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Prejudice Concerns and Race-Based Attentional Bias: New Evidence From Eyetracking

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Abstract

The present study used eyetracking methodology to assess whether individuals high in external motivation (EM) to appear nonprejudiced exhibit an early bias in visual attention toward Black faces indicative of social threat perception. Drawing on previous work examining visual attention to socially threatening stimuli, the authors predicted that high-EM participants, but not lower-EM participants, would initially look toward Black faces and then subsequently direct their attention away from these faces. Participants viewed pairs of images, some of which consisted of one White and one Black male face, while a desk-mounted eye-tracking camera recorded their eye movements. Results showed that, as predicted, high-EM, but not lower-EM, individuals exhibited patterns of visual attention indicative of social threat perception.

Keywords

social cognition, person perception, intergroup processes, intergroup relations, individual differences

Many people find interracial interactions to be stressful, anxiety-inducing, and even cognitively depleting (e.g., Devine, Evett, & Vasquez-Suson, 1996; Ickes, 1984; Richeson & Shelton, 2003; Richeson & Trawalter, 2005). Some individuals, however, are more susceptible to these negative outcomes than others. Specifically, Whites who are concerned that others will evaluate them negatively if they behave in a prejudiced manner (i.e., individuals who are motivated to appear nonprejudiced to avoid negative social evaluation) often experience interracial interactions as particularly anxiety-provoking (Plant, 2004; Plant & Devine, 1998, 2003; Trawalter, Adam, Chase-Lansdale, & Richeson, in press). The present research examined the hypothesis that the social concerns of individuals who are high in the external motivation to respond without prejudice ("high-EM") are so overlearned that they affect even the very early stages of visual attention toward Black individuals. Specifically, using eyetracking methodology, the present research investigated the prediction that, because they perceive Black individuals as social threats, high-EM individuals exhibit an attentional bias toward Black targets that is not observed in individuals lower in EM.

Importantly, recent work has begun to uncover some of the cognitive component processes that differentiate high-EM individuals from low-EM individuals. For instance, Amodio, Harmon-Jones, and Devine (2003) found that high-EM, but not low-EM, participants exhibit patterns of startle eyeblink behavior in response to Black targets that reflect early attention to these faces as well as automatic negative affective reactions. Richeson and Trawalter (2008) also examined the effects of EM on visual attention in response to Black targets and observed a pattern of biased attention among high-EM participants similar to that observed in socially anxious individuals. In other words, Richeson and Trawalter's work suggests that high-EM individuals construe Black individuals as a social threat. The primary purpose of the present work was to examine further the implications of high-EM to appear nonprejudiced for early stages of visual attention toward Black individuals. Specifically, this study examined the precise pattern of visual attention exhibited with Black and White faces by high-, compared with lower, EM individuals.

Anxiety and Attentional Bias

A number of previous studies have explored the relationship between anxiety and visual attention. Boyer and colleagues

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(2006) found, for example, that children who suffer from chronic pain exhibited initial visual attention toward anxiety-provoking stimuli (i.e., pain-related words like "injure"), but subsequently avoided these stimuli. Specifically, using a dot-probe detection paradigm (MacLeod, Mathews, & Tata, 1986), Boyer et al. found that participants were faster to locate a dot when it appeared behind a pain-related word that was presented briefly (i.e., 20 ms) than when it appeared behind a neutral stimulus (e.g., "water"), suggesting that their attention had already migrated to the threatening stimulus prior to the appearance of the dot. Interestingly, however, participants were slower to locate the dot when it appeared behind an anxiety-provoking stimulus that was presented for a longer duration (e.g., 1,250 ms) than when it appeared behind a neutral stimulus, suggesting that participants' attention had migrated away from the threatening stimulus. In other words, rather than exhibiting sustained engagement with threatening stimuli as has been found in some work (Fox, Russo, & Dutton, 2002), participants revealed a pattern of initial vigilance to, followed by the avoidance of, threatening stimuli.

