Attentional Asymmetry Between Blacks and Whites For Ingroup And Outgroup Faces

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In the present experiment, we examined whether Blacks and Whites differed in their automatic allocation of attention to ingroup versus outgroup faces. The rapid serial visual presentation paradigm (Raymond, Shapiro and Arnell, 1992) was employed to measure participants' ability to disengage from ingroup and outgroup faces. We hypothesized that Black participants would perform significantly worse at disengaging from faces than White participants because they, as members of the minority group, are more attentive to racial identity-relevant information. Our data show that ingroup (Black), traditional outgroup (White) and non-traditional outgroup (Asian-Indian) faces all held the attention of Black participants significantly more than White participants. Such a finding supports the idea that Blacks unconsciously attend to faces more than Whites, and that this process occurs at the automatic level.

When one is the sole woman around a poker table, or the sole Black person at a polo game, one's awareness of one's minority status becomes heightened. This increase in awareness renders the minority experience distinct from the majority experience. In the United States, the traditional majority group is White, and the traditional minority group is Black. Despite significant gains for Blacks generated by the civil rights movement in the last century, evidence shows that there are still serious disparities between these groups, including the well-documented gaps between Blacks and Whites in educational achievement (National Center for Education Statistics, 2001; U.S. Department of Education, 2002), income levels (Altonji & Doraszelski, 2005; U.S. Bureau of the Census, 1996), and wealth (Keister, 2000; Blau & Graham, 1990; Oliver & Shapiro, 1997).

Against the backdrop of these inequalities, recent research on social identity threat (e.g., Steel, Spencer, & Aronson, 2002; Kaiser, Vick, & Major, 2006; Spencer, Steel, & Quinn, 1999) and social identity contingencies (Purdie-Vaughns, Steele, Davies, Ditlmann, & Crosby, 2008) has shown that the minority experience has led Blacks to be more aware of identity cues and racially relevant information than Whites. To better understand the nature of this asymmetry, the present study tested whether it operates even at the unconscious level by employing the rapid serial visual presentation paradigm (RSVP). This paradigm measures how salient particular types of stimuli are to participants at the level of automatic perception. We hypothesized that Blacks would find faces (encoded with racial information) more salient than Whites.

Social Identity Threat

Stigmatization, the activation of negative group stereotypes, can sometimes lead members of the stigmatized group to feel threatened on account of their social identity (Major & O'Brien, 2005). This threat occurs because members of stigmatized groups are aware of the cultural stereotypes members of the dominant group hold against them (Crocker, 1999; Crocker, Steele, & Major 1998; Steele, 1997). This knowledge is learned from a young age (McKown & Weinstein, 2003), which means that from very early on, members of stigmatized groups "develop belief systems about being devalued" and "these expectations cause them to become especially alert or vigilant for signs of devaluation" (Kaiser et al., 2005, p. 332). When people feel their identity is threatened, they may automatically focus their attention on threat-related stimuli to determine how to respond (Pratto & John, 1990). For instance, in one study, female participants who expected to interact with a sexist man allocated more attention to subliminal cues that threatened their female identity (Kaiser et al., 2006). More stigma-conscious women were also found to be more vigilant for subliminally presented identity-threatening words (Kaiser et al.,

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2006). Similarly, race is a common source of identity threat for minorities; thus they are likely to be more attentive to racial identity-relevant information in threatening situations. In contrast, majority members rarely experience identity threat and thus are not likely to attend to cues related to their identity. This can lead to an attentional asymmetry between minority and majority members, where minority members attend to identity-relevant cues that majority members do not.

