THE EFFECT OF STEREOTYPE THREAT IN POLICE ENCOUNTERS ON

AFFECTIVE AND BEHAVIORAL OUTCOMES

_____

A Dissertation

Presented to

The Faculty of the Department of Psychology and Philosophy

Sam Houston State University

_____

In Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

_____

by

Anna Abate

May, 2021

THE EFFECT OF STEREOTYPE THREAT IN POLICE ENCOUNTERS ON

AFFECTIVE AND BEHAVIORAL OUTCOMES

by

Anna Abate

_____

APPROVED:

Amanda Venta, PhD
Committee Director

Craig Henderson, PhD
Committee Co-Director

Chelsea Ratcliff, PhD
Committee Member

Danielle Boisvert, PhD
Committee Member

James Harper, PhD
Committee Member

Chien-Pin Li, PhD
Dean, College of Humanities and Social
Sciences

ABSTRACT

Abate, Anna, *The effect of stereotype threat in police encounters on affective and behavioral outcomes*. Doctor of Philosophy (Clinical Psychology), May, 2021, Sam Houston State University, Huntsville, Texas.

Black and Hispanic individuals experience disproportionate levels of police contact and it has been hypothesized that stereotype threat—the fear of confirming negative stereotypes about one's group—negatively influences police-minority interactions. It is well documented that experiencing stereotype threat has negative behavioral, affective, cognitive, and health consequences—possibly accounting for disparities in physical/mental health outcomes among racial/ethnic minorities. Thus, the broad aim of this study was to examine the role stereotype threat may play in racial/ethnic minority group interactions with police officers.

Using a sample of 142 male college students, the current study examined (a) whether the relation between stereotype threat induction in a legal context and aggressive behavior/negative affective states is mediated by cortisol and testosterone levels, (b) whether previously documented relations between stereotype threat induction and aggressive behavior/negative affective states is mediated by dysfunction in social cognition, and (c) whether race/ethnicity act as a moderator of the stereotype threat effect. Overall, results did not indicate significant relations among the variables of interest. However, a marginally significant moderation effect of race/ethnicity on the relation between stereotype threat and social cognition was found such that, in the stereotype threat induction group, BIPOC status was related to improved social cognition whereas no such relation was found in White participants.

The absence of support for hypotheses may be a result of the experimental design, such as small sample and group sizes, a college student sample, measurement issues, or lack of stereotype threat activation. These results may also be due to the possibility that stereotype threat is not as robust in legal encounters as it is in educational settings. Regardless, these results provide important information for future studies.

KEY WORDS: Stereotype threat; Police encounters; Cortisol; Testosterone; Social cognition; Aggression; Affective states

TABLE OF CONTENTS

CHAPTER I

Introduction

Racial/ethnic disparities are evident in both physical and mental health as well as in the criminal justice system (August & Sorkin, 2010; Landrine & Klonoff, 1996; Thoits, 2010; Williams et al., 1997). First, in terms of physical health, Black Americans are at higher risk for early death (Mays, Cochran, & Barnes, 2007) and disease (August & Sorkin, 2010; S. K. Davis, Liu, & Gibbons, 2003; Mays et al., 2007; Mensah, Mokdad, Ford, Greenlund, & Croft, 2005). In terms of mental health, while minorities tend to report lower rates of mental disorders, there are subtle disparities (Asnaani, Richey, Dimaite, Hinton, & Hofmann, 2010; McGuire & Miranda, 2008), such that minorities tend to have more negative outcomes from psychological symptoms (Williams et al., 2007). Perceived racial or ethnic discrimination is receiving increased empirical attention as a class of stressors that could have negative consequences for health among Black and Hispanic individuals (Williams, Neighbors, & Jackson, 2003). For instance, studies have examined the relation between discrimination and daily moods among multi-ethnic U.S. adults (Broudy et al., 2007) and discrimination and conduct problems among adolescents (Brody et al., 2006). In addition, recent research has linked perceived discrimination to multiple forms of violence (Choi, Harachi, Gillmore, & Catalano, 2006). For the current study, the link between discrimination and health highlights the potential public health impact of examining minorities' biological reactions to a hypothetical police encounter.

