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The Other Race Effect:

The Role of Experience and Social Attitudes on Face Recognition

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THE OTHER RACE EFFECT:
THE ROLE OF EXPERIENCE AND
SOCIAL ATTITUDES ON FACE RECOGNITION

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The Other Race Effect:

The Role of Experience and Social Attitudes on Face Recognition

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Abstract

The ORE is phenomenon whereby recognition for own race faces is better than recognition of other race faces. This study examines how non-perceptual factors—social context, attitudes, and experience—impact the ORE. Participants from three different racial groups (Caucasian, Black, Asian) completed a face recognition task screening faces for status-specific targets (baseline, perpetrator, victim), self-report measures of explicit bias and experience with members from other races and a measure of implicit bias. Results indicated that non-perceptual factors impact the ORE. Specifically, Caucasian participants revealed a reduced ORE for other race perpetrators in comparison to victims. Black participants revealed a reduced ORE for Asian perpetrators in comparison to victims. Additionally, Asian participant negative implicit attitudes are related to a stronger ORE for Caucasian victims; for Blacks, increased social contact with Caucasians was associated with less implicit bias towards Caucasians. These findings support a multi-factor approach to studying the ORE.

Literature Review

Experience with faces is arguably one of the most important aspects of a person's life. We look at faces to gain social cues on emotions of others (Logothetis & Sheinberg, 1996). As discussed by Smith, Stinson and Prosser (2004), faces are also used for crucial evidence in eyewitness identifications. A well-studied phenomenon of facial recognition is the other race effect (ORE). This is a perceptual/memory phenomenon whereby recognition for own race faces is better than recognition for other race faces. It extends across several groups—Asians, African Americans, and Caucasians have all been shown to be susceptible to the ORE (Malpass & Kravitz, 1969; Rhodes, Brake, Taylor & Tan, 1989; Tanaka, Keifer & Bukach, 2004). The ORE is very pervasive, and can be found in almost all areas of face recognition research, including social perception of others through emotional expressions, infant face perception, and most importantly, eyewitness identification. Therefore, understanding the cognitive mechanisms of the ORE has many theoretical and practical applications.

There are several possible mechanisms that may underlie the ORE. The ORE is influenced by several outside factors such as mood and motivation (Johnson & Fredrickson, 2005; Hugenberg, Miller, & Claypool, 2007), and it is commonly agreed that experience in the form of perceptual expertise and/or social contact determines the extent of the ORE. However, it is less clear whether experience operates solely on perceptual mechanisms, or whether perceptual factors are influenced by changes in social attitudes as a result of more experience with other races. One such attitude, prejudice, has been suggested to impact the ORE (Ferguson, Rhodes, Lee & Sriram, 2001);

however, little empirical evidence has been found to support this claim. The aims of this study are to investigate both the perceptual mechanisms underlying the ORE and whether social attitudes and social contexts interact with perceptual judgments.

This literature review will first cover the importance of the ORE. Next, an overview of the role of experience on the mechanisms of the ORE will be reviewed. These are social, perceptual and neurological. Finally, manipulations of the ORE will be covered, followed by a brief review of social bias.

The Role of Experience

The contact hypothesis is a theory positing that greater experience with those of another race will also lead to better discrimination of that race and has often been referenced as a relevant theory when explaining differences in facial recognition between races (Goldstein & Chance, 1985; Lavrakas, Buri & Mayzner, 1976). In other words, according to the contact hypothesis, the ORE is related to experience.

Sangrigoli, Pallier, Argenti and de Schonen (2005) examined the merit behind this hypothesis by recruiting Korean adults who had been adopted as children by Caucasian families to participate in a study. These participants examined Caucasian and Asian faces, viewing a target face first and then viewing the target alongside a distracter.

Participants were asked to choose the original face from the two. Korean participants showed an ORE for Asian faces. A second group of Korean participants were given the same task. These had relocated to a predominantly Caucasian area as adults and did not have the same amount of experience with Caucasian others that the adoptees did.

Unlike the previous group, these participants showed an ORE for Caucasian faces.

Sangrigoli et al. attribute this to a lack of experience or contact with other race faces as the group with better face recognition for Caucasians was also the group with more contact or experience with Caucasian others.

The judicial system is one arena in which the recognition of other race faces is important, specifically in the area of eyewitness memory. There are many flaws to eyewitness memory such as forgetfulness, misattribution and bias. Bias is especially present with other-race identifications. Malcolm Gladwell, the author of Blink, writes about an incident that occurred in 1991 in which a Black man was shot and killed by four Caucasian police officers (Gladwell, 2002). The police officers explained that they believed the man had been reaching for a gun, but later found that he had been pulling out his wallet. This incident inspired several studies examining the link between racial bias and eyewitness identification. In one study, participants were more likely to identify a tool as a handgun after viewing a Black face, compared to viewing a Caucasian face (Payne, 2001). This demonstrates the potential bias that Caucasian participants have when viewing a Black face. The ORE has also been shown to be a factor in eyewitness identification—Smith et al. (2004) found that Caucasian participants were better at identifying Caucasian criminals from a video clip than they were at identifying Black criminals. This effect could be explained by experience, as previous studies have shown that a person often has more experience viewing faces of their own race and is therefore better at identifying novel own race faces as compared to novel other race faces (Goldstein & Chance, 1985).

Social Markers

Experience might affect one's facial recognition—via both social and perceptual mechanisms. Social perceptions will be discussed first. The out-group homogeneity effect is a relevant social phenomenon in the discussion of the ORE. As explained by Taylor, Fiske, Etoff and Ruderman (1978), individuals divide new information into categories in order to simplify life's daily complexities. Specifically, individuals classify new acquaintances into categories (such as race and gender) as a method of social discrimination. In theory, one of the simplest methods of categorization has been to divide others into “us” and “them” resulting in putting those who are “like us” into the in-group and those who are not like us into the out-group. Those who are viewed as a part of the out-group are viewed as more similar than members of the in-group. This concept is termed the out-group homogeneity effect and has been theoretically linked to the ORE (Sporer, 2001), such that own race acquaintances become part of “us” and other race acquaintances become part of “them”.

Hugenberg, et al. (2007) empirically examined how the ORE might line up with this effect. European American participants were randomly divided into different groups with each group getting a different set of instructions for a facial recognition task. A “control” group received instructions explaining how to complete the facial recognition task. The “general accuracy motivation” group received these basic instructions and instructions to attend closely to the faces in order to increase accuracy. The potential for racial bias was not mentioned. The “individuation” group was given basic instructions and instructions to pay careful attention to each face and its different characteristics in order to curb categorical thinking due to racial bias. After receiving instructions, participants

completed a learning phase in which they viewed Black and Caucasian faces. This was followed by a distracter task, and an old/new judgment task in which novel faces were presented with previously learned ones. The individuation group performed the best in identifying other race faces and did not show an ORE. This study is evidence that once participants view faces as individuals instead of a part of an out-group, they are better at recognizing novel other race faces.

Bernstein, Young & Hugenberg (2007) also examined the impact the out-group homogeneity effect may have on perceptual mechanisms by categorizing targets as part of an in-group or out-group based on university affiliation or experimentally created groups termed “green” or “red” personality types. Participants were better at recognizing targets that were part of their in-group, showing support for the idea that social attributions (such as categorizing others into “them” and “us”) interact with perceptual mechanisms (such as recognition for other race faces).

Perceptual Markers

Inversion Effect. In regards to the perceptual mechanisms of the ORE, the inversion effect and holistic processing are important to consider. The inversion effect occurs when one has difficulty recognizing objects presented upside-down (Kohler, 1940). In an early study of the inversion effect, participants performed a forced-choice recognition memory task, viewing pictures of single objects (faces, airplanes, houses, men in motion, sketches of faces, and faceless costumes) and then of pairs of objects (one previously viewed item and one novel item). Participants had to choose the originally viewed object from each pair (this type of task is called an old-new recognition task). Viewed items

that appeared upright might later appear inverted when presented in pairs. The results revealed that participants showed a greater inversion effect for faces than for other objects (Yin, 1969). It has been hypothesized that faces are most susceptible because they are objects of expertise, or objects with which people have the most experience (Rhodes, et al., 1989).

All faces are susceptible to the inversion effect, but it seems that other race faces are less susceptible than own race faces. Rhodes et al. (1989) found that participants showed a greater inversion effect when viewing faces of their own race than when viewing faces of other races. Chinese and European participants saw four different study sets of Chinese and European faces and were given a forced-choice recognition test after each set. Study faces appeared upright and test faces appeared either upright or inverted. The results indicated that participants showed a greater inversion effect as measured by both response time and response accuracy when viewing faces of their own race, e.g., Chinese participants showed a greater inversion effect for Chinese faces and European participants showed a greater inversion effect for European faces. Hancock and Rhodes (2008) also found that those viewing own race faces were more susceptible to the inversion effect than when viewing other race faces. Hancock and Rhodes also had participants complete a self-report measure assessing contact with other races along with the facial recognition task. Those reporting higher contact with other race faces showed a reduced ORE. Higher contact with other races was also associated with similar inversion effects for both own race and other race faces. Together, these findings suggest that expertise plays a role in the recognition of other race faces.

Holistic Processing. Farah, Wilson, Drain & Tanaka (1998) found that the perception of one part of the face is influenced by the details of another. This phenomenon is termed holistic processing. Holistic processing indicates that participants have a difficult time ignoring part of a face or selectively attending to a single part because of a failure in selective attention (Bukach, Bub, Gauthier & Tarr, 2006). Tanaka et al. (2004) found that other race faces are processed less holistically, and their data suggested that this effect depends on the level of experience with these faces. Caucasian participants recognized own race faces more holistically than other race faces, whereas Asian participants showed holistic recognition for both own race and other race faces. Both Asian and Caucasian participants were recruited from an area with a predominantly Caucasian population, thus giving Asian participants an advantage in experience with Caucasian faces.

The relationship between the ORE and holistic processing has frequently been examined using a “composite task” in which subjects are shown composite faces (faces created from the top and bottom of two different faces). Young, Hellowell and Hay (1987) first used this approach by showing participants the top of a famous face paired with the bottom of another face. Participants had faster responses for identifying the face halves when the faces were misaligned than when they were fused into one face, a finding attributed to interference from the bottom half when not misaligned. This effect may be attributed to experience as Tanaka et al. (2004) found evidence that experience impacts holistic processing for face recognition.

Michel, Rossion, Han, Chung & Caldera (2006) examined the relationship between the ORE and holistic processing by using a composite task. Asian and Caucasian participants first completed an old-new recognition task in which a series of faces was shown one at a time. Later, participants were shown another set of faces, some old and some new. Participants had to indicate which faces were new and which ones were old. Next, participants completed the composite task and were told to ignore the upper portion of the face and only concentrate on the lower portion. After the original was presented, a second face appeared, and participants had to decide if the second face was the same as the first. These second faces were presented as either “aligned” or “misaligned.” When faces were “aligned”, recognition was disrupted; this effect, the composite effect, was stronger for own-race faces than for other-race faces, demonstrating that own race faces are processed more holistically. Specifically, Caucasian participants showed more holistic processing of own race Caucasian faces than for Asian faces. But Asians who had been living among Caucasians for over a year showed holistic processing equally for both races. This is consistent with a role of experience in holistic processing measures of other race faces.

Neurological Markers

Fusiform Face Area. In addition to perceptual markers of experience, there are also neurological markers of experience for the recognition of faces. Studies using functional magnetic resonance imaging (fMRI) have explored how visual experience may activate specific brain regions. One such region is the fusiform face area (FFA), which is defined as an extra striate region of the brain that is activated more when viewing items for which

there is expertise, including faces. According to Grill-Spector, Knouf & Kanswisher (2004), this area is activated twice as strongly when viewing faces as when viewing objects. One reason for this finding could be an increased expertise for faces in comparison to other objects. To examine the effects of expertise on the FFA, Gauthier, Skudlarski, Gore and Anderson (2000) showed bird and car experts images of faces, birds, and cars and examined brain activity using fMRI. When viewing birds, bird experts showed increased activation of the FFA, as did car experts who viewed cars. This is further evidence that activation of the FFA may be sensitive to expertise. Experience with own race faces might also play a role in the stronger activation of the FFA for own race faces as compared to other race faces. While showing European American and African American participants photographs of faces from their own race and of other race, Golby, Gabrieli, Chiao & Eberhardt (2001) used fMRI and found that the FFA was less active in response to other race faces than to own race faces.