Social Identity Contingencies

Another potential source of attentional asymmetry for minority groups concerns cues that trigger social identity contingencies, "the range of vulnerabilities and opportunities people expect to face based on the settings' response to one or more of their social identities" (Purdie-Vaughns et al., 2008, p. 616). Cues to social identity contingencies include judgments, stereotypes, opportunities, restrictions, and treatments (Steele et al., 2002). Purdie-Vaughns et al. (2008) found that Black professionals were attuned to institutions' minority representation and diversity philosophy—that is, they paid attention to the number of minority members in a firm and whether that firm sent an explicit message of valuing diversity. They believed that the firms' hiring decisions and judgments on the value of diversity affected their vulnerabilities and opportunities with the firms, reporting mistrust of institutions with combined low minority representation and "colorblindness" instead of "valuing diversity" philosophies. They felt threatened by the social identity contingencies of work environments with those features.

A similar study was run with White participants, but found that Whites' trust and comfort were not affected by an institution's minority representation or diversity philosophies (Purdie-Vaughns, 2004). This asymmetry supports the idea that only "people at risk of devaluation based on group membership are attuned to cues that signal social identity contingencies" (Purdie Vaughns et al., 2008, p. 615). These racial and identity cues – minority representation and diversity philosophy – are less salient to majority members, but critical for minority members who find in them valuable information for how to maximize their opportunities in the given environment.

Present Research

The two lines of research described above have clearly shown that members of the racial minority group are more attentive to racial cues. However, these cues are represented as being processed at the conscious level. If Whites are less aware of identity information than Blacks, could this difference be captured at an automatic level as well? To the authors' knowledge, the present research explores for the first time whether the cognitive processes that facilitate attentional asymmetries between Blacks and Whites operate automatically without conscious control.

Attentional Blink

To examine Blacks' and Whites' automatic attention to racial information, we relied on the attentional blink phenomenon. Attentional blink refers to the impaired processing of a second visual stimulus presented immediately after an initial stimulus, due to "temporal or capacity limitation on attention" (Ryu & Chaudhuri, 2007, p. 1057). Simply stated, if a stimulus presented at Time 1 (T1) captures a participant's attention, the participant will be less likely to perceive a second stimulus presented immediately after at time 2 (T2). The duration of attentional blink can be measured using the rapid serial visual presentation paradigm (RSVP) (Raymond, Shapiro and Arnell, 1992), a method of displaying text or images in which each piece of information is shown briefly in sequential order.

Early attentional blink studies were interested in how much of the second stimulus is processed before participants "blink" (e.g., Chun & Potter, 1995; Luck, Vogel, & Shapiro, 1996; Maki, Frigen, & Paulson, 1997). The significance of the attentional blink paradigm then was whether attention was necessary for consciousness, drawing on participants' level of awareness of T2 as a proxy. More recent RSVP studies have displayed complex images to investigate other

aspects of attention, from the effect of emotional stimuli on attention (e.g., Anderson, 2005) to phobics' unique ability to overcome attentional blink for phobic-relevant information (e.g., de Jong & Martens, 2006; Cisler, Ries, & Widner, 2007). These new lines of research extend the traditional role of the attentional blink paradigm to study other aspects of attention. However, to our knowledge, no prior research has capitalized on the attentional blink paradigm's potential to inform how automatic attentional biases of racial-and identity-relevant information may operate, or differ between groups. The RSVP paradigm was thus chosen for its capacity to examine people's automatic attentional allocation to racial information.

In summary, to build on research showing that Blacks and Whites differ in how much they focus on racial identity-relevant information at a conscious level, we hypothesize that they will differ in their attention allocation to racial and identity information at an unconscious level as well. Specially, we predict that Black participants will find it more difficult to disengage from racial information at T1 than White participants and should thus fail to percieve more T2 stimuli, demonstrating a larger attentional blink impairment.

The present study uses faces to exhibit racial information—the sort of identity-relevant "cue" that we predict will induce attentional blink—because of their special potency in encoding race. Bargh, Chen & Burrows (1996) were able to subliminally prime race with faces that were presented for 13-26 ms; so we expect that faces presented at 100 ms per stimulus, as in our study, will automatically trigger categorization of race as well.

