

HOW BELIEFS AFFECT RELATIONSHIP FORMATION

VANESSA KAILYN BASURTO

A THESIS SUBMITTED TO THE FACULTY OF GRADUATE STUDIES IN PARTIAL
FULLFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS

GRADUATE PROGRAM IN PSYCHOLOGY

YORK UNIVERSITY

TORONTO, ONTARIO

July 2024

© Vanessa Basurto, 2024

Abstract

Past research has investigated racial implicit biases in the context of short-term relationships, such as strangers. However, implicit biases have not been studied in the context of longer-term relationships. To address this gap in the literature, the present study explores ways in which implicit biases may impact integral aspects of relationship formation: relationship stressors and supports, and friendship group diversity. Additionally, trait personality was examined as a potential contributor towards implicit bias and friendship diversity. Agreeableness and openness were chosen as the main personality traits of focus due to their involvement in explicit prejudice. Three types of relationships were assessed to explore whether effects differ based on closeness: family, friends, and acquaintances. People with whom we have closer relationships are also more likely to share social categories with us, which would mitigate the effects of implicit biases. Implicit biases were assessed using a race Implicit Association Test (IAT) which incorporated 24 different skin shades to represent a diverse racial spectrum. Relationship stressors and supports were assessed using the Wiseheart Socioeconomic Scale. Personality was assessed using the HEXACO-PI-R. We found weak, and statistically nonsignificant, correlations for all variables, suggesting that close relationships may not be impacted by implicit biases, regardless of the closeness of the relationship. Personality also does not appear to be related to implicit bias. The findings suggest that implicit biases may not be involved in longer-term relationships, and may have different contributing factors than explicit biases. The results and limitations from this study demonstrate the need for future research in the study of implicit bias.

Keywords: implicit bias, relationships, personality, diversity

Acknowledgements

Special thanks to my supervisor, Dr. Melody Wiseheart, for her support, guidance, patience, and knowledge throughout this journey. This thesis would not have been possible if not for your mentorship. Thank you to the entire Cognitive Flexibility Lab for their encouragement and ideas during this project. Our weekly meetings have been one of the many highlights during this period.

To my committee members, Dr. Raymond Mar, Dr. Kerry Kawakami, and Dr. Sachil Singh, thank you for offering your feedback and taking the time to attend my defense during such a busy time.

To my loved ones, thank you for being there for me when I needed it most and keeping me sane. You all have done more for me than you may know, and I could not do this without you.

Finally, thank you to my parents for supporting me throughout my entire academic journey and believing in me. You knew I could do great things even when I doubted myself. To my mom, thank you for being a pillar of strength during this time. You are the strongest person I know, and I'm eternally grateful for your support. To my dad, you always believed in me up until the very end. Although you didn't get a chance to be here during this accomplishment, your presence is always felt. I know that wherever you are in this universe, you're proud, and that is all I could ever ask for.

Table of Contents

Abstract	ii
Acknowledgments	iii
Table of Contents	iv
Introduction	1
Implicit Biases within Social Interactions	2
Implicit Biases and Friendship Diversity	4
Implicit Biases and Closeness	5
Implicit Biases and Personality Traits	6
Current Study	9
Hypotheses	10
Method	11
Participants	11
Design	12
Materials	12
Implicit Association Test (IAT)	12
Wiseheart Socioeconomic Status Scale (WSESS).....	14
Friendship Diversity	16
HEXACO-PI-R	16
Background Demographics Questionnaire	17
Procedure	18
Results	18
Hypothesis 1	18

Hypothesis 2	19
Hypothesis 3	19
Hypothesis 4	19
Hypothesis 5	20
Hypothesis 6	20
General Discussion	21
Challenges and Limitations	24
Conclusion and Future Directions	27
References	30
Appendices	38
Appendix A: Target Stimuli for the Implicit Association Test	38
Appendix B: Visual Demonstration of the race Implicit Association Test	39
Appendix C: Skin Shade Chart	43

How Beliefs Affect Relationship Formation

The biases people possess provide a basis for how they view and interact with their environment. Biases are separated into two overarching categories: explicit and implicit biases (Williams & Steele, 2019). Explicit biases are the biases within a person's awareness. People acknowledge that they possess these biases and can self-report them. As people typically have a high awareness of their explicit biases, they are capable of controlling how these biases are presented. For instance, people may attempt to control the influence their explicit biases have on their behaviour. (Dovidio et al., 2002; Daumeyer et al., 2019; Williams & Steele, 2019).

However, not all biases are explicit. People hold biases that they may not even be fully aware of. Implicit biases influence a person's thoughts and actions automatically and outside of their conscious awareness. People are often unaware of the implicit biases they possess and are therefore unable to disclose them on explicit measures, making it difficult to fully understand the extent of these biases and their impact (Dovidio et al., 2002; Daumeyer et al., 2019; Williams & Steele, 2019). A lack of insight into one's own implicit biases means that people are less likely to attempt to control, conceal, or change them than they would with their explicit biases. Due to their unconscious and uncontrollable nature, implicit biases may have stronger impact on people's behaviours (Dovidio et al., 2002).

Multiple studies have investigated the social impact of implicit biases, such as the quality of interactions and group diversity. However, these studies have limitations, such as only focusing on interactions among strangers, not identifying the type of friendship being analyzed, and utilizing implicit bias measures with a narrow concept of race (Amodio & Devine, 2006; Aberson et al., 2004; Dovidio et al., 1997; Dovidio et al., 2002; Jocyby-Senghor et al., 2015). It is not yet known how implicit biases impact the quality of longer-term relationships or different

types of friendship groups. Close relationships may be susceptible to negative influences of implicit biases due to increased contact and a higher level of trust leading to a lower likelihood of needing to present oneself in a positive manner (Øverup & Neighbors, 2016). Furthermore, many studies have focused on personality as a possible contributing factor of explicit biases but have failed to account for whether this influence is seen within implicit biases (Federico & Aguilera, 2019; Harris & Vazire, 2016; Ng et al., 2021; Scroggins et al., 2016; Sibley & Duckitt, 2008). The current study aims to address these limitations and expand on the current research by investigating how implicit biases influence the quality of close relationships and the diversity of various friendship groups, and whether personality traits contribute to a person's implicit bias level.

Implicit Biases within Social Interactions

One prominent area in which people are influenced by their implicit biases is during social interactions. Implicit biases against a person or their group may lead to more negative interactions and reduced relationship quality with others (Amodio & Devine, 2006; Dovidio et al., 1997; Dovidio et al., 2002; Jacoby-Senhor et al., 2015). Implicit biases influence social interactions through subconscious expressions and behaviours. People who score high on implicit bias measures tend to exhibit nonverbal displays of discomfort and discriminatory behaviours during social interactions (Dovidio et al., 1997; Dovidio et al., 2002). People tend to subconsciously discriminate against those who belong to social groups for which they hold negative implicit biases toward (Jacoby-Senhor et al., 2015; Scroggins et al., 2016).

Dovidio et al. (1997) investigated the relationship between implicit racial bias and the presence of nonverbal (i.e., spontaneous) behaviours during interactions. The study focused on two nonverbal behaviours: blinking and eye-contact. Blinking was interpreted as a measure of

negative arousal, whereas eye-contact indicated positive arousal. Participants' implicit bias score predicted their nonverbal behaviours, correlating with more blinking and less eye-contact when interacting with a Black interviewer than with the White interviewer. The results from this study indicate that the presence of implicit biases can subtly and subconsciously influence how people behave around those they are biased against.

