye gaze on an individual's experience of ostracism by having participants view a brief (2.5-minute) movie on a computer screen displaying a human face (i.e., an "avatar") that either directed its eye gaze at participants or averted its eye gaze from participants by looking left and right. Eye gaze was manipulated on a between-subjects basis. All participants were instructed to "mentally visualize" being in an interaction with the computerized face during the movie. In



a second task, all participants then (a) reported how excluded and ignored they felt by the computerized face, (b) completed the Basic Needs Scale (Williams, Cheung, & Choi, 2000), and (c) reported their currently experienced positive and negative moods.

We hypothesized that, relative to direct eye gaze, participants who were subjected to averted eye gaze would feel more ostracized, specifically feeling excluded and ignored, would experience lower basic need satisfaction, and would have worsened mood.

## Method

**Participants and design.** As part of a college course, 26 (11 females) undergraduate students participated. Participants' average age was 18.9 ( $SD = 0.86$ ) years, and most participants were Caucasian (92.3%). The direct versus averted eye gaze of the computerized face was manipulated between subjects.

**Materials.** The materials consisted of eight different 2.5-minute "movies," constructed from four different actors' faces (two male, two female). Two separate male and female actors' faces were used to enhance the generalizability of any effects. For each of the four actors' faces, a direct gaze movie and an averted gaze movie were constructed. Each movie was constructed from four still-frame pictures of an actor's face (see Figure 1): a direct gaze picture, a left-averted gaze picture, a right-averted gaze picture, and a closed-eyes picture (blinking).<sup>1</sup>

All eight movies consisted of the face gazing directly at the participant for 30 s, blinking once per second. Direct eye gaze movies displayed the actor continuing to gaze at the participant for an additional 2 min, with the images blinking once per second. Averted eye gaze movies displayed the actor looking left, then looking right at 1-s intervals, with the change in left-to-right eye gaze occurring following a blink, for the remaining 2 min of the movie. Thus, after the initial 30 s, the faces in the averted eye gaze movies looked left, looked right, and blinked, but never again looked directly at the participant (a time course similar to ostracizing participants in Cyberball; Williams et al., 2000; Zadro, Williams, & Richardson, 2004). The amount of time the interaction partner blinked versus had open eyes was held constant across direct gaze and averted gaze movies.

**Procedure.** After providing informed consent, participants were instructed that they would engage in a "mental visualization" exercise and then complete a series of questionnaires. Participants were seated at individual computers and instructed that they would see a movie of a face on the computer screen. Participants were asked to "mentally visualize" the experience of interacting with this individual. These instructions are similar to the "mental visualization" instructions used for the Cyberball paradigm.

All participants were then randomly assigned to view one of eight computerized movies (four actors  $\times$  two conditions),

which involved our primary manipulation of direct and averted eye gaze. At the end of the movie, participants completed an experimental packet including the dependent measures.

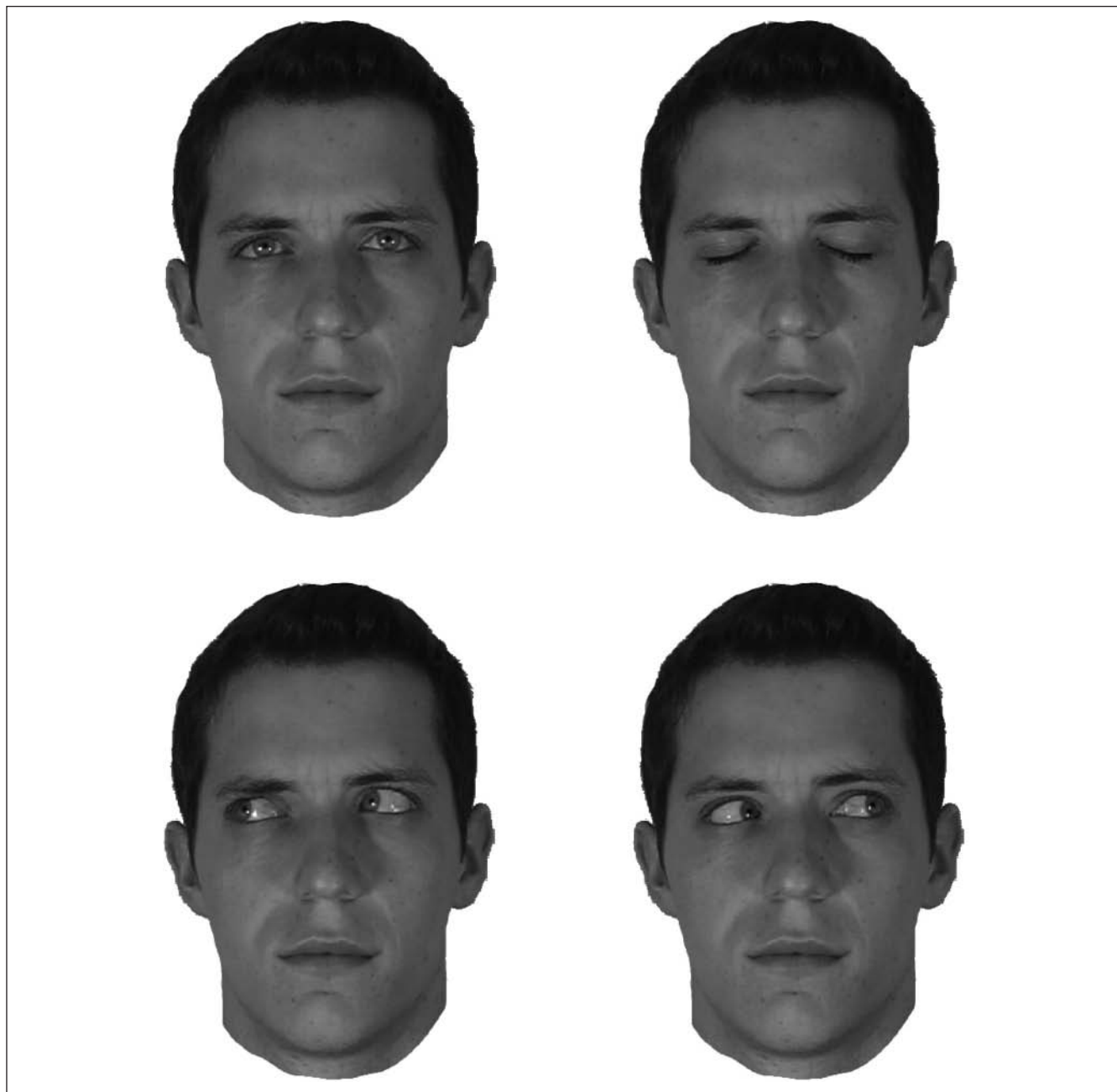
**Dependent measures.** All participants then completed a pencil-and-paper packet of dependent measures, reporting on how they felt during the "mental visualization" task. First, as a manipulation check to ensure participants recognized receiving averted or direct eye gaze, participants indicated, "What percentage of the time did the individual you interacted with look at you?" Participants then completed a series of questions that have been used to measure the consequences of being ostracized (e.g., Williams et al., 2000). All responses to these items were on a 1 (*not at all*) to 5 (*very much*) scale. Participants first responded to the items "I was ignored" and "I was excluded," to measure feelings of ostracism. All participants then completed the Basic Needs Scale (see Williams et al., 2000; Zadro et al., 2006) in which they reported the current levels of satisfaction of their four basic needs: belonging ( $\alpha = .52$ ), control ( $\alpha = .79$ ), meaningful existence ( $\alpha = .72$ ), and self-esteem ( $\alpha = .89$ ). Responses to these items were averaged together to create an overall index of basic need satisfaction ( $\alpha = .84$ ). Finally, adopting previously used mood measures following ostracism (Williams et al., 2000), participants indicated their positive mood (friendly, happy, good;  $\alpha = .89$ ) and negative mood (angry, unpleasant, sad, bad, unfriendly;  $\alpha = .85$ ). After completing all of the dependent measures, participants were thanked and debriefed.