Studies Using Event Related Potentials. Event related potentials, (ERPs), also give insight into facial expertise. An ERP component is defined as a time-specific change in brain electrical activity that occurs in conjunction with specific events, such as the presentation of a stimulus. These events trigger neural activity that can be observed by averaging electrical signals of the brain (Gazzaniga, Ivry & Mangun 2002). ERP responses are measured in milliseconds as either positive (P) or negative (N) peaks of brain activity in certain neural structures of the brain. In regards to face recognition, the N170 response has been indicated as a marker of face processing. Bentin, Allison, Puce, Perez and McCarthy (1996) found that when presenting subjects with various images of

human faces, animal faces, cars, scrambled faces, scrambled cars, furniture or human hands, human faces elicited a stronger N170 response. When human faces were inverted, the N170 response was elicited at a delay. This delay did not occur with other objects. These effects have also been shown for objects of expertise, indicating that experience plays a critical role in the emergence of the N170 component (Rossion, Gauthier, Goffaux, Tarr & Crommelink, 2002). Ito & Urland (2005) examined the N170 showing Caucasian participants images of Black and Caucasian faces. Results showed a stronger N170 response was elicited for Caucasian faces than for Black faces. Because the N170 is also elicited most strongly for images one has expertise with, this indicated that individuals are experts at recognizing faces of their own race.

Manipulating the ORE

Not only have there been several studies that have examined the ORE using perceptual, neurological and social markers of experience, there are also studies that show how the ORE can be manipulated to reduce the gap between recognition of own race and other race faces. These studies include both perceptual and social manipulations.

Hills and Lewis (2006) used perceptual manipulations by training Caucasian participants to distinguish the differences in facial features. Participants viewed faces constructed from a face composite computer program—FACES. Participants completed a baseline facial recognition task first and then completed one of three different training procedures. Afterwards, they completed a second facial recognition task. During the baseline task, participants were asked to rate 20 faces on attractiveness; afterwards, they were shown these same 20 faces along with 20 new ones. As each face was presented,

participants had to choose whether it was “old” or “new.” During the learning phase, participants were taught to examine a target’s features by focusing on features in either the upper portion of the face (hair, eyes and eyebrows), the lower portion of the face (chin, cheeks and lips) or on the change in color of “blobs” that were presented on the faces. Hills and Lewis (2006) found that those who attended to features in the lower half of the face had lower ORE scores than the control groups.

Lebrecht, Pierce, Tanaka and Tarr (2008) also used perceptual training to manipulate the ORE. Participants were assigned to either the “individuation” condition in which they learned faces by matching a specific letter with a specific face, or the “categorization” condition in which each face was categorized as either Black or Chinese. Participants also completed two pre/post measures: a perceptual measure and a social one. For the perceptual measure, participants viewed Hispanic and Black faces in a study phase. Later, they were asked to recall these faces in an old/new judgment test in which novel faces were presented with the learned faces. For the social measure, subjects were shown either Black, Caucasian or Chinese faces for 250 ms. Afterwards, subjects were shown a letter string that was either a positive word, a negative word, a neutral word, or a non-word. Participants were asked to attend to the face and decide if the string was a word or a non-word. Results showed that the categorization group performed better before training, but after training, the individuation group performed better than the categorization group. This study established a link between implicit racial bias and the ORE and showed that training reducing the ORE also reduced implicit racial bias.

Johnson and Fredrickson (2005) examined how moods might affect the ORE. Participants—all Caucasian, went through four phases: 1) they viewed a video that was meant to elicit a mood of comedy, horror or neutrality; 2) participants completed a learning phase, viewing gray-scale images of both Black and Caucasian faces; 3) they viewed a different video that elicited the same mood as the first; 4) they completed a testing phase in which they viewed learned faces and novel faces, indicating whether each face was novel or not. Recognition for Caucasian faces was better than recognition for Black faces, showing an ORE. However, those who saw the comedy video did not show an ORE, whereas those watching the horror and neutral videos did.

Finally, Hugenberg et al. (2007) discovered that the ORE could be manipulated through instructions. Those participants receiving instructions to pay special attention to faces that were of a different race from their own eliminated the ORE.

Social Attitudes

A Brief Background. Social attitude is another factor that has been hypothesized to play a role in the ORE. One type of social attitudes is prejudice, a negative bias toward a particular group of people (Allport, 1954). Myers (2007, p. 57) added that prejudice is “an unjustifiable (and often negative) attitude toward a group and its members. Prejudice usually involves stereotyped beliefs, negative feelings and a predisposition to discriminatory action.” According to Dovidio (2001), the study of prejudice in the United States has gone through three different “waves” beginning in the 1920s and continuing into the present day. During the first wave, from 1920 to 1950, prejudice was viewed as a psychopathology (or a deviation from normal behavior) and a problem to

society. Prejudiced persons were viewed as having an authoritarian personality type with characteristics including ethnocentrism (or the preference for one's own culture and lifestyle), hostility toward out-groups, an emphasis on obedience and discipline, and rigid thoughts and beliefs (Adorno, Frenkel-Brunswik, Levinson & Sanford, 1950). At that time, the popular belief was that those afflicted by prejudice must be identified and either cured or removed from society in order to maintain the health of the population at large.

During the second wave from the mid 1950s until the 1980s, prejudice was viewed as a normal process that was supported by socialization and social norms (Dovidio, 2001). Lohman and Reitzes (1952) posited that as society grew and diversified more social roles developed, leading to greater impersonalization (a process in which roles lacked reference to specific persons) so that conflict became more common between social groups, not just individuals. This wave was also characterized by an emphasis on changing attitudes and interactions, not just describing them (Jones, 1997, p. 59). This emphasis spurred the racial integration of the education system and the Civil Rights Movement of the 1960's.

Since the 1990s, the third wave has focused on the multidimensional nature of prejudice, and new technologies have been used to delve further into its study. For example, implicit (automatic and unconscious) attitudes and beliefs are now measured along with traditional self-report scales. The role of implicit attitudes has been important in current studies of prejudice, as it is no longer socially appealing to express views that stereotype others. Therefore, a person might hesitate to respond honestly about bias on self-report measures. Or, a person may be unaware of his or her attitudes of implicit bias

and fail to endorse them in self-report measures. In fact, Greenwald, McGhee & Schwartz (1998) showed that a person might harbor racial prejudice even when claiming otherwise by developing the Implicit Association Test or (IAT), now widely used to study implicit attitudes.

Implicit Attitudes and Race. The IAT is a test that measures the strength of association of two target concepts. In Greenwald et al.'s (1998) study, Caucasian participants were tested on the strength of their association between "White" + "pleasant" and "Black" + "pleasant". This was achieved by pairing traditional Caucasian names and traditional Black names with words that were pleasant or unpleasant. To measure implicit attitudes, the differences in reaction times from these stimuli pairs ("Caucasian" + "pleasant" and "Black" + "pleasant") were measured. An overwhelming 90% of respondents took longer to associate pleasant words with the correct key when these pleasant words were also paired with a traditional Black name as opposed to a traditional Caucasian name. Participants were also given self-report measures gauging ethnic identity and attitudes, and even though the IAT indicated a Caucasian preference, participants self-reported either indifference or a Black preference.

Ferguson, Rhodes, Lee & Sriram (2001) used a facial recognition task with self-report measures and an implicit measure developed by Fazio, Jackson, Dunton & Williams (1995) in search of a relationship between implicit social attitudes and the ORE. Caucasian participants were divided into low prejudice and high prejudice groups based on self-reported attitudes towards Asians. Surprisingly, results showed that implicit and self-reported prejudice influenced the recognition of faces, but this effect did not interact

with race. Those who reported higher prejudice showed a poorer recognition of both own race and other race faces than those who had lower self-report prejudice scores. The opposite was true for implicit prejudice; higher scores were associated with better recognition of both own race and other race faces. Even though these findings do not support a relationship between the ORE and non-perceptual measures, they show that general face recognition and non-perceptual measures are related. More recently, a connection has been discovered between implicit bias and the ORE such that training reducing implicit bias was also successful at reducing the ORE (Lebrecht et al., 2008).

The Current Study

In summary, this review has provided an overview of the perceptual and neurological mechanisms that accompany face recognition and the presentation of each for own race and other race faces. Faces are susceptible to the inversion effect (Yin, 1969) but other race faces are less susceptible than own race faces (Hancock & Rhodes, 2008). Faces are processed holistically (Farah, et al., 1998) but other race faces are processed less holistically than own-race faces (Tanaka, et al., 2004). The FFA is activated twice as strongly when viewing faces than when viewing other race objects (Grill-Spector, et al., 2004) but is less activated for own race faces than for other race faces (Golby, et al., 2001). Faces elicit a stronger N170 component than other objects (Bentin, et al., 1996) but own race faces elicit a stronger N170 than other race faces (Ito & Urland, 2005).

This review has also provided evidence supporting the hypothesis that non-perceptual factors such as context, attitudes, and experience influence the ORE. The manipulation of motivation through instructions for a face recognition task (Hugenberg, et al., 2007)

and the manipulation of mood (Johnson & Fredrickson, 2005) are evidence that context affects the ORE. And implicit attitudes have been shown to impact the ORE (Lebrecht, et al., 2008). Furthermore, the ORE has been linked to experience (Sangrigoli, et al., 2005; Tanaka, et al., 2004). The current study aims at clarifying the association of non-perceptual factors and the ORE in a new and different way. Most previous studies have examined the ORE in a neutral context and others have examined the perpetrator status and how it impacts non-perceptual factors. This study includes a victim status in addition to that of perpetrator. These social contexts may bring out correlations in the data that would not normally be evident from a neutral or baseline status alone. This study will further examine the influence of non-perceptual factors on the ORE by examining the following:

- 1) Does the ORE depend on social context (if a target face is a perpetrator or victim)?
- 2) Do implicit and explicit attitudes affect the ORE?
- 3) Does experience (both social contact and individuating experiences) impact attitudes?
- 4) Does experience impact the ORE?

Study 1

In Study 1, participants completed a series of explicit self-report measures. However because there are often problems associated with self-report (such as difficulty in recalling information accurately or response bias; Miller, Perlman & Brehm, 2007), an implicit measure was also included. In addition, participants also completed a facial recognition task in which photos of Caucasian, Black and Asian faces were used as stimuli. The use of stimuli from three different racial groups is not the norm, making this study unique.

Past research demonstrates that Caucasian participants reveal negative implicit bias towards Black others as measured by the IAT (Greenwald, et al., 1998; Cunningham, Johnson, Raye, Gatenby, Gore & Banaji, 2004) and that Caucasians are better at discriminating faces of their own race than for Black or Asian faces (Ackerman, et al., 2006; Walker & Hewstone, 2006, Sangrigoli & de Schonen, 2004; Hugenberg, et al., 2007; Johnson & Fredrickson, 2005, Rhodes, Hayward & Winkler, 2006). Additionally, Black male perpetrators are more memorable than Caucasian males or Black males of a lighter skin tone (Dixon & Maddox, 2005). Viewing other race perpetrators should be consistent with stereotypes of threat, making this a congruent pairing. These targets should be deeper encoded compared to other race victim. This may reaffirm stereotypes and pull for negative implicit bias. However, viewing victims of other races may be incongruent for Caucasians because of the impact of empathy.

The predictions for the current study are as follows:

- 1) Social context will matter in regards to the facial recognition task, such that Caucasian participants will reveal a smaller ORE when Black faces are shown in the perpetrator condition in comparison to Black faces shown in the victim condition.
- 2) Participant attitudes will impact the ORE. Based on past research, participants will reveal a negative implicit bias as measured by the IAT for other race faces (Black and Asian) when paired with faces from their own race. These implicit attitudes will be correlated with the ORE such that negative bias will be associated with a stronger ORE. More negative explicit attitudes will be correlated with a stronger ORE.
- 3) Experience will impact attitudes and the ORE. More social contact and individuating experiences will be associated with less implicit bias, less negative attitudes and a reduced ORE.

Methods

Participants. Participants were primarily recruited from the University of Richmond student population, however others came from the Richmond, Virginia community and from the Old Dominion University student population. All participants were compensated with \$15 after completion of the study. A total of 39 Caucasian participants took part in this study. An inclusion criteria was set, such that participants were required to obtain at least 30 % accuracy on the face recognition task. Two were excluded on the basis of inclusion criteria and 3 due to missing data leaving a total of 34 participants (Mean age = 20.61, Female $N = 22$).

Material and procedures

Procedure. This study was comprised of three tasks: the IAT, a facial recognition task and self-report measures. The order in which participants completed these tasks was counter balanced to avoid order effects using every possible order of the three tasks.