Second, racial/ethnic disparities have been documented in police contact and involvement in the criminal justice system. It is well documented that racial and ethnic minorities are overrepresented in criminal justice settings and experience increased police

contact (Crutchfield, Skinner, Haggerty, McGlynn, & Catalano, 2012; McNulty & Bellair, 2003; Rattan, Levine, Dweck, & Eberhardt, 2012; Weitzer & Tuch, 2004), particularly adverse police contact (Brunson, 2007; Rosenbaum, Schuck, Costello, Hawkins, & Ring, 2005) supporting minorities' beliefs that officers engage in racial profiling, discrimination, and bias (Kahn, Lee, Renauer, Henning, & Stewart, 2017). For instance, using data from pedestrian stops, researchers found Black and Hispanic individuals were disproportionately stopped, after controlling for precinct variability and race-specific estimates of crime (Gelman, Fagan, & Kiss, 2007). Research on arrest decision-making has found that race has a direct impact on decisions to arrest, with Black and non-White suspects arrested more often (Kochel et al., 2011; Smith, Visher, & Davidson, 1984). Using data from police–citizen interaction cases, Avdija (2014) found that Black suspects were 1.68 times aned Hispanic suspects were 1.73 times more likely to be frisked by the police compared with White suspects. In addition, research has found that police stops and search decisions in general suffer from racial bias, such that Black drivers were less likely to be stopped after sunset, when a 'veil of darkness' masks race and that police use a lower evidentiary bar when making search decisions regarding black and Hispanic drivers compared to white drivers (Pierson et al., 2020). Relatedly, minorities and males have more negative attitudes toward police compared to Whites and females (Engel, 2003).

In efforts to explain police-minority interactions, it has been hypothesized that social identity threats, the feeling that you will be treated differently based on your social identity (e.g., race) may negatively influence these interactions (Kahn et al., 2017; Najdowski, Bottoms, & Goff, 2015; Richardson, 2015) and bring about deleterious

mental health outcomes. Empirical evidence suggests that negative health outcomes (e.g., psychological distress, aggression, increased blood pressure, and the common cold) for racial/ethnic minorities may result from intrapersonal experiences of stereotype threat, a subset of social identity threat (Blascovich, Spencer, Quinn, & Steele, 2001; Inzlicht & Kang, 2010). Stereotype threat, operationalized as the fear of confirming negative stereotypes about one's own group, has negative effects on cognitive function (Beilock, Rydell, & McConnell, 2007; Blascovich et al., 2001) and mental health, such as anxiety (Bosson, Haymovitz, & Pinel, 2004) and aggression (Inzlicht & Kang, 2010). For example, Inzlicht and Kang (2010) found that participants in a stereotype threat condition were significantly more aggressive following the procedure. Research has also demonstrated physiological markers of anxiety following stereotype threat, such as increased blood pressure and non-verbal behaviors (e.g., fidgeting), as well as heightened activation in the ventral anterior cingulate cortex (vACC), a region implicated in social and emotional information processing (such as social cognition; Apps, Rushworth, & Chang, 2016) that plays a central role in processing negative social information (Krendl, Richeson, Kelley, & Heatherton, 2008). Krendl et al. (2008) theorized that stereotype threat may direct an individual's attention toward the negative social and emotional consequences of confirming negative stereotypes about their group, thereby increasing anxiety. However, no existing research measures psychophysiological responses to stereotype threat in police encounters, despite the high racial/ethnic discrepancies in this social sphere, and research has largely failed to address how stereotype threat in legal interactions relates to mental health (i.e., anxiety, depression, aggression) in minority individuals.

Only one study has examined how stereotypes that depict Black Americans as criminals affect the way participants experience encounters with police officers (Najdowski et al., 2015). Najdowski and colleagues (2015) proposed that during a police encounter, Black individuals might be concerned they will be judged and treated unfairly by police, in light of stereotypes regarding Black criminality. As Najdowski and colleagues (2015) describe, this reaction may have ironic effects on behavior which may inadvertently increase an individual's likelihood of confirming the stereotype (e.g., Steele & Aronson, 1995). In this study, researchers asked Black and White participants to report how they feel when interacting with police officers. As predicted, Black men, but not White men or women of any race, reported concern that police officers stereotype them as criminals due to their race. Next, they asked participants to imagine a vague police encounter and assessed the vignette's capacity to induce stereotype threat. Black men were significantly more likely than White men to report that the hypothetical police encounter induced stereotype threat. Finally, the authors documented racial differences in anticipated anxiety or the likelihood that they would feel anxiety when they encountered the police officer in the situation described. Overall, this study extended stereotype threat into the criminal justice domain and, critically, linked legal stereotype threat to mental health and anticipated behavior. The current study utilized Najdowski's paradigm while extending the study to not only measure anticipated anxiety but also behavioral and in-vivo affective consequences of stereotype threat. Further, the current study extended this paradigm to also include Hispanic young adults and test mechanisms underlying the link between the stereotype threat and mental health.