This "vigilance–avoidance" pattern of attention in response to anxiety-provoking stimuli has also been observed in other research using dot-probe paradigms (Mogg & Bradley, 2002; Mogg, Matthews, & Weinman, 1987; Williams, Watts, MacLeod, & Matthews, 1988). Mogg and Bradley (2002) found, for instance, that participants high in social anxiety exhibited initial visual attention toward social threat cues (i.e., angry faces) when they were presented for a short duration (17 ms), whereas Mansell, Clark, Ehlers, and Chen (1999) found that socially anxious individuals exhibited avoidance of socially threatening images when these stimuli were presented for a longer duration (500 ms). Mansell and colleagues argue that this type of avoidance is particularly likely among individuals high in social anxiety because the socially threatening cues represent opportunities for negative social evaluation that these individuals typically avoid. Taken together, this work suggests that the "vigilance–avoidance" pattern is particularly likely to be observed for socially threatening stimuli.

Because high-EM individuals are, by definition, anxious about negative social evaluation in regard to their behavior during interracial contact, it is reasonable to predict that they perceive Black individuals as a social threat. The research just reviewed suggests, then, that high-EM individuals may initially look toward Black faces but then subsequently avoid them. Indeed, this is exactly the pattern that emerged in the dot-probe detection task used by Richeson and Trawalter (2008). Specifically, the authors found that, at brief presentations (35 ms), high-EM individuals were faster to locate a dot behind Black faces than behind White faces, but at longer presentations (450 ms) they were faster to locate the dot behind White faces than Black faces. No such difference was found among low-EM participants. Consistent with the research reviewed previously (e.g., Mansell et al., 1999; Mogg & Bradley, 2002), in other words, high-EM participants seemed to look toward Black faces initially but then subsequently avoid them.

This work provides an informative look at how EM can shape early visual attention to out-group members. Importantly, however, dot-probe paradigms present a number of limitations that make it difficult to examine, in-depth, individuals' visual attention to threatening stimuli. Specifically, dot-probe detection results only allow us to *infer* that high-anxiety participants exhibit the complex patterns of visual attention typically associated with social threat appraisal. Indeed, critics of this methodology (e.g., Weierich, Treat, & Hollingworth, 2008) suggest that a great deal of visual behavior may occur during "long" stimulus presentation trials (e.g., trials that last 450–500 ms) that dot-probe paradigms are not able to measure. Said differently, participants may be able to make a number of saccades, or glances, in the time provided during these trials, which would be inconsistent with the predicted vigilance–avoidance pattern of visual attention.

Further, dot-probe tasks do not allow for an assessment of participants' naturalistic viewing behavior as it would occur in the real world. This is particularly important to consider given that recent research indicates that free viewing, compared with the restricted viewing that occurs during a dot-probe task, is integral to early processing of faces (Henderson, Williams, & Flak, 2005). Thus, in the present work, our goal was to examine high-EM individuals' patterns of visual attention in response to Black faces more directly using a paradigm that allows for more naturalistic, "free viewing" behavior. Direct evidence that high-EM, but not lower-EM, participants exhibit initial visual attention to Black faces and subsequently look away, as well as the time courses associated with this looking behavior, would provide important support for the hypothesis that high-EM individuals construe Black individuals as social threats and that this construal is evident at fairly early stages of visual processing.

To obtain such evidence, we used eyetracking to record individuals' moment-by-moment patterns of visual attention in the context of a novel task that encouraged participants to look freely at visual displays involving pictures of Black and White faces. In this manner, we examined whether high-EM participants' patterns of eye fixations when viewing Black faces are consistent with the social threat–related pattern of attentional engagement and avoidance found in previous work (e.g., Mansell et al., 1999; Mogg & Bradley, 2002).