Self-Report Measures. Participants completed pen and paper surveys assessing social attitudes towards Asian, Black and Caucasian others as well as contact and quality of contact with these races. Each questionnaire was presented as a set so that participants provided information on each race on all measures before moving onto the next section. The measures were administered in the same order every time (see Appendix 1).

The Attitudes Towards Blacks Scale. The Attitude Towards Blacks Scale (Brigham, 1993) was originally designed to measure one's attitudes towards Black others. For the purpose of this study, the scale was modified from its original version to allow participants to rate attitudes towards Asian others, by removing the target race of Black and replacing it with Asian. Additionally, certain items that seemed outdated or only relevant to one race were removed from the scale entirely (see Appendix 1 for examples of the measures along with the items excluded from the ATB). Higher scores equated to more positive attitudes and lower scores to more negative attitudes towards the target race (Black or Asian) in question. Participants completed social attitudes measures on both Black and Asian others. Examples of statements included in this scale are "It would not bother me if my new roommate was Black" or "I think that Asian people look more similar to each other than those of my own race do." Participants responded on a scale from 1 to 7 for each statement (strongly disagree, moderately disagree, slightly disagree,

neutral, slightly agree, moderately agree, strongly disagree). Items 1, 8, 9, 10, 12, 13, and 14 were reverse coded in order to obtain a total score, which was then divided, by the total number of questions. There were 15 questions for each race.

Social Contact Scale. Walker and Hewestone's (2006) Social Contact Scale (SCS) measures the amount of contact one has with another race. The SCS was modified to measure the amount of social contact participants had with each of the 3 target races. The original version inquired about contact with South Africans; the current versions measured social contact with Caucasians, Asians and Blacks. Additionally, more contemporary wording was added (for example, "go 'round with" was changed to "go") on Item 4. This scale included statements such as "I often spend time with Black people" or "Asian people often come around to my house." Participants responded on a scale from 1 to 5 for each statement (strongly disagree, sort of disagree, not sure, sort of agree, and strongly agree). Participants answered a total of 5 questions for each race (Black, Asian and Caucasian) for a total of 15 questions.

Individuating Experiences Scale. Walker and Hewestone's (2006) Individuating Experiences Scale (IES) is intended to measure the amount of individuating experiences above and beyond mere exposure one has with another race. The IES was modified from its original version by replacing the original target race (South African) with Caucasian, Black and Asian others as targets. Statements such as "I have comforted a Caucasian friend when they were feeling sad" and "I have asked an Asian person to be on my team or in my group during sports or activities" were rated using a scale ranging from 1 to 5

(never, hardly ever, sometimes, quite often and very often). There were 15 questions overall, 5 for each race.

Implicit Association Test.

Stimuli. Stimuli for the IAT were provided by the Tarr Lab (www.tarrlab.org). These were taken from standard resolution video footage and included images of Caucasian, Black and Asian faces from the neck up. Faces were shown straight on (0 degrees) with neutral emotional expressions. Faces were presented in color and standardized for attractiveness. Student volunteers viewed a pool of facial stimuli and rated each face on a scale from 1 (not at all attractive) to 5 (highly attractive). Faces selected for the final version were rated between 1.5 and 3.8. Identifying features (such as glasses or earrings) were removed using Photoshop Creative Suite.

Materials. Images of faces were used to represent the category of race and were provided by the Tarr Lab (www.tarrlab.org). Two male and two female faces were used from each race, for a total of 4 faces per race and 12 faces total. Word stimuli were initially selected from the list used by Ferguson and colleagues (2003) but were later pared down to 8 words, 4 positive and 4 negative. To make the words as similar as possible, 2 words were replaced from this list, such that each set of 4 differed only on the evaluation of positive or negative and nothing else (such as number of syllables or one set starting with all vowels). Words included positive: delightful, happy, wonderful, friendly; and negative: offensive, repulsive, horrible, nasty. These words appeared in the middle of the screen in black, 64-point Futura font. IATs were presented on Macintosh computers using Superlab 4.0.7 software.

Procedure. The target concepts for this study were race (Caucasian, Black, Asian) and evaluation (positive and negative). Each participant was given a total of 3 IAT's so each race was paired together (Caucasian-Black, Caucasian-Asian, and Black-Asian).

Each IAT had a total of 7 blocks. Protocol for these blocks was created using examples from Nosek, Greenwald and Banaji (2007). These blocks were presented in the following manner: (1) a 24-trial practice block in which participants categorized faces by race, for instance Caucasian faces on the left and Black faces on the right, (2) a 24-trial practice block in which participants categorized words by evaluation, for instance, positive words on the left and negative words on the right, (3) a 24-trial practice combination block, for instance, positive + Caucasian on the left and negative + Black on the right, (4) a 48-trial test block using the same pairing, (5) a 48-trial discrimination practice block in which target faces were reversed, Black faces on the left and Caucasian faces on the right, (6) a 24-trial practice combination block, for instance, positive + Black and negative + Caucasian, and (7) a 48-trial test block of the same combination. Participants used the "e" and "i" keys on their computer keyboards to categorize the stimuli.

Stimuli were presented randomly within each block except for combination blocks (blocks 3, 4, 6 and 7) in which words and faces were presented in a random order in each block. Trials were separated by a 250-millisecond interval. Participants received feedback for incorrectly categorized items and had to correct these mistakes before moving onto subsequent trials. To designate mistakes, a red "X" appeared in size 72 red Lucida Grand font. Stimuli remained on screen until participants responded. Face

stimuli were presented in the middle of the screen (0, 0). Depending on the block, words designating category constructs also appeared on screen. Race words (Caucasian, Black, Asian) appeared in size 36 blue Futura font at (-200, 175) and (200, 175). Valence words (Positive, Negative) appeared in size 36 black Futura font at (-200, 225) and (200, 225).

The order of initial race-evaluation pairing was counterbalanced across participants (for instance, the Caucasian-Black IAT was administered to half of the participants with positive + Caucasian as the first pairing and half with positive + Black as the first pairing). The order in which participants received these IAT's was also counterbalanced.

The method used to obtain a final IAT score was based on the D measure calculation recommended by Lane et al. (2007). This D measure is a standardized difference score in reaction times (D) between the combined responses in Blocks 3 and 6 compared to those in Blocks 4 and 7. It is calculated in such a way that a positive number is associated with faster responding to the pairing of positive attributes to one's own race. In the case that both faces were from other races (i.e., Asian-Black pairings), it is calculated such that a positive number indicates faster association to Asian-positive pairing. To calculate D, all trials greater than 10,000 milliseconds were deleted as were any subjects responding within less than 30 milliseconds for more than 10% of the trials. An inclusive standard deviation for all trials in Blocks 3 and 6 was calculated. The same was done for Blocks 4 and 7. The mean latency was calculated for each of these four Blocks. Next, the differences between the means of Block 6 and 3 and the means of Block 7 and 4 were calculated. The final D measure was computed by averaging these final 2 ratios. This D measure was used as a dependant variable for implicit attitudes.

Face Recognition Task.

Photo Stimuli. A total of 1,008 photograph stimuli from the University of Richmond face database were used for the face recognition task. A total of 144 different photographed faces were used for this study, 48 for each race. Each face was cropped from the crown of the head to the bottom of the chin for 7 different views: 30° Left, 30° Right, 60° Left, 60° Right, 90° Left, 90° Right, and 0° or straight on, so that there were 7 different views of each individual face. These stimuli were chosen because they had been standardized by the removal of externalizing features (such as hair) as well as identifying features (such as moles, birthmarks, earrings, and other piercings). Photo subjects had a neutral expression. During the experiment, photo stimuli appeared in color.

Procedure. Participants completed a 40-minute facial recognition task in the context of playing the role of an airport security official who is screening the faces of those boarding a plane and specifically looking to pull aside certain passengers. The baseline was presented as a “training” phase in which participants were asked to screen the faces of passengers in search of 2 target faces. All other blocks had participants screening for perpetrators and victims of crime. Target faces varied by race (Caucasian, Black and Asian) and status (Baseline, Perpetrator and Victim) but were always matched for gender. In each block, a study phase was presented first followed by a testing phase. The study phase for the Baseline blocks began with a neutral message indicating the presentation of a new set of faces to screen including the 2 neutral target faces. The study phase for other blocks began with an alert that included a perpetrator and victim from 2 different

races. Participants had unlimited viewing time to learn each pair of target faces. Status was assigned by the presentation of the labels “Perpetrator” and “Victim” in size 36 Geneva font above and below the target faces. Baseline faces were presented without labels. Target faces were presented at (-250, 0) and (250, 0).

After viewing the 2 target faces, participants completed a testing phase. During the testing phase, 8 facial stimuli (2 targets and 6 distracters, divided equally between 2 races) were presented from 7 different angles. These 8 stimuli included the two target faces. Participants only viewed one testing face at a time and had to press the “m” key on the keyboard if they recognized the face as a target or the “z” key if they did not. A total of 56 photo stimuli were shown for each block and these were presented in the center of the screen (0, 0). Participants had unlimited time to respond to each stimulus.

This task had a total of 18 block pairs (study phase + test phase). Block pairs contained 4 individual faces for each of the 2 races presented for a total of 8 individual faces. The first 6 were baseline block pairs in which status was not assigned to either of the 2 target faces in the study phase. Baseline pairings included Caucasian-Black, Caucasian-Asian, and Black-Asian. The remaining 12 block pairs contained target faces that were assigned a status of either Perpetrator or Victim. Once baseline blocks were completed, an “alert” appeared to notify participants of the new status labels: “ALERT! We have just received news that an international kidnapping ring has gone into operation. You will be receiving several alerts as information about the kidnappers and victims becomes available. Press spacebar to continue.” Participants were given a 3-second break between each block pair. Each individual face was only used in 1 block pair.

There were a total of 18 blocks. The baseline blocks were set up so all possible race pairings were used for each gender. The 12 testing blocks were set up such that each target was presented once as a victim and once as a perpetrator within each gender and for every possible race pairing.

The dependant variable for this task was the ORE in sensitivity (d'). The ORE for Caucasian Sensitivity was calculated by subtracting other race d' scores (Black and Asian) from Caucasian d' scores. This measure of the ORE is a pure measure of discrimination (for either perception or memory) because response bias is controlled. Analyses using the ORE as measured by response time were also computed and are presented in Appendix 2 along with brief summaries of findings. These are not presented in the main analysis because a number of factors could influence response time in two different directions, making it difficult to make clear predications. Similar to sensitivity, difficulty of discrimination could slow down response times. However, slower response times could also be due to incongruency with expectations and relative weighting of particular status. For example, participants might take more time because they are more motivated to respond correctly. Thus, a more positive attitude might be associated with a faster response time because participants have attended better initially or with a slower response time because they were taking more care with their decisions.

Study 1 Results

Implicit and Explicit Measures.

Self-Report Measures. Table 1 shows the means and standard deviations of Caucasian self-reported attitudes (higher numbers indicate more positive attitudes), social

contact (higher numbers indicate more social contact), and experiences with Caucasian, Black and Asian others (higher numbers indicate more individuating experiences). Differences between ratings for Black and Asian others were analyzed using paired samples t-tests for each questionnaire type. Caucasians had significantly more positive attitudes towards Asian others than Black others, $t(33) = -2.17, p = .037$. No other comparisons were significant.

Table 1

Caucasian Self-Report Measures Means and Standard Deviations

	Own	Black	Asian
Attitudes	-	5.82 (0.68)	6.06 (0.69)
SCS	4.83 (0.40)	2.82 (1.13)	2.70 (1.31)
IES	4.22 (0.76)	3.18 (1.07)	2.91 (1.19)

IAT Scores. Mean scores for each of the three IATs are presented in Figure 1. IAT scores were analyzed using a one-sample t-test to determine whether they were significantly different from 0. As Figure 1 shows, Caucasian participants revealed a negative bias to both Black and Asian others when paired with Caucasians. A one-sample t-test revealed that both the negative bias for Black others, $t(33) = 4.17, p = .000$, and the negative bias for Asian others, $t(33) = 5.06, p = .000$, was significantly different from 0. No other comparisons were significant.

