

Moving While Black: Intergroup Attitudes Influence Judgments of Speed

Andreana C. Kenrick and Stacey Sinclair
Princeton University

Jennifer Richeson
Northwestern University

Sara C. Verosky
Oberlin College

Janetta Lun
University of Maryland

Four experiments examined whether intergroup attitudes shape the speed with which Blacks are thought to be moving. When participants rated the speed of Black and White faces that appeared to be moving toward them, greater intergroup anxiety was associated with judging Black targets as moving more slowly relative to White targets (Experiments 1a and 1b). Experiment 2 demonstrated that this effect occurs only for approaching targets. Experiment 3 showed that this slowing bias occurs, at least in part, because of the perceived duration of time each image was moving. Such a slowing bias is consistent with the time expansion and perceptual slowing reported by people who experienced threatening events.

Keywords: prejudice, motion perception, intergroup dynamics

Every day, strangers walk toward us on the street, enter our workplaces, or pass us in a store. Reactions during these fleeting brushes with one another can set the stage for whether we choose to interact and the tenor of such interactions. There are a great many reasons to believe that for Whites encountering Blacks, such encounters can feel threatening. Whites may assume Black individuals are dangerous because of stereotypes (e.g., Cottrell & Neuberg, 2005; Devine & Elliot, 1995), or experience physiological arousal (Blascovich, Mendes, Hunter, & Lickel, 2000), anxiety about how to act (e.g., Shelton, 2003; Trawalter, Richeson, & Shelton, 2009), and the urge to avoid interracial contact (Paladino & Castelli, 2008; Plant & Devine, 2003).

Despite the abundance of work delineating how perceived threat can permeate affective and evaluative reactions to interracial encounters, little research has considered the role of race-related threat in shaping a seemingly benign, yet fundamental, property of the kinds of ubiquitous encounters just mentioned: motion perception (but see Duncan, 1976; Eberhardt, Goff, Toosi, Choi, & Ambady, 2013). This is a significant omission because the simple act of moving toward one another is often a necessary precursor to more extended forms of interracial interaction (e.g., casual conversations, roommate interactions) that have inspired a great deal of research and are thought to be the foundation of positive intergroup relations more generally (e.g., Tropp & Mallett, 2011).

Given that perceptions of others' movement inform judgments about their intentions, affective states, and social category memberships (Blake & Shiffrar, 2007; Johnson, Gill, Reichman, & Tassinari, 2007), they are a potentially rich, untapped source of information about the nature and consequences of interracial interactions. The current research takes a first step toward understanding motion perception in interracial encounters by considering whether interracial threat shapes the speed with which Whites judge Blacks' movement.

Extant research examining the effects of race on visual perception illustrates potent effects of the association between African Americans and threat. Individuals making quick judgments about a target are more likely to misidentify harmless objects as guns when paired with Blacks than Whites (e.g., Correll, Park, Judd, & Wittenbrink, 2002; Payne, 2001). The size of this tendency is associated with greater perceived threat, anti-Black prejudice, and stereotyping of Blacks as dangerous (Correll, Park, Judd, & Wittenbrink, 2007; Judd, Blair, & Chappelle, 2004; Payne, 2006). Also consistent with a connection between Blacks and threat, Whites demonstrate enhanced memory for angry, versus neutral, Black faces (Ackerman et al., 2006), and racially biased Whites are more likely to interpret a Black person's expression as angry (Hugenberg & Bodenhausen, 2003). Finally, neutral Black faces are perceived as being more threatening than their White counterparts and preferentially capture visual attention (Trawalter, Todd, Baird, & Richeson, 2008); this visual attention bias is more likely to the extent that African Americans are associated with danger (Donders, Correll, & Wittenbrink, 2008; Eberhardt, Goff, Purdie, & Davies, 2004).

In all of the aforementioned work, individuals viewed static images of Blacks and Whites, even though genuine social encounters are typically dynamic. However, there is support for the notion that preexisting intergroup attitudes and expectations influence perceptions of movement. For example, Duncan (1976) found that participants interpreted ambiguous behavior as being more hostile

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Andreana C. Kenrick and Stacey Sinclair, Department of Psychology, Princeton University; Jennifer Richeson, Department of Psychology, Northwestern University; Sara C. Verosky, Department of Psychology, Oberlin College; Janetta Lun, Department of Psychology, University of Maryland.

