

The Effects of Race on Implicit Attitudes about Social Anxiety

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**Author's Note**

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### Abstract

Previous research has found that social factors related to race such as discriminatory experiences can exacerbate symptoms of anxiety and depression in Black individuals. The effects of stereotype bias on social anxiety in Black individuals suggest that treatment must differentially address racial concerns. This study explored the relationships between symptoms of social anxiety, racial identity, and implicit associations between race and social anxiety in Black and Non-Hispanic White individuals. Twenty one healthy Black and twenty one healthy White adults completed a modified Implicit Associations Test (IAT) to assess associations between images of Black, White, or Asian faces and words related to either social anxiety (SA) or social relaxation (SR). Additionally, participants completed self-report measures of symptoms of social anxiety (SIAS) and attitudes about racial identity (MIBI). Findings from this study suggest that both Black and White participants show stronger associations between other racial groups and concepts related to SR. Symptom severity was not significantly correlated with implicit associations, however, racial identity was significantly correlated with associations between White and Asian faces and concepts of SA and SR. These results contribute to growing research on implicit associations regarding race and mental health and have potential implications for treatment of social anxiety in minority populations and demographics of mental health care providers.

### The Effects of Race on Implicit Attitudes about Social Anxiety

Social Anxiety (SA) is one of the most prevalent psychiatric conditions in the United States (Kessler, Petukhova, Sampson, Zaslavsky, & Wittchen, 2012). Although several studies have focused on the development of new forms of treatment for SA, most of these studies utilize primarily non-Hispanic White samples (Graham-LoPresti, Gautier, Sorenson, & Hayes-Skelton, 2017). Furthermore, despite comparable prevalence rates of SA for Black individuals, it remains unclear whether or not current forms of treatment are accessible and effective for this demographic (Himle, 2009; Graham-LoPresti et al., 2017). Previous research on race and health has suggested that racial bias may be related to differences in treatment of patients from minority backgrounds (Green, Anderson, Baker, Campbell, Decker, Fillingim, & ... Vallerand, 2003). However, further research is required to understand the ways that racial bias could potentially be associated to mental health conditions such as SA. This study seeks to explore potential associations that Black and White individuals may have between concepts related to SA and their own racial groups or other racial groups and to assess whether symptom severity of SA and racial identity may predict these associations.

#### **Social Anxiety**

SA typically develops in adolescence and is characterized by fear of social or performance settings in which a person must interact with unfamiliar people or settings in which they may face judgment from others. This fear creates excessive distress and interferes with academic, occupational, and social functioning (APA, 2013). People with SA are often at higher risk for developing comorbid disorders such as depression and substance abuse (Ruscio, Brown, Chiu, Sareen, Stein, & Kessler, 2008).

Current treatments for SA primarily involve psychotherapy, predominately Cognitive Behavioral Therapy (CBT), and medications such as SSRIs (Graham-LoPresti et al., 2017). Research has also investigated attention modification interventions that could be used to treat SA over the internet, making treatment more accessible to individuals who may be averse to in-person therapy (Carleton, Teale Sapach, Oriet, & LeBouthillier, 2017). Despite these attempts to develop new forms of treatment that are more effective and accessible for those with SA, there are still many individuals from particular demographics who still do not receive adequate care; several studies have examined the individual differences that may impact treatment utility and efficacy. A study by Young, Klap, Shoai, & Wells, (2008) assessed the individual differences that led to utility of treatment methods for individuals with anxiety disorders and depression and found that males and those who had up to a high school level education were less likely to seek out or receive treatment for their conditions. Research continues to focus on understanding barriers to treatment utilization, and on whether current forms of treatment are effective for individuals from different demographics (Young et al., 2008).

Several measures have been developed to understand individuals' experiences of their social anxiety symptoms, which is critical to determining how to best reduce or alleviate these symptoms. One of these measures is the Social Interaction Anxiety Scale, which is a validated scale allowing individuals to rate the severity of their symptoms (SIAS; Mattick & Clarke, 1998). Symptom severity scales such as the SIAS can be instrumental in assessing symptomatology in different populations, and for measuring change in symptoms before and after participants undergo new interventions to determine their subjective benefits. However, the SIAS does not address individual differences such as gender, or education that may contribute to

these subjective experiences of symptoms, and further measures must be given in conjunction with the SIAS to provide a fuller perspective of possible underlying differences in subjective symptom presentation (Young et al., 2008).

## **Race**

Racial identity is one particular individual difference that could have an impact on treatment outcomes in those with SA. Previously, studies on racial identities and the effects of racial stereotyping were primarily conducted in the field of social psychology. Studies have attempted to understand the social effects of implicit racial bias, or the pervasive stereotypes and attitudes about particular racial groups that may unknowingly impact a person's interactions and understanding of those groups (Devine, 1989; Kang, Bennett, Carbado, Casey, Dasgupta, Faigman et al., 2012). Implicit racial bias may influence or be related to explicit racial prejudice and discrimination. Several studies have elucidated the multitude of effects that discriminatory experiences and stereotyping can have on individuals from minority backgrounds, primarily those from groups that are often underrepresented, such as Black or Latino populations (Schmid & Amodio, 2007). Much of the work that has been done on racial stereotyping and discrimination has focused on the negative social consequences of these experiences on minority individuals in areas such as educational achievement and interpersonal interactions. Research on stereotyping and the impact of discrimination on outcomes may contribute to a better understanding social dynamics and particularly, the experiences of those from minority backgrounds.

Self-report measures can provide insight on an individual's explicit attitudes about their own identities and racial backgrounds. Examining these explicit attitudes in conjunction with

implicit biases about one's own racial group may provide a fuller perspective on the ways that one's views about their own race may shape their interactions with others as well. Many measures have been developed to understand the importance of racial identities to different populations and their experiences with discrimination and sense of belonging. One measure that assesses several dimensions of identity in those who identify as Black or African American is the Multidimensional Inventory of Black Identity (MIBI; Sellers, Rowley, Chavous, Shelton, & Smith, 1997). This is a validated set of subscales that assess different aspects of Black identity such as ideology, regard for one's own racial group in public settings, and centrality of race to one's own identity. Assessing attitudes towards one's own racial group or about an individual's racial identity can provide insight into the relationships between ethnic pride and social interactions. Conversely, it can reveal potential internalized racism, or the incorporation of the dominant racist narrative about one's own social group into his or her own beliefs, which has been shown to negatively impact social functioning and mental health in Black individuals (Graham, Martinez, & Roemer, 2016).

### **Implicit Associations Test**

While these self-report responses are important to understanding subjective experiences of identity, they still only provide a narrow perspective on stereotype beliefs. Several measures and tasks have been developed to more objectively assess implicit biases or stereotypes that individuals may have about particular groups. One frequently used and validated measure of inherent objective bias is the Implicit Associations Test (IAT; Greenwald & Banaji, 1995). The IAT is a categorization task that uses reaction time to elucidate underlying associations that individuals may have between certain concepts. The task often pairs social identities such as race

or gender with affective or emotionally valenced concepts; a faster reaction time for sorting stimuli into a particular pair of concepts is interpreted as a stronger implicit association between the pair of concepts.

For example, a study by Lueke & Gibson (2014) used the IAT paradigm to measure racial and age biases before and after participants completed mindfulness training to understand whether mindfulness could have an impact on implicit biases. Participants associated Black and Non-Hispanic White faces with good or positive and bad or negative words to measure implicit attitudes about race and old and young faces with good or bad words to measure attitudes about age. This test allows for a more objective measure of bias than self-report measures and can be modified to understand a variety of associations and attitudes regarding social concepts.