It should be stated that the attentional blink phenomenon has not been reliably demonstrated with faces used as stimuli. Awh, Serences, Laurey, Dhaliwal, van der Jagt, & Dassonville (2004) observed an attentional blink effect when both T1 and T2 were faces, but not when T1 was a symbol and T2 was a face. Landau and Bentin (2008) replicated the Awh et al. (2004) findings, but they also looked at whether there would be an attentional blink when T1 is a face and T2 is an object. In Experiment 2, they found that faces (T1) did not disrupt detection of watches (T2), while in experiment 4, they found that they did. The difference between the two experiments is the difficulty of the T1 task: experiment 2 was a detection task (Asian or Caucasian face) and experiment 4 was a discrimination task (Israel or Indian face). The authors conclude that "across-categories attentional blink effects when T1 are faces can be obtained in some circumstances but not in others, probably determined by the difficulty of the tasks employed" (Landau & Bentin, 2008).

Marois, Yi, and Chun (2004) designed an RSVP task with faces for T1 and scenes for T2 that was successful in inducing attentional blink; the present study uses this paradigm as well. Despite the occasional immunity of faces to the attentional blink effect, we predict that the RSVP task used in the present study (modeled after Marois, et al 2004) will be able to induce attentional blink.

In addition to Black and White faces, our research design also includes faces from one non-traditional outgroup, Asian-Indian. Given the research on social identity threat and social identity contingencies showing that Blacks are more sensitive to a wide array of racial cues, we hypothesize that Black participants will pay more attention than Whites to faces of all three races and thereby exhibit larger attentional blink impairment than Whites for all three T1 types.

METHOD

Participants

Fifty-nine Yale undergraduates (30 females, 29 males) were recruited through the Introduction to Psychology class or through campus postering. Eight were excluded from the final analysis either because they were biracial or they failed to score above chance on the T2 task. Failure to score above chance suggests that the participants did not complete the task as instructed. Therefore, 51 participants (13 Black females, 12 Black males, 14 White females, 12 White males) were included in

the final analysis. Participants were either granted course credit or were compensated $10 for their time.

Apparatus and Stimulus Materials

The rapid serial visual presentations of the stimuli were performed on a 15.3-inch Dell XPS M1630 at full brightness. All stimuli were presented in color and adjusted to a common resolution of 640×480 pixels.

The face stimuli (T1) were collected from the Productive Aging Lab Face Database (Minear & Park, 2004), which coded the faces for neutral expressions. Thirty-nine male faces (13 Blacks, 13 Indians, 13 Whites) between the ages of 18 and 35 were selected, and every effort was made to include only those whose did not wear extraordinarily bright or flashy clothing or accessories. Those with red hair or bright-colored eyes were excluded because, as with the flashy apparel, they would "pop out" too much in the streams of photos (see Appendix A).

The 56 natural scene distractors were selected from Google image searches. We selected only images that did not include humans or signs of human life (e.g., houses, electric and telephone poles, roads) because we wanted to visually and conceptually separate the two categories of stimuli (faces and natural scenes) as much as possible (see Appendix B). When presented at T2, these natural scene images were rotated 90° to the left or right. To create the rotated natural scenes (T2), the 56 distractors were randomly divided into the left-and right-orientation groups. The images were then rotated and cropped in Windows Photo Gallery (see Appendix C).

Measures and Procedure

Participants were greeted by one of the two experimenters (both Asian male Yale undergraduates) and were told that they were taking part in a study about "whether peoples' varying levels of interest in video games are correlated with their responses to the [rapidly presented] stimuli." The participants were told that they would first play a video game simulation that would measure their responses to the rapid presentations of stimuli, followed by a questionnaire that asked about their level of interest in video games.