Eyetracking

Eyetracking methodology has been used to examine visual attention and eye movements in a number of experimental contexts (Pessoa, McKenna, Gutierrez, & Ungerleider, 2002; Rayner, 1998). Particularly relevant to the current work is the research that uses eyetracking to examine visual attention to anxiety-provoking cues (see Weierich et al., 2008 for a comprehensive review). For example, Pflugshaupt et al. (2005) used eyetracking to examine spider phobic and non-spider phobic individuals' attentional vigilance for spiders when presented as part of complicated visual displays that appeared on a computer screen. The authors found that participants with spider phobias showed greater attentional vigilance for arrays of stimuli that included spiders than did participants who were not spider phobic. Further, research using eyetracking methodology conducted by Hermans, Vansteenwegen, and Eelen (1999) found evidence for the vigilance–avoidance pattern of visual behavior among spider phobic individuals when they were exposed to visual arrays containing a spider and a nonthreatening image (a flower). Such studies suggest that eyetracking can contribute to our understanding of anxiety-mediated attentional biases. In addition to examining visual attention to potentially threatening stimuli, like spiders, eyetracking methodology has been used to examine visual attention during the early stages of face perception. Henderson and colleagues (2005), for example, used eyetracking methodology to examine visual attention to novel faces and found that participants exhibited significantly better memory for faces when they were able to look freely at these stimuli than when their looking behavior was restricted. Given these previous uses, eyetracking methodology appears to be well suited for a more extensive examination of high-EM individuals' visual attention to Black faces.

Current Study

The present work examined high-EM and lower-EM individuals' visual attention to images of Black and White faces using a picture recognition paradigm that allowed for a direct assessment of naturalistic looking behavior. We used a desktop eyetracking camera to record participants' looking behavior when presented with test displays containing a picture of a Black face and a picture of a White face that appeared among a large number of filler displays. In the study phase, participants viewed a series of pictures containing faces and other everyday objects, each presented individually. Subsequently, in the test phase, participants saw picture pairs and indicated whether one, both, or neither of the pictures had been presented during the study phase. This task was intended to encourage participants to freely view both pictures on every test trial (as opposed to paradigms such as the dot-probe task in which participants can respond without overt eye movements).

We predicted that patterns of eye movements during the recognition task would provide direct evidence that high-EM individuals exhibit looking behavior in response to Black faces that is consistent with the vigilance avoidance attentional bias reflective of social threat perception. Further, because it is expected that this pattern of attentional bias is unique to individuals high in social anxiety regarding interracial contact, we compared the looking behavior of high-EM individuals to a sample of mid- and low-EM individuals (i.e., individuals who are not highly anxious about interacting with Black Americans). Said differently, we predicted a threshold effect of EM such that only high-EM individuals would exhibit biased visual attention in response to Black faces. Thus, it was expected that during critical trials consisting of one image of a Black individual and one image of a White individual, high-EM, but not lower-EM, participants would initially look toward the Black target before moving their eyes to the White target. These findings would provide further support for the contention that high-EM individuals exhibit attentional biases toward Black faces indicative of vigilance for perceived social threats and subsequent avoidance of these cues that is not found among individuals who are not highly anxious about appearing prejudiced during interracial contact. Further, the use of eyetracking methodology offers a direct assessment of the time course of high-EM individuals' visual attention to Black targets during a free-viewing paradigm.

Method

Participants

A total of 36 White undergraduates (18–24 years old) participated in this study for partial course credit. All participants completed the External Motivation to Respond without Prejudice scale (Plant & Devine, 1998) either as part of a mass testing session several weeks prior to the lab visit (29 participants) or after completing the eyetracking task (7 participants). Due to technical difficulties with the eyetracker ($N = 6$) or participant error/noncompliance (e.g., falling asleep, $N = 4$), data from 10 participants could not be used. Of the remaining participants, analyses are based on data from 10 individuals whose EM scores were in the top third ($M = 7.32$) of the distribution derived from the total sample of mass testing survey participants and 16 whose scores were in the middle and bottom thirds ($M = 4.92$).

Materials

The External Motivation to Respond without Prejudice scale ($\alpha = .92$) consists of 5 items (e.g., "Because of today's politically correct standards, I try to appear non-prejudiced toward Black people"). Participants used 9-point Likert-type scales to rate the degree to which they agree with each statement (1 = *strongly disagree*, 9 = *strongly agree*). Higher scores indicate higher EM to appear nonprejudiced.