More recently, the IAT has been modified to understand biases and attitudes surrounding clinical conditions. A study by Westberg, Lundh, & Jönsson (2007) paired the concepts of “social anxiety” and “social relaxation” with “self” or “other” related words to understand implicit associations between the self and SA. The IAT has also been used to study implicit associations between clinical conditions such as anxiety disorders and depression (Wong, Morrison, Heimberg, Goldin, & Gross, 2014). The integration of these social measures into clinical research has become especially useful as more research has focused on demographic differences in experiences of health conditions and in the efficacy of treatment methods for those from ethnically diverse backgrounds.

### **Race and Health Outcomes**

Research on stereotyping and racial bias has implications beyond everyday social interactions; it is possible that racial bias may negatively impact health care outcomes for

minority individuals. Some studies have found differences in health care providers' perceptions of pain and physical health conditions in patients from different racial backgrounds (Green et al., 2003). These studies report mixed results; some studies found that non-Hispanic White patients were more likely to be prescribed pain medication for complaints of acute pain than Hispanic or Black individuals with similar conditions, while other studies report equal prescription rates or no differences in treatment. These studies did not record the racial backgrounds of the healthcare providers or examine differences in perception of pain in those of a medical worker's own race versus a different race. Little work has been done to understand the specific racial and social dynamics between physicians and patients that may lead to these differences.

### **Race and Mental Health**

In addition to the research examining relationships between racial bias and general health outcomes, several studies have examined the role of ethnic or racial identity on mental health and wellness. Umana-Taylor (2011) showed that regardless of racial group, a stronger sense of belonging to an ethnic identity protects against issues like drug abuse and promotes social functioning. Black individuals in particular showed the most robust positive relationships between behavior, health, and sense of ethnic identity; Black adolescents had lower levels of aggression and externalizing behavior, less risky sexual behavior, and increased self-esteem if they placed a greater value on ethnic identity (Umana-Taylor, 2011). It is possible that the protective measures of a strong racial identity could be employed in clinical settings, and further research is necessary to understand how it could be fostered in therapeutic contexts.

While a strong ethnic identity seems to be beneficial, social factors related to race such as prejudicial or discriminatory experiences can exacerbate symptoms of anxiety and depression in



Black individuals (Levine, Himle, Abelson, Matusko, Dhawan, & Taylor, 2014). Research has suggested that psychosomatic symptoms of anxiety may manifest differently in those from different ethnic backgrounds. A study by Kirmayer (2001) outlined differences in expression and regulation of emotion and psychosomatic experiences of anxiety and depression in western and non-western cultures. These differences in manifestation and experience of symptoms and emotions may alter the efficacy of standardized forms of assessment and treatment in those from different backgrounds. Although these differences have primarily been examined in individuals from different cultural backgrounds and geographic regions, it is possible that racial differences could also lead to different physical manifestations of symptoms as well.

In addition, there are significant differences in patient retention and treatment utilization between White and Black individuals. Specifically, Black individuals identify additional barriers to treatment access and often leave therapy after a fewer number of sessions than White individuals. These barriers can often prevent minority individuals, especially those from underrepresented populations such as those who identify as Black or African American, from receiving adequate treatment. Much of the work done on racial differences in the manifestation and treatment of anxiety disorders has focused on differences between East Asian individuals and European Americans, and little research has assessed differences in historically underrepresented minority groups within the United States, such as Hispanic or Black individuals (Kirmayer, 2001).

### **Race and Social Anxiety**

Understanding racial stereotypes and bias is especially salient for understanding differences in the manifestation of SA. While prevalence rates of SA in African American and

Caribbean Black individuals are comparable to rates for White individuals (Himle, 2009), stereotypes may differentially impact the way individuals from minority backgrounds experience social interactions and SA symptoms. Greater ethnic pride in Black children has been indirectly linked to less sensitivity to anxiety and fewer symptoms of social anxiety by promoting greater parental acceptance and family values (Gray, Carter, & Silverman, 2011). Research has also demonstrated a relationship between greater resiliency and stronger ethnic pride in Black adults when compared to European American adults on surveys regarding racial identity and symptoms of social anxiety and depression (Williams, Chapman, Wong, & Turkheimer, 2012). Some studies have found that interracial interactions may increase SA symptoms in White samples due to fear of appearing prejudiced (Ofan, Rubio, & Amodio, 2014). Other studies suggest that while Black individuals display higher levels of stereotype confirmation concerns, these levels correlate with fears of social evaluation as strongly as in White participants (Johnson & Anderson, 2014).

Current methods of treatment for SA have primarily been developed in White samples and do not explicitly consider racial factors that might affect mental health. Current research on new forms of treatment for SA primarily focuses on White samples as well, and therefore findings may not be applicable for individuals from minority backgrounds. Some research has shown mixed results regarding the success of treatment for individuals from minority backgrounds; some studies suggest that forms of treatment such as CBT are not racially sensitive and do not address the needs of those from minority backgrounds (Graham-LoPresti et al., 2017). Other studies suggest that Black individuals present symptoms of social anxiety similarly to White individuals, and that they see similar benefits from sustained periods of treatment

(Gordon-Hollingsworth, Becker, Ginsburg, Keeton, Compton, Birmaher, & ... March, 2014). As research has demonstrated both protective and harmful effects of ethnic pride and internalized racism respectively on SA symptoms, it is possible that focusing treatment on specific experiences surrounding race could help mitigate symptoms in Black individuals (Umana-Taylor, 2011; Williams et al., 2012).

Although intersections between racial identities and experiences of mental health conditions have suggested differences in efficacy of treatment and manifestation of symptoms, few studies have assessed specific attitudes regarding race and SA in different racial groups. Furthermore, few studies have attempted to understand specific attitudes people hold about SA and their own race when compared to attitudes about SA and those of other racial groups. Understanding these specific interracial attitudes might be important to understanding dynamics between care providers and patients to understand how they impact treatment.

### *Study Aims*

To better understand the role personal identities, such as racial background, play in the manifestation and experience of social anxiety, primarily in those of minority backgrounds, we examined relationships between racial identity, implicit bias, and social anxiety in Black and White participants. Participants completed self-report scales to assess social anxiety symptoms (SIAS) and racial identity (MIBI). To assess associations between the concepts of race and social anxiety, participants completed a modified IAT in which they were presented with two racial categories (White-Black (W-B), White-Asian (W-A), Black-Asian (B-A)) that were paired with either “social anxiety” (SA) or “social relaxation” (SR) words.

For pairings of categories on the IATs, we were primarily interested in understanding associations between own-race or other-race conditions and the concept of social anxiety in both Black and White individuals. The Asian condition was included as an additional category to understand whether there were differences between associations for one's own race and other racial groups, or whether there were specific biases regarding particular racial groups. Based on previous research on race effects in anxiety disorders indicating that fear of appearing prejudiced in interracial interactions may increase levels of SA in White participants, we predicted that White participants would have faster response times when associating faces of other races (Black and Asian) and SA words (Ofan, Rubio, Amodio, 2014) . We also expected that Black participants would have faster response times when associating own-race (Black) faces and SA. This is consistent with previous research that demonstrates how internalized racism and discrimination affect SA symptoms specifically in Black participants (Graham, Martinez, & Roemer, 2016).