Participants were seated in front of the computer and were instructed on how to complete the RSVP task. The task consisted of a series of trials consisting of a stream of 10 stimuli presented at a rate of 100 milliseconds per stimulus. In the stimulus stream, T1 occupied position 3, 4, or 5 in the RSVP stream and T2 was placed at lag 1, lag 2, or lag 4. "Lag" refers to the position of T2 relative to T1. Specifically, there was no distractor between T1 and T2 at lag 1, there was one distractor between T1 and T2 at lag 2, and three distracters between T1 and T2 at lag 4. There were 9 types of trials: 3 categories of faces (Black, Indian, and White) X3 lags (1, 2, or 4). Each type of trial had 30 iterations for a total of 270 trials, presented in a random order.

Participants completed 20 practice trials before beginning the RSVP task. For each trial they were presented with distractor stimuli (natural scenes), followed by T1 (a face), a variable number of distractors, T2 (a rotated natural scene), and more distractors. Following each trial participants were asked to determine the direction to which T2 was rotated, and the dependent variable was whether the participants answered correctly.

The experimenter then re-entered the room and showed the participant three faces, one of each race that was randomly selected from the face stimuli set. Participants were given the forced-choice of "yes" or "no" in answering whether they had seen the faces in the practice trials. The participants' answers were not recorded or analyzed because this recollection task was only a ploy to reaffirm the cover story that they would have to identify the faces after the actual trials. Participants were reminded to pay particular attention to the one face and one rotated natural scene in each series, and then they were left to complete the 270 actual trials.

Following the RSVP task, participants were given a measure ostensibly assessing interest in video games and a basic demographics measure.

The questionnaire asked how much participants enjoyed playing videogames, how often they play, whether they owned any video game systems, and, if so, which ones (see Appendix D). Participants then completed a demographics questionnaire assessing their age, gender, and race (see Appendix E).

Finally, participants were fully debriefed and thanked for their participation. During the debriefing, participants were probed for suspicion about the actual hypothesis of the study. All participants reported that they did not suspect that this study had anything to do with race before playing the video game. Some claimed that they knew that this was a race study during the video game, when they started to realize that the faces were of three distinct races. These participants were not dropped from analysis, however, because their suspicion cannot have influenced their automatic allocation of attention to these faces. The rate at which the stimuli were presented was too fast for participants to consciously control their attention-allocation processes.

RESULTS

A mixed factorial analysis of variance (ANOVA) was conducted, with lag (1, 2, 4) and T1 type (Black, Indian, White) as within-subject factors, and the race of participants (Black, White) as the between-subject factor. The ANOVA confirmed that our rapid serial visual presentation task induced attentional blink with a main effect of lag, $F(2, 48) = 12.33$, $p < .001$. Examining the mean accuracies (see Table 1) showed that Black and White participants performed better on the T2 task at lag 2 and 4 than at lag 1.

The ANOVA also showed a main effect of race, $F(1,49) = 7.40$, $p < .01$, suggesting that Black and White participants differed significantly in their accuracy on the T2 task. In addition, the ANOVA also showed a significant interaction between lag and race of participants, $F(2,48) = 4.37$, $p < .05$, suggesting that the amount of attentional blink experienced by Blacks and Whites differed significantly. There was a marginally significant main effect of T1 type, $F(2, 48) = 2.76$, $p = .074$, meaning that T1 type was not a significant factor in the amount of blink participants experienced.

To determine the nature of the interaction between lag and race of participants, follow-up tests were conducted and showed that at lag 1, the mean accuracies were comparable between Black and White participants across the three T1 types. At lags 2 and 4, however, Black participants' mean T2 performance was lower than White participants' across all three T1 types. In other words, Blacks recovered slower than White participants from the attentional blink induced by all three T1 types (see Table 1). These results are consistent with our hypothesis that Black participants find it more difficult than White participants to disengage from faces of all three races.