## Results and Discussion

**Preliminary analyses.** Preliminary analyses first investigated whether the effects of eye gaze were qualified by the sex of the interaction partner or by participant gender. No such effects were observed ( $ps > .18$ ). This lack of interaction partner and participant gender effects is consistent with past ostracism research that has found that individual differences or situational factors do not moderate ostracism's immediate impact (Williams, 2009).

**Manipulation check.** Participants in the averted eye gaze condition reported their interaction partner looked directly at them less frequently ( $M = 21.38\%$  of the interaction,  $SD = 14.14$ ) than did participants in the direct eye gaze condition ( $M = 77.50\%$ ,  $SD = 30.04$ ),  $t(23) = -6.06$ ,  $p < .001$ ,  $d = 2.39$ , indicating that participants were well aware of the eye gaze of the target face.

**Feelings of ostracism, basic needs, and mood.** Of primary interest was whether a brief experience with a computerized target averting its gaze would elicit feelings of ostracism and its sequelae, relative to direct gaze. In support of our hypotheses, participants who received averted eye gaze felt more excluded and ignored than those who received direct eye gaze ( $ps < .01$ ; see Table 1 for a complete report of descriptive and



**Figure 1.** Example stimuli used in creating the movies  
The faces are printed with the permission of Bruce Hood.

inferential statistics). Furthermore, participants reported lower overall basic need satisfaction ( $p = .03$ ), specifically indicating lower levels of belonging, self-esteem, and meaningful existence when receiving averted compared to direct eye gaze ( $ps < .05$ ). Contrary to prediction, eye gaze did not affect feelings of control ( $p > .80$ ). Our mood hypothesis was supported as participants felt more negative mood ( $p = .02$ ) but not positive mood ( $p = .20$ ) when receiving averted eye gaze compared to direct eye gaze. Taken together, these

results indicate that receiving averted eye gaze from another individual may be sufficient to elicit feelings of ostracism, and its attendant effects on need fulfillment and mood. Study 1 provides initial evidence that direct versus averted eye gaze is indeed a signal of relational evaluation. Averted eye gaze may signal low relational evaluation and trigger the experience of ostracism, relative to direct eye gaze. More remarkably, these effects emerge even though the person with whom participants were mentally visualizing an interaction

**Table 1.** Statistics for Study 1 Feelings of Ostracism, Basic Need Satisfaction, and Mood

Measure	Direct eye gaze		Averted eye gaze		t-value	p value	Cohen's d
	M	SD	M	SD			
Excluded	2.08	0.95	3.23	1.01	2.99	.006	1.17
Ignored	2.08	0.86	3.92	0.90	5.22	<.001	2.09
Basic need satisfaction	2.98	0.64	2.51	0.40	-2.26	.03	0.89
Belonging	2.71	0.47	2.22	0.42	-2.81	.01	1.10
Control	2.63	1.09	2.54	0.95	-0.23	.82	0.09
Self-esteem	3.32	0.89	2.65	0.50	-2.40	.03	0.94
Meaningful existence	3.26	0.61	2.65	0.72	-2.34	.03	0.92
Positive mood	2.77	1.15	2.28	0.68	-1.32	.20	0.52
Negative mood	2.12	0.82	2.85	0.71	2.41	.02	0.95

Scale ranged from 1 (*not at all*) to 5 (*very much*).

with was clearly a preprogrammed movie, with no ability to actually respond to participants' behavior in any way.

## Study 2

In Study 2, we sought not only to replicate our initial findings but also to more directly test our hypothesis that averted eye gaze signals low relational evaluation relative to direct eye gaze. Past research has indicated that individuals who are rejected feel low relational evaluation compared to those who are included (Buckley et al., 2004). Thus, individuals showing signs of ostracism after experiencing averted eye gaze is indirect evidence for this relational evaluation hypothesis. Study 2, however, is designed as a more direct test of this hypothesis. We used the same paradigm as Study 1 but also included a direct measure of relational evaluation, in which participants rated their beliefs of how close, how valuable, and how important they felt to the person who was gazing at them during their imagined interaction (Leary, 1999a). Moreover, Study 2 was designed to generalize the effects of Study 1 to a new domain: aggression. Extensive research has found that experiencing ostracism leads individuals to become more aggressive (Warburton et al., 2006), especially toward those perpetrating the ostracism (Chow et al., 2008). If the results of Study 1 are because of a true experience of ostracism, then even briefly being subjected to averted eye gaze (even by a computerized other) should also elicit increased aggressive tendencies, as has previously been found. Thus, Study 2 is designed to (a) replicate the need fulfillment and mood effects of the previous study, (b) provide direct evidence that averted eye gaze harms relational evaluation, and (c) generalize the effects of the previous study to aggression.

## Method

**Participants.** As part of a college course, 133 undergraduate students participated. Of these participants, 24 did not

provide demographic information. Of those who provided demographic information, 79 were female, the average age of the participants was 21.2 ( $SD = 3.74$ ) years, and most of these participants were Caucasian (83.5%). Analyses involving demographic information (gender) are based on the 109 participants who provided this information. All other analyses were based on the full sample of 133 participants.

**Procedure.** All participants completed this experiment during a regularly scheduled laboratory section of an undergraduate psychology research methods course. Participants completed the experiment one at a time at a classroom monitor that was out of sight of other participants. All participants completed the same mental visualization task as in Study 1, wherein all participants were randomly assigned to see a 2.5-minute movie of a male or a female face that gave either direct eye gaze or averted eye gaze to participants. The movies used in Study 2 were identical to those used in Study 1. After completing the mental visualization task, participants completed the pencil-and-paper packet of dependent measures.