In addition, we hypothesized that those with higher levels of self-reported social anxiety would be faster when the concepts of SA were paired with their own racial group, compared to the other racial groups (Teachman, 2005). However, we expected SA symptom scores to be similar across both racial groups, as the study involved healthy individuals.

Two subscales (Centrality and Private Regard) of the MIBI were administered to Black participants and were modified for White participants to understand participants' attitudes towards their own racial groups and importance of race to their identities. Based on previous literature regarding the protective effects of ethnic pride and greater sense of ethnic identity, it would be plausible to see a positive relationship between scores on the MIBI and reaction times

when SA is paired with participants' own racial groups (Umana-Taylor, 2011). This relationship would indicate that higher sense of centrality and private regard for one's own racial group would predict weaker associations between own-race faces and social anxiety.

## **Method**

### **Participants**

Participants were recruited, screened for eligibility, and scheduled through the University of Michigan Psychology Subject Pool and the UMHealthResearch.org volunteer network from the University of Michigan Ann Arbor campus and surrounding communities. 21 White adults (17 females, 4 males, age range = 18– 54,  $M = 22.90$ ,  $SD = 9.79$ ) and 21 Black adults (17 females, 4 males, age range = 18– 38,  $M = 23.42$ ,  $SD = 5.28$ ) completed a series of computer tasks and questionnaires for the study.

Eligibility was determined through the UMHealthResearch and Subject Pool screening process where potential participants provided demographic and medical information. In order to qualify for the study, participants had to self-identify as Black or Non-Hispanic White, be over the age of eighteen, be able to give informed consent, and be free of significant medical, psychiatric or neurological conditions. Participants who completed the study were compensated with either course credit (if recruited through the UM Psychology Subject Pool) or monetarily (if recruited through the UMHealthResearch website).

### **Procedures**

Eligible participants were scheduled for a study visit on the University of Michigan campus to complete the SIAS, the Centrality and Private Regard subscales of the MIBI, and three computerized IATs. The study visit took approximately 30 minutes total and the IAT

paradigms alone lasted approximately 12 minutes. All tasks for this study, including self-report scales, were created and administered using E-Prime 2.0 software (Psychology Software Tools, Pittsburgh, PA).

## Measures

**Social Interaction Anxiety Scale.** Although this study excluded those with a history of psychiatric, neurological, or physical conditions, there is still variability in symptoms of social anxiety among healthy individuals. To provide additional insight into the relationship between varying degrees of social anxiety symptoms and behavioral reaction time data, participants first completed the Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998). For the SIAS, participants responded to a series of twenty statements and indicated how characteristic or true the statements were of their subjective social anxiety symptoms on a scale of 0 (not at all characteristic of me) to 4 (extremely characteristic of me), with a total possible score of 80. Despite its intended use for clinical samples, the SIAS has also been previously validated for use with non-anxious populations as well (Le Blanc, Bruce, Heimberg, Hope, Blanco, Schneier, & Liebowitz, 2014). Total scores for the SIAS were calculated according to standard methods outlined by Mattick & Clarke (1998). 26 participants scored within the subclinical range (13 White, 13 Black), while 16 participants reported scores greater than 34 (8 White, 8 Black), indicating clinical level symptoms.

**Multidimensional Inventory of Black Identity.** Following the SIAS, participants completed two subscales from the MIBI surrounding Centrality and Private Regard. These subscales were chosen as they were most representative of attitudes that would have the strongest relationship with social aptitude and potential anxiety. As defined by Sellers et al. (1997),

centrality refers to the connection between an individual's race and their self-definition or identity. Private regard refers to one's attitudes towards those of their own racial group and their sense of belonging to that racial group. The centrality subscale is comprised of eight statements about identity and race, and the private regard subscale contains six statements surrounding attitudes about one's own racial group. Participants responded to these statements with their degree of agreement or disagreement on a scale of 1 (strongly disagree) to 7 (strongly agree). The MIBI has previously been validated for Black or African American individuals and was designed as a subjective measure of identity and racial attitudes in minority populations; there is little previous research on the efficacy of this measure in understanding centrality and racial identity in White samples. Statements from the MIBI were modified minimally (changed "Black" to "White") for White participants to complete (Appendix A).

**Modified Implicit Associations Test.** Following the scales, participants completed modified versions of the IAT. Face stimuli for the modified IAT were taken from the previously validated MR2 Face Set (Appendix B) and were modified for standardized presentation (MR2; Strohminger, 2015). In addition to the face images, the task used a set of words related to the "social anxiety" category ("alienated", "afraid", "anxious", "nervous", "embarrassed", and "criticized") and the "social relaxation" category ("calm", "relaxed", "safe", "secure", "accepted", and "untroubled") as previously validated in studies by Westberg, Lundh, & Jonsson (2007) and Egloff & Schmukle (2002). The words were standardized to match size and resolution of the face images. Stimuli were presented in a randomized and counterbalanced order and were self-paced so that trial length was dependent upon participant response. Before each set of stimuli, participants viewed a slide indicating what categories would appear on the right and

left sides of the screen. Participants were instructed to press the “e” key with their left hands if a word or image appeared on the screen that fit into the categories on the left, and they were told to press the “i” key with their right hands if the image fit into the pair of categories on the right.

The IAT consisted of multiple blocks in which participants were asked to assign faces or words to categories (Black, White, Asian, Social Anxiety, Social Relaxation) as quickly and accurately as possible. In each block, a racial classification was paired with either “Social Anxiety” (SA) on one side of the screen and another racial classification was paired with “Social Relaxation” (SR) on the other side of the screen. Reaction time data was measured for categorizations for each pair of classifications to understand the correlation between SA or SR and race. An “incorrect” message appears following trials that participants respond to with the incorrect key (Appendix C).

Participants first completed a practice version of the modified IAT where they were instructed to sort words and images into singular categories on either side of the screen to orient them to the task directions and eliminate any effect of novelty on response time. The practice task consisted of four blocks with 24 trials each where all possible stimuli were presented; order of blocks and stimuli were randomized for each participant.

Following the practice task, participants completed three test versions of the IAT to assess associations between SA or SR words and White compared to Black faces (W-B), SA or SR words and White compared to Asian faces (W-A), and SA or SR words and Black compared to Asian faces (B-A). Each test IAT was comprised of three blocks with 40 trials in each block as modeled after the test blocks in a study by Westberg, Lundh, & Jonsson (2007) and accounted for possible confounding effects of handedness.



According to scoring guidelines outlined by Greenwald, Nosek & Banaji (2003), trials were excluded if response times were less than 300ms or above 10000ms, and there was no penalty for incorrect trials, as it was expected that participants would ultimately have slower reaction times for incorrect responses. We accounted for outliers by searching for any bias differences that were above or below three standard deviations from the means for each pairing; no data points were removed according to these parameters.

### **Analysis Strategy**

All analyses were conducted using SPSS statistical software. Reaction time data for each pair of categories (one racial group with either social anxiety or social relaxation) were standardized to account for individual differences by dividing the mean by the standard deviation for each condition. We then calculated differences between these standardized scores between each pairing to derive bias scores for each IAT for SA pairs and SR pairs separately: [(White) – (Black)], [(White) – (Asian)], [(Black) – (Asian)]. We assessed group differences in bias scores using independent t-tests, and a 3 (IAT Type; W-B, W-A, B-A) x 2 (Group; Black, White) mixed ANOVA on reaction time for SA and SR pairings separately. We also ran independent t-tests to compare group differences on the total scores for each of the self-reported scales (SIAS, Centrality subscale for MIBI, and Private Regard subscale for MIBI). Finally, we assessed the relationships between scores from the SIAS and MIBI and the standardized differences on the IATs by conducting correlations in the Black and White groups. An alpha level of  $p = .05$  was used as the cutoff for all statistical analyses.