Similar to Najdowski and colleagues (2015), the proposed study suggests stereotype threat plays a role in racial/ethnic minorities' interactions with police officers. To illustrate this point, imagine the following scenario: a Black or Hispanic young adult male is walking down the street at 10:00 pm carrying a backpack filled with items from class. As he is walking, a police officer steps out of a corner convenience store, some ways in front of him. When the officer notices the young male, he stops and stands there, obviously watching as the young male approaches. This scenario was used by Najdowski et al. (2015) to induce stereotype threat. Given a history of discrimination, and consistent with the study's findings, a Black male is more likely to notice the police officer and may think that the officer is suspicious of him. In the current study, we empirically tested the downstream effects of this stereotype threat induction. Physiologically, upon stereotype threat activation, the young male may experience an increase in cortisol and/or social cognitive impairments that lead to feelings of anxiety. Repeated experiences like this could lead to dysregulation in the hypothalamic-pituitary-adrenal (HPA) axis (Miller, Chen, & Zhou, 2007), with consequences for mental and physical health (Faravelli et al., 2012; Gold et al., 2005; Keller, McCluskey, Morgan, & O'connor, 2006; Xiong & Zhang, 2013). However, a different outcome is possible. Perhaps the young male experiences an increase in a testosterone/cortisol ratio and/or impairment in social cognition (e.g., misinterpret the officer's face as aggressive) that lead to aggressive behavior. The aim of this study was to test mechanisms (i.e., neurobiology and social cognition) linking stereotype threat to subsequent mental health outcomes. Examining the mental health outcomes (i.e., negative affective states and aggression) as well as neurobiological and social cognitive processes at play in stereotype threat are high impact contributions;

findings would not only indicate that stereotype threat in legal settings may confer risk for more negative police-minority encounters but may deleteriously impact health in Hispanic and Black young adults.

Two theories suggest relations between confrontation with the threat and subsequent behavior (i.e., aggression) and affective states (i.e., anxiety and depression). First, the integrated process model of stereotype threat indicates that stereotype threat acts as an acute stressor that increases a physiological stress response, producing negative thoughts and feelings (Schmader, Johns, & Forbes, 2008). This model suggests that stereotype threat leads to impairment in prefrontal processing caused by activation of the HPA axis. Indeed, studies using physiological measures of stress-based arousal have supported a link between stereotype threat and physiological stress response (Schmader et al., 2008). Further, an increase in cortisol, a catabolic hormone that rises in response to psychological stressors (Dickerson & Kemeny, 2004; Lovallo & Thomas, 2000), has been linked to social identity threat (such as a suggestion that students at their university are less competent; Matheson & Cole, 2004). As stereotype threat is a form of social identity threat and a psychological stressor, it stands to reason that stereotype threat will increase levels of cortisol as well. While the current study will be the first to link increased cortisol to stereotype threat (Schmader et al., 2008), broader research indicates that physiological responses to stress negatively impact almost all of the body's processes and increase the risk for health problems (Djuric et al., 2008) and negative affective states, such as anxiety (Faravelli et al., 2012). Additionally, testosterone has been implicated in the effect of stereotype threat (Josephs, Newman, Brown, & Beer, 2003) as well as in aggressive behavior (Lansford, Malone, Dodge, Pettit, & Bates, 2010;

Montoya, Terburg, Bos, & van Honk, 2012; Terburg, Morgan, & van Honk, 2009). In particular, the dual-hormone hypothesis posits that the effect of testosterone on social behavior is moderated by cortisol, such that a high testosterone to cortisol ratio predicts social aggression (Terburg et al., 2009). This research underlies the first research aim: to examine whether the previously documented relation between stereotype threat and negative affective states is mediated by cortisol levels and if the relation between stereotype threat and aggression is mediated by the testosterone to cortisol ratio.