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Correspondence concerning this article should be addressed to Andreana C. Kenrick, Department of Psychology, Princeton University, Princeton, NJ 08544. E-mail: ackenrick@gmail.com

if the same act was perpetrated by a Black, relative to a White, target. Similarly, Devine (1989) demonstrated that when reading about a person engaging in ambiguously hostile behaviors, White participants who had been primed with Black stereotypes perceived that target as being more hostile when he was identified as Black rather than as White. Although this work did not use dynamic stimuli, it suggests that the same behaviors or movements enacted by a Black target may be perceived differently because of one's attitudes and expectations.

Different literatures yield very different ideas about how perceived threat might affect the speed with which Blacks are thought to move relative to Whites. On the one hand, consideration of the clinical literature on threat perception suggests a speeding bias. Drawing upon research showing that seeing objects move rapidly toward them (i.e., looming) instigates fear reactions in humans, rhesus monkeys, hens, and even locusts (Ball & Tronick, 1971; Fotowat & Gabbiani, 2011; Jones, Duncan, & Hughes, 1981; Schiff, Caviness, & Gibson, 1962), Riskind and colleagues postulate that anxious or threatened individuals tend to imagine feared stimuli as rapidly moving toward them (Riskind, Kelley, Harman, Moore, & Gaines, 1992). In one study, for example, this was demonstrated with respect to the imagined movements of spiders (Riskind, Moore, & Bowley, 1995). People high in spider fear were more apt to imagine a pictured tarantula as moving rapidly toward them. However, because this work focuses on the anticipation of feared events, its relevance may be limited to imagined interracial encounters rather than the actual experience of one.

On the other hand, and more relevant to the current research, cognitive research on perception of threatening events suggests a slowing bias. In this literature, people have been shown to perceive time as slowing while actually experiencing a threatening event, and this subjective experience of the slow passage of time could be used as an indicator of slow speed. For example, survivors of car accidents and other traumas report that these events seemed to take longer than their actual duration (Conway, Meares, & Standart, 2004; McNally, 2003). Similarly, police officers involved in lethal shootings often report that the events seemed to unfold more slowly than in real time (Artwohl, 2002; Solomon & Horn, 1986). Research on time perception suggests that attention, in concert with physiological arousal or anxiety, elicits the experience of time expansion (e.g., Stetson, Fiesta, & Eagleman, 2007; Tse, Intriligator, Rivest, & Cavanagh, 2004). Indeed, Droit-Volet, Brunot, and Niedenthal (2004) found that the attention and arousal garnered by angry and fearful faces shown on a computer led people to perceive them as appearing for longer durations than neutral faces, despite all faces being presented for the same duration.

Given that stimuli moving toward individuals generally capture attention (e.g., Lin, Franconeri, & Enns, 2008), and that static images of African American males have already been shown to spontaneously capture attention to the extent that people associate Blacks with threat (Trawalter et al., 2008), Whites who feel anxiety around Blacks might experience subjective time expansion when Blacks appear to be approaching. Furthermore, because one's subjective experience of time can be an indicator of speed (e.g., if it seems like it took someone longer to traverse a space than it took others, we assume that he was moving more slowly), it may be the case that this experience of time expansion when viewing approaching Blacks will lead threatened Whites to per-

ceive Blacks as moving more slowly, compared with their experience of Whites approaching in the same manner.

Current Research

The current research examines whether the extent Whites consider Blacks threatening affects perceptions of the relative speed with which they are moving. Specifically, we will examine whether perceiving Blacks as threatening is associated with the rate at which Black versus White targets are perceived to be moving toward the self. Across three experiments, White participants judge the speed of both Black and White people moving (Experiments 1a to 3). Based on the previous literature, we expect to find a slowing bias when participants who are threatened by Blacks actually experience Black targets moving toward them. To hone in our proposed explanation for the slowing bias, we also compare perceptions of approaching and receding Blacks and Whites (Experiment 2) as well as assess the mediational role of the perceived passage of time (Experiment 3).

Experiment 1a

Research on perceptions of threatening events supports the possibility that Whites will perceive Blacks as moving more slowly than Whites to the extent they feel threatened by outgroup members. As such, in Experiment 1a, we had participants estimate the speeds of Blacks and Whites who appeared to move toward them.

Method

Participants. One hundred five White U.S. residents (56.2% female) were recruited through Amazon's Mechanical Turk (MTurk). They were paid \$0.50 to \$1.00 for participation.