## Results

### White-Black Implicit Associations Test

We conducted independent *t*-tests to understand how the groups differed in reaction time bias scores for SA and SR pairings on each test IAT. For SA category pairs on the W-B IAT, there was a trend-level difference between Black ( $N = 21$ ,  $M = .157$ ,  $SD = 1.253$ ) and White ( $N = 21$ ,  $M = -.416$ ,  $SD = .654$ ) individuals,  $t(40) = 1.860$ ,  $p = .070$ , with black participants showing faster reaction times for Black+SA pairs and White subjects responding more quickly to White+SA pairs. SR pairings on the W-B IAT did yield a significant difference, with Black participants showing faster reaction times for White+SR pairs ( $N = 21$ ,  $M = -.533$ ,  $SD = 1.291$ ) and White participants responding more quickly to Black+SR pairs ( $N = 21$ ,  $M = .486$ ,  $SD = 1.008$ );  $t(40) = -2.853$ ,  $p = .007$ ; (Figure 1a).

### White-Asian Implicit Associations Test

There were no significant group differences ( $N_{black} = 21$ ,  $M_{black} = -.307$ ,  $SD_{black} = .799$ ;  $N_{white} = 21$ ,  $M_{white} = .103$ ,  $SD_{white} = 1.549$ ) for reaction time biases from White+SA or Asian+SA pairs,  $t(40) = -1.080$ ,  $p = .286$ . We also did not see significant differences between groups ( $N_{black} = 21$ ,  $M_{black} = .191$ ,  $SD_{black} = 1.602$ ;  $N_{white} = 21$ ,  $M_{white} = .557$ ,  $SD_{white} = .959$ ) with either White+SR or Asian+SR pairings,  $t(40) = -.897$ ,  $p = .376$  (Figure 1b).

### Black-Asian Implicit Associations Test

Neither the Black+SA nor Asian+SA pairs from the B-A IAT yielded significant group differences ( $N_{black} = 21$ ,  $M_{black} = -.029$ ,  $SD_{black} = .924$ ;  $N_{white} = 20$ ,  $M_{white} = -.302$ ,  $SD_{white} = .791$ ) in reaction time bias,  $t(39) = 1.013$ ,  $p = .318$ . SR Pairings with White and Asian faces did not

reveal significant group differences in reaction time biases either ( $N_{black} = 21$ ,  $M_{black} = .278$ ,  $SD_{black} = 1.137$ ;  $N_{white} = 20$ ,  $M_{white} = -.021$ ,  $SD_{white} = 1.293$ ),  $t(39) = .788$ ,  $p = .436$  (Figure 1c).

### **Social Interaction Anxiety Scale**

Independent t-test analyses for the SIAS revealed no significant differences in scores between Black ( $N = 21$ ,  $M = 29.57$ ,  $SD = 16.045$ ) and White ( $N = 21$ ,  $M = 29.57$ ,  $SD = 15.539$ ) groups on the SIAS,  $t(40) = .000$ ,  $p = 1.00$ .

### **Social Anxiety Interaction Scale and Implicit Associations Test**

To understand whether symptom level might be a predictor of reaction time bias on the IATs, we ran correlations to examine relationships between scores on the SIAS and reaction time bias for each IAT in each group. There were no significant relationships between scores on the SIAS and performance on the IAT, all  $p \geq .346$  (Figure 2 a-f).

### **Multidimensional Inventory of Black Identity- Centrality Subscale**

An independent t-test analysis did show significant group differences on the Centrality subscale of the MIBI, with Black ( $N = 20$ ,  $M = 8.80$ ,  $SD = 5.625$ ) individuals reporting significantly higher centrality scores than our White ( $N = 21$ ,  $M = 3.67$ ,  $SD = 4.892$ ) sample,  $t(39) = 3.122$ ,  $p = .003$ .

### **Multidimensional Inventory of Black Identity- Private Regard Subscale**

We saw significantly higher scores on the Private Regard subscale of the MIBI for Black ( $N = 20$ ,  $M = 20.15$ ,  $SD = 3.281$ ) individuals when compared to our White ( $N = 21$ ,  $M = 15.48$ ,  $SD = 4.479$ ) sample,  $t(39) = 3.796$ ,  $p = .004$ .

### **Multidimensional Inventory of Black Identity Subscales and Implicit Associations Tests**

Additionally, we ran correlations between scores on each of the subscales of the MIBI and reaction time biases on each of the IATs for each group. The Centrality subscale was negatively correlated with reaction time bias on the W-A SA IAT for White participants,  $r(21) = -.577, p < .01$ , such that higher Centrality scores predicted faster reaction times for White+SA pairs (Figure 3d). There was also a significant positive correlation between scores on the Centrality subscale and Black individuals' reaction time bias on the W-A SR IAT, indicating that higher centrality predicted faster reaction times for Asian+SR pairs,  $r(20) = .450, p < .05$ . (Figure 3c). All other correlations with the Centrality subscale for either group on the W-B, W-A, and B-A IATs were non-significant, all  $p \geq .103$ . (Figure 3 a, b, e, f).

Correlations for the Private Regard subscale of the MIBI and each of the IATs for each group did not reveal any significant relationships between private regard scores and IAT responses for either group, all  $p \geq .095$  (Figure 4 a-f).

### **Comparisons between Implicit Associations Tests**

In order to assess specific group differences between IATs, we analyzed reaction time biases for both SA and SR pairings on each IAT using a 3 (IAT Type; W-B, W-A, B-A) x 2 (Group; Black, White) mixed ANOVA. We found no main effects of IAT Type or group, and the group x IAT Type interaction was non-significant, all  $F_s < 3.01, p_s > .05$ .

### **Own-Race vs. Other-Race Comparisons across IATs**

We conducted a final 3(Race; Own Race, Other Race 1, Other Race 2) x 2(Group; Black, White) ANOVA to determine whether there were differences in reaction times for all own-race vs. other-race trials for SA and SR pairs across IATs for each group. Standardized reaction time

data were reorganized for each group into responses to pairs with an individual's own race (White category trials for White participants, Black category trials for Black participants) and the into responses for the two "other-race" categories (Other Race 1= Asian face trials, Other Race 2= Black face trials for White participants; Other Race 1= Asian face trials, Other Race 2= White face trials for Black participants). We did not find significant differences between these conditions for Black ( $N = 41$ ,  $M_{own} = 2.193$ ;  $M_{other1} = 2.394$ ;  $M_{other2} = 2.213$ ) or White ( $N = 42$ ,  $M_{own} = 2.583$ ;  $M_{other1} = 2.647$ ;  $M_{other2} = 2.456$ ) participants for SA pairs, all  $F_s < 3.7$ ,  $p_s > .05$ . SR pairs also did not show an effect of group by race, but revealed a main effect of race across both groups  $F(2, 162) = 6.081$ ,  $p = .003$ ,  $\eta^2 = .070$ . Pairwise comparisons to examine differences between race categories revealed that participants had slower reaction times for own-race pairs ( $N = 83$ ,  $M_{own} = 2.759$ ) compared to other-race 1 ( $M_{other1} = 2.339$ ,  $p = .004$ ) and other-race 2 ( $M_{other2} = 2.388$ ,  $p = .005$ ), while the two other-race conditions did not differ ( $p > .05$ ) (Figure 5).