Dovidio et al. (2002) conducted a similar study in which White participants were instructed to interact with a Black confederate and were rated on both verbal and non-verbal friendliness by outside observers. This study found that participants' scores on an implicit bias measure significantly predicted nonverbal friendliness ratings. Participants with higher implicit scores were rated as less friendly by both observers and the confederate they interacted with. These results indicate that negative implicit biases may influence how friendly a person is perceived during social interactions. These behaviours can be detected by people both within and outside of the interaction and can influence perceptions of the interaction. This result demonstrates that people who score high on implicit bias measures may be considered unfriendly, even by people to whom they are not directing unfriendly behaviours toward.

Implicit biases can also influence people's perception of ambiguous situations and targets. Gawronski et al. (2003) Results showed that participants who held high racial implicit biases were more likely to interpret ambiguous behaviour negatively if the target was from that out-group. The researchers further tested the effects of implicit biases by inquiring whether having a high motivation to control bias would moderate bias levels. Results showed that motivation to control bias moderated explicit, but not implicit, biases. This result further suggests that implicit biases cannot be as easily controlled as explicit biases, even if someone is highly motivated to control them. Additionally, this result shows that people with high negative biases

may have lower quality social interactions due to negative assumptions made towards the behaviours of others.

Many of the studies discussed focus on the presence of implicit biases within social interactions among strangers, or out-groups. Pre-existing studies on the topic of implicit biases and social interactions fail to account for whether these biases impact social interactions within longer-term and more established relationships, such as friendships and family relationships. As interactions within longer-term relationships are vastly different from interactions between strangers, it is important to determine whether implicit biases go beyond interactions with strangers and negatively impact the quality of close relationships, such as contributing to interactions that are more stressful and less supportive. Furthermore, the studies discussed focus on a narrow concept of race by using versions of the Implicit Association Test that portray Black and White skin through one shade for each race, ultimately missing out on the diverse spectrum of skin shades that exist within racial backgrounds.

Implicit Biases and Friendship Diversity

In addition to subtle actions within interactions, implicit biases can also influence social behaviours in more obvious ways. For instance, implicit racial biases influence how people perceive others with racially diverse friends. Jacoby-Senghor et al. (2015) showed White participants photographs containing a friendship pair consisting of either a White target and Black friend, or a White target and White friend. Participants with stronger implicit racial biases (i.e., higher anti-black bias scores) were more likely to have a low affiliative response to White targets pictured with a Black friend than with a White friend, and were less likely to perceive the target as similar to themselves. Interestingly, these results were not statistically significant when participants were told that the people shown in the photographs were randomly paired, indicating

that implicit bias impacts perceptions of friendship, specifically. Implicit biases against out-groups are thus able to influence people's judgements towards others, even when the person they are judging is of the same race as them.

Implicit biases have also been shown to influence one's own ingroup diversity. People with implicit racial biases are less likely to pursue friendships with those who are racially dissimilar to them, and instead opt for friendships that are racially homogenous. For example, a study by Aberson et al. (2004) looked at the relationship between implicit biases and friendship group diversity. White participants completed a racial IAT to determine their implicit bias levels toward African Americans. They then indicated how many African American friends they had on a questionnaire. The findings of this study showed that participants who had more African American friendships (i.e., out-group friendships) tended to score lower on implicit bias measures. This finding demonstrates that close out-group contact is related to low implicit racial biases.

Implicit Biases and Closeness

The labels people are given, also called their social categories, can greatly influence how they are perceived. Scroggins et al. (2016) investigated how changing the salience of a social category may reduce people's implicit biases towards others. The study's participants consisted of non-Black University of California, Santa Barbara students. Participants completed Implicit Association Tests in which they had to categorize outgroup members based on whether race (i.e., Black and White) or a shared social categorization (i.e., Black UCSB student and White UCSB student) was made salient. The researchers found that participants showed less implicit bias toward Black faces labelled as UCSB students than faces without a label. When a shared social categorization is made salient, people are more likely to see others as part of their ingroup and

reduce their biases, even when they have implicit biases towards another social categorization the target holds (e.g., race).

This study focuses on the categorization of targets who are considered to be in a participant's outgroup (i.e., strangers). However, shared social categorization also exists within a person's various relationships: relationships with a higher degree of closeness would have a higher likelihood of containing important shared social categories, which would mitigate any negative effects caused by high implicit biases. It is thus important to determine how the effects of implicit biases differ between groups of varying closeness.

Implicit Biases and Personality Traits

In order to fully understand the impact of negative implicit biases, it is important to investigate possible contributing factors towards these biases. Some researchers have proposed that personality traits, often operationalized by the five-factor model of personality (also known as the "Big Five"), can impact their implicit bias levels (Federico & Aguilera, 2019; Harris & Vazire, 2016; Ng et al., 2021; Scroggins et al., 2016; Sibley & Duckitt, 2008). The five-factor model of personality is comprised of five main personality traits: "Openness to experience", "Conscientiousness", "Extraversion", "Agreeableness", and "Neuroticism". Openness to experience involves being open to a wide range of experiences, ideas, and values.

Conscientiousness involves self-discipline and competence. Extraversion involves sociability and energy levels. Agreeableness involves empathy, kindness, and helping others. And neuroticism involves anxiety, hostility, and instability (McCrae & John, 1992; Ng et al., 2021).

Sibley and Duckitt (2008) conducted a meta-analysis on the relationship between the five personality dimensions and prejudice, as well as prejudice-related concepts. Based on their analyses of 71 studies and over 22,000 participants, the researchers found evidence supporting a

connection between certain personality constructs and prejudice levels. Prejudice was found to be related to low levels of Openness and Agreeableness (Federico & Aguilera, 2019; Harris & Vazire, 2016; Ng et al., 2021; Scroggins et al., 2016; Sibley & Duckitt, 2008). Two prejudice-related constructs—Right Wing Authoritarianism and Social Dominance Orientation—were also associated with these personality dimensions. Right Wing Authoritarianism is a construct related to concepts such as aggression, and conservatism, it was associated with high Conscientiousness and low Openness. Social Dominance Orientation, the extent to which a person prefers hierarchical versus equal intergroup relations, was associated with low Agreeableness. Furthermore, the associations found between prejudice and Openness and Agreeableness did not differ across geographical regions. However, the two personality dimensions were associated with various types of prejudice in different ways. Agreeableness and Openness were related to generalized prejudice (an aggregate of prejudice representing various social categories), with both dimensions only moderate associations with prejudice related to race and gender. In general, personality had a much stronger effect on generalized prejudice than on more specific forms of prejudice (Sibley and Duckitt, 2008).

A similar study by Federico and Aguilera (2019) provides further evidence for the role of personality in predicting generalized prejudice in addition to resentment towards African Americans (i.e., Racial Resentment). As expected, the researchers found a strong relationship between generalized prejudice and lower levels of Agreeableness and Openness. Racial Resentment was also related to low Agreeableness, in addition to higher levels of high Conscientiousness. This suggests that although generalized prejudice is strongly associated with Agreeableness and Openness, more specific forms of prejudice may be related to other personality dimensions like conscientiousness.