Procedure and measures. Participants were told they were completing a study on image perception. All stimuli were presented and responses made via Inquisit 3.0. Participants were instructed that they would be estimating the speed of multiple moving images. The images appeared to be moving toward them on the computer screen and consisted of two Black male, Black female, White male, and White female faces, presented four times each in random order for a total of 32 trials. The faces were taken from stimuli developed for the Implicit Association Test (Nosek et al., 2007). Participants began each trial by focusing on a white fixation cross that appeared in the center of a black computer screen for one second. The fixation cross disappeared, and after a 1-s delay, was then replaced by either a Black or White face that remained on the screen for either 1.5 s or 3 s. All faces were presented an equal number of times at both speeds in random order. During this time, the image of the face enlarged from 1 cm × 1.5 cm to 2.5 in. × 3.0 in., giving the illusion that it was moving toward participants. This method of simulating a target's approach via manipulating size has been used successfully in an abundance of previous research on visual perception of looming targets (e.g., Franconeri & Simons, 2003; Gray & Regan, 1998; Regan & Vincent, 1995). Following each face, participants rated the speed of approach on a Likert-type scale, ranging from 1 (*very slow*) to 8 (*very fast*). We presented faces for either 1.5 s or 3 s to

produce some variance in the apparent speed of movement—the images that were on the screen for less time appeared to move more quickly than those on the screen for the longer duration. However, because the difference in presentation times was relatively short, the distinction between apparently fast and slow images was somewhat ambiguous, allowing participants to feel as if rating the speed of approach was a valid endeavor. Ratings provided so quickly (<200 ms) or slowly (>4,000 ms) that we questioned whether participants paid attention during the corresponding trial were dropped from the analysis (9.6%).¹ These cutoffs were determined by having three people complete the task in a controlled setting in order to ascertain the range of latencies people who were doing the task without distraction would exhibit.

To assess interracial threat, participants then completed the Intergroup Anxiety Scale (Stephan & Stephan, 1985; $\alpha = .67$). This scale asks participants to rate how true the statement “I would feel _____ when interacting with members of other racial groups” is when the blank contains words such as “anxious,” “threatened,” or “comfortable.” Ratings were provided for 12 statements and averaged together such that higher numbers indicated greater threat. Finally, participants completed demographic measures.

Results

To test whether the interaction between the continuous, between-participants variable of intergroup anxiety and the within-participants variable of target race (Black vs. White) predicted subjective speed ratings, we used the analytic strategy for testing moderation with a continuous predictor and a continuous outcome in a repeated measure design recommended by Judd, Kenny, and McClelland (2001). Specifically, we entered a difference score capturing perceived speed of Black versus White targets into a multiple regression analysis with mean-centered intergroup anxiety as the predictor. The predicted interaction was reliable ($\beta = .203$, $p = .038$, $R^2 = .041$). It indicates that as intergroup threat increased, Black targets were judged as moving more slowly relative to White targets.²

Experiment 1b

Experiment 1b sought to replicate the slowing effect of intergroup threat on perceptions of Black targets' speed in an in-person rather than online setting.

Method

Participants. Fifty-two White U.S. residents (43% female; $M_{\text{age}} = 19.8$ years) were recruited from a private Northeastern university or at a local shopping mall. Participants were compensated with course credit or \$8.

Procedure and measures. Participants completed a similar procedure to that of Experiment 1a, with one significant exception: The study was conducted in person by one of several White female experimenters.

Results

Using the same analytic strategy as in Experiment 1a, we again found the predicted interaction ($\beta = .321$, $p = .020$, $R^2 = .103$); as intergroup anxiety increased, Black targets were seen as moving

more slowly relative to White targets. As such, both Experiments 1a and 1b provided evidence of a slowing effect. For participants who expressed more intergroup anxiety, Black targets were perceived as approaching more slowly relative to White targets.