**Dependent measures.** Participants first completed all of the dependent measures used in Study 1 using the same 1 (*not at all*) to 5 (*very much*) scale. Participants began by completing the same measures used in Study 1: the eye gaze manipulation check, how excluded and ignored they felt, and the Basic Needs Scale, involving belonging ( $\alpha = .67$ ), control ( $\alpha = .69$ ), meaningful existence ( $\alpha = .76$ ), and self-esteem ( $\alpha = .78$ ) as well as their experienced positive mood ( $\alpha = .88$ ) and negative mood ( $\alpha = .85$ ). All Basic Needs Scale items were averaged together to create an overall measure of basic need satisfaction ( $\alpha = .90$ ). Finally, to further elaborate on the impact of averted eye gaze on mood, we indexed five mood states suggested to be felt following rejection (Buckley et al., 2004). Specifically we measured anger (irritated, annoyed, angry, mad;  $\alpha = .87$ ), happiness (happy, delighted, cheerful, pleased;  $\alpha = .88$ ), hurt feelings (hurt, pained, injured, wounded;  $\alpha = .85$ ), anxiety (anxious, nervous, tense, uneasy;  $\alpha = .85$ ), and sadness (depressed, dejected, sad, down;  $\alpha = .83$ ).

**Relational evaluation.** To investigate how eye gaze conveys information on relational evaluation, participants next completed items based on Leary's (1999a) definition of relational evaluation. Participants indicated how valuable, close, and important they felt to the computerized "person" gazing at them during the mental visualization task ( $\alpha = .92$ ), on a 1 (*not at all*) to 7 (*very much so*) scale. Furthermore, as a measure of the esteem in which they believed themselves to be held, participants completed a feeling thermometer (0 = *extremely negative*, 100 = *extremely positive*) based on how participants believed their interaction partner felt about them ("Right now, how does the person you interacted with feel about you?").

**Attributions for eye gaze.** Several additional items were included to investigate whether participants had inferred a meaning or cause of the eye gaze direction. Participants responded on a 1 (*not at all*) to 5 (*very much*) scale. To determine if participants recognized that their faux interaction partner was trying to ostracize them, participants indicated if "I felt this person was trying to ignore or exclude me." Participants responded to the item, "By looking away, this person indicated our relationship was worthless to him or her," to determine if participants inferred eye gaze as a means of communicating relational evaluation. Finally, participants also indicated if they felt the person they interacted with was trying to make them feel low relational evaluation: their relationship was not valuable, not important, and that the participant was not close to their interaction partner ( $\alpha = .96$ ).

**Behavior temptations toward the interaction partner.** To index whether averted eye gaze also increased aggressive or prosocial (reaffiliative) tendencies and desires, participants indicated how tempted they would be to perform a variety of behaviors if they were actually able to meet their interaction partner in real life (Buckley et al., 2004). Participants were reminded that we were not asking whether they would actually perform the behaviors but rather how tempted they would be to enact the behaviors. Participants indicated how inclined they would be to perform eight aggressive behaviors (e.g., "humiliate the person";  $\alpha = .93$ ) and eight prosocial behaviors (e.g., "smile at the person,";  $\alpha = .92$ ) on a 1 (*not at all tempted*) to 7 (*very tempted*) scale.

**Social perception measures.** Past ostracism research indicates that source(s) of ostracism are evaluated more negatively than source(s) of inclusion (Williams et al., 2002; Zadro et al., 2006). Thus, participants were asked to rate their interaction partner on how friendly, helpful, boring, dishonest, caring, selfish, creative, insensitive, sincere, and physically attractive he or she was ( $\alpha = .88$ ).

## Results

**Preliminary analyses.** As in Study 1, preliminary analyses were conducted to investigate whether any of the effects of eye gaze were qualified by interactions with participant

gender or target sex. Only one significant effect emerged across the 33 statistical tests: an Eye Gaze  $\times$  Participant Gender interaction on the basic need of control,  $F(1, 105) = 5.56$ ,  $p = .02$ , indicating that the effects of averted eye gaze were stronger for men than for women. No other effects of eye gaze were qualified by participant gender or target sex interactions. The failure to find consistent and robust participant gender or target sex effects again replicates past ostracism research finding no participant or situational characteristics that moderate the initial negative experience of ostracism (Williams, 2009).

**Manipulation check.** In the averted eye gaze condition, participants indicated their interaction partner looked directly at them less frequently ( $M = 21.65\%$  of the interaction,  $SD = 14.03$ ) than did participants in the direct eye gaze condition ( $M = 85.78\%$ ,  $SD = 23.33$ ),  $t(130) = -19.27$ ,  $p < .001$ ,  $d = 3.33$ , indicating that participants were well aware of the direct and averted eye gaze they received.

**Feelings of ostracism, basic needs, mood, and emotion.** We tested our hypothesis that receiving averted eye gaze, relative to direct eye gaze, would engender the feeling of being excluded and ignored and would therefore be detrimental to participants' basic need fulfillment and mood. This primary hypothesis was supported as participants receiving averted, compared to direct eye gaze, felt more excluded and ignored ( $ps < .001$ ), less basic need satisfaction (for all basic needs;  $ps < .05$ ), and more negative mood ( $p = .03$ ). Our in-depth analysis of mood found averted eye gaze led to less happiness, more hurt feelings, more sadness ( $ps < .05$ ), and marginally more anger ( $p = .07$ ) than direct eye gaze (see Table 2 for a complete report). Once again, it appears that averted eye gaze led to feelings of ostracism, thwarting of basic need satisfaction, and increased negative mood, relative to direct eye gaze. In addition, receiving averted eye gaze, relative to direct eye gaze, led to a similar negative emotional response as being rejected (Buckley et al., 2004).

**Relational evaluation.** We hypothesized averted eye gaze, compared to direct eye gaze, would cause participants to feel lowered relational evaluation. As predicted, participants in the averted eye gaze condition reported feeling lowered relational evaluation compared to those in the direct eye gaze condition (see Table 2). We also found support for our hypothesis that receiving averted eye gaze, relative to direct eye gaze, would be seen as a signal that the interaction partner held the participant in low esteem.