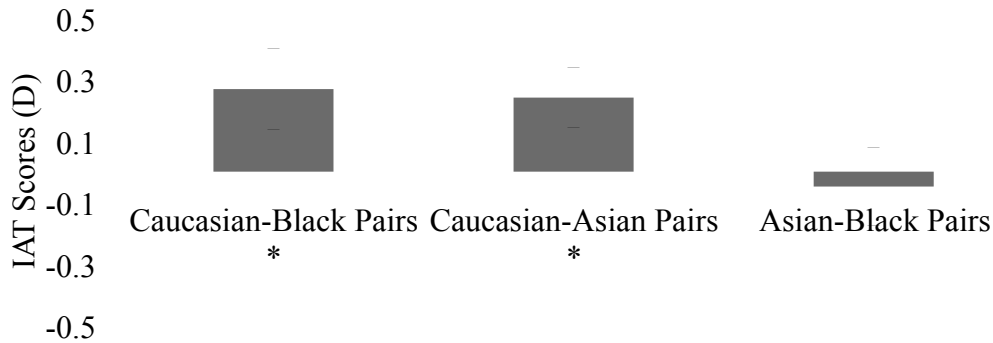


Figure 1. IAT Scores for Caucasian Participants. Error bars reflect 95% confidence intervals based on the one-sample t-test. Stars indicate significance, $p \leq .05$.

Correlations Between Explicit and Implicit Measures. The relationship between explicit and implicit measures was examined using bivariate correlations; refer to Table 2 for Caucasian attitudes towards Black others and Asian others. Caucasian bias towards Black others as measured by the IAT was negatively correlated with Caucasian Attitudes Towards Blacks scale, $r(34) = -.43, p = .011$, with more negative attitudes being associated with a greater bias. Additionally, Caucasian participant responses on the Individuating Experiences scale were positively related to responses on the Social Contact scale towards both Black and Asian others, $r(34) = .82, p = .000$ and $r(34) = .87, p = .000$, respectively. More social contact was associated with more individuating experiences. No other correlations were significant.

Table 2

Caucasian Attitudes towards Black and Asian others

	1. IAT	2. ATT	3. SCS	4. IES
1. IAT	-	-.18	-.25	-.21
2. Attitudes	-.43 **	-	.14	.15
3. SCS	-.13	.26	-	.87**
4. IES	-.14	.31 +	.82 **	-

Note. Significant for $+p \leq .1$; $*p \leq .05$, $**p \leq .01$; Caucasian Attitudes Towards Blacks are below the diagonal. Caucasian Attitudes towards Asians are above the diagonal.

Face Recognition ORE. The ORE for sensitivity is the dependent variable for this study; however, the overall means in sensitivity are displayed to assist in the presentation of data (Figure 2). These calculated ORE d' scores were submitted to a 2x3 (Race x Status) Repeated Measures ANOVA examining the ORE for Caucasian Sensitivity (Figure 3). Caucasian participants showed a main effect of race of face, $F(1, 33) = 10.09, p = .003, \eta^2 = .23$. The ORE was greater for Black faces ($M = .60$) than Asian faces ($M = .37$). There was also a main effect of status, $F(2, 66) = 3.47, p = .037, \eta^2 = .10$. Tukey's post-hoc tests revealed that the ORE was stronger for faces in the Victim ($M = .64$) condition than it was for perpetrators ($M = .22$). The interaction between face and status was only marginally significant, $F(2, 66) = 2.79, p = .069, \eta^2 = .08$. No other comparisons were significant.

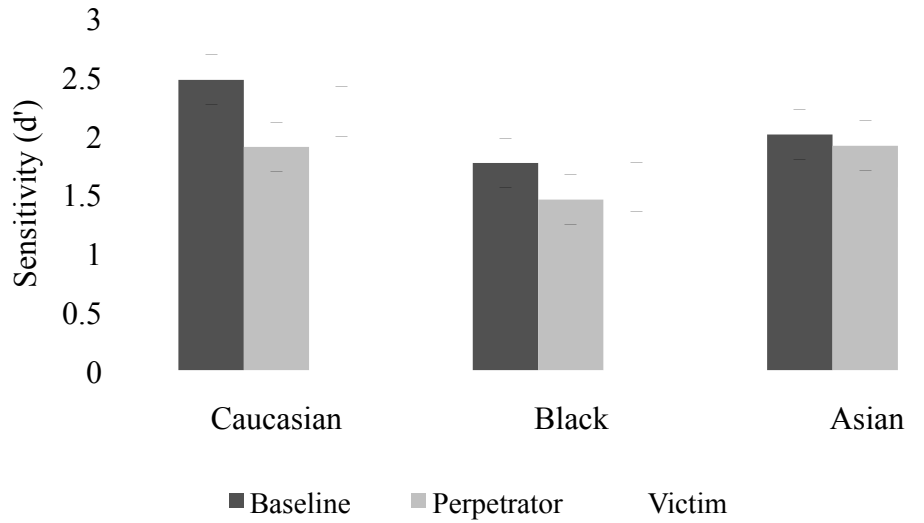


Figure 2. 3x3 ANOVA of Caucasian participant mean sensitivity scores.

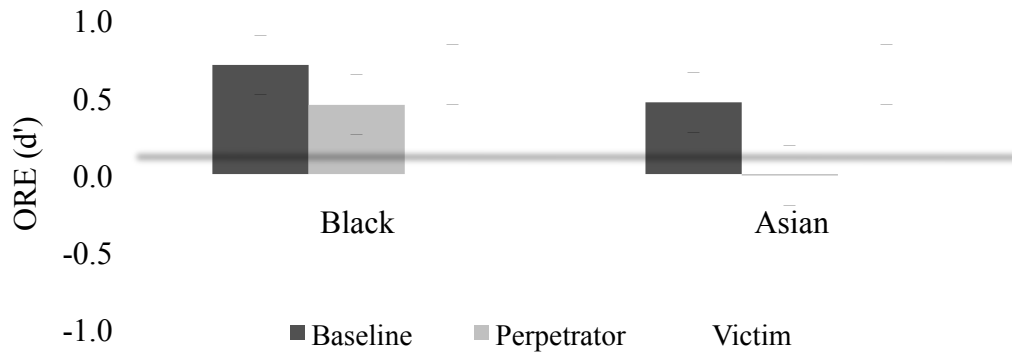


Figure 3. Mean ORE in sensitivity for Caucasian Participants. Error bars reflect 95% confidence interval calculated based from the interaction MSE of the 2x3 ANOVA. The line at 0.17 d' indicates the cutoff for a significant ORE based on Tukey's HSD for a

main effect of face from the 3 (Face: Asian, Black, Caucasian) x 3 (Status: Baseline, Perpetrator, Victim) ANOVA.

Correlations with Perceptual Performance. The relationship between the perceptual measures of the ORE and the measure of bias (implicit and explicit) was examined with bivariate correlations (Table 3). The ORE for Black perpetrators as measured by sensitivity was negatively correlated with Attitudes, $r(34) = -.44, p = .010$. Negative attitudes were associated with a greater ORE for Black Perpetrators. No other correlations were significant.

Table 3

Caucasian Attitudes and Perceptual Measures Towards Blacks and Asians

		ORE Sensitivity Baseline	ORE Sensitivity Perpetrator	ORE Sensitivity Victim
Black Others	IAT	.05	.21	.21
	Attitudes	-.03	-.44 **	-.21
	SCS	-.04	-.23	-.12
	IES	.03	-.11	-.12
Asian Others	IAT	.16	.16	-.06
	Attitudes	.05	-.03	-.11
	SCS	-.08	-.16	-.25
	IES	.12	-.21	-.30 +

Note. Significant for $+p \leq .1$; $*p \leq .05$, $**p \leq .01$.

Study 1 Discussion

The results from Study 1 provide additional support for the overall hypothesis of this study—that non-perceptual factors impact the ORE. The ORE was influenced by social status—it was hypothesized that Caucasians participants would reveal a smaller ORE for Black participants. Not only did participants reveal a lower ORE for Black perpetrators in comparison to victims, participants also revealed a lower ORE for Asian perpetrators

in comparison to victims. Explicit attitudes were correlated with the ORE. Negative attitudes towards Black others were associated with a stronger ORE towards Black perpetrators. It was hypothesized that negative bias would be associated with a stronger ORE, however, the data did not support this hypothesis. It was hypothesized that experience would be related to attitudes. This hypothesis was supported in regards to explicit attitudes, but not for implicit. More individuating experiences with Asians were associated with more positive attitudes towards Asians. However, this effect was marginal, providing only weak support for this hypothesis. It was hypothesized that more experience would be correlated with a reduced ORE. This was supported with a marginal trend revealing that more individuating experiences with Asian others were associated with a smaller ORE for Asian victims.

Study 2

In Study 2, those self-identifying as “Black” or “African American” were recruited to participate in the same set of measures and tasks as those from Study 1. Previous studies have examined the ORE by showing Black participants novel faces of Black and Caucasian others. These studies have revealed that Black participants are better at recognizing novel faces from their own race than faces from other races (Carroo, 1987) or ambiguous faces (Pauker, Weisbuch, Ambady, Sommers, Adams, Ivcevic, 2009). This is especially true for novel stimuli sharing the same ethno-geography of a participant. For instance, Black participants from South Africa perform better on face recognition tasks including Black South African faces as stimuli than those using Black faces from the United States (Chiroro, Tredoux, Radaelli & Meissner, 2008). Additionally, Black participants have shown a smaller ORE for Caucasian faces than Caucasians have shown for Black faces (Feinman & Entwisle, 1976). Past research also shows that Caucasian perpetrators paired with Black victims are viewed as less socially acceptable than pairing Black perpetrators with Caucasian victims (Lee & Craig-Henderson, 2005). To date, very little information is available on Black participant recognition of Asian faces.

In regards to social attitudes, Livingston (2002) reported Black participants responded with more positive feelings towards Black others on a measure of explicit attitudes when compared to explicit attitudes towards Caucasian others. However, these same participants responded with a positive bias towards Caucasian others on an implicit task. Overall, Black participants have yielded mixed results on IAT responses (Project Implicit). Nosek, et al. (2002) have hypothesized that responses on the race IAT are

linked to political ideology and explicit attitudes and that these vary by person, so may be a factor in explaining these mixed results.

The predictions for the current study are as follows:

- 1) Social context will matter in regards to the facial recognition task, such that Black participants will show a smaller ORE when Caucasian faces are shown in the perpetrator condition. Because Caucasian perpetrators are viewed as less socially acceptable (Lee & Craig-Henderson, 2005), Black participants will pay more attention to Caucasian faces in this condition, resulting in a smaller ORE.
- 2) Attitudes will impact the ORE. Negative implicit attitudes will be correlated with a stronger ORE than positive attitudes. Participant explicit attitudes will reveal a negative bias for Caucasian and Asian others. These will be correlated with a stronger ORE.
- 3) Experience will impact attitudes and the ORE. More social contact and individuating experiences will be associated with less implicit bias, less negative attitudes and a reduced ORE.

Methods

Participants. Participants for Study 2 were recruited using the same methods and recruitment sites as Study 1 and were subject to the same inclusion criteria. A total of 39 Black participants took part in this study. Three were excluded on the basis of inclusion criteria and 4 due to missing data leaving a total of 32 participants (Age $M = 22.25$, Female $N = 23$).

Materials and Procedure. Participants completed three tasks: the IAT, a facial recognition task and self-report measures. The order in which participants completed these tasks was counter balanced to avoid order effects. The procedures for these tasks were the same as those for Study 1 except for a few changes. When completing the Attitudes Towards Blacks Scale, participants reported on attitudes towards both Caucasian and Asian others. To obtain a final IAT score for Caucasian-Asian pairings, the D measure was calculated such that a positive number indicated faster association to the Caucasian-positive pairing.

Results

Explicit and Implicit Measures.

Self-Report Measures. Table 4 shows the means and standard deviations of Black self-reported attitudes, social contact, and experience with Black, Caucasian and Asian others. Black participants had significantly more social contact, $t(31) = 3.93, p = .000$, and individuating experiences, $t(31) = 6.54, p = .000$, with Caucasians than Asians. No other comparisons were significant.

Table 4

Black Self-Report Measures Means and Standard Deviations

	Own	Asian	Caucasian
Attitudes	-	5.10 (1.75)	4.96 (1.43)
SCS	4.69 (0.57)	2.01 (1.09)	2.99 (1.12)
IES	4.66 (0.58)	2.39 (1.13)	3.66 (0.89)

Black IAT Scores. Black participants revealed a marginally significant negative bias towards Asians only when paired with Caucasians (Figure 4). A one-sample t-test

revealed that this bias was different from 0, $t(31) = 2.03, p = .051$. No other comparisons were significant.