For the facial recognition task, we obtained 90 pictures of male faces from Park's Productive Aging Face Database (Minear & Park, 2004). These pictures included 30 European American men, 30 African American men, and 30 South Asian men, all of which were presented in Black and White. All target individuals were shown displaying neutral facial expressions, and the faces were matched for attractiveness and expressivity. Further, images were processed to be uniform in clarity and brightness. Filler pictures consisted of 60 Black and White photographs of everyday, household objects from a commercially available collection of digital images (*Photo-Objects 50,000 Volumes I and II*, distributed by Hemera Technologies, Inc., 2002). These pictures were resized to be similar in shape and size to the face pictures, approximately 200 $\times$ 200 pixels.

During the study phase, participants saw a series of displays, each of which contained a single image (either a face or an everyday object) centered on the computer screen. Participants were presented with 90 images—45 faces (15 Black, 15 White, and 15 South Asian)[1] and 45 everyday objects. During the test phase, participants viewed 264 displays, each of which included two images. Each pair of images appeared in one of four possible spatial configurations: upper left and upper right, upper left and lower left, upper right and lower right, and lower left and lower right. Image pairs appeared in multiple configurations to discourage participants from developing biases to attend to specific screen locations across trials. There were 32 critical displays and 232 filler displays. Critical displays consisted of one image of a Black male and one image of a White male, both of which were always "new" (i.e., they had not been presented during the study phase). However, each target face appeared 4 times during the test phase, paired with a different other-race face each time.

The 232 filler displays consisted of 100 pairs of faces and 132 pairs of everyday objects. The face filler displays were constructed so that there were 12 "new" pairs (i.e., neither face appeared during the study phase), 44 "old" pairs (i.e., both faces appeared during the study phase), and 44 "one new/one old" pairs. For each combination of new and old faces (both new, both old, or one new/one old), there were equal numbers of filler displays containing either two White faces, two Black faces, one White/one South Asian face, or one Black/one South Asian face. Each face appeared on multiple filler trials, though participants never saw the same pairing of faces twice, and each individual picture was displayed the same number of times across the experiment.

The everyday object filler displays were constructed similarly to the face filler trials. There were 44 "new" pairs (i.e., neither object appeared during the study phase), 44 "old" pairs (i.e., both objects appeared during the study phase), and 44 "one new/one old" pairs. Like the faces, each object appeared on multiple trials across the test phase. We combined the critical and filler displays into eight counterbalanced versions of the experiment. Each face and each filler object appeared equally in all possible location and configurations across trials.

Procedure

After consent was obtained, participants were seated at a desk in front of a computer monitor and an ASL Model 6000 eyetracker with desktop optics that sampled eye position at 60 kHz. Directly in front of the monitor was a chinrest used to help participants remain in place for accurate eyetracking. The experimenter informed participants that they would be taking part in a memory task and that the eyetracker would be used to monitor their looking behavior during the second phase of the study. The instructions described the memory task as examining how people remember everyday objects and people. Participants were informed that there would be two phases: a study phase and a test phase. For the study phase, participants were told to attend carefully to the items displayed because they would be included in a memory task later in the study. The study phase consisted of a slide show presentation of pictures of objects and faces. Each picture was displayed for 3 s and appeared on the computer screen individually, with no repetition. After completion of the study phase, the experimenter calibrated the eyetracker for 5 min and then began the test phase. During the test phase, each trial began with a fixation point for 1.5 s, after which two pictures appeared on the screen. Participants were asked to indicate whether the images were "both new," "both old," or "one new/one old" by pressing one of three keys on the computer keyboard. The pictures remained on screen until the participants made their decision. Eye movements were tracked throughout this phase of the experiment.

Results

Data Preparation

Participants' point of gaze to the computer display was recorded in 16.7 ms samples, starting at the onset of the display and ending when he or she pushed one of the response buttons on the computer keyboard. To identify when participants were fixating on faces during this interval, we utilized predefined Areas of Interest (AOIs) that consisted of 300 $\times$ 300 pixel squares centered on each possible face location (upper left and upper right, lower left and lower right). On any given test trial, one of these AOIs corresponded to the location of the White face and a different AOI corresponded to the location of the Black face.