Personality dimensions may also influence relationship behaviours. A recent study by Antonoplis and John (2022) investigated the connection between personality dimensions and friendship. Similar to the previous studies on personality and prejudice, the researchers found that Openness to Experience predicted how likely people were to befriend others of a different race than themselves. In particular, those lower in Openness were less likely to befriend others of a different race. However, in contrast to previous studies, Agreeableness was not related to intergroup befriending.

Several ideas have been proposed by researchers to explain the connection between prejudice and various personality dimensions. Individuals who are low in Agreeableness are more likely to view social interactions with out-groups using a competitive framework. People low in Agreeableness may develop a sense of in-group superiority, thus viewing themselves and their in-groups as stronger than, and superior to, out-groups. Individuals who are low in Openness to Experience are more likely to stay away from people and situations that are new or unfamiliar to them. An avoidance and dislike of novel and unfamiliar things may cause people to view out-groups with hostility, which may then fuel bias and prejudice towards others. Additionally, those who are low in Openness would be less open to violating norms and values that they adhere to and may view out-groups as violators, causing them to develop negative attitudes towards these out-group members (Sibley & Duckitt, 2008; Federico & Aguilera, 2019). Federico and Aguilera (2019) argue that conscientiousness is involved in racial prejudice because individuals high in conscientiousness possess traits that may orient them towards more conservative values, such as enjoying order and upholding obligations and duties. People who are high in conscientiousness may therefore be more hyper-aware and hypercritical of others' ability to live up to these meticulous standards and values.

Current Study

The present study explores the influence of implicit biases on close relationships. We investigated whether implicit biases influence the level of supports and stressors people perceive within relationships of various degrees of closeness. This builds on past research demonstrating that implicit biases lead to hostile and uncomfortable social interactions (Amodio & Devine, 2006; Dovidio et al., 2002; Jacoby-Senghor et al., 2015). Previous studies investigated this topic solely in the context of short-term interactions among strangers. We were interested in investigating whether these results extend to longer-term relationships, thus reducing the overall perceived quality of one's friendships. We chose to focus on three longer-term relationships of varying closeness: family (the closest relationship), friends, and acquaintances (the least close relationship). We chose these three types of long-term relationships as they have differing levels of closeness, which may influence how much influence implicit biases have on the quality of the relationship. Closer relationships may be less influenced by implicit biases (Scroggins et al., 2016).

To find support for the influence of implicit biases on friendships, we attempted to replicate previous research findings that showed evidence supporting the role of implicit racial biases in friendship group diversity. We sought to determine whether people with high implicit biases would have less ethnically diverse friendship groups than those with lower implicit biases. Previous studies looking at racial diversity and implicit biases tend to have a narrow definition of race. Our study utilizes implicit and explicit measures that were designed to provide a more inclusive and diverse concept of race, such as identifying nuances in racial backgrounds through the use of skin shades.

We looked at how personality traits are involved in implicit biases, friendship diversity, and relationship supports and stressors. Previous literature on this topic has focused on explicit measures of bias, such as self-reports. It is thus unknown whether personality traits influence one's implicit biases. Implicit bias has been shown to be very different from explicit bias (Dovidio et al., 2002; Daumeyer et al., 2019; Williams & Steele, 2019), and so it is thus important to compare the effect of personality traits on both implicit and explicit bias.

We decided to focus on the two traits of Agreeableness and Openness, as they are the traits with the most evidence supporting their involvement in prejudice (Federico & Aguilera, 2019; Sibley & Duckitt, 2008). Past studies on personality and prejudice have employed the five-factor model of personality. In contrast, our study measures personality using the HEXACO Personality Inventory, which measures an additional dimension: Honesty-Humility).

Hypotheses

Primary Hypotheses

1. There will be a stronger correlation between implicit bias scores and stressors as relationship distance increases.
2. There will be a stronger negative correlation between implicit bias scores and supports as relationship distance increases.

Secondary Hypotheses

3. Individuals with stronger implicit biases against darker skin will have low friendship group diversity.
4. Individuals who are low on openness and/or agreeableness will have strong implicit biases.

5. Individuals who are low on openness and/or agreeableness will have low friendship group diversity.
6. Individuals who are low on openness/and or agreeableness will have (i) high stressors and (ii) low perceived support in their relationships.

Method

Participants

Participants were recruited from York University's Undergraduate Research Participant Pool (URPP). Students received 1.5 academic course credits for 90 minutes of participation, which counted toward their course completion. Participants were required to have a sufficient understanding of English to properly understand and complete the necessary study materials. Additionally, access to a computer was required to complete the study, as tablet and phone access may have interfered with the display of the online study materials.

A total of 306 students completed the study, and 125 participants were excluded from the final data analyses due to implausible questionnaire responses (e.g., choosing the same answer for entire segments of questions, failing both attention checks, failure to complete the study). Another 21 students were excluded on the implicit bias measure if they had a response error rate of 35% or greater, or if more than 10% of their response latencies were less than 300ms (Greenwald et al., 2003; Steele & Lipman, 2023). The final study sample consisted of 160 students. The sample size for this study was chosen based on recommendations provided by simulation data testing possible scenarios (Wolf et al., 2013). The chosen sample size was deemed to be sufficient for moderately non-normally distributed data (Nevitt & Hancock, 2001). We aimed to have enough participants in our study to ensure that our hypotheses showed at least moderate evidence for the null or experimental hypothesis (i.e., $0.33 > \text{BF}_{10} > 3$). We planned, a

priori, to use a moderate evidence stopping rule to add additional participants. This was to be done if we were unsuccessful after our initial round of data collection. This study was approved by York University's Human Participants Review Committee (e2023-316). Consent was obtained using an online consent form agreement.

Design

This study utilized a within-subjects design. Counterbalancing was done by randomly assigning students to either group 1 or group 2 to eliminate order-effects during the Implicit Association Test portion. Group 1 was shown compatible pairs first and incompatible pairs second on the IAT, whereas group 2 was shown the reverse order. The random assignment of groups for the IAT did not affect the questionnaire portion of the study.

Materials

The study was primarily hosted through the online platform Qualtrics, with the Implicit Association Test portion hosted on Millisecond's Inquisit application. The questionnaire portion of the study was comprised of various smaller questionnaires to collect demographic, socioeconomic status, and friendship diversity data. In total, the completion of all materials was estimated to take around 90 minutes.

Implicit Association Test (IAT)

The Implicit Association Test (IAT) was used to measure implicit associations participants hold between a target concept and an evaluation (Greenwald et al., 1998). The IAT is the most widely used measure of implicit bias, and has a higher predictive validity than self-report measures for criterion related to interracial behaviours (Greenwald et al., 2009). The present study utilizes a modified version of the Race Implicit Association Test. The stimuli chosen for our Race Implicit Association Test was based on the Implicit Association Test used in

Project Implicit, which utilizes concept pairs of “Black vs. White” and “Good vs Bad” (Xu et al., 2014). However, instead of the words “Black” and “White”, our study used images of 24 different skin shades to convey inclusivity and capture a diverse racial spectrum. The concepts of “Good vs. Bad” follow the classic Implicit Association Test setup and are conveyed through words that are positively valenced (i.e., “joy”, “laughter”, “love”, “happy”, “wonderful”, and “friend”) or negatively valenced (i.e., “terrible”, “evil”, “horrible”, “agony”, “awful”, “nasty”; Xu et al., 2014; see Appendix A for the targets).