### Discussion

The primary findings of this study did not support our initial hypotheses that White participants would be quicker to associate both other-race categories with SA, and Black participants would be quicker to associate SA concepts with Black faces, since SA pairs on the IATs did not reveal significant differences as predicted. However, our findings suggest that both Black and White participants demonstrate associations between SR words and other-race faces, as Black and White individuals had significantly faster reaction times for White+SR pairs and Black+SR pairs respectively on the White-Black IAT. Trend-level results for Black+SA pairs in Black participants and White+SA pairs in White participants are in concert with these findings as they indicate faster reaction times for own-race face pairings with SA words. These findings

suggest that individuals are relating the negative experience of social anxiety to themselves or those of their own racial group, while perceiving other racial groups as more related to calming or SR words.

It is notable that we did not see significant group differences in biases for pairs on the White-Asian and Black-Asian IATs as we had predicted in our initial hypotheses; although, our additional analyses on own-race versus other-race trials across IATs provide further evidence suggesting that instead, individuals may demonstrate stronger associations between calming or SR words and other racial groups. Regardless of race, participants were slower to associate their own race with SR than both other-race categories, while there were no significant differences between reaction times for other-race categorizations. These results might align with previous studies on healthcare providers' perception of pain in individuals from different racial backgrounds that found that White providers perceived Black and Hispanic individuals as experiencing less pain than White patients (Green *et al.*, 2003). Further research on participants of different racial backgrounds would be required to provide additional evidence for strong other-race associations with concepts related to SR.

Furthermore, we expected to see a positive relationship between larger scores the SIAS and stronger associations between participants' own racial groups and SA on the IATs; however, our data did not support this hypothesis. Although we did not specifically recruit participants with diagnosed SA, we did see scores SIAS spanning into clinical levels and anticipated that these higher levels of anxiety would predict faster reaction times for pairs with SA words and the participant's own racial group. It is possible that specifically recruiting individuals with diagnosed SA would yield a larger effect size. This study also did not directly make participants'

symptoms salient during the IAT paradigms. It is also possible that symptoms are not directly related to associations regarding one's own racial group; however, these findings are not in accordance with previous studies that have related implicit associations to anxiety disorders (Teachman, 2005).

Additionally, we had hypothesized that higher scores of Centrality and Private Regard on the MIBI in Black participants would predict slower reaction times on IAT pairs between own-race categories and SA, as evidenced by previous studies examining the protective effects of ethnic pride (Umaña-Taylor, 2011). Black participants did score higher on the Centrality and Private Regard subscales of the MIBI compared to the White sample as expected based on previous validation of the scale for Black samples (Sellers et al., 1997). However, Black participants' scores on the MIBI were not correlated with own-race associations as we had predicted. Instead, we saw significant correlations between scores on the Centrality subscale and slower reaction times for White+SR pairs for Black participants when compared to Asian+SR which suggest that specific associations may become salient when particular groups are compared. If participants had associated all other-race faces with SA or SR in the same way, as we initially predicted, then we would not have seen different directions in the correlation between ethnic identity for the White or Asian (both "other-race" conditions) pairings in Black individuals. This finding is interesting, because it highlights the possibility that differences in centrality in Black participants could elucidate specific differences in implicit associations with Asian or White faces and SR. These results are not consistent with our analysis of own-race and other-race conditions across IATs, as that analysis showed no difference between other-race conditions. Furthermore, these results at face value appear to contradict findings from the White-

Black IAT that showed faster reaction times for White+SR pairs in Black subjects. However, it is possible that Black individuals with varying levels of racial centrality could demonstrate different associations with White faces and SA concepts when compared to either Black or Asian faces. These findings suggest that relationships between ethnic identity and implicit bias could be more complicated than “own” vs “other” race. The negative correlation between Centrality scores and SA pairings on the W-A IAT in White participants, however, suggests a similar pattern of association to findings from the W-B IAT. As higher centrality of White race to identity is related to faster associations between White faces and SA words, while reaction times for Asian faces and SA words were slower. This does not support our initial hypothesis that stronger racial identity would predict correlations between own-race faces and calming or relaxation words; although, it is possible that centrality as measured by the MIBI in White individuals has different meanings than minority groups and results are not conclusive. Few studies have examined results from the MIBI in White individuals, although these findings contribute to a an emerging body of work on White, or dominant-group identity and are consistent with studies that have administered the modified centrality and private regard subscales in White samples (Knowles & Peng, 2005). It is possible that these differences could result from greater ethnic pride and higher value placed on racial identity within Black communities, as found in previous literature (Gray, Carter, & Silverman, 2011). However, it is difficult to generalize these results, as greater ethnic pride and value in one’s own racial identity have more negative social connotations and meaning for White individuals than for particular minority groups (Knowles & Peng, 2005). Therefore, these results could also be indicative of a



need for a specific measure of white identity that would address the nuanced perceptions of a white individual's racial identity.

### **Implications**

Overall, results from this study indicate that both Black and White individuals appear to associate other racial groups more with concepts related to SR, although more specific differences may arise when considering the relationship between racial centrality and these implicit associations. These results help illuminate a greater need for research to more critically examine potential relationship between race and SA. These findings reinforce previous findings that suggest Black individuals and those from ethnic backgrounds have higher senses of ethnic pride, and more strongly value their racial identities than White individuals. These values could differentially impact perception of social dynamics and could play an important role in the manifestation of SA in minority individuals.

### **Limitations**

There are a number of limitations that should be considered when interpreting the findings from this study. For the sake of time, the three IATs given were modified to only include five blocks instead of the standard model of seven blocks. The shortened version of the test may have impacted the strength of the biases that we were able to measure. It will be important for future studies replicate our results using the full IAT paradigms to thoroughly understand implicit biases about race and social anxiety.

Due to the limited duration of the study and the constraints surrounding recruitment of a minority population, the sample size for each group in this study was fairly small. Repeating or expanding this study with a larger sample may yield more informative differences between

groups, and may have more power to detect relationships between SA symptoms, racial identity, and implicit associations between race and SA. Furthermore, this sample was primarily comprised of young adults from an urban collegiate setting. It is possible that confounding factors such as age, education, and average socioeconomic status could impact responses on self-report measures and performance on the IAT. Thus, our finding may not generalize to other samples. It will be critical for future studies to attempt to replicate the findings reported here in participants of different ages and socioeconomic backgrounds.

### **Future Directions**

This study examined differences between White participants and participants from one particular racial minority group that shows a comparable rate for SA but less treatment utilization and efficacy (Himle, 2009; Graham-LoPresti et al., 2017). However, as this study has shown patterns indicating differences in associations between one's own race or other racial groups and concepts related to SA in Black and White groups, it is possible that those from different minority groups could show different relationships between their perceptions of race and SA as well. It will be important to replicate this study with other racial groups such as Asian or Latino populations to understand these different relationships and to further inform nuances in treatment for those from different ethnic backgrounds. To understand more specific biases that might arise in interpersonal and racial dynamics between patients and therapists further research must be conducted on these specific dynamics.