For analysis purposes, every three consecutive eyetracking samples were combined into 50 ms "bins." Thus, the first bin covered the region of time from 0 ms to 50 ms, followed by the second bin at 50 ms to 100 ms, and so forth. Within each bin, we counted the number of samples in which a participant looked at the White face, the Black face, or neither face. From these counts, we then computed the proportion of time within that bin that each participant spent looking at each face (e.g., if a person looked at the White face for the first two samples and then at "nothing" for the third sample, this would produce a 0.66 proportion for looking at the White face during that 50 ms window and a 0.00 proportion for looking at the Black face). Then, for each bin, we averaged these proportions across all participants within each EM group, computing separate averages for each racial category. In this manner, we obtained measures of the average amount of time that each EM group spent looking at the Black face and the White face in 50 ms increments. This allows us to examine whether there is a stronger preference, on average, for individuals within each group to look at one face or another at particular points in time following stimulus onset.

Because it takes approximately 180–200 ms to register a visual stimulus and execute a saccade in response (Rayner, 1998), our analyses begin at 200 ms following display onset (i.e., Bin 4) as is customary in the analysis of eyetracking data (Pflugshaupt et al., 2005). Similarly, because the time course of threat-based attentional bias has been shown not to last beyond

1,250 ms (Mogg, Philippot, & Bradley, 2004), our analyses end at 1,350 ms following display onset (i.e., Bin 27). The mean and median latencies for participants to make their recognition decisions (and, thus, end the trial) were 2,252 ms and 2,041 ms, respectively. That said, some participants ended some trials sooner than 1,350 ms (18% of the critical trials). In these cases, the relevant bin data were recorded as missing and, thus, did not contribute to the later bin average proportion for either race.

The primary analyses we report below were conducted on all critical trials, regardless of participants' recognition decisions of the faces as "old" or "new." On average, participants correctly identified 63.0% of critical trials as containing two new faces, and error rates did not differ as a function of EM (high-EM: 64.0% correct; lower-EM: 62.3% correct; $t(24) = 0.16$, $p = .87$, $d = .07$). We also carried out the same analyses on the subset of critical trials in which participants correctly judged both faces as "new." The results of these analyses, presented in Footnote 2, were similar to the overall patterns.

Primary Analyses

To test our hypothesis that only high-EM participants (i.e., individuals high in anxiety regarding interracial contact) exhibit a vigilance avoidance pattern of visual attention in response to Black faces, we submitted the proportions of fixations across trials to a 2 (EM: high vs. lower) × 2 (target race: Black vs. White) × 24 (bin: 4 through 27) analysis of variance (ANOVA), with EM as a between-participants factor, and target race and bin as within-participant factors. In this omnibus ANOVA, we obtained a highly significant main effect for bin, $F(23, 552) = 321.22$, mean square error (MSE) = .014, $p < .0001$, $\eta_p^2 = .93$, which reflects the fact that fixations to the faces varied across the course of each trial. Importantly, we also obtained a significant three-way EM × Target race × Bin interaction, $F(23, 552) = 2.92$, MSE = .052, $p < .001$, $\eta_p^2 = .09$, suggesting that the time course of fixations to faces of each race varied significantly as a function of EM group. No other two-way interactions were significant (all Fs < 1).

Next, we carried out two-way Target race × Bin ANOVAs for each EM group separately. For the high-EM group, we obtained a highly significant main effect of bin, $F(23, 207) = 101.2$, MSE = .002, $p < .001$, $\eta_p^2 = .92$, and a significant Target race × Bin interaction, $F(23, 207) = 2.84$, MSE = .009, $p < .01$, $\eta_p^2 = .24$. For the lower-EM group, we obtained a significant main effect of bin, $F(23, 345) = 233.36$, MSE = .013, $p < .001$, $\eta_p^2 = .94$, but the Target race × Bin interaction was not significant, $F(23, 345) < 1$. Looking behavior to each race differed more across time for high-EM individuals than for lower-EM individuals. The nature of these patterns can be seen in Figure 1A and B, which present the proportions of fixations to Black faces and White faces across bins for the high-EM group and the lower-EM group, respectively. As Figure 1A shows, the high-EM group displayed an early preference for looking at the Black face, followed by a later preference for looking at the White face. This is consistent with the predictions concerning early attentional engagement with, and subsequent avoidance of, Black faces among high-EM participants. As Figure 1B shows, however, the lower-EM group exhibited a different pattern, with less differentiation in looking behavior across the faces and a possible late preference for looking at the Black face.