The Implicit Association Test consists of 7 blocks containing both practice and test trials, based on guidelines provided by Greenwald et al. (2003). The target word or image is shown in the center of the screen, while a header concept pair is shown in the top left and right corners (one word in each corner of the screen, both belonging to the same concept pair). Target words and images are shown in a randomized order with a new target appearing on every trial. The header pair displayed depends on what block/trial the participant is on. The side each word in the header pair is on will be counterbalanced across participants to ensure that the side words are viewed on do not influence participants’ answers (Lipman et al., 2021). The IAT contains two types of pairing trials – compatible and incompatible. Compatible pairing trials contain a pairing that is expected for people to have a bias towards, while incompatible pairing trials contain the opposite. In our race IAT, the pairings “Good or White” and “Bad or Black” are considered compatible pairings, as these concept pairs are consistent with pro-White and anti-Black biases. In contrast, “Good or Black” and “Bad or White” are considered incompatible pairings, as these concept pairs are inconsistent with pro-White and anti-Black biases.

Participants first complete two blocks, each containing 20 practice trials. In the first practice block, participants are told to press a computer key if the image is categorized as

“White”, and another key if the image is categorized as “Black”. In the second practice block, participants similarly categorize target words shown as either “Good” or “Bad”. Participants then complete two critical blocks, the first with 20 practice trials and the second with 40 real trials. In these critical blocks, participants categorize the target as either “Good or White” or “Bad or Black”. Next, participants are given an additional practice block that switches the order of the “Black” and “White” headers. Finally, participants complete two more critical blocks. These final critical blocks are similar to the first two critical blocks, except the pairings are reversed: targets are categorized as “Good or Black”, or “Bad or White” (see Appendix B for a visual demonstration of our race Implicit Association Test).

Based on previous studies utilizing the Implicit Association Test, a faster association between a target concept and an evaluation demonstrates that the specific pairing is more implicitly associated, thus providing evidence of an implicit bias (Greenwald et al., 1998; Nosek et al., 2002). Scores on the IAT test will be analyzed utilizing the Implicit *D* score, which represents the direction and strength of an association. The sign of the *D* score represents the direction, while the absolute value represents the strength. The *D* score represents the difference in a participant’s reaction time between compatible and incompatible pairing trials. A positive *D* score indicates that the participant had a faster reaction time during compatible pairing trials, which demonstrates a pro-White bias. Alternatively, a negative *D* score indicates that the participant had a faster reaction time during incompatible pairing trials, which demonstrates a pro-Black bias (Greenwald et al., 2003).

Wiseheart Socioeconomic Status Scale (WSESS)

The WSESS expands on the traditional socioeconomic scale model through the inclusion of both standard and novel socioeconomic and sociodemographic subscale measures. The

WSESS conceives of SES as multifaceted and includes social (socio-) issues, whereas traditional SES measures tend to leave out social aspects of SES and focus more on economic status factors, such as: education, income, and occupational prestige. The WSESS measures various aspects of a person's social, economic, and demographic characteristics through the use of 11 subscales in total. Participants were directed to complete the entirety of the WSESS. Each subscale within the WSESS instructs participants to rate their agreement with a series of statements using a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Overall, the WSESS subscales were shown to have moderate-to-strong reliability (Rowlin, 2020). We focused on the following relationship measures: family, close friends, and acquaintance supports and stressors. Each relationship subscale required participants to answer each question by reflecting on the last five years.

The "Family" subscale examines participants' families through 11 statements: 5 on perceived family supports, and 6 on perceived family stressors. Examples of statements on the "Family" WSESS subscale include: "I am satisfied with my family's attention to my emotional needs" and "I often feel burdened by the amount of caretaking I do for my family". Answers on the Family subscale were used to determine how much support and stress a participant feels within their family.

The "Close Friends" subscale examines the quality of participants' friendships through 10 statements: 5 on perceived friendship supports, and 5 on perceived friendship stressors. Examples of statements on the "Close Friends" WSESS subscale include: "I am satisfied with the amount of time I spend with my close friends" and "I often feel left out or ignored by my close friends". Answers on the Close Friends subscale were used to determine how much support and stress a participant feels within their friendships.

The “Acquaintance” subscale examines the quality of participants’ acquaintance relationships through 11 statements: 6 on perceived acquaintance supports, and 5 on perceived acquaintance stressors. Examples of statements on the “Acquaintance” WSESS subscale include: “I am satisfied with the encouragement I receive from my broader social network” and “I am often unhappy with the way I am treated by my broader social network”. Answers on the Acquaintance subscale were used to determine how much support and stress a participant feels within various acquaintance relationships (Wiseheart and Wiseheart, 2021).

Friendship Diversity

Pre-existing studies have utilized questionnaires to measure group diversity (Brigatti, 2011; Fischer, 2008; Hitti & Killen, 2015). In a study by Fischer (2008), group diversity was examined by measuring how close participants felt to various racial groups using a 10-point Likert scale. Similarly, Hitti and Killen (2015) used a 4-point Likert scale to look at how many ethnically diverse friends participants had, where 1 stood for “none” and 4 stood for “a lot”.

The present study used a modified version of Hitti and Killen’s (2015) Friendship Diversity Questionnaire. We chose to modify this questionnaire to better fit the goals of this study. This allowed us to expand our investigation of group diversity to different types of friendship groups, as not all friendship groups are similar. Expanding the original measure, we asked about the diversity of friendships at school and work, in their extracurricular activities, and their closest friendship group. Participants rated their agreement with statements relating to the diversity of various friendship groups they are involved in on a 7-point Likert scale, where 1 stands for “strongly disagree”, and 7 stands for “strongly agree”. An example of a statement on our Friendship Diversity Questionnaire is: “my friends at work are racially diverse”.

HEXACO-PI-R

Participants completed the HEXACO Personality Inventory - Revised (100 item version) (HEXACO-PI-R) to determine their scores over six personality dimensions - Honesty-Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience. The HEXACO-PI-R consists of 100 personality statements, where each statement corresponds to one of the six HEXACO personality dimensions. Participants were asked to rate how much the statement applied to their own personality on a 5-point Likert Scale ranging from 1 (strongly disagree) to 5 (strongly agree), with half of the items reverse-coded. Examples of statements on the HEXACO-PI-R include: “I would never accept a bribe, even if it were very large” (Honesty-Humility), “I sometimes can’t help worrying about little things” (Emotionality), “I rarely express my opinions in group meetings” (reverse-coded Extraversion), “I tend to be lenient in judging other people” (Agreeableness), “I clean my office or home quite frequently” (Conscientiousness), and “I don’t think of myself as the artistic or creative type” (reverse-coded Openness to Experience) (Lee & Ashton, 2018). The HEXACO-PI-PR has high reliability, with reliability that is considered comparable to other popular personality measures (e.g., the Five-Factor Model) (Henry et al., 2022).

Background Demographics Questionnaire

Participants were asked a range of demographic questions, including: age, gender identity, sex assigned at birth, race, ethnicity, degree of bilingualism, sexual orientation, years of education, highest education level, current occupation, social class, weekly hours worked, native language, and skin shades. To measure skin shades, participants were presented a skin shade chart consisting of images of hands depicting 24 different skin shades and were asked to choose which skin shades was the closest to their own skin shade from a drop-down menu list (see appendix c for skin shades).