As issues of identity become more culturally salient and visibility for those from different sexual, cultural, and socioeconomic backgrounds increases, additional research on the ways that these identities may interact with SA is necessary to understand possible implications for

treatment. Understanding relationships between social identities and mental health conditions such as SA may lead to the development of more effective forms of treatment for those from underrepresented backgrounds.

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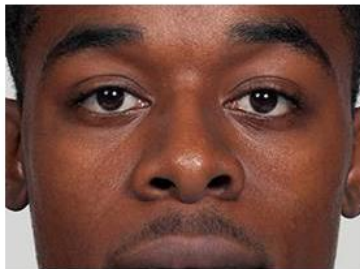
**Appendix A**

Sample item from the MIBI Centrality subscale administered to Black participants and modified item administered to White participants.

**Overall, being Black has very little to do with how I feel about myself.**      **Overall, being White has very little to do with how I feel about myself.**

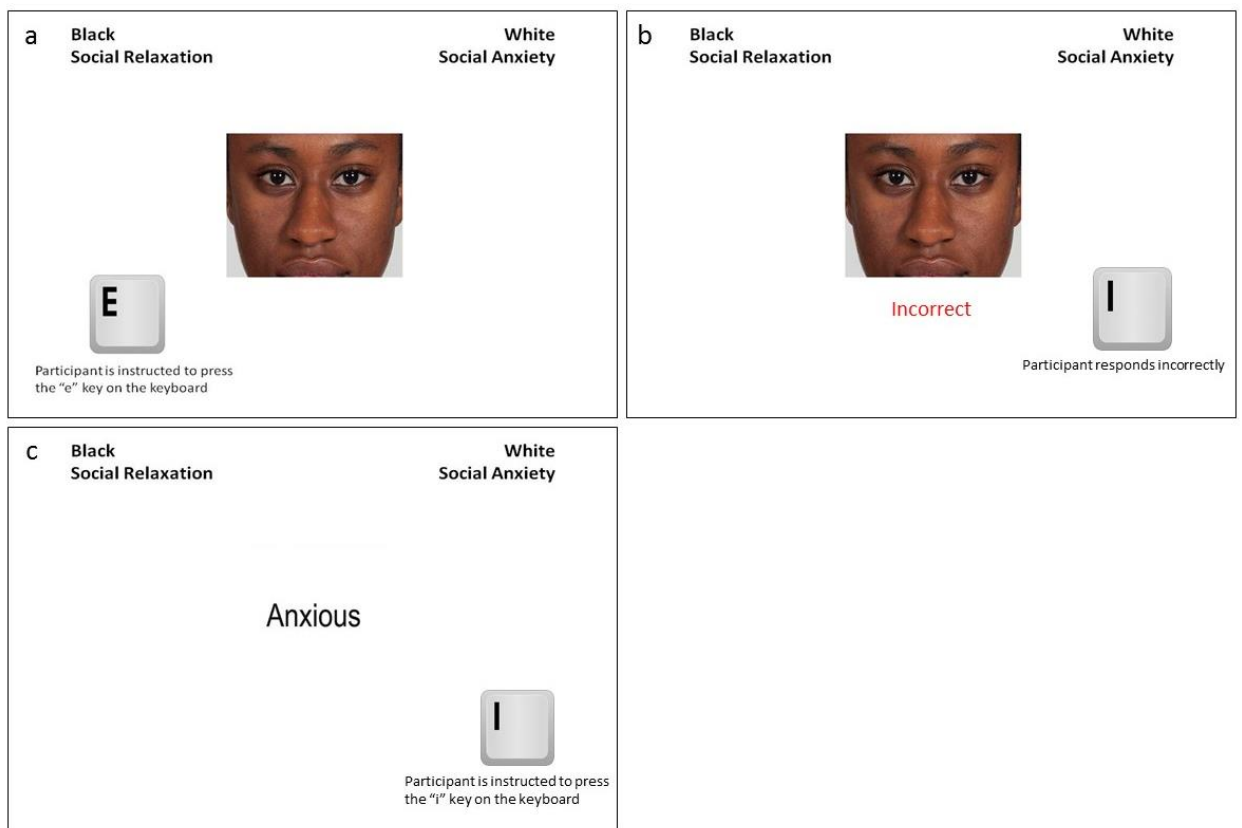
**Appendix B**

Sample images from the MR2 Face Set (MR2; Strohming, 2015) used in the modified IAT paradigm. Three male and three female faces were used from the Asian, Black, and Caucasian subsets of the MR2 face set. All images were cropped and standardized to the same size and resolution and presented in a randomized order in each IAT.



**Appendix C**

Sample (a) face and (c) SA word trials from the W-B Test IAT. Participants were instructed to press the "e" key on the computer keyboard with their left hands if the stimulus belonged to one of the paired categories on the left hand side of the screen and to press the "i" key with their right hands if the stimulus belonged in a category on the right side. (b) If participants responded incorrectly, an incorrect message would appear immediately following their response before the next trial.



## Figures

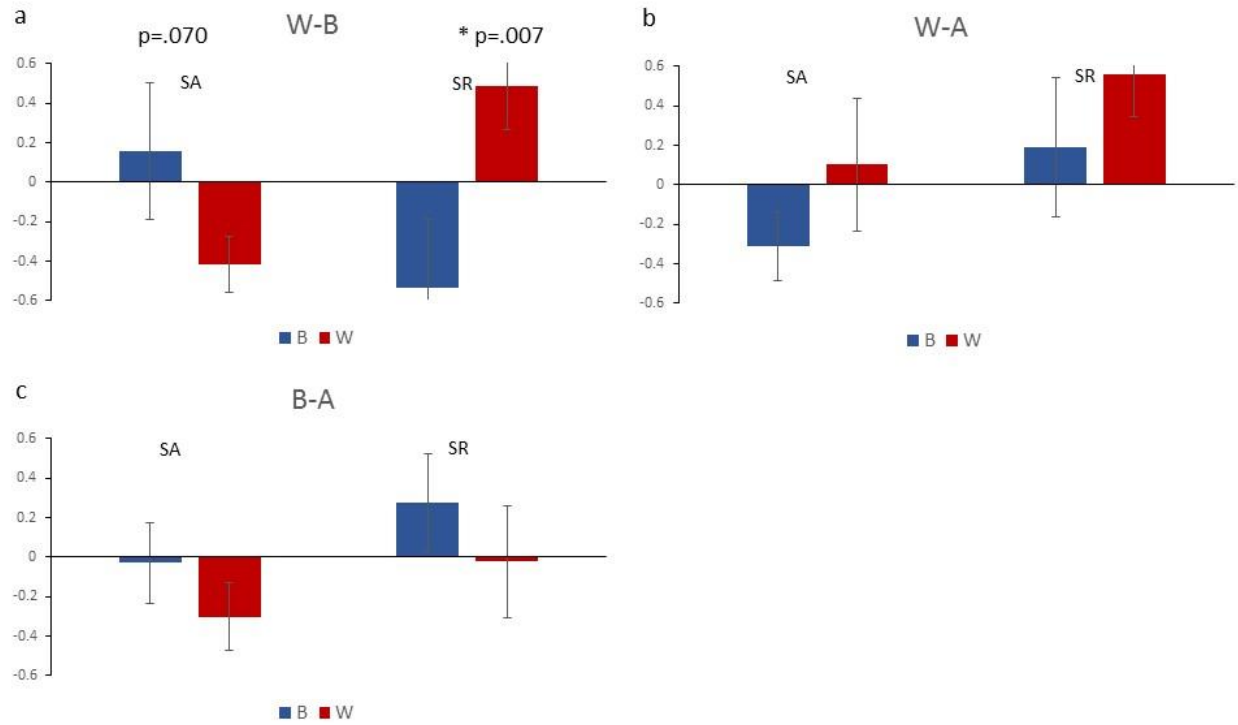


Figure 1. Group mean comparisons on the (a) W-B IAT, (b) W-A IAT, (c) B-A IAT for SA and SR pairs