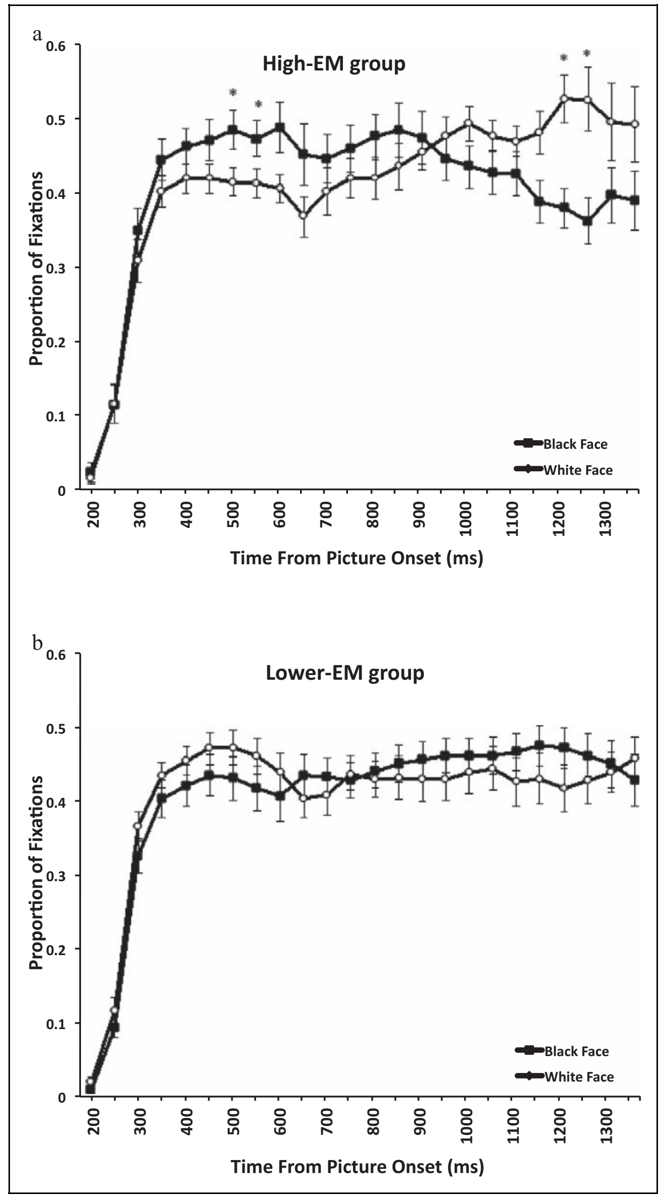

Figure 1. Proportions of fixations toward the Black face and the White face, in 50 ms bins following display onset, for (A) high-EM and (B) lower-EM participants. Error bars represent standard errors for each mean, and asterisks indicate bins where the difference in the proportion of fixations to the Black versus White faces is significantly different (p < .05).

To examine the reliability of these patterns, we conducted t tests bin-by-bin for each EM group in order to directly compare each group's tendency to look at the Black versus the White face at each point in time. For the high-EM group, these comparisons indicate a significant preference for looking toward the Black face starting at the 500 ms bin after stimulus onset,

$t(9) = 2.91$, $p < .02$, $d = 0.96$, a preference that remains significantly or marginally significantly different for the next 100 ms, corresponding to the next two bins, $t(9) = 2.67$, $p < .03$, $d = 0.86$, and $t(9) = 2.11$, $p < .07$, $d = 0.69$, respectively. These results indicate that high-EM participants are directing attention toward the Black faces early during the experimental trials. Following this early tendency to fixate on the Black face, the high-EM participants then showed a later preference for looking at the White face for two consecutive bins at 1,200 ms, $t(9) = -2.84$, $p < .02$, $d = 0.90$, and 1,250 ms, $t(9) = -2.43$, $p < .04$, $d = 0.77$. Although these tests have relatively low power due to the small number of participants, it is notable nonetheless that, consistent with predictions, the tendency for high-EM participants to look toward the Black faces and then to look away and fixate on the White faces is reliable. All other comparisons for high-EM participants did not reach statistical significance, *p*s > .05. Further, lower-EM participants exhibited a largely indifferent pattern of looking behavior (all *p*s > .05).[2]