Procedure

All materials in this study were collected electronically from December 2022 to July 2024. Consent to participate was obtained through an online form. Once consent was given, participants were redirected from Qualtrics to the Implicit Association Test. Students were instructed to install the Inquisit app platform to complete the assessment. Once the Implicit Association Test was completed, participants were redirected back to Qualtrics to complete the remaining questionnaires. Two attention checks were included in the questionnaire portion to gauge whether participants were properly reading questions. Once the study was completed, participants were granted credits and were provided with the researchers' contact information, as well as the opportunity to submit feedback on the study.

Results

All results were calculated using the statistical software JASP. Correlations were analyzed with Bayesian correlations. A D score was calculated for each participant prior to conducting analyses. D scores were calculated following guidelines outlined by Greenwald et al. (2003). On average, participants showed a pro-White bias ($M = .46$, $SD = .38$). We then conducted further exploratory analyses between participants' D scores and their skin shade. There was inconclusive evidence for an association between implicit bias and skin shade ($r = .175$, $BF_{10} = .920$). Here, a higher value indicates greater implicit bias in people with whiter skin shades.

Hypothesis 1: *There will be a stronger correlation between implicit bias scores and stressors as relationship distance increases.*

We conducted correlations between participants' implicit D scores and their family stressors, friendship stressors, and acquaintance stressors. There was evidence for a null

correlation between implicit bias and family stressors, ($r = .034$, $BF_{10} = .115$), implicit bias and friendship ($r = .025$, $BF_{10} = .109$), and implicit bias and acquaintance stressors ($r = .087$, $BF_{10} = .176$).

Hypothesis 2: *There will be a stronger negative correlation between implicit bias scores and supports as relationship distance increases.*

We conducted correlations between participants' implicit D scores and their family supports, friendship supports, and acquaintance supports. At final test, there was evidence for a null association between implicit bias and family support ($r = .037$, $BF_{10} = .117$), implicit bias and friendship support ($r = -.038$, $BF_{10} = .115$), and implicit bias and acquaintance supports ($r = -.060$, $BF_{10} = .134$).

Hypothesis 3: *Individuals with stronger implicit biases against darker skin will have low friendship group diversity*

A series of correlations were calculated between participants' implicit D scores and each friend diversity category: school friends, work friends, extracurricular friends, and close friends. There was evidence for a null association between implicit bias and: school friends diversity ($r = -.087$, $BF_{10} = .177$); work friends diversity ($r = -.067$, $BF_{10} = .142$); extracurricular friend diversity ($r = -.162$, $BF_{10} = .665$); and close friends diversity ($r = .088$, $BF_{10} = .179$).

Furthermore, there was evidence for a null correlation between implicit bias and overall friendship diversity (i.e., a combination of all friendship categories) ($r = -.058$, $BF_{10} = .132$).

Hypothesis 4: *Individuals who are low on openness and/or agreeableness will have strong implicit biases.*

Correlations were calculated between participants' implicit D scores and our main HEXACO traits, openness to experience and agreeableness. No correlation was found between

openness to experience and participants' implicit bias ($r = -.128$, $BF_{10} = .329$), nor was a correlation found for agreeableness and participants' implicit bias ($r = -.070$, $BF_{10} = .147$).

Hypothesis 5: *Individuals who are low on openness and/or agreeableness will have low friendship group diversity*

We ran correlations between the HEXACO personality traits and each friendship diversity type. First, we ran correlations between our HEXACO traits of interest, openness to experience and agreeableness, and friendship diversity. Starting with openness to experience, our analyses failed to show evidence of a strong association between openness and: school friends diversity ($r = .183$, $BF_{10} = 1.387$); work friends diversity ($r = .067$, $BF_{10} = .140$); extracurricular friends diversity ($r = .160$, $BF_{10} = .754$); and close friends diversity ($r = .029$, $BF_{10} = .105$). No correlation was found between openness and overall friendship diversity ($r = .082$, $BF_{10} = .168$).

We then analyzed agreeableness and friendship diversity. We found no evidence of correlations between agreeableness and: school friends diversity ($r = .147$, $BF_{10} = .544$); work friends diversity ($r = .035$, $BF_{10} = .109$); extracurricular friends diversity ($r = .001$, $BF_{10} = .099$); and close friends diversity ($r = -.025$, $BF_{10} = .104$). No correlation was found between agreeableness and overall friendship diversity ($r = .014$, $BF_{10} = .100$).

Hypothesis 6: *Individuals who are low on openness/and or agreeableness will have (i) high stressors and (ii) low perceived support in their relationships.*

We ran a series of correlations between stressors for each type of relationship and our HEXACO traits of interest, openness to experience and agreeableness. No correlations were found between family stressors and openness ($r = .062$, $BF_{10} = .135$), or family stressors and agreeableness ($r = .030$, $BF_{10} = .108$). When analyzing friendship stressors, we found no correlation between friendship stressors and openness ($r = .012$, $BF_{10} = .100$), or friendship

stressors and agreeableness ($r = .048$, $BF_{10} = .119$). When analyzing acquaintance stressors, we found no correlations between acquaintance stressors and openness ($r = .092$, $BF_{10} = .191$), or acquaintance stressors and agreeableness ($r = -.082$, $BF_{10} = .168$).

We then ran correlations between supports for each relationship type, and openness and agreeableness. We found no correlations between family supports and openness ($r = -.088$, $BF_{10} = .180$), and family supports and agreeableness ($r = -.019$, $BF_{10} = .104$). When analyzing friendship supports, no correlations between friendship supports and openness ($r = .058$, $BF_{10} = .129$), and friendship supports and agreeableness ($r = -.114$, $BF_{10} = .274$), were found. Finally, we ran correlations between acquaintance supports, and openness and agreeableness. No correlations were found between acquaintance supports and openness ($r = .061$, $BF_{10} = .132$), and acquaintance supports and agreeableness ($r = -.149$, $BF_{10} = .572$).

General Discussion

The present study sought to further our understanding of implicit biases by investigating how people's implicit biases impact various aspects of their different relationships. Utilizing the Implicit Association Test, we first examined whether participants held a pro-White skin bias. On average, participants had a faster reaction time when pairing Whiter skin shades with good words and Blacker skin shades with bad words, and a slower reaction time when pairing Whiter skin shades with bad words and Blacker skin shades with good words. These results are indicative of the presence of a pro-White skin bias in our sample. These results replicate previous findings demonstrating a pro-White bias in different populations (Dovidio et al., 1997; Dovidio et al., 2002; Gawronski et al., 2003; Hugenberg & Bodenhausen, 2004). Our results also extend our understanding of implicit racial bias by presenting different skin shades in the Implicit Association Test. Prior research on implicit racial biases has used the traditional version of the

race Implicit Association Test, which portrays Black and White through black and white faces. By capturing a wide range of Black and White skin shades, we were able to show that a pro-White bias still exists even when a spectrum of lighter and darker shades of White and Black skin are presented. We then explored whether implicit bias levels were influenced by a participant's skin shade and found inconclusive evidence for a correlation between implicit bias scores and skin shade of a participant. It is therefore unclear if a participant's skin shade correlates with the level of implicit bias.

Next, we investigated how implicit biases may manifest within relationships with differing degrees of closeness: family, friends, and acquaintances. We attempted to determine whether the adverse effects that implicit biases have for interactions between strangers would extend to longer-term relationships and influence their quality. We first explored the impact of implicit biases on relationship support by correlating implicit bias and scores on the WSESS Supports section for each relationship type. There were no strong relationships between implicit bias and these relationship supports, regardless of closeness. We then conducted a similar set of analyses using the WSESS stressors section for each relationship type. Once again, we found no strong relationships between implicit bias and relationship stressors. These two sets of results indicate that implicit bias does not influence the level of supports and stressors perceived for relationships with family, friends, and acquaintances. Thus, implicit biases do not seem to negatively affect the quality of relationships across varying degrees of closeness.