Second, the Social Information Processing (SIP) model and related studies (Dodge & Crick, 1990; Lansford et al., 2010) describe aggression and negative affective states as resulting from negative biases in the processing of social stimuli. This model describes the phases that an individual undergoes when interacting in social situations, such as perceiving and interpreting social cues, selecting a target outcome, and reacting with an appropriate response (Crick & Dodge, 1994). The model suggests that a deficit at any one of these phases could lead to an increased risk of aggressive behavior (Crick & Dodge, 1994). Although a majority of SIP research has been conducted with children and adolescents a significant amount of research has found similar processes in adults (Coccaro, Fanning, & Lee, 2017). For instance, studies have found that aggressive adults exhibit cognitive and emotional biases (Eckhardt & Cohen, 1997; Epps & Kendall, 1995). Similarly, studies in adults have shown that aggressive individuals show attentional bias toward aggression-themed words (Eckhardt & Cohen, 1997; Smith & Waterman, 2003) and tend to expect aggressive outcomes to ambiguous social interactions and tend to interpret others' ambiguous or neutral behavior as aggressive (Dill, Anderson, Anderson, & Deuser, 1997). SIP models have also been proposed as

being relevant for the understanding of negative affectivity, such as anxiety (Suarez & Bell-Dolan, 2001) and depression (Garber, Keiley, & Martin, 2002). Likewise, expansive literatures link impaired social cognition to increased behavioral and emotional maladjustment (Fonagy, Gergely, & Jurist, 2004). Thus, aggression and negative affective states (i.e., anxiety and depression) may result from anomalous social cognition, such as misinterpretations of others' intentions. Therefore, the current study examined whether dysfunction in social cognition— the cognitive processes of understanding, comprehending, explaining, predicting, and communicating behavior in terms of underlying mental states and emotions (Bateman & Fonagy, 2010)—drives this effect. In other words, the current study examined whether dysfunction in social cognition mediates the relation of stereotype threat (a stressful social situation) with negative affective states (i.e., anxiety and depression) and state aggression.

Together, the aims of this study represent several novel contributions. First, this study was first to test social cognition specifically as a cognitive domain that is negatively impacted by stereotype threat with downstream effects on mental health symptoms. This is particularly important given the expansive literature linking social cognitive deficits to a range of pathology and impaired psychosocial functioning. Second, few studies have examined the neurobiological effects of stereotype threat, and to date, no studies have examined whether the links between stereotype threat and behavior and affective states are mediated by physiology. Further, at present, the bulk of the literature is focused on stereotypes of Black Americans in educational or health care settings with relatively little attention to Hispanic individuals, or with any race in criminal justice settings. As it is well documented that racial and ethnic groups experience

disproportionate rates of police contact and racial bias within the justice system, it is important to examine how stereotype threat in this context may confer risk for psychopathology and behavioral outcomes. No study has explored the effect of stereotype threat in such a police encounter on cortisol, testosterone, social cognition, and psychopathology in racial/ethnic minority young adults. Therefore, there remains a critical need to examine the effect of stereotype threat on physiology and to uncover how stereotype threat in a legal context impacts mental health in minority young adults. By examining the impact of stereotype threat on neurobiological mechanisms (e.g., cortisol and testosterone), cognitive mechanisms (e.g., social cognition), behavior (e.g., aggression), and negative trait states via self-report (e.g., anxiety and depression), this innovative project was the first to examine the mechanisms associated with stereotype threat in a legal setting and how it may confer risk for mental health.