Experiment 2

In Experiment 2, we examine whether the relationship between intergroup threat and differential perceptions of the speed of approaching Black and White targets extends to receding targets as well. We posit that for Whites who feel intergroup threat, seeing Blacks appear to move toward them slows the perception of time and, thus, perceived speed compared with their perceptions of Whites. However, there are a number of viable alternate hypotheses. One such explanation is that Black targets are perceived as moving more slowly by threatened Whites because of the stereotype that Blacks are lazy, rather than the experience of threat affecting perception. If this were the case, one would expect to find a slowing bias for the perceived speed of both approaching and receding Blacks. Another alternate explanation is that motivated perception of the initial location of the faces affected perceptions of speed. It has been shown that threatening stimuli (e.g., a live tarantula) are seen as closer than they actually are (Cole, Balcetis, & Dunning, 2013). If threatened Whites were subject to this visual illusion at the start of a given trial, they may have estimated Blacks as moving more slowly because they appeared to traverse less distance in approximately the same amount of time as their White counterparts. To the extent this explanation is accurate, one would also expect participants to estimate receding Blacks as moving more quickly. That is, if Blacks are initially seen as closer than their White counterparts, they should be perceived as moving more quickly when receding because, in this instance, they now would be traversing a greater distance within the same general time frame. In contrast to the predictions derived from these explanations, our logic suggests that the demonstrated perceptual bias should be limited to targets that could potentially pose a threat: approaching Blacks. It is functionally advantageous to attend to approaching targets preferentially—relative to receding targets—to determine whether these targets pose some danger. Only approaching targets may put a person at risk of bodily harm, whereas receding ones require less attention because they are less likely to pose this same type of threat. Indeed, existing research suggests that receding objects do not capture attention (Franconeri & Simons, 2003; von Mühlen & Lleras, 2007) or elicit fear (Ball & Tronick, 1971; Schiff et al., 1962) in the same way that looming targets do. If the perceptual slowing of moving Blacks is brought about by time expansion as a result of the conjoint impact of attention and anxiety, it should be mitigated with receding targets. In support of this hypothesis, New and Scholl (2009) have directly shown that receding stimuli do not elicit time expansion, whereas similar looming stimuli do. Thus, based on previous research, we

¹ Excluding participants who responded too quickly (-2 SD from the mean) on any single, explicit item resulted in removing zero to two respondents from the online data sets (Study 1a, $n = 0$; Study 2, $n = 0$; Study 3, $n = 2$) and did not change the pattern of results. Therefore, we did not use any exclusion criterion based on the speed of response to explicit items.

² All reported analyses collapse across target and participant gender, as there were no significant effects of these factors (all p s $\geq .172-.758$).

expect to find that Whites high in intergroup anxiety will perceive approaching Blacks as moving more slowly when compared with approaching Whites, but not receding Blacks relative to Whites. In other words, when targets are receding, we do not expect their perceived speed to relate to intergroup anxiety.

Finally, it could be the case that social anxiety is conflated with intergroup anxiety, and because Blacks are less familiar to Whites than their fellow in-group members, our effects are being driven by arousal in novel social situations. To gain some insight into this possibility, we also measured the tendency to be aroused in social situations to examine and control for its effects in speed ratings.

Method

Participants. Two hundred sixty-six White U.S. residents (46.2% female) participated in this experiment through MTurk. Participants were prescreened based on their unique MTurk Worker ID and excluded from analyses if they had ever participated in the study before. They were paid \$0.75 to \$0.95 for their participation.

Procedure and measures. Again, the procedure was similar to that of Experiment 1. The differences are as follows: Participants first completed the Semantic Self-Assessment Manakin (Bradley & Lang, 1994), worded for arousal in social situations, and the Intergroup Anxiety Scale ($\alpha = .93$), embedded among a small number of distractor measures. They also provided some basic demographic information. The speed rating task was modified such that participants viewed two Black male, two Black female, two White male, and two White female faces appearing to move forward two times each and appearing to recede two times each, in random order, for a total of 32 judgment trials. Participants began each trial by focusing on a white fixation cross that appeared in the center of a black computer screen for 1 s. The fixation cross disappeared, and after a 1-s delay, was then replaced by a Black or White face that remained on the screen for 1.5 s or 3 s. During this time, the image of the face either enlarged from 1 cm \times 1.5 cm to 2.5 in. \times 3.0 in., giving the illusion that it was moving toward participants or diminished in size from 2.5 in. \times 3.0 in. to 1 cm \times 1.5 cm, giving the illusion that it was moving away from the participant. As before, speed ratings that took less than 200 ms or greater than 4,000 ms to provide were recoded as system-missing (7.5%).