We then attempted to replicate prior research by exploring whether people with stronger anti-Black implicit biases have less diverse friendships. Correlations between implicit bias and friendship diversity did not reveal any strong associations, across all friend groups (i.e., school friends, work friends, extracurricular friends, close friends, and overall). Interestingly, there was

no strong relationship between implicit bias and friendship diversity for any of the friendship groups. The lack of a correlation between implicit bias and friendship diversity could be due to the diversity of the sample used. The sample chosen for this study came from a highly diverse school (York University) within a diverse city (Toronto), and participants may therefore have diverse friend groups regardless of whether they have high implicit biases or not.

Another goal of this study was to investigate a possible determining factor of implicit biases - personality traits. To accomplish this, we analyzed correlations between implicit bias scores and personality traits using the HEXACO model. We focused on agreeableness and openness as they are the most traits most commonly linked to prejudice and explicit bias in prior research (Federico & Aguilera, 2019; Harris & Vazire, 2016; Ng et al., 2021; Scroggins et al., 2016; Sibley & Duckitt, 2008). No significant correlations were found between implicit biases and agreeableness or openness. Although there is research showing a relationship between personality traits and explicit bias, our results show that personality may not be a factor in implicit biases. This result further demonstrates that there are major differences between explicit and implicit biases. Explicit and implicit biases may have vastly different contributing factors, and what is related to one form of bias may not be applicable in another form of bias. As the causes and effects of explicit and implicit biases differ, more research should be conducted to determine other possible contributing factors for implicit biases.

We then looked at whether the traits agreeableness and openness were correlated with friendship diversity. Correlation analyses were conducted between participants' diversity scores in each friendship category, and agreeableness and openness. There were no strong relationships between friendship diversity and agreeableness, nor openness, across all friendship groups.

Our final goal was determining whether personality traits, specifically agreeableness and openness, are involved in how much support and stressors a participant perceives in each relationship group. Specifically, we looked at whether high agreeableness and/or low openness would cause more stressors and less perceived support in each of their relationships, as well as whether the level of perceived support and stressors differed based on relationship closeness. To accomplish this, we conducted correlations looking at the relationship between supports and stressors in each relationship type and the HEXACO personality traits agreeableness and openness. We did not find significant relationships between stressors and supports for any of the three relationship types, and neither for openness nor agreeableness. A participants' level of openness and agreeableness is therefore not related to how much support and stressors they perceive within their relationships.

Challenges and Limitations

The Sample

One major limitation in this study was the sample. All participants in this study were recruited using the York University undergraduate research participant pool. Many previous studies investigating the impact of implicit biases within social interactions and relationships have used racially homogenous samples in their studies, such as using only White participants (Dovidio et al., 1997; Dovidio et al., 2002; Gawronski et al., 2003). York University is incredibly diverse, and the diversity in our sample could explain the lack of negative influence of implicit biases on social relationships. For instance, students at York University have greater exposure to various racial groups, and therefore may have more diverse friendship groups, even if they hold high implicit biases. Thus, York University's undergraduate research pool may not be ideal for studying implicit biases in relationships.

Our study included 24 different skin shades for participants to choose from. Although this approach provides diversity in terms of response options, categorizing these skin shades into a few sub-groups may be a useful future approach.

The Data

A main challenge of our study relates to various issues regarding the data itself. Participants were given two attention checks to determine whether they were paying attention. Both attention checks told participants to select a specific answer to show that they were paying attention. A total of 39 participants failed attention check one and 80 participants failed attention check two. Out of these 119 participants who failed attention checks, 21 participants failed both attention checks. Participants who had failed either or both attention checks were removed from the data. Failed attention checks are a cause for major concern as they indicate that the participant has failed to properly read or understand what the question is asking of them. A lack of attention towards questions can thus skew results. To solve this issue, we used several methods to eliminate careless responding (i.e., attention checks and break reminders). These strategies ensured that inattention was not an issue in the sample we analyzed, thus giving us higher quality data.

Another major data-related issue is implausible questionnaire responses. We included many questions in our questionnaires that were reverse-coded or related to other questions to determine if participants were answering in a plausible manner. There were many instances in which participants' responses were implausible. A common implausible response pattern we noticed during data cleaning was responding to multiple questions or entire sections with the same answer, even if those questions were about opposing ideas. An example of this problem is a participant answering every question in a section with "strongly agree", even if that answer does

not make sense with answers to previous questions. Implausible data creates many issues, such as skewing results and calling into question the reliability of the rest of a participant's answers. This issue may result from not understanding a question or a lack of attention toward the questionnaire. Participants with large amounts of implausible data were excluded from the final analyses. Our decision to remove careless responding enhances data quality rather than harming it, as careless responding can cause spurious correlations when conducting analyses, such as inflated or spontaneously created effects (Stosic et al., 2024).

Implicit Association Test Stimuli

The traditional version of the race Implicit Association Test hosted on the Project Implicit website uses photographs of humans as targets to represent race. In our version of the race Implicit Association Test, we chose to use drawings of hands with various skin tones to represent race. It is possible that due to the use of hands instead of human faces, race was not properly evoked. Instead of perceiving the hands as representative of various skin shades belonging to different ethnic and racial groups, participants may have perceived them simply as different shades without any connection to skin colour. Furthermore, using drawings instead of real photographs may have removed some realism from the task as participants may have viewed the hands as solely belonging to cartoon drawings rather than representative of real humans. This may have caused a further disconnect between what we were attempting to evoke in our Implicit Association Test (i.e., different skin shades belonging to humans) versus what was perceived by participants (e.g., colours belonging to drawings). It is also possible that our stimuli reflected colourism, rather than racism. As participants had to categorize different shades of cartoon hands into the categories “White” and “Black”, the sense of race may not have been evoked at all.

Instead, participants may have completed the IAT while thinking of the stimuli in terms of colours.

Conclusion and Future Directions

This study attempted to increase our understanding of implicit biases and how these biases influence various factors within different types of long-term relationships. Previous studies have focused on implicit biases in the context of strangers, and explicit biases. This study addressed major gaps in the research, including: how implicit biases impact long-term relationships, how implicit biases reduce diversity within different types of friendships, and the effects of personality on implicit biases.

The limitations of our study contribute to many interesting avenues for future research that can further our understanding of implicit biases, their influence within social dynamics, and what factors contribute to an anti-black implicit bias. Firstly, it is important that different types of populations are investigated, as not all populations will demonstrate similar levels of bias and diversity. Not all populations are as diverse as the population we chose for our sample, and varying levels of diversity may have a large impact on how implicit biases influence relationships. For instance, future research could investigate implicit biases and relationships using a sample taken from a more racially-homogenous population, as a population of that nature may have higher implicit biases, less friendship diversity, and possibly a more adverse influence on relationships.