Overall, the results of this study have broad implications for mental health as well as future development of interventions. First, numerous psychiatric disorders can be linked to dysregulation in the HPA axis (Keller et al., 2006). Because experiences with stereotype threat may disrupt the HPA axis as evidenced by abnormal cortisol levels, this study may help elucidate an etiology of mental health disorders (i.e., anxiety disorders) for racial/ethnic minority young adults who face this unique stressor. Additionally, numerous health consequences are associated with dysregulation of the HPA axis and abnormal cortisol levels (Keller et al., 2006; Xiong & Zhang, 2013). By understanding the process by which stereotypes affect behavior, we are better equipped to alter those processes through interventions. For example, social cognitive interventions that help individuals reappraise stereotype threat inductions while also normalizing and validating

their experiences may decrease the likelihood of impaired social cognition. Further, interventions (e.g., community policing programs that emphasize building trust and relationships with members of the public) may be developed to attenuate Black and Hispanic young adults' experience of stereotype threat in police encounters. Additionally, this research may also help understand the social psychological processes that contribute to biases in the judicial system, an important step in improving racial equality. Specifically, innocent Black and Hispanic individuals may be targeted by police because of stereotype-threat-induced behavior and thus are at risk for miscarriages of justice (Davis & Leo, 2013; Norris & Bonventre, 2015).

Taken together, the broad aim of this study was to empirically test the downstream effects of stereotype threat induction (based on Najdowski et al., 2015). This study sought to test the mechanisms (i.e., neurobiology and social cognition) linking stereotype threat to subsequent mental health outcomes. First, this study sought to examine whether the previously documented relation between stereotype threat and aggression/negative affective states is mediated by cortisol and testosterone levels. Second, this study sought to examine whether dysfunction in social cognition mediates the relation between stereotype threat and negative affective states and state aggression. It was hypothesized that stereotype threat would have a direct effect on aggression and affect such that those who have experienced stereotype threat would show an increase in aggression and an increase in negative affectivity (higher anxiety, depression). It was further hypothesized that social cognition and cortisol/testosterone would mediate this relation; such that dysfunction in social cognition would mediate the relation with both aggression and affect; high testosterone to cortisol ratio would mediate the relation with

aggression; and increased cortisol would mediate the relation with negative affectivity. It was also hypothesized that the relation between stereotype threat and social cognition/hormones would be moderated by race/ethnicity, such that the effects would only occur for Hispanic and Black participants. Finally, it was hypothesized that the entire mediation would be moderated by race/ethnicity such that the model would only occur for Hispanic and Black participants.

CHAPTER II

Method

Participants

The inclusion criteria for participation in this study were males ages 18 to 26 years old who speak English and identify as either White, Black, or Hispanic. Participants were recruited via the Psychology Experimental Research Participation (PeRP) system at SHSU and through Criminal Justice and Psychology courses. Compensation was research credits in accordance with the amount of time spent completing the study, required by students enrolled in Psychology classes, or extra credit per specific courses. Participants were randomly assigned to the control or experimental condition through simple randomization. Specifically, participant identification numbers were randomly assigned to the two conditions prior the enrollment of participants using computer-generated random numbers.

In total, participants included 142 male college students, ages 18 to 26 with an average age of 19.71 (SD = 1.92). Using participants' self-perceived race, the racial/ethnic breakdown was as follows: 56 White, 33 Black, 48 Hispanic, and 5 "mixed race" young adults. However, using participants' "street race," the racial/ethnic breakdown was as follows: 65 White, 35 Black, 41 Hispanic, and 2 "mixed race" young adults. In terms of education, 38.5% of the participants had graduated high school, 18.9% had completed one year of college, 19.6% had completed two years of college, and 23.1% had completed three years of college. The breakdown of total combined family income for the past 12 months was as follows: 16.8% reported less than $25,000, 14.7% reported $25,000-$50,000, 10.5% reported $50,000-$75,000, 9.1% reported $75,000-

$100,000, 12.6% reported $100,000-$150,000, 11.2% reported greater than $150,000, 22.4% reported they did not know, and 2.1% declined to respond. In terms of types of communities in which the participants resided for a majority of their life, 16.1% stated "a large city," 38.5% stated "a suburb near a large city," 33.6% stated "a small city or town," 11.2% stated "a rural area."

The experimental condition consisted of 73 participants with an average age of 19.56 (*SD* = 1.68), and the "street race" racial/ethnic breakdown was as follows: 37 White, 16 Black, and 20 Hispanic young adults. In terms of education, 35.6% of the participants had graduated high school, 21.9% had completed one year of college, 24.7% had completed two years of college, and 17.8% had completed three years of college. The breakdown of total combined family income for the past 12 months was as follows: 17.8% reported less than $25,000, 15.1% reported $25,000-$50,000, 8.2% reported $50,000-$75,000, 9.6% reported $75,000-$100,000, 11.0% reported $100,000-$150,000, 12.3% reported greater than $150,000, 23.3% reported they did not know, and 2.7% declined to respond. In terms of types of communities in which the participants resided for a majority of their life, 9.6% stated "a large city," 43.8% stated "a suburb near a large city," 32.9% stated "a small city or town," 13.7% stated "a rural area."