**Attributions for eye gaze.** We explored if participants receiving averted eye gaze, relative to direct eye gaze, would be more likely to perceive their interaction partner as trying to ostracize them and trying to indicate their relationship was worthless and that their interaction partner had evaluated them negatively. Participants in the averted eye gaze condition were more likely to indicate the interaction partner was trying to ostracize them ( $M = 3.18$ ,  $SD = 1.44$ ) than in the direct eye gaze condition ( $M = 1.74$ ,  $SD = 1.02$ ),  $t(106) = 5.99$ ,  $p < .001$ ,



**Table 2.** Statistics for Study 2 Feelings of Ostracism, Basic Need Satisfaction, Mood, Relational Evaluation, and Perceived Esteem

Measure	Direct eye gaze		Averted eye gaze		t-value	p value	Cohen's d
	M	SD	M	SD			
Excluded	1.77	1.11	2.81	1.49	4.57	<.001	0.79
Ignored	2.06	1.31	3.16	1.55	4.40	<.001	0.77
Basic need satisfaction	3.10	0.61	2.66	0.64	-4.06	<.001	0.70
Belonging	3.02	0.77	2.62	0.71	-3.10	.002	0.54
Control	2.73	0.86	2.24	0.76	-3.47	.001	0.60
Self-esteem	3.18	0.75	2.88	0.74	-2.36	.02	0.41
Meaningful existence	3.49	0.69	2.92	0.86	-4.20	<.001	0.73
Positive mood	2.86	1.07	2.62	0.87	-1.43	.16	0.25
Negative mood	1.97	0.94	2.31	0.86	2.17	.03	0.38
Anger	2.38	1.13	2.72	1.02	1.83	.07	0.32
Happiness	2.28	0.96	1.95	0.81	-2.17	.03	0.37
Hurt feelings	1.33	0.52	1.61	0.87	2.22	.03	0.39
Anxiety	2.22	1.04	2.49	1.07	1.49	.14	0.26
Sadness	1.60	0.73	2.01	0.86	3.01	.003	0.52
Relational evaluation	2.70	1.44	1.98	1.14	-3.21	.002	0.55
Perceived esteem	54.84	17.37	42.03	17.79	-4.20	<.001	0.73

Scale ranged from 1 (*not at all*) to 5 (*very much*).

$d = 1.15$ . In addition, interaction partners displaying averted eye gaze ( $M = 2.89$ ,  $SD = 1.17$ ) compared to direct eye gaze ( $M = 1.74$ ,  $SD = 1.08$ ) were perceived as more likely to be indicating their relationship with the participant was worthless,  $t(106) = 5.34$ ,  $p < .001$ ,  $d = 1.03$ . Finally, participants receiving averted eye gaze were more likely to report their interaction partner was trying to indicate he or she had low relational evaluation ( $M = 2.64$ ,  $SD = 1.20$ ) compared to participants receiving direct eye gaze ( $M = 1.83$ ,  $SD = 1.18$ ),  $t(107) = 3.56$ ,  $p = .001$ ,  $d = 0.68$ . Individuals who received averted eye gaze were more likely to indicate their interaction partner was trying to make them feel ostracized and was trying to signal low relational evaluation.

**Behavior temptations toward the interaction partner.** We found support for our hypothesis that receiving averted eye gaze would lead to increased aggressive tendencies. Participants receiving averted eye gaze were more tempted to perform aggressive behaviors targeted at their interaction partner ( $M = 2.11$ ,  $SD = 1.29$ ) than those receiving direct eye gaze ( $M = 1.65$ ,  $SD = 1.02$ ),  $t(131) = 2.23$ ,  $p = .03$ ,  $d = 0.39$ . In addition, participants that received averted eye gaze were less tempted to be prosocial toward their interaction partner ( $M = 3.73$ ,  $SD = 1.22$ ) than those receiving direct eye gaze ( $M = 4.50$ ,  $SD = 1.45$ ),  $t(131) = -3.35$ ,  $p = .001$ ,  $d = 0.58$ .

**Social perception measures.** Finally, as hypothesized, participants receiving averted eye gaze rated their interaction partner as having fewer positive and more negative traits ( $M = 2.47$ ,  $SD = 0.75$ ) compared to participants receiving direct eye gaze ( $M = 3.05$ ,  $SD = 0.79$ ),  $t(107) = -3.96$ ,  $p < .001$ ,  $d = 0.76$ . These results replicate findings that ostracism leads to lowered trait evaluation of the source of ostracism (e.g., Williams et al., 2002; Zadro et al., 2006).

## Discussion

Study 2 successfully accomplished its three goals. Study 2 clearly replicated the effects of Study 1, showing that averted eye gaze, relative to direct eye gaze, led to feelings of being excluded and ignored, reduced participants' fulfillment of basic human needs, and created more negative mood and emotions. Second, Study 2 indicated that averted eye gaze led to the subjective experience that the gaze averter was intending to signal, that the interaction was low in value, and that the participant was held in low esteem. Third, Study 2 provided unique evidence that merely being subjected to a few moments of averted eye gaze, relative to direct eye gaze, engendered more aggressive and fewer prosocial behavioral temptations directed at the source of ostracism and that this source of ostracism was believed to have few positive and many negative traits. Taken together, this study indicates that even being briefly subjected to averted eye gaze, relative to direct eye gaze is not only a signal of low relational value but also engenders a genuine ostracism experience.

## Study 3

The first two studies demonstrate that eye gaze can communicate relational evaluation, with those receiving averted eye gaze reporting low relational evaluation and greater feelings of ostracism, relative to direct eye gaze. This experience of being excluded and ignored is powerful, as are its motivational, evaluative, and affective sequelae, with effect sizes for even this brief computerized rejection ranging from moderate to large (see Tables 1 and 2). Leary's (1999a, 1999b; Leary & Baumeister, 2000; Leary & Downs, 1995) sociometer

hypothesis contends that changes in self-esteem are some of the primary manifestations of feelings of relational evaluation. That is, self-esteem acts as a barometer of our current level of social inclusion. High self-esteem is feedback to the self that we have been included. Lowered self-esteem is feedback that we have been rejected or ostracized (and that perhaps palliative action is needed). In line with this sociometer hypothesis, in both of our previous studies participants self-reported lower self-esteem following averted, relative to direct, eye gaze.

Unlike the previous studies, Study 3 investigated whether averted eye gaze reduces *implicit* self-esteem, relative to direct eye gaze. Implicit self-esteem captures *self-evaluative associations* (e.g., Greenwald et al., 2002) or the associative strength of links between the mental representation of one's "self" and evaluative content. For example, a version of the self-esteem Implicit Association Test (IAT; Pinter & Greenwald, 2005) might pair words associated with the self (e.g., *I, me, self*) with evaluative words (e.g., *cheer, happy, death, filth*). The facility with which these pairings are made is indicative of positive and negative associations with the self. If averted eye gaze generates a genuine experience of ostracism, this should not only affect participants' explicit self-esteem but also at least temporarily change their *implicit* evaluative associations with the self. As such, we hypothesize that averted eye gaze will result in lower implicit self-esteem, relative to direct eye gaze.

## Method

**Participants and design.** As part of a college course, 29 (22 females) undergraduate students participated. Participants' average age was 18.7 ( $SD = 1.03$ ) years, and most were Caucasian (89.7%). Participants completed the same mental visualization task as in Studies 1 and 2.