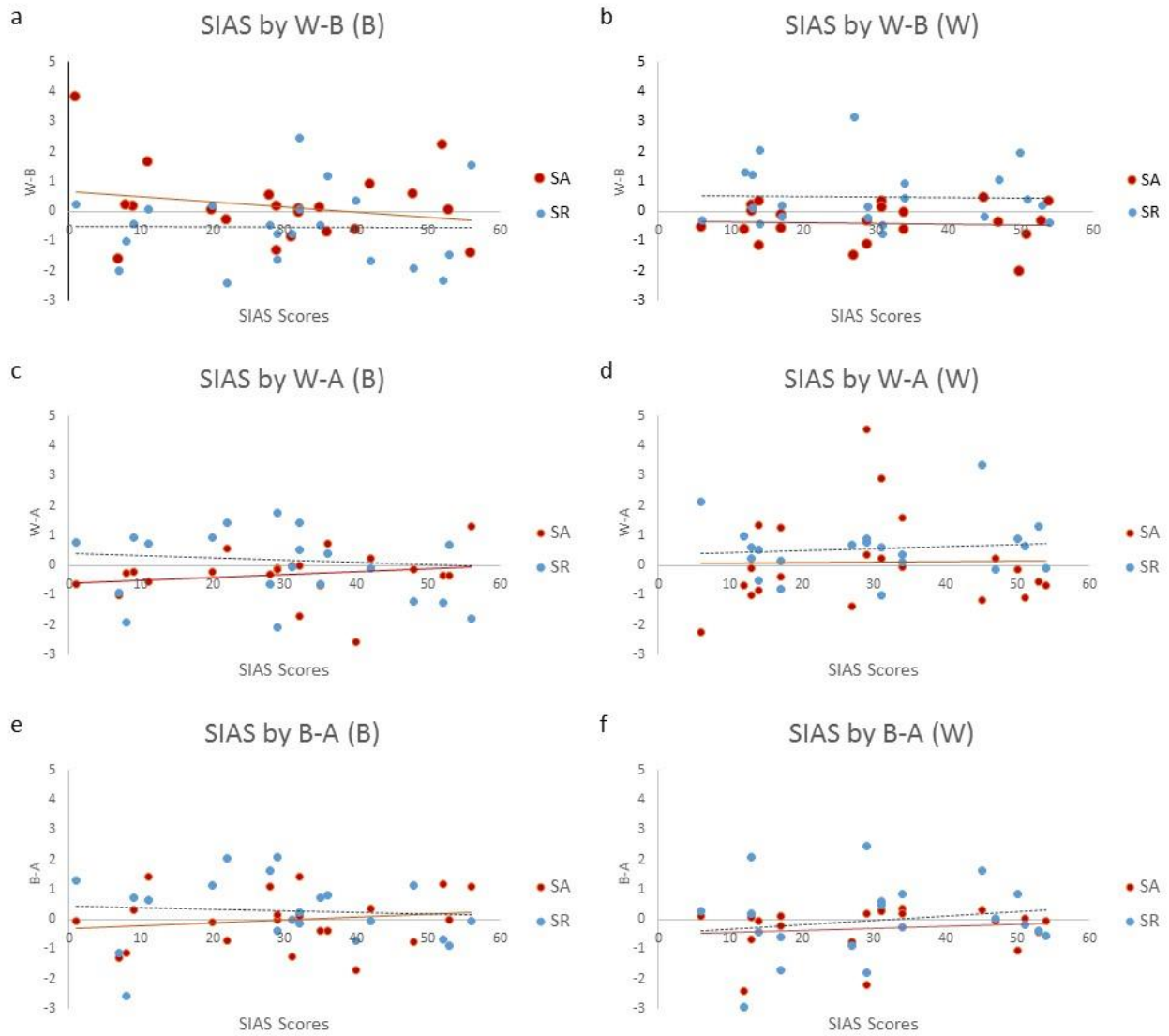


Figure 2. (a,c,e) Correlations between scores on the SIAS and each IAT in Black participants. (b,d,f) Correlations between scores on the SIAS and each IAT in White participants.