Results

To test whether the three-way interaction between the continuous, between-participants variable, intergroup anxiety, and the within-participants variables of target race (Black vs. White) and direction (forward vs. backward) predicted continuous, subjective speed ratings, we did the following (in line with recommendations from Judd et al., 2001): We calculated the difference between the difference scores capturing perceived speed of Black versus White targets going forward and perceived speed of Black versus White targets going backward. We then entered this variable into a multiple regression analysis with mean-centered intergroup anxiety as the predictor. To control for potential effects of social arousal, a mean-centered version of this variable was also entered into the model as a predictor. The expected three-way interaction

between intergroup anxiety, target race, and direction was statistically significant ($\beta = .135$, $p = .035$, $R^2 = .017$).³

To probe this interaction, we conducted separate multiple regression analyses to assess the statistical significance of the underlying two-way interactions. As expected, there was a significant interaction predicting the speed of forward-moving targets ($\beta = .165$, $p = .010$, $R^2 = .025$) but not the backward-moving targets ($\beta = -.016$, $p = .808$, $R^2 = .000$). Consistent with Experiment 1, as intergroup anxiety increased, Black forward-moving targets were judged as moving more slowly relative to White targets. This was not case with backward-moving targets.

Social arousal did not significantly interact with the within participants variables ($p = .517$), nor was it a significant contributor in any of the follow-up analyses (all $ps > .265$).

Experiment 3

Although we suggest that people utilize their subjective experience of time to make their speed judgments, the previous experiments did not directly assess this hypothesis. In Experiment 3, we address this question by asking participants to estimate how much time passed while they viewed the moving stimuli. We hypothesized that intergroup anxiety would be associated with perceiving time as passing more slowly when participants judged moving Blacks, and these time judgments would mediate the relationship between threat and speed ratings.

Method

Participants. One hundred eighty-three White U.S. residents (43.2% female, 1.1% no report) were recruited through MTurk. Again, any possible repeat participants were excluded from the study via prescreening. Eligible participants were paid \$0.85 for participating.

Procedure and measures. Participants completed a procedure similar to that of Experiment 1. The changes are as follows: First, participants completed the Semantic Self-Assessment Manakin (Bradley & Lang, 1994), worded for arousal in social situations and the Intergroup Anxiety Scale ($\alpha = .94$), embedded among a small number of distractor measures. They provided demographics as well. Second, because a widely accepted model explaining perceived time expansion postulates that it stems from adjustments to individuals' "internal clocks" (Eagleman, 2008), we added instructions to encourage participants to focus inward when assessing the passage of time. The instructions stated, "Many people find it helpful to use their internal clocks. For example, people report that counting to oneself, by saying 'one,' 'two,' 'three' out loud, helps." Third, prior to estimating how quickly each image seemed to move, participants were asked, "How quickly did TIME PASS while the image was moving on the screen?" Responses were provided on a Likert-type scale, ranging from 1 (*very quickly*) to 8 (*very slowly*).

We initially tried to apply the latency cutoffs used in the previous studies, but discovered that doing so would eliminate too

³ We conducted a previous version of this experiment that did not yield this significant three-way interaction. In retrospect, we realized that it was underpowered because our estimate of the required sample size did not take into account the reduced number of trials per cell. These data are available from the first author upon request.

many responses. So we had four individuals who were unaware of the hypotheses take this version of the task under controlled circumstances, as we did to develop the initial cutoffs. From this we discovered that providing the time judgments allowed people to make quicker speed ratings. As such, ratings provided in less than 100ms or greater than 4,000ms were recoded as system-missing (6.4%). In addition, based on the responses from these pilot participants, time judgments provided in less than 200 ms or greater than 8,000 ms were recoded as system-missing (.3%). In addition, five people were removed for reporting in the open-ended questions that they did not follow the instructions.

Results

We first examined whether the perceived passage of time and apparent speed of the approaching image were distinguishable for participants. Perceived passage of time and speed ratings were highly correlated but distinguishable, $r = .65$, $p < .001$, and thus we analyzed them as separate dependent measures.

Passage of time. We used the same analytic strategy employed in Experiment 1, with the addition of social arousal as a control variable as in Experiment 2. The expected Intergroup Anxiety \times Target Race interaction effect on the perceived passage of time was statistically significant ($\beta = .168$, $p = .050$, $R^2 = .023$). As intergroup anxiety increased, time seemed to pass more slowly when viewing Black, relative to White, faces.

Social arousal did not significantly interact with the within participants variables ($p = .199$), nor was it a significant contributor in any of the follow-up analyses (all $ps > .140$).