Our study used an innovative version of the race Implicit Association Test, by employing different shades of skin to represent a diverse racial spectrum. However, there is a lot more research potential that can be explored using skin shades. Participants' skin shades can be examined in a more detailed way by analyzing singular skin shades or creating various skin

shade groups to investigate various exploratory differences based on certain skin shades. It is possible that certain skin shades lead to stronger implicit biases than others, and vast differences between participants could emerge even between skin shades that are similar to one another. Furthermore, although our Implicit Association Test included different shades, each shades were still grouped as either “White” or “Black”. Future research could investigate subtle nuances between skin shades by creating multiple versions of the IAT that each focus on a different set of skin shades. The use of multiple versions of the IAT for different shades can be used to investigate implicit biases related to colourism: for instance, how people’s implicit biases differ with lighter and darker skin within the same race (Hunter, 2007).

Differences in results may emerge based on what medium is chosen as the IAT target. To represent skin shade, our targets were created by using a blank template of an outline drawing of a hand and filling in 24 hands different hands to showcase all 24 of our skin shades. Using both real photographs and faces, as done in the traditional race IAT, may be a better alternative to assess people’s implicit biases towards skin shades and to accurately study racism rather than colourism. By using faces, race may be more strongly evoked, and participants may have stronger reaction to the target stimuli than if they were seeing a single detached body part. Using target stimuli of real images rather than drawings may also contribute to stronger reactions within participants as this may evoke a heightened sense of realism, as participants’ biases will reflect skin shades on actual humans rather than cartoon images. Future researchers could accomplish this by implementing AI technology, such as DeepAI’s text to image generator, to generate sets of AI images showing people of different skin colours and racial combinations. Another potential research exploration is to investigate what differences emerge based on the type of stimuli, such as an IAT involving cartoons versus real images, and IATs with skin shade

represented on different body parts. This information can be used to determine the best types of target stimuli that can be used to improve future skin shade IATs.

We chose to focus on personality as a potential contributor within implicit bias due to prior research showing a relationship between certain personality traits and explicit biases (Federico & Aguilera, 2019; Harris & Vazire, 2016; Ng et al., 202; Scroggins et al., 2016; Sibley & Duckitt, 2008). There are many other factors that may greatly contribute towards a person's implicit biases, and it is important to determine not only what those factors are, but how they contribute to implicit bias. Discovering different contributing factors of implicit biases can help further our understanding of how implicit biases differ from explicit biases, as different mechanisms may be at play during the formation of a person's biases. Furthermore, gaining insight into different causes of implicit biases can assist in determining how and if these biases can be manipulated and, most importantly, lessened. Implicit biases largely exist outside of one's awareness and are thus difficult to control (Dovidio et al., 2002; Daumeyer et al., 2019; Williams & Steele, 2019). If researchers can figure out more explanations as to what causes these biases, it is possible to target these biases at the source and potentially limit the level of bias and the impact that they have.

References

Aberson, C. L., Shoemaker, C., & Tomolillo, C. (2004). Implicit bias and contact: The role of interethnic friendships. *The Journal of Social Psychology, 144*(3), 335-347.

<https://doi.org/10.3200/SOCP.144.3.335-347>

Amodio, D. M., & Devine, P. G. (2006). Stereotyping and Evaluation in Implicit Race Bias:

Evidence for Independent Constructs and Unique Effects on Behavior. *Journal of*

Personality and Social Psychology, 91(4), 652-661.

<https://doi.org/10.1037/0022-3514.91.4.652>

Antonoplis, S., & John, O. P. (2022). Who has different-race friends, and does it depend on context? Openness (to other), but not agreeableness, predicts lower racial homophily in

friendship networks. *Journal of Personality and Social Psychology, 122*(5), 894-919.

<https://doi.org/10.1037/pspp0000413>

Brigatti, L. C. M. (2011). *White racial identity, friendship group diversity, and multicultural tolerance as predictors of white college students' interpersonal adjustment* (Publication

No. 3475171) [Doctoral dissertation, Fordham University]. ProQuest Dissertations

Publishing.

Daumeyer, N. M., Onyeador, I. N., Brown, X., & Richeson, J. A. (2019). Consequences of

- attributing discrimination to implicit vs. explicit bias. *Journal of Experimental Social Psychology*, 84, 103812. <https://doi.org/10.1016/j.jesp.2019.04.010>
- Dovidio, J. F., Kawakami, K., & Gaertner, S. L. (2002). Implicit and explicit prejudice and interracial interaction. *Journal of Personality and Social Psychology*, 82(1), 62-68. <https://doi.org/10.1037/0022-3514.82.1.62>
- Dovidio, J. F., Kawakami, K., Johnson, C., Johnson, B., & Howard, A. (1997). On the nature of prejudice: Automatic and controlled processes. *Journal of Experimental Social Psychology*, 33(5), 510–540. <https://doi.org/10.1006/jesp.1997.1331>
- Federico, C. M., & Aguilera, R. (2019). The distinct pattern of relationships between the Big Five and racial resentment among white Americans. *Social Psychological and Personality Science*, 10(2), 274-284. <https://doi.org/10.1177/1948550617752063>
- Fischer, M. (2008). Does campus diversity promote friendship diversity? A look at interracial friendships in college. *Social Science Quarterly*, 89(3), 631-655. <https://doi.org/10.1111/j.1540-6237.2008.00552.x>
- Fritz, M. S., & MacKinnon, D. P. (2007). Required sample size to detect the mediated effect. *Psychological Science*, 18(3), 233-239. <https://doi.org/10.1111/j.14679280.2007.01882.x>
- Gawronski, B., Geschke, D., & Banse, R. (2003). Implicit bias in impression formation:

Associations influence the construal of individuating information. *European Journal of Social Psychology*, 33(5), 573–589. <https://doi.org/10.1002/ejsp.166>

Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality and Social Psychology*, 74(6), 1464–1480. <https://doi.org/10.1037/0022-3514.74.6.1464>

Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2003). Understanding and using the Implicit Association Test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology*, 85(2), 197–216. <https://doi.org/10.1037/0022-3514.85.2.197>

Greenwald, A. G., Poehlman, T. A., Uhlmann, E. L., & Banaji, M. R. (2009). Understanding and Using the Implicit Association Test: III. Meta-Analysis of Predictive Validity. *Journal of Personality and Social Psychology*, 97(1), 17–41. <https://doi.org/10.1037/a0015575>

Harris, K., & Vazire, S. (2016). On friendship development and the Big Five personality traits. *Social and Personality Psychology Compass*, 10(11), 647–667. <https://doi.org/10.1111/spc3.12287>

Henry, S., Thielmann, I., Booth, T., & Möttus, R. (2022). Test-retest reliability of the HEXACO 100—And the value of multiple measurements for assessing reliability. *PLoS ONE*, 17(1). <https://doi.org/10.1371/journal.pone.026246>

- Hitti, A., & Killen, M. (2015). Expectations about ethnic peer group inclusivity: The role of shared interests, group norms, and stereotypes. *Child Development, 86*(5), 1522-1537.
10.1111/cdev.12393
- Hugenberg, K., & Bodenhausen, G. V. (2004). Ambiguity in social categorization: The role of prejudice and facial affect in race categorization. *Psychological Science, 15*(5), 342–345.
<https://doi.org/10.1111/j.0956-7976.2004.00680.x>
- Hunter, M. (2007). The Persistent Problem of Colorism: Skin Tone, Status, and Inequality. *Sociology Compass, 1*(1), 237-254. <https://doi.org/10.1111/j.1751-9020.2007.00006.x>
- Jacoby-Senghor, D. S., Sinclair, S., & Smith, C. T. (2015). When Bias Binds: Effect of Implicit Outgroup Bias on Ingroup Affiliation. *Journal of Personality and Social Psychology, 109*(3), 415-433. <https://doi.org/10.1037/a0039513>
- Lee, K., & Ashton, M. C. (2018). Psychometric properties of the HEXACO-100. *Assessment, 25*, 543-556.
- Lipman, C., Williams, A., Kawakami, K., & Steele, J. R. (2021). Children's spontaneous associations with targets who differ by race and emotional expression. *Developmental Psychology, 57*(7), 1094-1110. <https://doi.org/10.1037/dev0001199>
- McConnell, A. R., Leibold, J. M. (2001). Relations among the Implicit Association Test,

discriminatory behaviour, and explicit measures of racial attitudes. *Journal of Experimental Social Psychology*, 37(5), 435-442.