**Procedure.** After providing informed consent, participants were seated in individual laboratory cubicles containing a computer. All instructions, stimulus presentation, and data collection were conducted on the computer. Participants first completed the same visualization task as in the previous two studies, in which they were randomly assigned to either receive direct or averted eye gaze from a male or female computer avatar.

Following the mental visualization task, participants completed the same manipulation check as in the previous studies. All participants then completed an ostensibly unrelated speeded word categorization task, which was actually the self-esteem IAT. The stimuli for the self-esteem IAT were taken directly from Pinter and Greenwald (2005). Following the completion of this implicit self-esteem measure, participants provided some demographic information, were thanked for their participation, and were debriefed.

**Implicit self-esteem measure.** All participants completed a seven-block IAT designed to assess participants' implicit

self-esteem. The IAT was composed of 180 trials across the seven blocks; 20 in Blocks 1 and 2 (practice for concept and attribute classifications), 20 in Block 5 (reversal of the concept classification), 20 in Blocks 3 and 6 (the practice combined task blocks), and 40 in Blocks 4 and 7 (the test combined blocks).

Each trial consisted of the appropriate category heading depending on the experimental block (i.e., self/positive words vs. other/negative words). A word from one of the categories was presented on the screen and would remain on the screen until participants made the appropriate response for that trial (using the *E* and *I* keys on the keyboard, respectively). There were five words representing pleasant attributes (*cheer, happy, health, laughter, and peace*), five words representing unpleasant attributes (*death, filth, jail, murder, and sickness*), five words representing the concept of self (*I, me, my, mine, and self*), and five words representing the concept of other (*others, they, them, their, and theirs*; Pinter & Greenwald, 2005).

Participants were required to correct errors to continue onto the next trial, and response latencies were recorded on each trial. The order of the combined task blocks was counterbalanced so that each of the two orders of the IAT occurred equally often across the participant sample.

## Results and Discussion

**Manipulation check.** Participants in the averted eye gaze condition indicated their interaction partner looked directly at them less frequently ( $M = 33.9\%$  of the interaction,  $SD = 25.1$ ) than did participants in the direct eye gaze condition ( $M = 78.4\%$ ,  $SD = 16.4$ ),  $t(27) = -5.71$ ,  $p < .001$ ,  $d = 2.12$ , indicating again that participants were aware of whether they were subjected to direct or averted eye gaze.

**Implicit self-esteem analyses.** Before analyzing the IAT data, we followed the procedures outlined by Greenwald, McGhee, and Schwartz (1998) for preparing the data; we dropped the first two trials of each block, we recoded latencies less than 300 ms as 300 ms and latencies greater than 3,000 ms as 3,000 ms, and we used a logarithmic transformation to normalize the distribution of latencies.<sup>2</sup> We then computed participants' average response latency on congruent trials (i.e., self-good, other-bad) and incongruent trials (i.e., self-bad, other-good). Because higher implicit self-esteem would be reflected in faster responding on congruent rather than incongruent trials, we subtracted each participant's congruent score from his or her incongruent score, which yielded an implicit self-esteem IAT score where higher numbers indicate greater implicit self-esteem (i.e., faster responding on congruent as opposed to incongruent trials).

Preliminary analyses once again did not find the effect of eye gaze on implicit self-esteem to be qualified by interactions with either participant or target sex ( $ps > .2$ ).

Consistent with our hypothesis, participants in the averted eye gaze condition displayed significantly lower implicit

self-esteem ( $M = 141.7$  ms,  $SD = 195.9$ ) than did participants in the direct eye gaze condition ( $M = 298.9$  ms,  $SD = 168.9$ ),  $t(27) = -2.29$ ,  $p = .03$ ,  $d = 0.85$ . Mentally visualizing a social interaction with an interaction partner displaying averted eye gaze led to lower implicit self-esteem, relative to direct eye contact.

## General Discussion

Across three studies we demonstrated the deleterious effects of receiving averted eye gaze during a social interaction. Individuals who received averted eye gaze reported feeling ostracized, excluded, and ignored. Moreover, they also experienced lower satisfaction of basic human needs, and more negative moods and emotions, relative to direct eye gaze participants. Our experimental manipulation of averted eye gaze produced the negative feelings participants reported feeling in response to the silent treatment (Williams et al., 1998). Furthermore, averted eye gaze produced emotional (e.g., Buckley et al., 2004) and behavioral (e.g., Warburton et al., 2006) consequences typical of individuals who have been more explicitly rejected (e.g., Buckley et al., 2004; Leary et al., 2001; Williams et al., 2000). Specifically, we found those who received averted eye gaze felt more anger, hurt feelings, and sadness and less happiness compared to those who received direct eye contact. Failing to receive eye contact from another individual engendered more temptations to perform aggressive behaviors that could harm their interaction partner. Such aggression may reestablish a sense of control (e.g., Warburton et al., 2006), especially in the current studies where a chance for reaffiliation is not afforded. Finally, participants in the averted eye gaze condition experienced this as a form of devaluation as well, a signal that they were held in low esteem. Ultimately, even being briefly subjected to the averted eye gaze of another (even a computerized other) appears to beget feelings of ostracism and low relational evaluation.

What is particularly noteworthy is the degree to which self-esteem is reduced stemming from averted eye gaze. Not only did participants report explicitly feeling lowered self-esteem after receiving averted compared to direct eye contact, but participants also displayed lowered implicit self-esteem. Implicit self-esteem is argued to be relatively less accessible to conscious awareness and is distinct from explicit self-esteem (Gailliot & Schmeichel, 2006), suggesting that the reduction in self-esteem from averted eye gaze does not appear to be a strategic or intentional response. Thus, our results are also consistent with the sociometer hypothesis (Leary, 1999a, 1999b); that is, participants' self-esteem, both explicit and implicit, was powerfully determined by the experience of direct relative to averted eye gaze.

Our findings are also consistent with past research demonstrating that eye gaze is a powerful regulator of ongoing social interactions. Insofar as averted eye gaze can signal

exclusion, even brief flashes of averted eye gaze may be a sufficient signal of opprobrium to elicit a change in behavior. Thus, not only is gaze aversion a signal of disinterest in a conversational topic (Richmond et al., 2008), but according to our findings, averted gaze is even a signal of disdain and social exclusion, relative to direct gaze. The signal of social exclusion was detected despite the fact that averted eye gaze is a passive form of social exclusion (implicit, indirect) based on the criteria established by Molden, Lucas, Gardner, Dean, and Knowles (2009).<sup>3</sup> Indeed, given that our social monitoring systems are generally quite sensitive to signals of rejection, being able to send relatively subtle signals of social exclusion with one's eyes may actually serve to regulate ongoing interactions effectively without necessitating more overt means of social exclusion. In this same vein, the relative subtlety of such eye gaze cues may explain why individuals who are cognitively, developmentally, or otherwise unable to extract eye gaze signals may experience social dysregulation (e.g., Dalton et al., 2005). They may simply be insensitive to a commonplace signal of relational evaluation that otherwise serves to regulate social interaction.