Speed ratings. Using the same analytic strategy, the expected Intergroup Anxiety \times Target Race interaction emerged marginally significant ($\beta = .156$, $p = .068$, $R^2 = .020$). Replicating the findings of Experiments 1 and 2, as intergroup anxiety increased, approaching Blacks were judged as moving more slowly relative to Whites.

Social arousal did not significantly interact with the within participants variables ($p = .517$), nor was it a significant contributor in any of the follow-up analyses (all $ps > .501$).

Mediation

To test whether the predicted relationship between intergroup anxiety and the perceived speed of Black targets is explained, at least in part, by perceptions of the passage of time, we conducted a mediation analysis following bootstrapping procedures and utilizing the SPSS PROCESS macro developed by Hayes (2012).

Intergroup anxiety was input as the predictor, the mediator was the difference score of timing rating for all Black relative to White targets, and the outcome variable was the difference score of perceived Black versus White speed ratings. As in previous analyses, we controlled for social arousal. Bootstrapping analyses revealed significant mediation (indirect effect (IE) = .0216; 95% confidence interval (CI) [.0013, .0501]). As depicted in Figure 1, these analyses showed that intergroup anxiety predicted both speed ratings (marginally significant: $B = .044$, $p = .068$) and timing ratings ($B = .050$, $p = .027$) of Black relative to White targets independently, and when timing ratings were included as a mediator, the relationship between intergroup anxiety and timing ratings dropped to nonsignificance ($p = .32$). The alternate mediation pathway in which the difference score of speed ratings of Black relative to White targets was indicated as the mediator and timing judgments were input as the outcome was not significant (IE = .0167; 95% CI includes zero [-.0401, .0016]).

General Discussion

Though previous research suggests that interracial judgment of static images can be biased by preexisting stereotypes and attitudes toward a target's group (Ackerman et al., 2006; Donders et al., 2008; Trawalter et al., 2008), to our knowledge, very little research has examined this question with respect to motion perception. This is an important omission in light of the fact that most interactions between people are dynamic, and movement toward one another is a necessary precursor to, and may set the tone for, many forms of interracial contact. We hypothesized that, when faced with Blacks who appear to be moving toward them, Whites' intergroup anxiety would be associated with perceiving Black targets as moving more slowly than similarly moving Whites (i.e., a slowing bias) because the arousal and attention associated with such approaching threat would yield time expansion.

As expected, the greater participants' level of intergroup threat, the more *slowly* they perceived Black relative to White targets as moving toward them (Experiments 1 to 3). Consistent with the hypothesized role of intergroup threat and anxiety in this effect, receding Black targets did not generate the same slowing bias (Experiment 2). Potentially threatening stimuli that are receding are less apt to garner attention, fear, and time expansion than those that are looming (Franconeri & Simons, 2003). This makes sense because it is functional to attend and respond to approaching threats as opposed to those that are receding. Finally, Experiment 3 offers direct evidence supporting the role of perceived time expansion in this effect. Participants' perceptions of how much

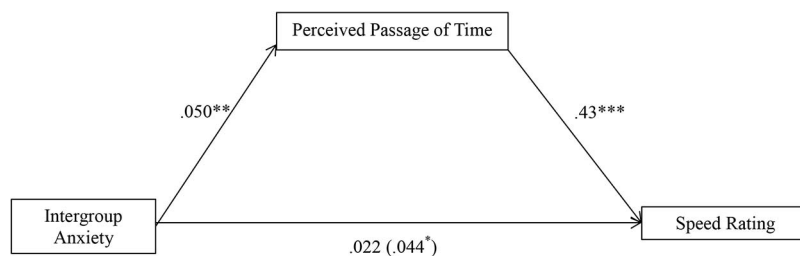


Figure 1. Mediation analyses: Perception of the passage of time mediates the relation between intergroup anxiety and speed ratings. Unstandardized coefficients reported. * $p < .10$, ** $p < .05$, *** $p < .001$.

time passed while viewing the images of Blacks moving toward them mediated the relationship between intergroup threat and perceptions of Blacks' speed.