<https://doi.org/10.1006/jesp.2000.1470>

McCrae, R. R., & John, O. P. (1992). An introduction to the Five-Factor Model and its applications. *Journal of Personality*, 60(2), 175-215.

<https://doi.org/10.1111/j.1467-6494.1992.tb00970.x>

Nevitt, J., & Hancock, G. R. (2001). Performance of bootstrapping approaches to model test statistics and parameter standard error estimation in structural equation modeling.

Structural Equation Modeling, 8(3), 353-377.

https://doi.org/10.1207/S15328007SEM0803_2

Ng, D. X., Lin, P. K. F., Marsh, N. V., Chan, K. Q., & Ramsay, J. E. (2021). Associations between openness facets, prejudice, and tolerance: A scoping review with meta-analysis.

Frontiers in Psychology, 12, 1-23. <https://doi.org/10.3389/fpsyg.2021.707652>

Nosek, B. A., Banaji, M. R., & Greenwald, A. G. (2002). Harvesting implicit group attitudes and beliefs from a demonstration website. *Group Dynamics, Theory, Research, and Practice*,

6(1), 101-115. <https://doi.org/10.1037/1089-2699.6.1.101>

Øverup, S. C., & Neighbors, C. (2016). Self-presentation as a function of perceived closeness

- and trust with romantic partners, friends, and acquaintances. *The Journal of Social Psychology*, 156(6), 630-647. <http://dx.doi.org/10.1080/00224545.2016.1152215>
- Rowlin, V. (2020). *Socio-Economic Status Scale Validation Study*. [Master's thesis, York University]. York University Electronic Theses and Dissertations. <http://hdl.handle.net/10315/37903>
- Scroggins, W. A., Mackie, D. M., Allen, T. J., & Sherman, J. W. (2016). Reducing prejudice with labels: Shared group memberships attenuate implicit bias and expand implicit group boundaries. *Personality and Social Psychology Bulletin*, 42(2), 219-229. <https://doi.org/10.1177/0146167215621048>
- Shelton, J. N. (2000). A reconceptualization of how we study issues and racial prejudice. *Personality and Social Psychology Review*, 4(4), 374-390. https://doi.org/10.1207/S15327957PSPR0404_6
- Sibley, C. G., & Duckitt, J. (2008). Personality and prejudice: A meta-analysis and theoretical review. *Personality and Social Psychology Review*, 12(3), 248–279. <https://doi.org/10.1177/1088868308319226>
- Steele, J. R., & Lipman, C. (2023). Children's implicit attitudes toward targets who differ by race and gender. *Developmental Psychology*. 59(5), 908-917.

<https://doi.org/10.1037/dev0001505>

Stosic, M. D., Murphy, B. A., Duong, F., Fultz, A. A., Harvey, S. E., & Bernieri, F. (2024).

Careless responding: Why many findings are spurious or spuriously inflated. *Advances in Methods and Practices in Psychological Science*, 7(1), 1-19.

<https://doi.org/10.25384/SAGE.c.7124141.v1>

Williams, A. & Steele, J. R. (2019). Examining children's implicit racial attitudes using

exemplar and category-based measures. *Child Development*, 90(3), e322–e338.

<https://doi.org/10.1111/cdev.12991>

Wiseheart, M., & Wiseheart, S. (2021, November). *Validation of the Wiseheart Socioeconomic*

Status Scale. Paper presented at the Psychonomic Society Annual Meeting, New Orleans, LA.

Wolf, E. J., Harrington, K. M., Clark, S. L., & Miller, M. W. (2013). Sample size requirements

for structural equation models: An evaluation of power, bias, and solution propriety.

Education and Psychological Measurement, 76(6), 913-934.

<https://doi.org/10.1177/0013164413495237>

Xu, K., Nosek, B., & Greenwald, A. G. (2014). Psychology data from the race implicit

association test on the project implicit demo website. *Journal of Open Psychology Data*,

2(1), 2-3. <http://dx.doi.org/10.5334/jopd.ac>

Appendix A: Target Stimuli for the Implicit Association Test

Category	Item
Good	Joy, Laughter, Love, Happy, Wonderful, Friend
Bad	Terrible, Evil, Horrible, Agony, Awful, Nasty
White	
Black	

Appendix B: Visual Demonstration of the race Implicit Association Test

Implicit Association Test

In this task you will press the 'E' key (left response key) or the 'I' key (right response key) to categorize words and pictures into groups as fast as you can. Here are the four groups and the words and pictures that belong to them:

Category	Item
Good	Joy, Laughter, Love, Happy, Wonderful, Friend
Bad	Terrible, Evil, Horrible, Agony, Awful, Nasty
White	
Black	

The task has 7 parts and the instructions change for each one. Pay attention!

Press [space] to continue

White

Black

Put your left finger on the 'E' response key for items that belong to the category 'White'.

Put your right finger on the 'I' response key for items that belong to the category 'Black'.

Items will appear one-by-one in the middle of the screen.

If you make an error, a red X will appear - to continue, press the other response key.

Go as fast as you can while making as few errors as possible.

Press the SPACE BAR to begin.

White

Black



If you make an error, a red X will appear. Press the other key to continue.

Good

Bad

Put your left finger on the 'E' response key for items that belong to the category 'Good'.
Put your right finger on the 'I' response key for items that belong to the category 'Bad'.

If you make an error, a red X will appear - to continue, press the other response key.

Go as fast as you can while making as few errors as possible.

Press the SPACE BAR to begin.

Good

Bad

Happy

If you make an error, a red X will appear. Press the other key to continue.

Good

Bad

Laughter

X

If you make an error, a red X will appear. Press the other key to continue.

Good
or
White

Bad
or
Black

Press the left 'E' key for 'Good' and 'White'.
Press the right 'I' key for 'Bad' and 'Black'.

Each item belongs to only one category.

If you make an error, a red X will appear - to continue, press the other response key.

Go as fast as you can while making as few errors as possible.

Press the SPACE BAR to begin.



Good
or
White

Bad
or
Black

Horrible

If you make an error, a red X will appear. Press the other key to continue.

Good
or
White

Bad
or
Black



If you make an error, a red X will appear. Press the other key to continue.

Black

White

Attention! The labels have changed sides.

Press the left 'E' key for 'Black'.

Press the right 'I' key for 'White'.

Go as fast as you can while making as few errors as possible.

Press the SPACE BAR to begin.



Good

or

Black

Bad

or

White

Friend

If you make an error, a red X will appear. Press the other key to continue.

Appendix C: Skin Shade Chart

Which shade is the **closest** to your skin colour?