## Limitations

Although we have found across all three experiments that averted relative to direct eye gaze leads to feelings of ostracism, there are some limitations in our studies that temper our conclusions. First, it is important to note that we do not argue that direct and averted gaze will always function in this manner, across contexts. Indeed, direct eye gaze is a signal of approach, and averted eye gaze is associated with avoidance (see Argyle & Cook, 1976; Marsh, Ambady, & Kleck, 2005), but exactly how approach and avoidance play out in a situation depends critically on other situational cues. In our experiment, participants were engaged in a faux interaction with the computerized target, in a relatively low-threat, mundane setting. In this context, direct eye gaze typically signals friendliness or affiliation (Kleinke, 1986; van Hooff, 1972). However, in other contexts, direct eye gaze can communicate threat or dominance (Argyle & Cook, 1976; Redican, 1982), whereas averted gaze (especially downward gaze) may convey submission (e.g., Lorenz, 1966; van Hooff, 1967). How eye gaze is interpreted is certainly a function of contextual cues, such as the expression of an emotion (Argyle & Cook, 1976), and vice versa. For example, individuals are faster to recognize approach-related expressions (anger and joy) when they are displayed with direct eye gaze. Avoidance-related expressions (fear and sadness) are better recognized when concurrently displayed with averted eye gaze (Adams & Kleck, 2003). This implies that changing the relationship between the participant and the avatar (e.g., a competitive relationship) may change how direct and averted gaze is interpreted.

Beyond this contextual variability in the meaning of direct and averted eye gaze, it is also the case that our gaze effects

must be interpreted as relative effects. Because we included only a direct and averted gaze condition, without a “no avatar” control, our findings may be a result of positive effects of direct eye gaze signaling acceptance, averted gaze signaling rejection, or some combination of the two. Because of this, it may be worthwhile to look at past ostracism research to address this issue. Early ostracism research used an in-person ball-toss paradigm in which the degree participants were included depended on the number of balls confederates tossed to the participant (see Kerr, Seok, Poulsen, Harris, & Messe, 2008; Williams & Sommer, 1997). A no-ball-toss control group was included to compare basic need levels of ostracized and included participants. These studies found basic need satisfaction levels of included participants in the ball-toss game did not differ from those in the control condition, suggesting need-level changes were from ostracism. Recently, researchers (Wesselmann, Bagg, & Williams, 2009) found ostracism is powerful enough to threaten basic need satisfaction by simply watching another individual be ostracized. A control condition (Cyberball naïve participants) found these participants had higher levels of basic need satisfaction than those watching someone being included and someone being ostracized. The negative response to watching ostracism appears to be from the ostracism condition thwarting rather than inclusion elevating basic need satisfaction. Thus, without a control condition, it is difficult to infer whether the current effects are because of inclusion. However, past research has consistently found that similar effects are driven by ostracism rather than by the experience of social inclusion.

Finally, it is also worth noting that the self-esteem IAT effects in our third experiment must also be understood as relative effects. The IAT is designed to create a relative measure of association strength (Greenwald & Farnham, 2000). In our case, we measured the strength of self-positive, relative to other negative associations. This makes it difficult to infer whether the reductions in implicit self-esteem are from reductions in positive associations with the self or an increase in negative associations of others. One clue may come from the explicit measures in Study 2, in which we found both effects emerging. Participants receiving averted eye gaze reported having less self-esteem than participants receiving direct eye gaze. Moreover, participants felt averted gaze was an attempt to treat them negatively (i.e., convey a low relationship evaluation) and to be antisocial. Thus, it may be that participants receiving averted eye gaze felt both a decrease in positive self-associations *and* more negative associations with others.

### Future Questions

Although the current research clearly indicates that averted relative to direct eye gaze creates the experience of ostracism, there are certainly a number of open questions generated by

the current work. One clear question is whether the experience of lowered relational evaluation is the cause or the result of feelings of rejection. That is, does feeling low in the esteem of others create the feeling of rejection, or vice versa? Buckley et al. (2004) suggest that individuals' first experience lowered relational evaluation, which then prompts feelings of rejection. However, mediational tests done to investigate causal order of these effects in Study 2 were inconclusive.<sup>4</sup> Thus, the causal sequence of these phenomena still remains an open question.

Second, the current research employed only computerized avatars rather than actual interaction partners. It thus remains an open question as to whether averted eye gaze from an actual person would elicit similar effects. Although this choice of a computerized confederate may open the current research to critique, we believe it serves as a real strength. First, it ensures that the experience of participants across and within conditions is identical except for the differential eye gaze. Thus, the amount of time the confederate faces the participant, facial angle, and other stimulus features are held perfectly constant. Second, this procedure indicates that the effects of exclusion occur even when participants know with certainty that they are predetermined to receive the preprogrammed averted eye gaze of the confederate (see Zadro et al., 2004, for similar effects). Finally, although the computer is preprogrammed, there is good reason to believe that participants treat such stimuli as social stimuli. First, the mere presence of eyes on a target or characteristics that resemble eyes leads individuals to treat a target as social (e.g., Senju & Hasegawa, 2006; Windhager et al., 2008). Second, characters in clearly unidirectional media such as television are treated as social agents and engage the same social-cognitive processes that are observed for “actual” people (e.g., Derrick, Gabriel, & Hugenberg, 2009). Thus, it seems a reasonable assumption that the effects of averted eye gaze from a true confederate would have similar if not stronger effects.

A final question concerns the sequence of averted eye gaze used in our studies. In the averted gaze condition, the computerized movie confederate provided direct eye gaze for 30 s before averting eye gaze for the remainder of the movie. Thus, it remains an open question as to whether experiencing averted eye gaze for the entire duration would elicit similarly strong effects. It seems plausible that receiving an initial orientation from others before receiving averted eye gaze may be a more powerful rejection experience than never receiving attention in the first place. In fact, Buckley et al. (2004) found participants who experienced increasing amounts of rejection felt worse than those who were constantly rejected. Thus, receiving another individual's attention and then losing it may be more aversive than never having received it in the first place. Directly testing this hypothesis in future research may help to further articulate how the attention or inattention of others can signal relational evaluation.



## Conclusion

Direct eye gaze and averted eye gaze are powerful signals of relational evaluation and means of including and ostracizing others. Even briefly subjecting participants to averted eye gaze from a computerized confederate, relative to direct eye gaze, led participants to feel ostracized and to show the effects attendant to ostracism: lowered satisfaction of basic human needs, lowered experience of relational evaluation, more negative moods, lower self-esteem, and enhanced temptations to act aggressively. Moreover, participants understood averted eye gaze as intending to ostracize and send a signal that the relationship or interaction is low in value. Finally, the effectiveness of averted eye gaze may explain why it is the most frequent behavior reported (even more than silence) when attempting to give others the silent treatment.