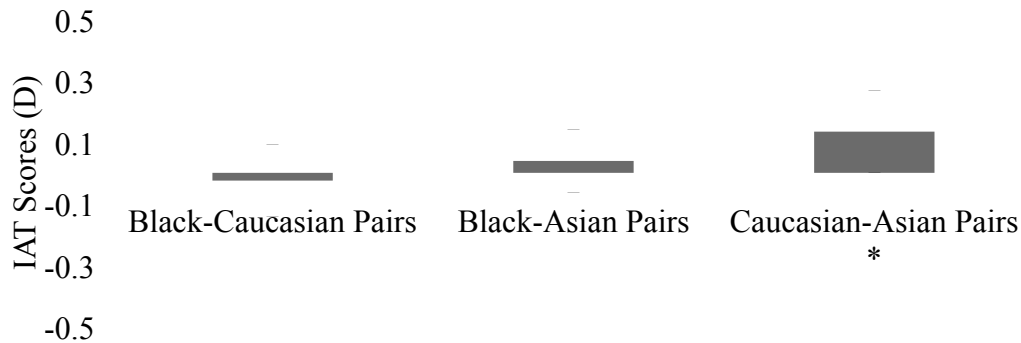


Figure 4. IAT Scores for Black Participants. Error bars reflect 95% confidence interval based on the one-sample t-test. Stars indicate significance, $p \leq .05$.

Correlations Between Explicit and Implicit Measures. The relationship between explicit and implicit measures was examined using bivariate correlations (Table 5). Scores on the SCS were negatively correlated with the Black-Caucasian IAT, $r(32) = -.40, p = .022$ such that a greater bias was associated with less social contact with Caucasian others. Black participant responses on the Individuating Experiences scale were positively related to responses on the Social Contact scale towards both Caucasian and Asian others, $r(32) = .57, p = .001$ and $r(32) = .63, p = .000$ respectively. More contact was associated with more individuating experiences for both groups. No other correlations were significant.

Table 5

Black Attitudes Towards Caucasian and Asian Others

	1. IAT	2. ATT	3. SCS	4. IES
1. IAT	-	.02	-.03	.16
2. Attitudes	.15	-	.11	.08
3. SCS	-.40 *	-.09	-	.63**
4. IES	-.17	-.10	.57**	-

Note. Significant for + $p \leq .1$; * $p \leq .05$, ** $p \leq .01$; Black Attitudes Towards Caucasians are below the diagonal. Attitudes Towards Asians are above the diagonal.

Face Recognition ORE. Figure 5 displays the overall means in sensitivity. A 2x3 (Face x Status) ANOVA examined the ORE for Black Sensitivity (Figure 6). There was a trend for a reduced ORE for Asian perpetrators relative to victims, but the interaction between race and status failed to reach significance, $F(2,62) = 2.76, p = .071, \eta^2 = .08$. No other comparisons were significant.

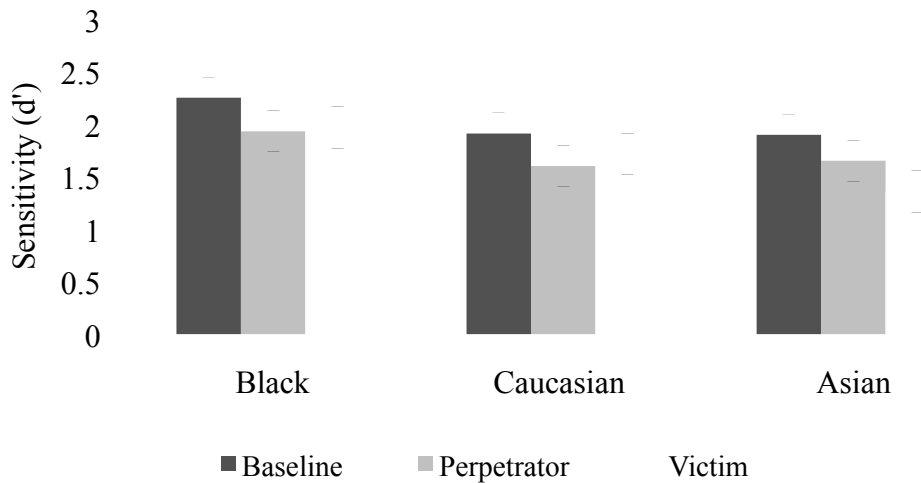


Figure 5. 3x3 ANOVA of Black participant mean sensitivity scores.

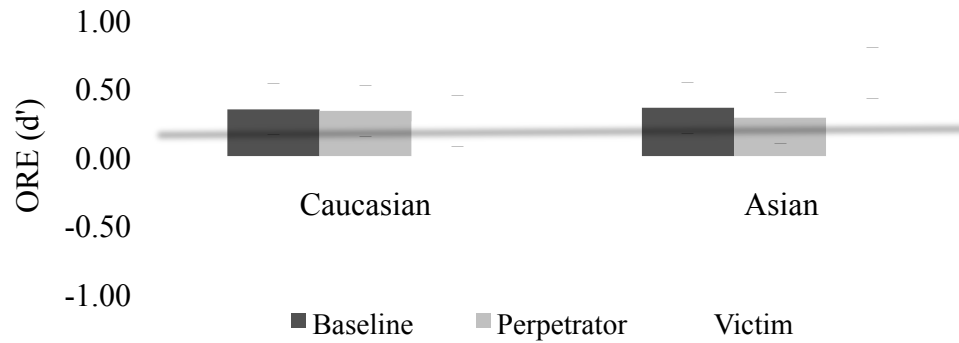


Figure 6. Mean ORE in sensitivity for Black Participants. Error bars reflect 95% confidence interval calculated from the interaction MSE of the 2x3 ANOVA. The line at 0.19 d' indicates the cutoff for a significant ORE based on Tukey's HSD for a main effect of face from the 3 (Face: Asian, Black, Caucasian) x 3 (Status: Baseline, Perpetrator, Victim) ANOVA.

Correlations with Perceptual Performance. There were no significant correlations between Black participant attitudes towards Caucasian and Asian others and perceptual performance with faces of these races (Table 6).

Table 6

Black Attitudes and Perceptual Measures Towards Caucasians and Asians

		ORE Sensitivity Baseline	ORE Sensitivity Perpetrator	ORE Sensitivity Victim
Caucasian Others	IAT	.05	.12	.13
	Attitudes	.25	.16	.05
	SCS	.04	-.04	.04
	IES	-.08	-.12	.18
Asian Others	IAT	-.18	-.04	-.15
	Attitudes	.20	-.01	.23
	SCS	.12	-.08	.04
	IES	.02	.15	-.11

Note. Significant for $+p \leq .1$; $*p \leq .05$, $**p \leq .01$.

Study 2 Discussion

Data from Study 2 supports the hypothesis that non-perceptual factors impact the ORE. Even though data from the face recognition task did not support the hypothesis that participants would show a smaller ORE for Caucasian perpetrators compared to Caucasian victims, did reveal that the ORE depends on social context. Black participant data showed the same trend of a lower ORE for Asian perpetrators. This finding was similar to the results for Caucasian participants. It was hypothesized that experience impacts attitudes. Data from Study 2 also indicated that experience affects implicit attitudes, but not explicit ones. More social contact with Caucasians was associated with reduced implicit bias towards Caucasians. This study did not provide support for the hypotheses that implicit and explicit attitudes or experience impact the ORE.

Study 3

In Study 3, self-identified Asians were recruited to participate in the same set of measures and tasks as those from Studies 1 and 2 to explore how social attitudes and status may impact the ORE for Asian participants. Previous studies have examined the ORE by showing Asian (usually Chinese) participants novel faces of Asian and Caucasian others. Asian participants use holistic processing for both own race and other race faces and are better at recognizing own race faces than Caucasian other race faces (Tanaka et al, 2004; Walker & Tanaka, 2003). Asian participants have also been shown to recognize own race faces better than Black faces (Gross, 2009), however, just as the ORE for Caucasian faces is reduced by experience (Sangrigoli et al., 2005; Tanaka, et al., 2004), the ORE for Black faces may be reduced by experience.

In regards to social attitudes, Asian participants report more positive explicit attitudes towards Caucasian others than Caucasians report towards Asian others (Turner, Hewstone & Voci, 2007). Additionally, when given an Asian-Caucasian IAT, Asian participants have shown negative bias towards Caucasians (Rudman, Feinberg, & Fairchild, 2002). Little is known about Asian attitudes towards Blacks.

The predictions for the current study are as follows:

- 1) Previous research shows that Caucasian participants are viewed less favorably in the perpetrator condition (Lee & Craig-Henderson, 2005). Therefore, social context will matter in regards to the facial recognition task, such that Asian participants will show a smaller ORE when Caucasian faces are shown

in the perpetrator condition, as they will be more likely to attend to this pairing than others.

- 2) Attitudes will impact the ORE. Based on past research, participants will reveal a negative implicit bias for other race faces (Caucasian and Black) when paired from faces of their own race. Negative explicit attitudes will be associated with a larger ORE.
- 3) Experience will impact attitudes and the ORE. More social contact and individuating experiences will be associated with less implicit bias, less negative attitudes and a reduced ORE.

Methods

Participants. Participants for Study 3 were recruited using the same methods and recruitment sites as Studies 1 and 2 and were subject to the same inclusion criteria. A total of 30 Asian participants took part in this study. Three participants were excluded on the basis of inclusion criteria and 5 more were excluded due to missing data. An additional participant was excluded because she recognized stimuli in the face recognition task. This left a total of 21 participants (Age $M = 22.67$, Female $N = 16$).

Materials and Procedure. Participants completed three tasks: the IAT, a facial recognition task and self-report measures. The order in which participants completed these tasks was counter balanced to avoid order effects. The procedures for these tasks were the same as those for Studies 1 and 2 except for a few changes. When completing the Attitudes Towards Blacks Scale, participants reported on attitudes towards both Caucasian and Black others. To obtain a final IAT score for Caucasian-Black pairings,

the D measure was calculated such that a positive number indicated faster association to the Caucasian-positive pairing.

Results

Explicit and Implicit Measures.

Self-Report Measures. Table 7 shows the means and standard deviations of Asian self-reported attitudes, social contact, and experience with Asian, Caucasian and Black others. Asian participants showed a nonsignificant trend towards more social contact with Caucasian others than with Black others, $t(20) = 1.96, p = .064$. No other comparisons were significant.

Table 7

Asian Self-Report Measures Means and Standard Deviations

	Own	Black	Caucasian
Attitudes	-	5.16 (0.54)	5.52 (1.10)
SCS	3.82 (1.32)	2.75 (1.24)	3.48 (1.18)
IES	3.96 (0.97)	3.32 (1.04)	3.73 (0.89)

IAT Scores. Asian participants revealed a negative bias towards Black others when paired with their own race, $t(20) = 3.46, p = .002$ as well as when paired with Caucasian others, $t(20) = 2.93, p = .008$. A one-sample t-test revealed that the bias for Black others was significantly different from 0 in each pairing. Asian participants showed no bias towards Caucasians (Figure 7). No other comparisons were significant.

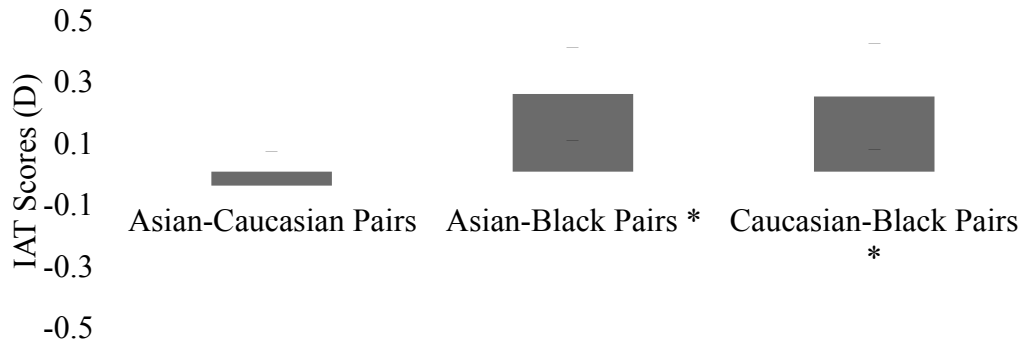


Figure 7. IAT Scores for Asian Participants. Error bars reflect 95% confidence intervals based on the one-sample t-test. Stars indicate significance, $p \leq .05$.

Correlations Between Explicit and Implicit Measures

The relationship between explicit and implicit measures was examined using bivariate correlations (Table 8). Asian participant responses on the Individuating Experiences scale were positively related to responses on the Social Contact scale towards both Caucasian and Black others, $r(20) = .70, p = .000$ and $r(20) = .76, p = .000$ respectively. The more social contact Asians had with Caucasian and Black others, the more individuating experiences Asians had with Caucasian and Black others. Asian attitudes towards Black others were positively correlated with individuating experiences, $r(20) = .49, p = .024$. More positive attitudes towards Black others were associated with more individuating experiences. No other correlations are significant.