The control condition consisted of 70 participants with an average age of 19.86 (*SD* = 2.13), and the "street race" racial/ethnic breakdown was as follows: 28 White, 19 Black, 21 Hispanic, and 2 "mixed race" young adults. In terms of education, 41.4% of the participants had graduated high school, 15.7% had completed one year of college, 14.3% had completed two years of college, and 28.6% had completed three years of college. The breakdown of total combined family income for the past 12 months was as follows:

15.7% reported less than $25,000, 14.3% reported $25,000-$50,000, 12.9% reported $50,000-$75,000, 8.6% reported $75,000-$100,000, 14.3% reported $100,000-$150,000, 10.0% reported greater than $150,000, 21.4% reported they did not know, and 1.4% declined to respond. In terms of types of communities in which the participants resided for a majority of their life, 22.9% stated "a large city," 32.9% stated "a suburb near a large city," 34.3% stated "a small city or town," 8.6% stated "a rural area."

Due to small sample sizes across racial/ethnic groups, the "street race" groups were dichotomized into White and BIPOC (Black, Indigenous and People of Color). As such, the experimental group condition had 37 White students and 36 BIPOC students. The control group had 28 White students and 42 BIPOC students.

Materials

Demographics

Descriptive characteristics of the participants were collected, including age, birth date, ethnic/racial background, socioeconomic status, and types of communities in which the participant has lived. In particular, participants were asked to identify their (1) "street race," or how they believe other "Americans" perceive their race at the level of the street; (2) socially assigned race, which refers to how they believe others usually classify their race in the United States; and (3) self-perceived race, or how they usually self-classify their race on questionnaires (López, Vargas, Juarez, Cacari-Stone, & Bettez, 2018). In fact, "street race" has been found to be associated with mental health, and as the current study examines mental health in the context of perceptions (i.e., stereotype threat), asking participants for their "street race" is important (López et al., 2018). Further, street race

has been described as a promising multidimensional measure of race for exploring

inequality (López et al., 2018). See Appendix A.

Aggression

Aggression was assessed in several ways, including both state and trait

aggression.

State Aggression. State aggression was assessed using the Point-Subtraction-

Aggression-Paradigm (PSAP) and handgrip strength.

Point-Subtraction-Aggression-Paradigm (PSAP). The PSAP was designed by

Cherek (1981) and is guised as an online computer game that participants play against a

fictitious opponent. Participants are told that the goal of the game is to earn as many

points as possible (Cherek, Moeller, Schnapp, & Dougherty, 1997; Geniole, MacDonell,

& McCormick, 2017). The current study used the task developed by Geniole, Busseri,

and McCormick (2013). Participants were told that they are paired with an opponent of

the same sex and that the goal of the game is to earn points; the participant presses a

button 100 consecutive times to earn a point. During the game, participants were

provoked by the fictitious player (i.e., the participant's points are stolen), which was

indicated to the participant by the point counter increasing in size, flashing several times

in red font, and decreasing by a point. Participants could continue to earn points and

ignore the opponent, or they could make one of two other button presses: the first of

which protects their points for a variable period of 0.5 to 45 seconds; the second of which

steals a point from the opponent. Participants were told that they do not keep stolen

points, and thus there is no incentive to retaliate. After a one-minute practice round,

participants completed one 10-minute round. Participants were automatically provoked

randomly (once every 6–60 seconds). The extent to which each participant was provoked also depended, in part, on the button presses made by the participant throughout the task; some button presses led to provocation-free time intervals (e.g., protect presses). The percentage of steals across the two rounds was used for statistical analyses as a measure of state aggression. Reliability and validity for this measure have been previously established (Geniole et al., 2013, 2017). Outliers were removed from analyses.