## Declaration of Conflicting Interests

The authors declared no potential conflicts of interests with respect to the authorship and/or publication of this article.

## Financial Disclosure/Funding

This research was supported by a National Science Foundation (NSF) grant BCS-0642525 awarded to the third author, K. Hugenberg, and by an NSF grant No. 0519209 awarded to the fourth author, K. D. Williams.

## Notes

1. We thank Bruce Hood for providing the eye gaze face stimuli.
2. Data from the Implicit Association Test (IAT) practice blocks were not recorded. Therefore, we could not utilize the updated scoring algorithm for the IAT (Greenwald, Nosek, & Banaji, 2003).
3. In Study 2, we found averted eye gaze produced feelings of sadness, but not anxiety, which, according to Molden, Lucas, Gardner, Dean, and Knowles (2009), is a characteristic response of passive social exclusion.
4. Mediation tests done to investigate causal order of our effect found relational evaluation mediates the relationship between eye gaze direction and feelings of ostracism (Sobel's  $z = 2.43$ ,  $p = .02$ ). However, the reverse mediation is also significant. Feelings of ostracism mediate the relationship between eye gaze direction and relational evaluation (Sobel's  $z = 2.93$ ,  $p < .01$ ).

## References

Adams, R. B., Jr., & Kleck, R. E. (2003). Perceived gaze direction and the processing of facial displays of emotion. *Psychological Science*, 14, 644-647.

Argyle, M., & Cook, M. (1976). *Gaze and mutual gaze*. Cambridge, UK: Cambridge University Press.

Baron-Cohen, S. (1995). The eye direction detector (EDD) and the shared attention mechanism (SAM): Two cases for evolutionary psychology. In C. Moore & P. J. Dunham (Eds.), *Joint attention:*

*Its origins and role in development* (pp. 41-59). Hillsdale, NJ: Erlbaum.

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117, 497-529.

Bayliss, A. P., Paul, M. A., Cannon, P. R., & Tipper, S. P. (2006). Gaze cueing and affective judgments of objects: I like what you look at. *Psychonomic Bulletin & Review*, 13, 1061-1066.

Bernstein, M. J., Young, S. G., Brown, C. M., Sacco, D. F., & Claypool, H. M. (2008). Adaptive responses to social exclusion: Social rejection improves detection of real and fake smiles. *Psychological Science*, 19, 981-983.

Buckley, K. E., Winkel, R. E., & Leary, M. R. (2004). Reactions to acceptance and rejection: Effect of level and sequence of relational evaluation. *Journal of Experimental Social Psychology*, 40, 14-28.

Chow, R. M., Tiedens, L. Z., & Govan, C. (2008). Excluded emotions: The role of anger in antisocial responses to ostracism. *Journal of Experimental Social Psychology*, 44, 896-903.

Corneille, O., Mauduit, S., Holland, R. W., & Strick, M. (2009). Liking products by the head of a dog: Perceived orientation of attention induces valence acquisition. *Journal of Experimental Social Psychology*, 45, 234-237.

Dalton, K. M., Nacewicz, B. M., Johnstone, T., Schaefer, H. S., Gernsbacher, M. A., Goldsmith, H. H., . . . Davidson, R. J. (2005). Gaze fixation and the neural circuitry of face processing in autism. *Nature Neuroscience*, 8, 519-526.

Derrick, J. L., Gabriel, S., & Hugenberg, K. (2009). Social surrogacy: How favored television programs provide the experience of belonging. *Journal of Experimental Social Psychology*, 45, 352-362.

DeWall, C. N., Maner, J. K., & Rouby, D. A. (2009). Social exclusion and early-stage interpersonal perception: Selective attention to signs of acceptance. *Journal of Personality and Social Psychology*, 96, 729-741.

Eisenberger, N. I., Lieberman, M. D., & Williams, K. D. (2003). Does rejection hurt? An fMRI study of social exclusion. *Science*, 302, 290-292.

Faulkner, S., Williams, K., Sherman, B., & Williams, E. (1997, May). *The "silent treatment": Its incidence and impact*. Paper presented at the 69th annual Midwestern Psychological Association meeting, Chicago, IL.

Frischen, A., Bayliss, A. P., & Tipper, S. P. (2007). Gaze cueing of attention: Visual attention, social cognition, and individual differences. *Psychological Bulletin*, 133, 694-724.

Gailliot, M. T., & Schmeichel, B. J. (2006). Is implicit self-esteem really unconscious? Implicit self-esteem eludes conscious reflection. *Journal of Articles in Support of the Null Hypothesis*, 3, 73-83.

Gardner, W. L., Pickett, C. L., & Brewer, M. B. (2000). Social exclusion and selective memory: How the need to belong influences memory for social events. *Personality and Social Psychology Bulletin*, 26, 486-496.

Gardner, W. L., Pickett, C. L., Jeffries, V., & Knowles, M. (2005). On the outside looking in: Loneliness and social monitoring. *Personality and Social Psychology Bulletin*, 31, 1549-1560.