Table 8

Asian Attitudes Towards Caucasian and Black Others

	1. IAT	2. ATT	3. SCS	4. IES
1. IAT	-	-.04	-.29	-.41+
2. Attitudes	-.01	-	.37+	.49*
3. SCS	.10	.17	-	.76**
4. IES	.00	.15	.70 **	-

Note. Significant for + $p \leq .1$; * $p \leq .05$, ** $p \leq .01$; Attitudes towards Caucasians are below the diagonal and Attitudes towards Blacks are above the diagonal.

Face Recognition ORE. There were no significant results to report for Asian Sensitivity. Figure 8 shows overall means and Figure 9 shows the ORE means.

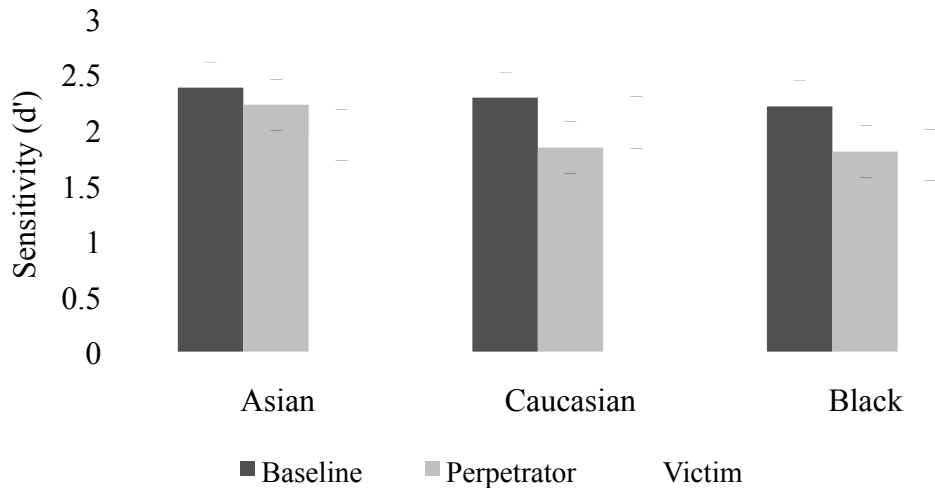


Figure 8. 3x3 ANOVA of Asian participant mean sensitivity scores.

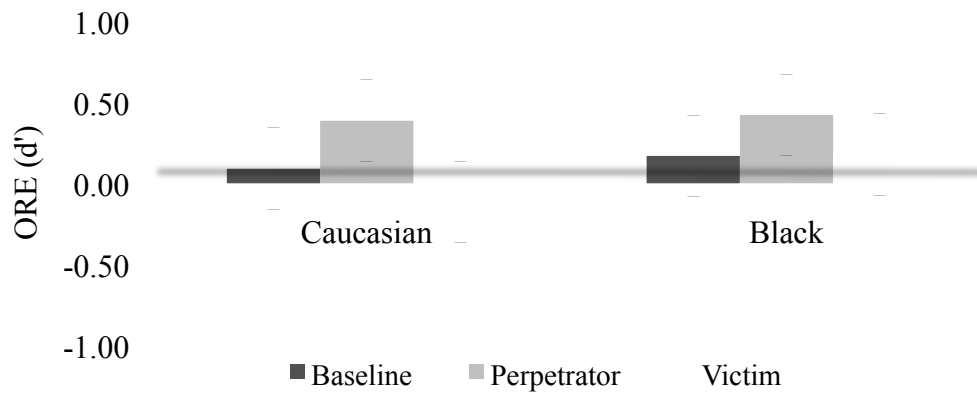


Figure 9. Mean ORE in sensitivity for Asian Participants. Error bars reflect 95% confidence interval calculated from the interaction MSE of the 2x3 ANOVA. Line 0.06 d' indicates the cutoff for a significant ORE based on Tukey's HSD for a main effect of face from the 3 (Face: Asian, Black, Caucasian) x 3 (Status: Baseline, Perpetrator, Victim) ANOVA.

Correlations with Perceptual Performance. Refer to Table 9. More social contact and individuating experiences were associated with a smaller ORE for Black victims, however this trend did not reach significance. Also, a nonsignificant trend was found between the IAT and ORE for Caucasian perpetrators. More positive attitudes were associated with a larger ORE for Caucasian perpetrators. For Caucasian victims, the ORE as measured by sensitivity was positively correlated with the IAT, $r(21) = .43, p = .050$. A stronger bias was associated with a greater ORE for Caucasian victims. A similar trend was revealed for the relationship between the IAT and ORE for Caucasian perpetrators but this did not reach significance. No other correlations were significant.

Table 9

Asian Attitudes and Perceptual Measures Towards Caucasians and Blacks

		ORE Sensitivity Baseline	ORE Sensitivity Perpetrator	ORE Sensitivity Victim
Caucasian Others	IAT	-.12	.41+	.43*
	Attitudes	-.41+	-.23	-.18
	SCS	.09	.07	-.08
	IES	-.24	-.02	.09
Black Others	IAT	.23	.01	-.25
	Attitudes	-.13	.04	-.20
	SCS	-.16	.09	-.41+
	IES	-.11	-.17	-.39+

Note. Significant for $+p \leq .1$; $*p \leq .05$, $**p \leq .01$.

Discussion

The hypothesis that participants would reveal a reduced ORE for Caucasian perpetrators compared to Caucasian victims was not supported. The hypothesis that attitudes impact the ORE was supported for implicit, but not explicit attitudes. A greater ORE for Caucasians victims was associated with more implicit bias. Data revealed this same trend for Caucasian perpetrators. The hypothesis that experience would affect Asian attitudes was supported for both implicit and explicit attitudes. Asian individuating experiences with Black others was associated with more positive attitudes towards Black others. There was little support for the hypothesis that experience impacts the perception effect of the ORE. There were marginal trends for more individuating experiences with Black others was associated with less implicit bias towards Blacks and more social contact with Black others was associated with more positive attitudes towards Black

others. Less social contact and fewer individuating experiences were associated with a reduced ORE for Black victims.

General Discussion

The Impact of Social Context on the ORE

The main question of this study was to examine the relationship between the ORE and non-perceptual factors such as social context, attitudes and experience. The first factor examined was social context. This was examined by giving participants a facial recognition task with target faces designated as either a perpetrator or victim, thus creating a status manipulation. It was hypothesized that there would be a reduced ORE for perpetrators because they would be better attended to. Consistent with this hypothesis, social context influenced the ORE for both Caucasian and Black participants, but the evidence was less clear for Asians.

Both Caucasian and Black participants recognized Asian perpetrators better than Asian victims. In addition, Caucasians recognized own victims better than own perpetrators. This cannot be due to a response bias as sensitivity is independent of this bias. Status appears to affect either the stored representation of the faces or perceptual saliency, such that it favors own race victims and other race perpetrators. This effect was most evident for Caucasians, possibly because Caucasians were the majority status in the locations from which participants were recruited and therefore the pairing of other race with perpetrator may have been particularly congruent. Past research shows that Blacks are not as implicitly biased towards Caucasians as Caucasians are towards Blacks (Project Implicit) and that Blacks show a smaller ORE for Caucasian faces than Caucasians do for Black faces (Feinman & Entwisle, 1976). Therefore, it makes sense that Black participants did not reveal a reduced ORE for Caucasian perpetrators. In

general, it seems as though this effect may depend on one's own race and whether an individual is a part of the majority or minority group.

Previous research shows that Caucasian perpetrators paired with Black victims are viewed as less socially acceptable than pairing Black perpetrators with Caucasian victims (Lee & Craig-Henderson, 2005). Pairings such as this one may be more memorable because of the social context, and participants may show better recognition for other race faces in these contexts because of the incongruency of the pairings. However, our participants did not show a reduced ORE for incongruent pairings, they showed a reduced ORE for pairings that were congruent. For Caucasian participants, other race perpetrators are better recognized than Caucasian perpetrators and own race victims are better recognized than other race victims. Maybe these pairings were easier for Caucasians because they were more salient in their memory and consistent with a stereotype. This would suggest that Caucasians are experiencing a memory effect. Perceptually, faces could capture attention during the task. Other race targets could be viewed as threatening and be more likely to grab attention. In addition, storing images and recalling the images for two different faces at one time may have been too difficult and participants may have chosen to monitor for other race perpetrators more than other race victims.

The current study extends previous research on the relationships between context and the ORE. Hugenberg, et al. (2007) discovered that manipulating instructions impacted the ORE and Johnson and Fredrickson (2005) discovered that manipulating mood impacted the ORE. This study is one of the first to use both a perpetrator and a victim

status instead of a baseline or perpetrator only in the face recognition task and shows that manipulating the status of target faces can also impact the ORE.

The Impact of Attitudes on the ORE

Another point of interest was how attitudes built up over a lifetime might impact the ORE. This was measured by examining participant responses on a measure of implicit bias (the IAT) and participant self-reported explicit attitudes and the correlations of these measures with the ORE. It was hypothesized that implicit attitudes would be correlated with the ORE such that negative bias would be associated with a stronger ORE. There was no support for implicit attitudes having an impact on the ORE for Caucasian or Black participants. However, for Asian participants negative implicit bias towards Caucasians was associated with a stronger ORE in the victim condition. This association was not clear from the baseline data, so adding context was a more powerful way to measure this relationship. Previous research has found an association between the ORE and implicit attitudes (Lebrecht, et al., 2008) but not between the ORE and IAT (Ferguson, et al., 2001).

It was also hypothesized that more negative explicit attitudes would be correlated with a stronger ORE. Consistent with this hypothesis, Caucasian participant negative attitudes towards Blacks was associated with a stronger ORE in the perpetrator condition. In the past, there has been no support for a relationship between the ORE and explicit attitudes (Ferguson, et al., 2001). The data from this study, however, revealed that Caucasian participants reporting less positive attitudes towards Blacks were also likely to reveal an ORE for Black perpetrators.

Negative attitudes could lead to a faster acceptance of an other race face as perpetrator and adding social context to the facial recognition task may accentuate the relationship between non-perceptual mechanisms and the ORE. Using only a neutral status may not bring these things to light, but adding a perpetrator and a victim status might pull for this relationship. Because this data is correlational, one can only report that these two variables vary together, not that one predicts the other. However, this is an important first step in discovering how these variables interact with one another.

The Impact of Experience on Attitudes

The third factor examined was experience and the impact it had on attitudes. This was investigated by submitting the participant reports of social contact and individuating experience and participant reports of implicit and explicit bias to a correlational analysis. It was hypothesized that more social contact and more individuating experiences would be associated with less implicit bias and less negative attitudes. Previous research reveals mixed findings about the relationship between type of contact and explicit and implicit measures of prejudice (Aberson, et al., 2004; Ferguson, et al., 2001). One study revealed Caucasian participant explicit attitudes were more associated with the quality of contact with others but that implicit attitudes were more associated the quantity (Prestwich, Kenworthy, Wilson & Kwan-Tat, 2008). Results from the current study indicate that more experience with other race individuals is associated with more positive implicit and explicit attitudes towards other race groups. Reduced bias of Black participants was associated with more social contact with Caucasians. A marginal trend emerged for Asian participants for a relationship of more individuating experiences with Blacks and

more positive attitudes towards Black others. This same trend was evident for Caucasian participant reports of attitudes towards Asians and individuating experiences with Asians but did not reach significance.

The current study replicates the research of Prestwich and colleagues (2008) but interestingly, more for Blacks than Caucasians. This could be because Prestwich et. al had Caucasians report on contact with and attitudes towards Indian, Pakistani and Bangladeshi others, whereas the current study prioritized including stimuli of faces from East Asian descent (such as Chinese or Japanese) for the IAT and face recognition task. Although both studies included targets from the continent of Asia, the differences between attitudes towards and contact with those from an East Asian ethnicity as compared with those from a Middle Eastern Asian ethnicity may differ greatly.

The Impact of Experience on the ORE

Finally, the impact of experience on the ORE was examined. Responses on measures of social contact and individuating experiences and ORE scores for perpetrators and victims were submitted to a correlational analysis. It was hypothesized that more social contact and more individuating experiences would be related to a reduced ORE. This hypothesis was not supported, as the associations pulled from participant data were only marginally significant. A reduced ORE for Asian victims was associated with more individuating experiences with Asians for Caucasian participants. Asian participants reporting either more social contact or individuating experiences towards Black others were also likely to respond with a reduced ORE for Black victims. However, little can be inferred from these findings because they failed to reach significance. Previous research

has shown that the ORE is linked to experience (Sangrigoli, et al., 2005; Tanaka, et al., 2004). The results from the current study did not support these as any data replicating these findings were non-significant. This may have been due to the small sample size (and therefore, reduced power) and future studies should explore these questions using a larger sample.