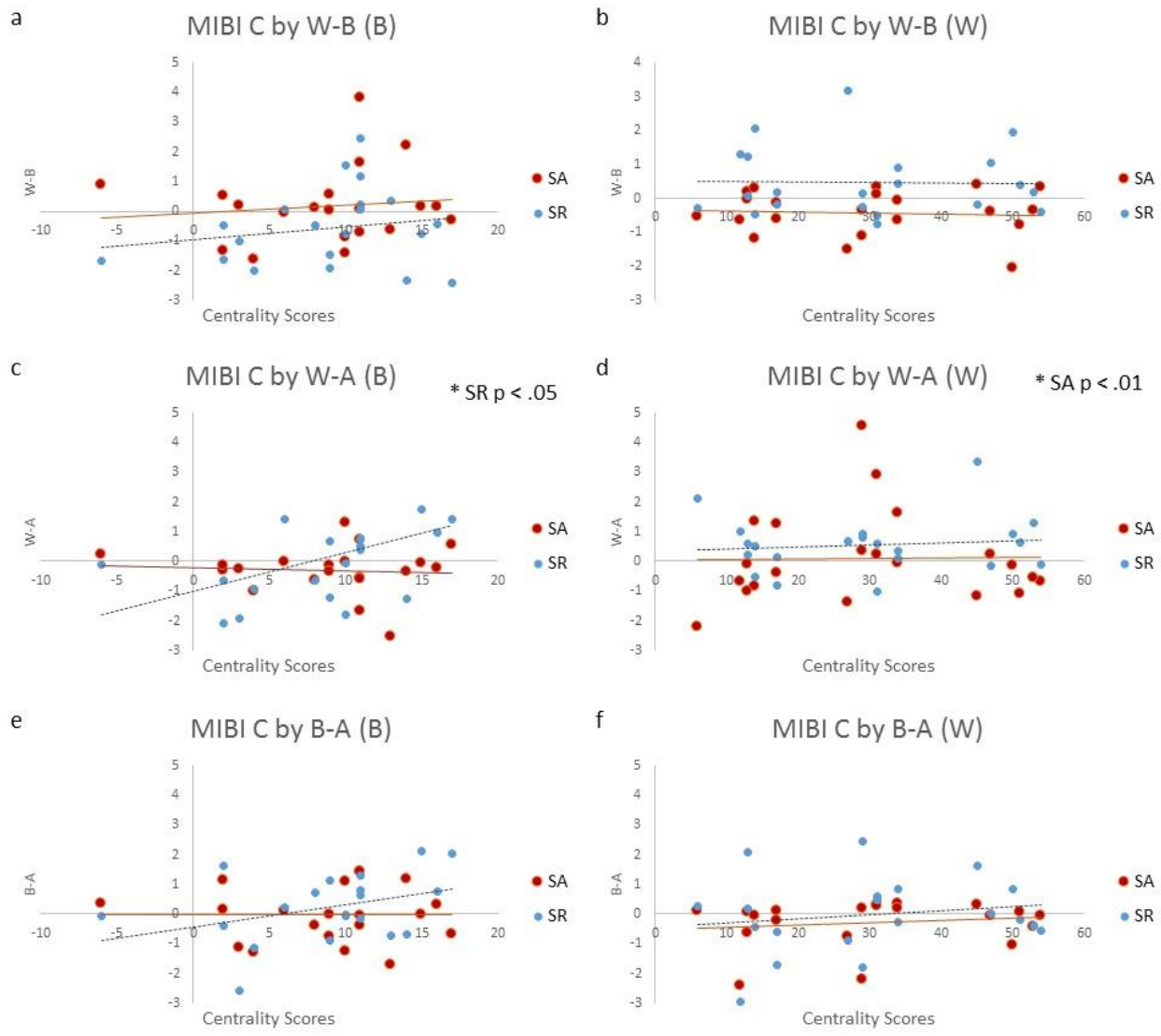


Figure 3. (a,c,e) Correlations between scores on the MIBI Centrality subscale and each IAT in Black participants. (b,d,f) Correlations between scores on the MIBI Centrality subscale and each IAT in White participants.

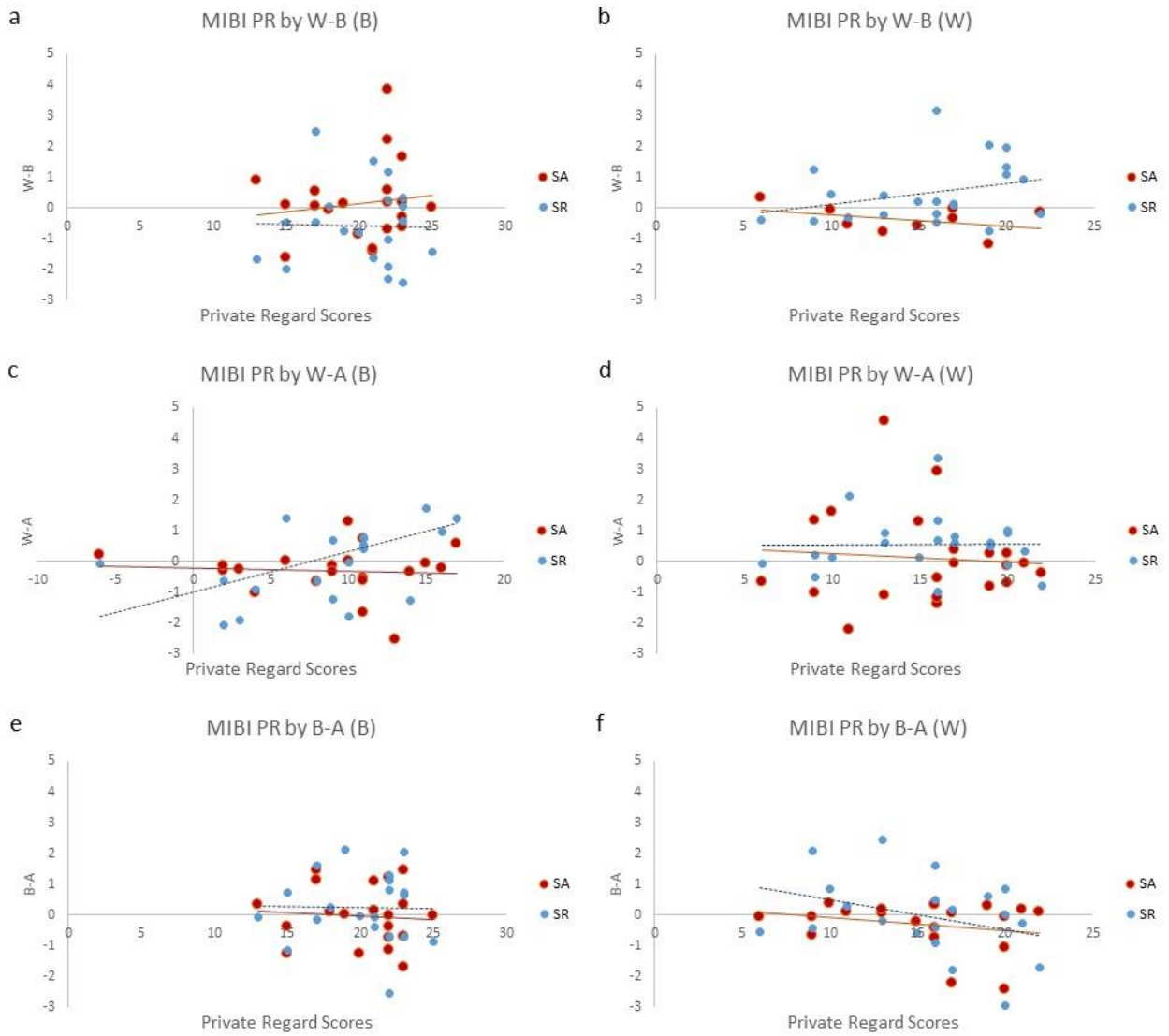
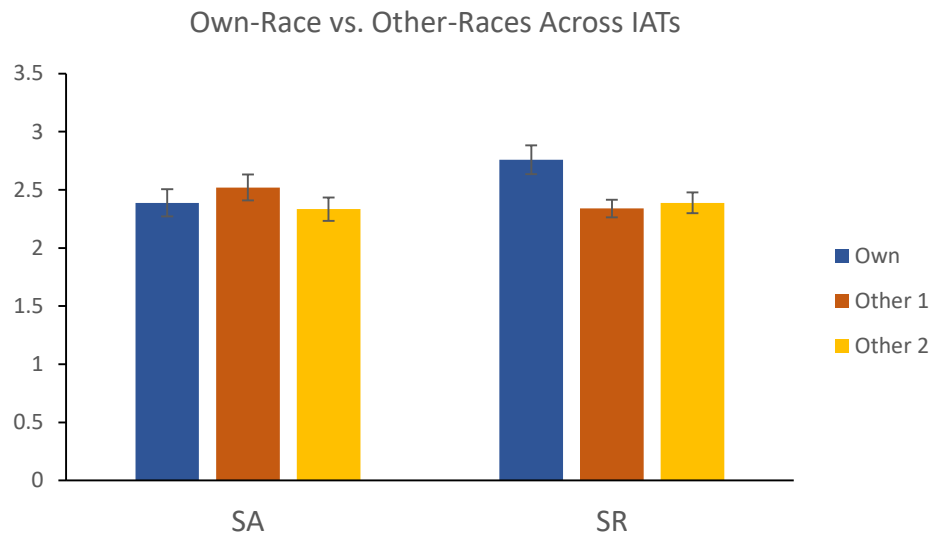


Figure 4. (a,c,e) Correlations between scores on the MIBI Private Regard subscale and each IAT in Black participants. (b,d,f) Correlations between scores on the MIBI Private Regard subscale and each IAT in White participants.



*Figure 5.* Comparisons of reaction times for own-race (Own =White for White participants, Own = Black for Black participants) and 2 other-race (Other-Race 1 = Asian, Other-Race 2 = Black for White participants; Other-Race 1 = Asian, Other-Race 2 = White for Black participants) conditions collapsed across IATs for Black and White subjects for SA and SR pairs.