- Greenwald, A. G., Banaji, M. R., Rudman, L. A., Farnham, S. D., Nosek, B. A., & Mellott, D. S. (2002). A unified theory of implicit attitudes, stereotypes, self-esteem, and self-concept. *Psychological Review*, 109, 3-25.
- Greenwald, A. G., & Farnham, S. D. (2000). Using the implicit association test to measure self-esteem and self-concept. *Journal of Personality and Social Psychology*, 79, 1022-1038.
- Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality and Social Psychology*, 74, 1464-1480.
- Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2003). Understanding and using the Implicit Association Test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology*, 85, 197-216.
- Haley, K. J., & Fessler, D. M. T. (2005). Nobody's watching? Subtle cues affect generosity in an anonymous economic game. *Evolution and Human Behavior*, 26, 245-256.
- Hermann, A. D., Lucas, G. M., & Friedrich, J. (2008). Individual differences in perceived esteem across cultures. *Self and Identity*, 7, 151-167.
- Hietanen, J. K., Leppänen, J. M., Peltola, M. J., Linna-aho, K., & Ruuhiala, H. J. (2008). Seeing direct and averted gaze activates the approach-avoidance motivational brain systems. *Neuropsychologia*, 46, 2423-2430.
- Kanwisher, N., & Wojciulik, E. (2000). Visual attention: Insights from brain imaging. *Nature Reviews Neuroscience*, 1, 91-100.
- Kerr, N. L. (2007, May). *How do I reject thee? Let me count the ways*. Poster presented at the annual convention of the Midwestern Psychological Association, Chicago, IL. Retrieved from <http://www.apa.org/psycextra>
- Kerr, N. L., Seok, D. H., Poulsen, J. R., Harris, D. W., & Messe, L. A. (2008). Social ostracism and group motivation game. *European Journal of Social Psychology*, 38, 736-746.
- Kleinke, C. L. (1986). Gaze and eye contact: A research review. *Psychological Bulletin*, 100, 78-100.
- Leary, M. R. (1999a). Making sense of self-esteem. *Current Directions in Psychological Science*, 8, 32-35.
- Leary, M. R. (1999b). The social and psychological importance of self-esteem. In R. M. Kowalski & M. R. Leary (Eds.), *The social psychology of emotional and behavioral problems: Interfaces of social and clinical psychology* (pp. 197-221). Washington, DC: American Psychological Association.
- Leary, M. R., & Baumeister, R. F. (2000). The nature and function of self-esteem: Sociometer theory. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 32, pp. 1-62). San Diego, CA: Academic Press.
- Leary, M. R., Cottrell, C. A., & Phillips, M. (2001). Deconfounding the effects of dominance and social acceptance on self-esteem. *Journal of Personality and Social Psychology*, 81, 898-909.
- Leary, M. R., & Downs, D. L. (1995). Interpersonal functions of the self-esteem motive: The self-esteem system as a sociometer. In M. H. Kernis (Ed.), *Efficacy, agency, and self-esteem* (pp. 123-144). New York, NY: Plenum.
- Lorenz, K. (1966). *On aggression*. New York, NY: Harcourt Brace.
- Maner, J. K., DeWall, C. N., Baumeister, R. F., & Schaller, M. (2007). Does social exclusion motivate interpersonal reconnection? Resolving the "porcupine problem." *Journal of Personality and Social Psychology*, 92, 42-55.
- Marsh, A. A., Ambady, N., & Kleck, R. E. (2005). The effects of fear and anger facial expressions on approach- and avoidance-related behaviors. *Emotion*, 5, 119-124.
- Mason, M. F., Tatkov, E. P., & Macrae, C. N. (2005). The look of love: Gaze shifts and person perception. *Psychological Science*, 16, 236-239.
- Molden, D. C., Lucas, G. M., Gardner, W. L., Dean, K., & Knowles, M. L. (2009). Motivations for prevention or promotion following social exclusion: Being rejected versus being ignored. *Journal of Personality and Social Psychology*, 96, 415-431.
- Nummenmaa, L., Hyönä, J., & Hietanen, J. K. (in press). I'll walk this way: Eyes reveal the direction of locomotion and make passersby look and go the other way. *Psychological Science*.
- Pickett, C. L., & Gardner, W. L. (2005). The social monitoring system: Enhanced sensitivity to social cues as an adaptive response to social exclusion. In K. D. Williams, J. P. Forgas, & W. von Hippel (Eds.), *The social outcast: Ostracism, social exclusion, rejection, and bullying* (pp. 213-226). New York, NY: Psychology Press.
- Pickett, C. L., Gardner, W. L., & Knowles, M. (2004). Getting a cue: The need to belong and enhanced sensitivity to social cues. *Personality and Social Psychology Bulletin*, 30, 1095-1107.
- Pinter, B., & Greenwald, A. G. (2005). Clarifying the role of the "other" category in the self-esteem IAT. *Experimental Psychology*, 52, 74-79.
- Redican, W. K. (1982). An evolutionary perspective on human facial displays. In P. Ekman (Ed.), *Emotion in the human face* (pp. 212-280). New York, NY: Cambridge University Press.
- Richmond, V. P., McCroskey, J. C., & Hickson, M. L., III. (2007). Eye behavior. In *Nonverbal behavior in interpersonal relations* (pp. 92-104). Boston, MA: Pearson.
- Schwarzer, G., Huber, S., & Dummmler, T. (2005). Gaze behavior in analytical and holistic and face processing. *Memory & Cognition*, 33, 344-354.
- Senju, A., & Hasegawa, T. (2006). Do the upright eyes have it? *Psychonomic Bulletin & Review*, 13, 223-228.
- Smith, M. L., Cottrell, G. W., Gosselin, F., & Schyns, P. G. (2005). Transmitting and decoding facial expressions. *Psychological Science*, 16, 184-189.
- Striano, T., & Reid, V. M. (2006). Social cognition in the first year. *Trends in Cognitive Sciences*, 10, 471-476.
- van Hooff, J. A. R. A. M. (1967). The facial displays of the Catechism monkey and apes. In D. Morris (Ed.), *Primate ethology* (pp. 7-68). Chicago, IL: Aldine.
- van Hooff, J. A. R. A. M. (1972). A comparative approach to the phylogeny of laughter and smiling. In R. A. Hinde (Ed.), *Non-verbal communication* (pp. 209-241). New York, NY: Cambridge University Press.

- Warburton, W. A., Williams, K. D., & Cairns, D. R. (2006). When ostracism leads to aggression: The moderating effects of control deprivation. *Journal of Experimental Social Psychology, 42*, 213-220.
- Wesselmann, E. D., Bagg, D., & Williams, K. D. (2009). "I feel your pain": The effects of observing ostracism on the ostracism detection system. *Journal of Experimental Social Psychology, 45*, 1308-1311.
- Williams, K. D. (1997). Social ostracism. In R. M. Kowalski (Ed.), *Aversive interpersonal behaviors* (pp. 133-170). New York, NY: Plenum.
- Williams, K. D. (2009). Ostracism: A temporal need-threat model. In M. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 41, pp. 279-314). New York, NY: Academic Press.
- Williams, K. D., Cheung, C., & Choi, W. (2000). Cyberostracism: Effects of being ignored over the Internet. *Journal of Personality and Social Psychology, 79*, 748-762.
- Williams, K. D., Govan, C. L., Croker, V., Tynan, D., Cruickshank, M., & Lam, A. (2002). Investigations into differences between social- and cyberostracism. *Group Dynamics: Theory, Research, and Practice, 6*, 65-77.
- Williams, K. D., Shore, W. J., & Grahe, J. E. (1998). The silent treatment: Perceptions of its behaviors and associated feelings. *Group Processes & Intergroup Relations, 1*, 117-141.
- Williams, K. D., & Sommer, K. L. (1997). Social ostracism by coworkers: Does rejection lead to social loafing or compensation. *Personality and Social Psychology Bulletin, 23*, 111-127.
- Windhager, S., Slice, D. E., Schaefer, K., Oberzaucher, E., Thorstensen, T., & Grammer, K. (2008). Face to face: The perception of automotive designs. *Human Nature, 19*, 331-346.
- Zadro, L., Boland, C., & Richardson, R. (2006). How long does it last? The persistence of the effect of ostracism in the socially anxious. *Journal of Experimental Social Psychology, 42*, 692-697.
- Zadro, L., Williams, K. D., & Richardson, R. (2004). How low can you go? Ostracism by a computer lowers belonging, control, self-esteem, and meaningful existence. *Journal of Experimental Social Psychology, 40*, 560-567.