Discussion

The present work examined whether high-EM participants would exhibit patterns of attentional bias toward, and subsequent avoidance of, Black faces. Using eyetracking methodology that allows for direct examination of participants' naturalistic eye movements, the results indicated that high-EM participants who were presented with images of Black and White male faces exhibited patterns of looking behavior consistent with this vigilance avoidance pattern. Lower-EM participants, on the other hand, exhibited a largely indifferent looking pattern. Thus, these results provide further support for the contention that, for high-EM Whites, Black faces may serve as a social threat cue (i.e., an opportunity to appear prejudiced and evaluated negatively by others; Richeson & Trawalter, 2008). Indeed, high-EM participants exhibited patterns of attentional bias in response to Black faces that have been found in other research examining visual responses to socially threatening stimuli (Mansell et al., 1999; Mogg & Bradley, 2002).

These results contribute to the growing body of research suggesting that a target's race may affect early stages of attention (Correll, Urland, & Ito, 2006; Eberhardt, Goff, Purdie, & Davies, 2004; Ito & Urland, 2003). Importantly, the present research provides evidence for race-based attentional biases using an experimental paradigm in which participants were unaware that a target's race was an important component of the task they were asked to complete. In particular, the results indicate that even when high-EM individuals engage in a task that requires attention to a broad range of stimuli (everyday objects, faces), they exhibited biased attention in response to Black faces. Thus, high-EM individuals are likely to reveal biased patterns of attention to Black targets even in more naturalistic situations.

The implications of the present research are also striking, given that high-EM individuals, compared with lower-EM individuals, are particularly likely to avoid interracial contact (Plant, 2004). The results of the present study provide evidence that an individual's level of EM may affect both uncontrolled and strategic processes (i.e., attentional vigilance and behavioral avoidance). Further, these results suggest that high-EM individuals may engage in cognitive processes that encourage the avoidance of Black targets as soon as such targets become visible. Future research should examine whether the race-based pattern of visual attention found among high-EM individuals plays a role in predicting the behavioral avoidance of Black targets by these individuals. In other words, future work is needed to consider the relation between the patterns of visual attention revealed in this work and the cognitive–motivational component processes that result in the avoidance of Black people by high-EM individuals.

The results of the present research provide an important contribution to our understanding of the processes that underlie the reactions that high-EM individuals have toward Black individuals. Specifically, using a paradigm that allowed for direct assessment of high-EM participants' visual attention to Black faces, we found convincing evidence that these individuals exhibit basic attentional bias indicative of social threat perception when exposed to racial out-group members. Specifically, high-EM participants initially looked toward Black faces and subsequently avoided them, providing direct evidence that race affects even early stages of person perception for them. Thus, the present work contributes to the growing literature showing that White individuals' concerns about appearing prejudiced may play an important role in shaping how they perceive and treat Black Americans.

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Notes

1. We did not have any a priori hypotheses regarding the effects of external motivation to control prejudice toward Black Americans on visual attention toward South Asian faces. However, we would predict a vigilance avoidance pattern of looking behavior toward

South Asian faces among individuals high in external motivation to control prejudiced responses toward members of this group.

2. Analyses of just the correct recognition trials revealed a main effect of bin, $F(23, 552) = 176.3$, MSE = .003, $p < .0001$, and a significant three-way interaction, $F(23, 552) = 2.57$, MSE = .027, $p < .001$. Separate two-way ANOVAs for each EM group revealed a significant Target race × Bin interaction for the high-EM group, $F(23, 207) = 1.99$, MSE = .023, $p < .01$, but this interaction was not significant for the lower-EM group ($F < 1$). *t* tests comparing the proportions of fixations to each face for the high-EM group revealed significantly more looks to the Black face than the White face at 500 ms, 550 ms, and 600 ms, and significantly more looks to the White face at 1,200 ms and 1,250 ms (all *p*s < .05). For the lower-EM group, however, there were no significant differences in the proportions of fixations to the Black versus White face (all *p*s > .05).

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