DISCUSSION

Our data show that faces of the ingroup, traditional outgroup (White) and the non-traditional outgroup (Asian-Indian) held the attention of Black participants significantly more than White participants. This longer engagement with the faces (T1) came at the expense of processing T2, so Blacks experienced larger attentional processing impairment for T2, on average, missing which direction the T2 natural scene was rotated more times than Whites. These results are therefore consistent with our working hypothesis that Blacks are more attuned to racial and identity information than Whites are.

These results are consistent with the research on social identity threat (e.g., Major & O'Brien, 2005; Kaiser et al., 2006) and social identity contingencies (Purdie-Vaughns et al., 2008) that informed our hypothesis. Our data suggest that, insofar as faces are valid encoders of racial cues, minority group members are more attentive, including at the automatic level, to the racial and identity information in faces than majority group members.

While the findings of this present research are consistent with existing literature on attentional asymmetries, this study is novel in three aspects: (1) the automaticity of the attentional asymmetry, (2) the inclusion of both majority and minority group members as participants, and (3) the the inclusion of Asian-Indians as a non-traditional outgroup cues[1]. In capturing the differences in Blacks' and Whites' attentional blink for ingroup and outgroup faces, the RSVP paradigm in this study can help to generate a new line of research exploring how the daily experiences of minority group and majority group members are affected by automatic attentional biases.

The implications of these novel findings are significant to our understanding of the impact of the minority status on the minority experience. The social identity threat and social identity contingencies literatures have established that members of stigmatized groups have to contend with greater attentional demand. They must pay more attention to their surroundings to survive and succeed. Our current study attempts to extend this attentional asymmetry to an automatic level. Even without explicit threat conditions in this experiment, Black participants exhibited greater attentional allocation to racial and identity information, as represented by faces. This unconscious aspect of attentional asymmetry between Blacks and Whites adds to and complements the research on the conscious aspects such as threat, thus moving us toward an understanding of the underlying mechanisms that drive the extra-vigilant minority experience.

Limitations and Future Research Issues

This present research's theoretical underpinning of the current findings is based on the effect of minority status on attention. The inverse of this framing – why Whites perform better on the T2 task than Blacks–was not explored. Could there be psychological reasons or societal influences that cause Whites to dwell less on faces as opposed to Blacks' dwelling more on faces? Even if Blacks' dwelling more on faces contributes to this attentional asymmetry, does it have to be attributed to minority status? Based on these data, an argument could be made that Blacks simply experience more attentional blink in general than Whites do – not that they are attending to the racial information in faces. Two controls should be used in future research to clarify our findings. First, non-face T1 stimuli should be used. If Blacks perform at the same level as Whites on an RSVP task with, for example, common household objects as T1 stimuli, this would rule out the interpretation that Blacks experience greater attentional blink than Whites in general. Furthermore, to make sure it is the racial information encoded in faces that drives the attentional blink effect for Blacks, rather than the faces themselves, race-relevant non-face cues should be used. Together, these controls would strengthen our interpretation that Blacks attend to race-relevant cues at the automatic level more than Whites.

Concluding Remarks

We have developed what we believe to be a useful paradigm for studying between-race attention-allocation effects at the automatic level. Our study represents just the first step in what may be a fruitful line of research exploring the unconscious attentional aspects of minority experience, based on our predictions from literature on social identity threat and social identity contigencies. ■

1 Asians have been largely neglected in race research. Yet according to the 2000 census, Asian-Americans are the fastest growing population in America, and Asian-Indians are the third largest Asian group (Barnes & Bennett, 2002). We wanted to expand the idea of the outgroup to Asian-Americans because our society is increasingly diverse, with U.S. Census projections that by 2042 Whites will lose plurality and that Asians will grow from 5% to 9% of the American population (Bernstein, 2008). An increasingly diverse society means that any ingroup will have multiple outgroups, which necessitates the stripping of the traditional Black-White pairing for the traditional ingroup-outgroup dynamic. The present finding suggest that Asian-Indian faces are as much a part of Blacks' attentional bias as Black and White faces are.

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