Experiment 2 also provides evidence against alternative explanations of these perceptual slowing results. Were it the case that Black targets are activating a different stereotype among threatened Whites, such as laziness (rather than dangerousness), and this stereotype fueled speed ratings, then receding Black faces should also have been seen as moving more slowly. Another alternate explanation is that threatened individuals perceived Black targets as beginning closer to them (as in Cole et al., 2013), and thus traversing a shorter distance in the same amount of time as their White counterparts. Were this the case, receding Black targets should have been perceived as moving away from perceivers more quickly. In contrast to both of these predictions, receding faces did not elicit a perceptual bias; their perceived speed was unrelated to intergroup threat.

Given that perceived movement of a target toward the self is naturally conflated with expansion of that target in the visual field (Franconeri & Simons, 2003; Gray & Regan, 1998; Regan & Vincent, 1995), it could be the case that participants are not reacting to perceived movement but rather to perceived postural expansion, a nonverbal behavior related to apparent power and dominance (e.g., Magee & Galinsky, 2008). However, there is no empirical reason to assume reactions of threat stemming from such power moves would be moderated by target race and intergroup attitudes as they are in the present research. In addition, this literature shows that postural contraction signals submission. According to the research on time perception, such safety cues should speed the apparent passage of time (Pariyadath & Eagleman, 2008), thus leading to a speeding effect when images appear to be moving away from perceivers. We do not find such an effect (Experiment 2). Future research cuing movement via other modalities, such as changes in the apparent volume with which a target is speaking, may help elucidate the precise properties necessary to elicit group-based effects on motion perception.

Our theorizing also illuminates opportunities for future research. First, in the present research, intergroup anxiety is measured broadly. However, it would be useful in future research to isolate how and whether specific sources of intergroup anxiety affect motion perception. For example, are perceptions of approaching African Americans slowed relative to approaching Whites because perceivers are experiencing a sense of physical threat, the threat of having an awkward interaction in which they feel or are accused of being prejudiced, or both? Second, though we provide persuasive circumstantial support for the contention that time expansion stemming from the conjoint impact of attention and anxiety in shaping perceptions of moving Blacks and Whites, understanding of interracial motion perception would be enriched by confirming the operation of these factors. Third, given research showing people envision threats as rapidly looming (e.g., Riskind et al., 1995), it may be surprising that we found a consistent slowing bias for Blacks who appeared to be moving toward Whites high in intergroup anxiety. Perhaps a speeding bias characterizes the perceived movement of threatening events when people imagine how they will unfold, whereas a slowing bias characterizes the perceived movement of threatening events when they actually do unfold. We sought insight into this possibility by asking survey respondents to imagine a Black or White person moving toward them. Consistent

with the aforementioned research, greater intergroup threat was indeed associated with *imagining* approaching Blacks as moving more quickly.⁴ Future research is necessary to both replicate and follow-up this initial finding, but it is consistent with the idea that imagining potential threat results in differential perceptual biases—including speed perception—than does experiencing potential threat.

Future research should also discern whether differences in perceived speed as reported in our studies reflect online perceptual differences or differences in short-term memory for targets' movements. Honing in on the precise perceptual experience will shed light on the further implications of the current findings. For example, if threatened Whites are actually seeing Black targets moving toward them more slowly relative to White targets, perhaps they will also be better at identifying said targets. However, if the present effects are more memory-based, perhaps threatened Whites will be no more accurate at identifying moving Black targets but be more confident in their judgments. That is, feeling that they were exposed to the person for a longer amount of time might falsely bolster confidence in the details of their memory for that person.

In conclusion, the present experiments add novel insight to our understanding of the complex dynamics of race-based threat and person perception. Indeed, the present findings suggest that, similar to the effects of other types of anxiety on the perceived motion of relevant "looming" threats, interracial anxiety biases the perception of Blacks' movement relative to Whites' movements. Further, this is some of the first research (to our knowledge) to consider the possibility that race-based threat shapes not only the perception of characteristics of Black targets themselves (e.g., their emotional expressions; see Hugenberg & Bodenhausen, 2003) but also seemingly objective aspects of interracial encounters, such as the perception of motion and time. Consequently, this line of work is likely to have important, heretofore unexplored implications for both the study of interracial interaction dynamics, as well as interventions designed to guide individuals across the often rocky terrain of such encounters.

⁴ One hundred eight White U.S. residents were recruited through Mechanical Turk. Using multiple regression, only the interaction between intergroup anxiety and target race emerged ($\beta = .315$, $p = .037$, $R^2 = .072$). As intergroup anxiety increased, Black targets were imagined moving toward participants more quickly relative to Whites. These data are available from the first author upon request.

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