Limitations

Design and Internal Validity. One limitation involving the study design is related to the baseline status of the face recognition task. This status was always presented before the perpetrator and victim blocks of the facial recognition task and may have been subject to order effects such as fatigue or loss of interest. However, counterbalancing baseline was not a viable option because participants may have been biased after viewing conditions with status labels and then viewing a neutral condition. Therefore, the baseline was not compared to the counterbalanced conditions of perpetrator and victim.

Additionally, data was not collected on the explicit attitudes that each racial group held for their own race. Each group was asked to self-report attitudes towards the other two races, but not their own. This data would have made it possible to compare the differences in attitudes towards own race and other race for each participant group. Future students should consider collecting this additional data as these calculations may have indicated either in-group or out-group preference for other racial groups.

External Validity and Generalizability. As in all lab-controlled studies, it is often difficult to translate results directly into real-world situations. The settings of this experiment may have been influential in the performance on the facial recognition task as

participants completed their tasks in a controlled lab setting instead of in a naturalistic setting. Participants in this study did not have any emotional connection to the faces they saw. Those identifying perpetrators of crime might be subjected to a number of emotional and psychological difficulties. Johnson and Fredrickson (2005) who found that the ORE could be manipulated by emotions. Specifically, those who had witnessed a comedic video revealed a diminished ORE as compared to those who had viewed either a fear inducing or a neutral video. Participants in this study may have responded differently had they been in an environment eliciting negative mood states.

Previous research shows that accuracy for eyewitness identification in high-stress situations is often worse than in low-stress situations (Morgan et al., 2004). This was probably not present for participants in this study. There are no consequences for incorrectly identifying a perpetrator, such as incarcerating the wrong person. Also, participants were given instructions detailing exactly what would be experienced and the testing scenarios allowed participants to take as much time as they desired to learn the target faces. This is not realistic. "It all happened so fast" is often a key phrase capturing the speed at which a crime seems to take place. When given the chance to identify a perpetrator in a line-up, the victim or onlooker may feel unprepared for to do so.

Additionally, recruiting Asian participants was difficult as the student body at the University of Richmond is largely homogeneous and many participants who met the race requirement were ineligible as they were familiar with the stimuli used in this particular study. This limited the current study from testing a similar number of participants from each race and calls into question the ability to make generalizations from so small a

sample. Furthermore, participants who identified themselves as Asian were not of the same ethnicity, but many such as Chinese, Korean, and Japanese. A study using a wide range of participants may be viewed as more generalizable, however, controlling these various ethnicities may have shown subtle differences in the results.

Analyses and Statistical Power. The small number of Asian participants who took part in this study is another limitation. Being unable to recruit a large sample may have limited the power of this participant group and made detecting differences in the face recognition task more difficult.

Measurement. The SCS and IES were so strongly correlated for each participant group that it was difficult to make conclusions about the differing contributions of mere contact and individuating experiences to either the ORE or participant racial attitudes. These two scales may measure the same construct and therefore not allow for the examination of these two types of contact.

Participant responses on the Attitudes scales had low variability for some participant groups. Specifically, Asian attitudes towards Black others and Caucasian attitudes towards both Black and Asian others had low variability. These raw data reveal that participants did not respond using the full range of scores and that the standard deviations from the mean responses were very low. In addition, there was also low variability in the report of contact and/or individuating experiences with other groups. Because of this variability, the ability to detect some of the correlations between self-report measures and the ORE may have been lost. Or, the strength of these correlations may have been exaggerated.

Future Directions

In the future, researchers could replicate these findings but separate the perceptual and memory effects. A study that always has the target face present during the facial recognition task would be purely perceptual and thus remove effects due to memory. Researchers could also replicate this study in a different location. This may provide different results due to differing levels of experience with other races.

Additionally, modeling analyses should be used to better understand the associations between social contact, attitudes, experience and the ORE. The direction of these relationships should also be considered, as they may be bi-directional. For instance, experience may impact the ORE, however, one's ORE may impact the future experiences he or she seeks out and therefore, further impact one's ORE. Examining these relationships as bi-directional may further clarify how these perceptual and non-perceptual processes interact.

Conclusion

The ORE can be drawn out in certain contexts as those who show an ORE in some contexts might not show it in others. Our ability to recognize perpetrators in comparison to victims depends on whether they are from our own race or other races. In addition, researchers should consider studying the ORE using a multi-factor approach as there are multiple influences on the ORE and these findings vary by race.

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Appendix A. Self-Report Measures

Table A1

Social Contact Scale

1	How many Caucasian people do you know very well?
2	I often spend time with Caucasian people.
3	I spend a lot of free time doing things with Caucasian people.
4	I often go around to the houses of Caucasian people.
5	Caucasian people often come around to my house.

Note. The response for the first question were 0-2, 3-5, 6-8, 9-12, and 12 or more. The responses for the remaining questions were as follows: strongly disagree, sort of disagree, not sure, sort of agree and strongly agree. Participants answered for each target race (Caucasian, Black and Asian).

Table A2

Individuating Experiences Scale

1	I have looked after or helped a Caucasian friend when someone was causing them trouble or being mean to them.
2	A Caucasian person has looked after me or helped me when someone was causing me trouble or being mean to me.
3	I have comforted a Caucasian friend when they were feeling sad.
4	A Caucasian person has comforted me when I have been feeling sad.
5	I have asked a Caucasian person to be on my team on in my group during sports or activities.

Note. The responses for each question were as follows: never, hardly ever, sometimes, quite often, and very often.

Table A3

Attitudes Towards Blacks Questionnaire

1	I would rather not have Caucasians live in the same apartment building I live in.
2	I get very upset when I hear someone make a prejudicial remark about Caucasians.
3	Caucasians and my own race are inherently equal.
4	I would not mind at all if a Caucasians family with about the same income and education as me moved in next door.
5	It would not bother me if my new roommate was Caucasian.
6	If a Caucasian person was put in charge of me, I would not mind taking advice from him or her.
7	I think that Caucasian people look more similar to each other than those of my own race do.
8	I would probably feel somewhat self-conscious dancing with a Caucasian person in a public place.
9	Interracial marriage between a Caucasian person and people of my own race should be discouraged to avoid the “who-am-I?” confusion that the children feel.
10	I enjoy a funny racial joke about a Caucasian person, even if some people may find it offensive.
11	If I had a chance to introduce Caucasian visitors to my friends and neighbors, I would be pleased to do so.
12	Generally, Caucasians are not as smart as those of my own race.
13	Some Caucasians are so touchy about race that it is difficult to get along with them.
14	It is likely that Caucasians will bring violence to neighborhoods when they move in.
15	Racial integration of schools, businesses, residences, etc. has benefitted both Caucasians and people of my own race.
* 16	I favor open housing laws that allow more racial integration of neighborhoods.
* 17	The federal government should take decisive steps to override the injustices blacks suffer at the hands of local authorities.
* 18	Black people are demanding too much too fast in their push for equal rights.
* 19	Whites should support blacks in their struggle against discrimination and segregation.
* 20	I worry that in the next few years I may be denied application for a job or a promotion because of preferential treatment given to minority group members.
* 21	Most whites can't be trusted to deal honestly with blacks.
* 22	Most whites can't understand what it's like to be black.
* 23	I feel that black people's troubles in the past have built them a stronger character than white people have.
* 24	Local city officials pay less attention to a request or complaint from a black person than from a white person.

Note. Items that were excluded from the ATB marked with an asterisk (*).

Appendix B: Results of Response Time Data

Study 1

Results

Face Recognition ORE. The ORE for Caucasian Response Time was calculated by subtracting own race response times (Caucasian hits only) from other race response times (Black and Asian hits only) from Caucasian d' scores. Overall means are displayed in Figure B1. The ORE was calculated for response times for hits and submitted to a 2x3 (Race x Status) ANOVA, refer to Figure B2. There was a main effect of Race, $F(2,33) = 6.13, p = .019, \eta^2 = .16$. Caucasian participants revealed a greater ORE for Black faces ($M = 211.05$) than for Asian faces ($M = 150.87$). No other comparisons were significant.

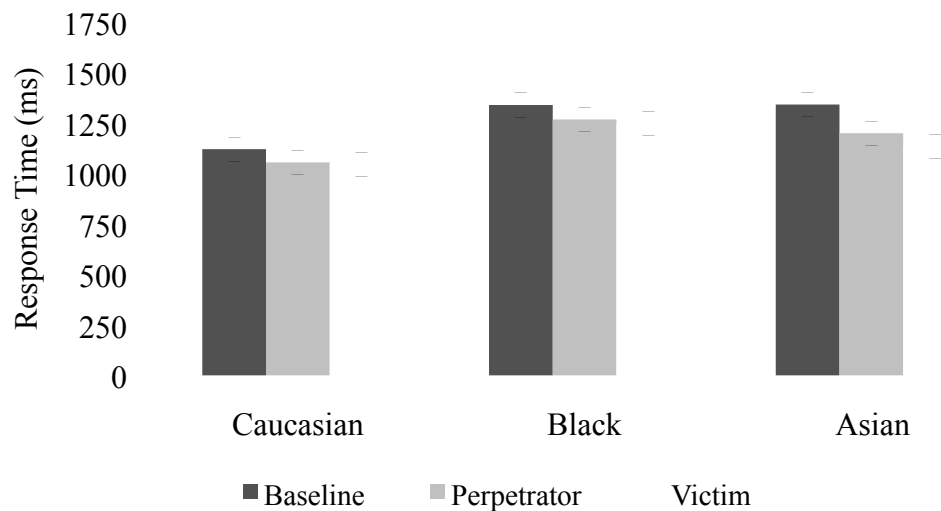


Figure B1. 3x3 ANOVA of Caucasian participant mean response times.

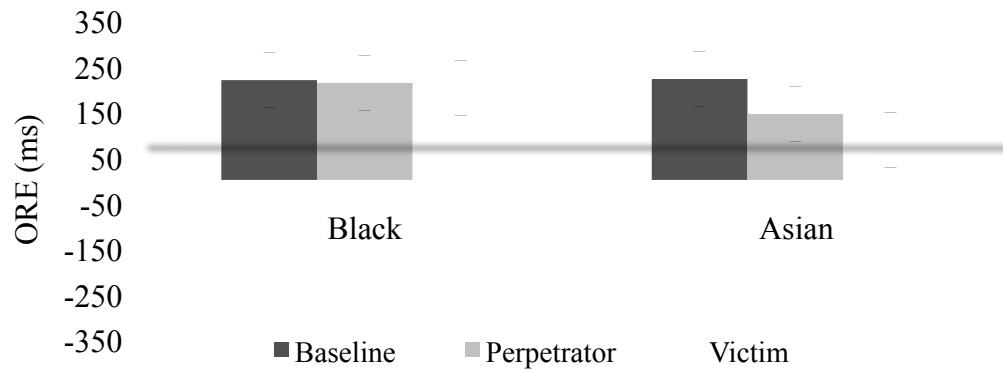


Figure B2. Mean ORE in response time for Caucasian participants. Error bars reflect 95% confidence interval calculated from the interaction MSE of the 2x3 ANOVA. The line at 63.57 ms indicates the cutoff for a significant ORE based on Tukey's HSD for a main effect of face from the 3 (Face: Asian, Black Caucasian) x 3 (Status: Baseline, Perpetrator, Victim) ANOVA.

Correlations with Perceptual Performance. The ORE for victims as measured by response time was negatively correlated with both the IAT and SCS, $r(34) = -.35, p = .042$ and $r(34) = -.34, p = .050$, respectively. A smaller bias towards Black others and less social contact were both associated with a greater ORE for Black Victims. For Asian faces, the ORE for perpetrators as measured by response time was positively correlated with the SCS, $r(34) = .36, p = .037$. Less social contact with Asian others was associated with a smaller ORE for Asian perpetrators. Finally, the ORE for Asian victims as measured by response time was negatively associated with the IAT, $r(34) = -.37, p =$

.033. A smaller implicit bias towards Asian others was associated with a greater ORE for Asian victims. No other correlations were significant (Table B1).

Table B1

Caucasian Attitudes and Perceptual Measures (RT) Towards Black and Asian Others

		ORE Response Time Baseline	ORE Response Time Perpetrator	ORE Response Time Victim
Black Others	IAT	-.16	-.28	-.35*
	Attitudes	.10	.20	.24
	SCS	-.02	-.10	-.34*
	IES	.08	.05	.17
Asian Others	IAT	.28	-.22	-.37 *
	Attitudes	.22	.18	-.13
	SCS	.21	.36*	.28
	IES	.17	.26	.15

Note. Significant for $+p \leq .1$; $*p \leq .05$, $**p \leq .01$.

Study 1 Discussion

Results from Study 1 do not provide support for an association between the ORE and social context. There was a relationship between attitudes and the ORE. Negative implicit bias was correlated with a stronger ORE for both Black and Asian victims. Experience was associated with the ORE. More social contact with Blacks was associated with a reduced ORE for Black victims. More social contact with Asians was correlated with an increased ORE for Asian perpetrators.

Study 2

Results

Face Recognition ORE. A 2x3 (Face x Status) ANOVA examined the ORE for Black response time, Figure B3 displays overall means and Figure B4 displays means of ORE scores. There was a main effect of Face, $F(1,31) = 25.31, p = .000, \eta^2 = .45$ and a main effect of Status, $F(2,62) = 3.81, p = .028, \eta^2 = .11$. These were qualified by an interaction between race of face and status, $F(2,62) = 3.49, p = .037, \eta^2 = .10$. There was a significant difference between Caucasian and Asian faces both at baseline and in the perpetrator condition. Tukey's post hoc test revealed an other race advantage for Caucasian perpetrators ($M = -235.85$). Specifically, Black participants showed a greater other race advantage for Caucasian perpetrators in comparison to Caucasian victims. Black participants showed an ORE for Asian faces at baseline only ($M = 220.06$). These were significantly different from Asian perpetrators ($M = -42.44$) and Asian victims ($M = -10.66$). No other comparisons were significant.

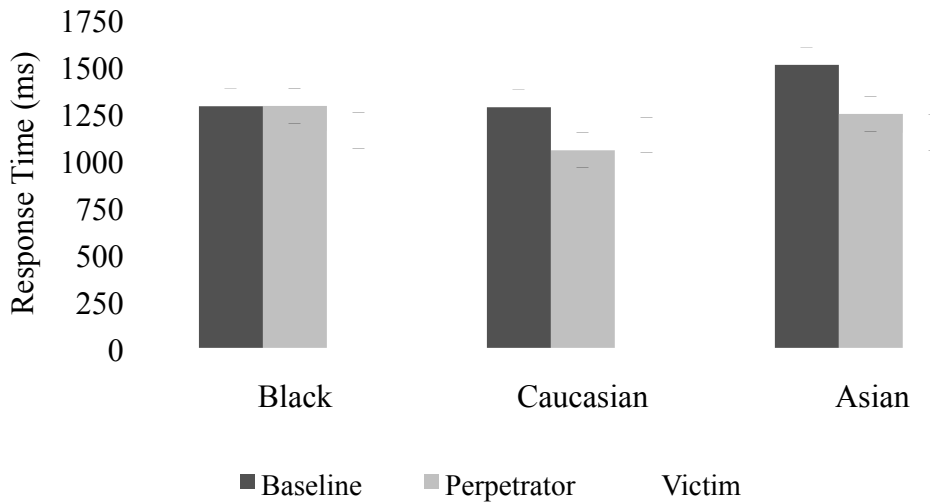


Figure B3. 3x3 ANOVA of Black participant mean response times.

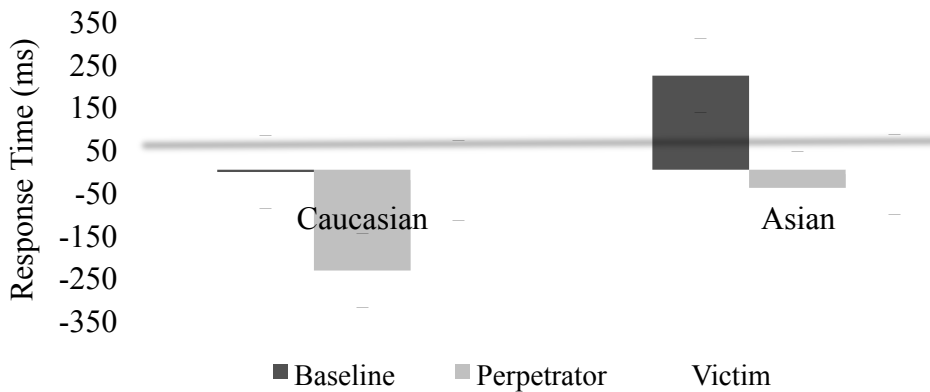


Figure B4. Mean ORE in response time for Black participants. Error bars reflect 95% confidence interval calculated from the interaction MSE of the 2x3 ANOVA. The line at 77.49 ms indicates the cutoff for a significant ORE based on Tukey’s HSD for main effect of face from the 3 (Face: Asian, Black, Caucasian) x 3 (Status: Baseline, Perpetrator, Victim) ANOVA.

Correlations with Perceptual Performance. For Asian faces, individuating experiences were positively correlated with the ORE at baseline, $r(32) = .41, p = .019$, and negatively correlated with Asian victims, $r(32) = -.32, p = .071$, as measured by response time. More individuating experiences with Asian others was associated with a larger ORE for Asian faces at baseline and a smaller ORE for Asian victims. No other correlations were significant (Table B2).

Table B2

Black Attitudes and Perceptual Measures (RT) Towards Caucasian and Asian Others

		ORE Response Time Baseline	ORE Response Time Perpetrator	ORE Response Time Victim
Caucasian Others	IAT	-.18	.19	.04
	Attitudes	-.14	.31+	-.10
	SCS	.29	-.10	-.11
	IES	-.05	-.27	-.15
Asian Others	IAT	.04	-.06	.10
	Attitudes	.13	.18	-.03
	SCS	.16	-.14	-.20
	IES	.41 *	-.14	-.32 *

Note. Significant for $+p \leq .1$; $*p \leq .05$, $**p \leq .01$

Study 2 Discussion

Results support the relationship between social contact and the ORE. Black participants showed a greater ORE for Caucasian perpetrators than for Caucasian victims. There was an association between experience and the ORE. More individuating experiences with Asians was correlated with a reduced ORE for Asian victims.

Study 3

Results

Face Recognition ORE. A 2x3 (Face x Status) ANOVA examined the ORE for Black response time, refer to Figure B5 for overall means and Figure B6 for means of ORE scores. There was a main effect of Face, $F(1,31) = 25.31, p = .000, \eta^2 = .45$ and a main effect of Status, $F(2,62) = 3.81, p = .028, \eta^2 = .11$. These were qualified by an interaction between race of face and status, $F(2,62) = 3.49, p = .037, \eta^2 = .10$. There was a significant difference between Caucasian and Asian faces both at baseline and in the perpetrator condition. Tukey's post hoc test revealed an other race advantage for Caucasian perpetrators ($M = -235.85$). Specifically, Black participants showed a greater other race advantage for Caucasian perpetrators in comparison to Caucasian victims. Black participants showed an ORE for Asian faces at baseline only ($M = 220.06$). These were significantly different from Asian perpetrators ($M = -42.44$) and Asian victims ($M = -10.66$). No other comparisons were significant.

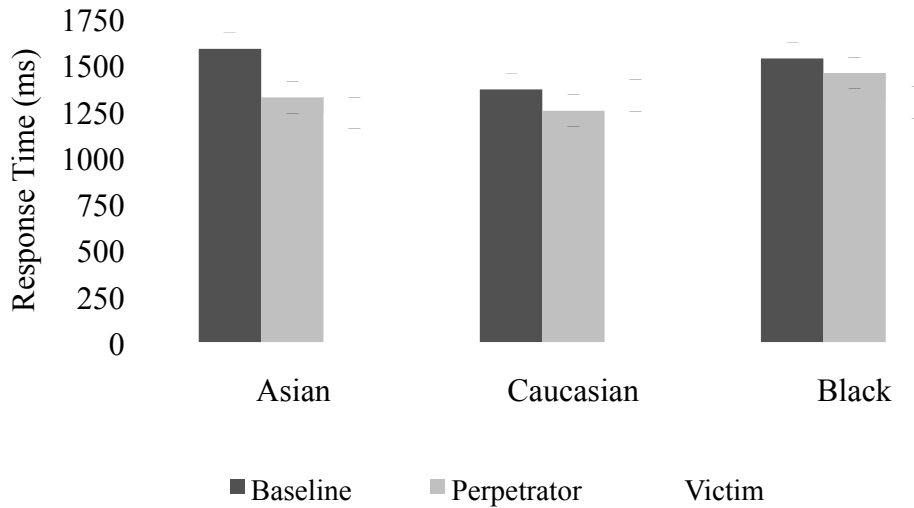


Figure B5. 3x3 ANOVA of Asian participant mean response times.

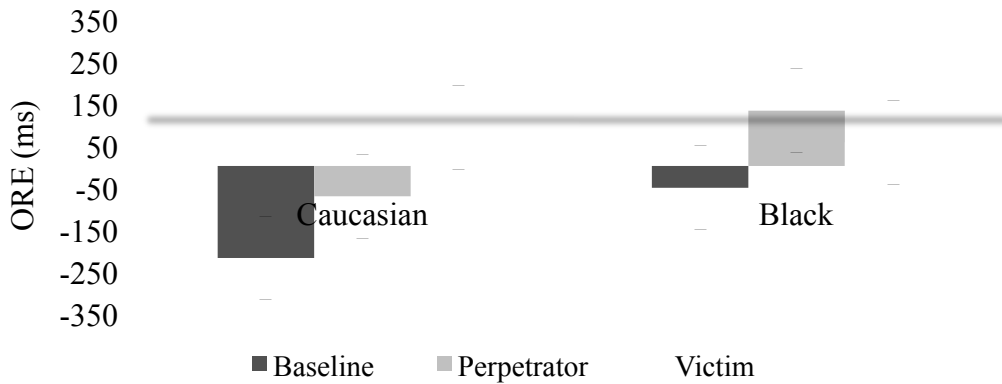


Figure B6. Mean ORE in response time for Asian participants. Error bars reflect 95% confidence interval calculated from the interaction MSE of the 2x3 ANOVA. Line 82.44 ms indicates the cutoff for a significant ORE based on Tukey’s HSD for a main effect of face from the 3 (Face: Asian, Black, Caucasian) x 3 (Status: Baseline, Perpetrator, Victim) ANOVA.

Correlations with Perceptual Performance. More social contact and more individuating experiences were both associated with a greater ORE for Caucasian perpetrators. For Caucasian victims, the ORE measured by response time was negatively correlated with attitudes, $r(21) = -.66, p = .001$. Negative attitudes towards Caucasian others were associated with a greater ORE for Caucasian victims. For Caucasian perpetrators, the ORE as measured by response time was positively correlated with social contact, $r(21) = .55, p = .010$, and individuating experiences, $r(21) = .45, p = .040$. For Black victims, the ORE as measured by response time was negatively correlated with social contact, $r(21) = -.47, p = .031$. Less social contact was associated with a greater ORE for Black victims. Additionally, Asian participant ORE for Black perpetrators as measured by response time was negatively correlated with IAT scores, $r(21) = -.53, p = .014$. Less bias towards Black others was associated with a greater ORE for Black victims. No other correlations were significant (Table B3).

Table B3

Asian Attitudes and Perceptual Measures (RT) Towards Caucasian and Black Others

		ORE Reaction Time Baseline	ORE Reaction Time Perpetrator	ORE Reaction Time Victim
Caucasian Others	IAT	.04	.20	-.30
	Attitudes	-.38+	.15	-.66**
	SCS	.06	.55**	-.28
	IES	.21	.45 *	-.09
Black Others	IAT	.05	-.53**	.28
	Attitudes	-.29	-.05	-.22
	SCS	-.20	.29	-.47*
	IES	-.30	.13	-.27

Note. Significant for $+p \leq .1$; $*p \leq .05$, $**p \leq .01$

Study 3 Discussion

There was no support for a relationship between social context and the ORE. Attitudes were correlated with the ORE. Less implicit bias towards Blacks was associated with a greater ORE for Black perpetrators. Negative attitudes towards Caucasians were correlated with a greater ORE for Caucasian victims. Experience was related to the ORE. More social contact and individuating experiences were associated with a greater ORE for Caucasian perpetrators. More social contact was associated with a reduced ORE for Black victims.

Emily Wheat received her Bachelor of Arts degree from the University of South Alabama (Mobile, Alabama) in May 2006. She majored in Psychology and minored in Art History. Emily began the General Masters program in Psychology at the University of Richmond in Richmond, Virginia in August 2007. Her graduate mentor was Dr. Cindy Bukach. Emily is currently enrolled at Virginia Commonwealth University (Richmond, Virginia) as a doctoral student in the Clinical Psychology Child Track and is advised by Dr. Bryce McLeod.