Handgrip Strength (HGS). Measurement of handgrip strength was conducted according to standard procedures recommended by the American Society of Hand Therapists (ASHT; Fess, 1992) and prior research (Gasior et al., 2018). The participants sat upright on a height-adjustable chair with their feet supported. The tested arm was positioned on a table with the shoulders slightly abducted (~10°) and neutrally rotated, the elbow in 90° of flexion, the forearm in 0° between pronation and supination, and the wrist in neutral resting position. The participants were instructed to maintain that position during the test. The HGS of both hands was measured using the Jamar® Plus+ Digital Hand Dynamometer (Patterson Medical, Warrenville, IL, USA). The Jamar included five different handle positions: I – 3.5 cm; II – 4.8 cm; III – 6.1 cm; IV – 7.3 cm; and V – 8.6 cm. Prior research has recommended handle position 2 as the standard position for measuring grip strength with the Jamar Plus+ hand dynamometer (Trampisch et al., 2012), and therefore, this position was used for all participants. The test always started with the dominant hand. A timed rest break of 30 seconds was given between each trial. Before each test, the verbal direction was given as follows: This task will measure your grip strength; please squeeze as hard as you can until I tell you to stop. Then the participants were asked to squeeze continuously for 2–3 seconds. The display of the

dynamometer was pointed toward the examiner, providing a measurement blinded to the participants. Handgrip strength was measured as the maximum voluntary contraction (kilo-grams) sustained for at least 3 seconds. Handgrip strength was measured prior to the stereotype threat procedure as well as following the stereotype threat procedure in accordance with the procedures outlined below.

Trait Aggression. Trait aggression was measured using the Brief Aggression Questionnaire (Webster et al., 2014).

The Brief Aggression Questionnaire. This 12-item measures asks participants to rate statements on a scale from 1 (extremely uncharacteristic of me) to 5 (extremely characteristic of me). Initial studies of this measure indicate adequate internal consistency (.80) and test-retest reliability over a 12-week interval (.66; Webster et al., 2015). Internal consistency in the current study was found to be acceptable ($\alpha = .76$). See Appendix B.

Social Cognition

Social cognition was assessed using a version of the Morphed Emotional Faces procedure (Heuer, Lange, Isaac, Rinck, & Becker, 2010; Joormann & Gotlib, 2006; Niedenthal, Halberstadt, Margolin, & Innes-Ker, 2000) developed by Heuer et al. (2010). Color pictures of 16 individuals (8 female, 8 male) were used to produce four movies of each individual, depicting a transformation ("morphing") from neutral expression to one of four emotions (i.e., angry, happy, disgust, surprise). The faces were selected from the IASLab Face Set, which contains diversity in the pictures. Each individual appeared four times, changing in expression from neutral to either angry, happy, disgust, or surprise. The software MorphX (http://www.norkross.com) was used to produce the movies. Thus,

64 100-second movies resulted, which always started with a neutral expression of an individual actor and gradually (1%-steps) changed into one of the expressions.

Participants were informed that a total of 64 short movies will be presented to them on a computer screen in random order, each starting with a neutral expression, gradually changing into an emotional expression. The participants were tasked with detecting the developing emotion as soon as possible (reaction time was recorded in milliseconds and then converted to seconds). They were instructed to stop the movie by pressing a marked number on the keyboard (1 = angry, 2 = contempt, 3 = disgust, 4 = happy, 5 = surprise). Contempt was chosen as an additional response category based on previous research (Heuer, Lange, Isaac, Rinck, & Becker, 2010) and to increase the probability of misinterpretations. After the key press, the next movie started. The order of the videos was randomized for all participants. The sequence of a trial was as follows: a black screen with a fixation cross appeared for 50 milliseconds before the movie started. When a key was pressed, reaction time and the key choice was recorded. The participants then saw a black screen with a fixation cross and the next video started. E-Prime software was used to present this task. Emotional accuracy was calculated as the ratio of accurate emotions to total videos; and emotional reaction time was recorded in milliseconds (and converted to seconds). Emotional reaction time scores were log-transformed to adjust for skewness.

Affective States

Affective state was assessed using the State-Trait Personality Inventory (STPI), an 80-item questionnaire that assesses both trait and state anxiety, depression, anger, and curiosity (Jacobs, Latham, & Brown, 1988; Spielberger, Gorsuch, & Lushene, 1970). The

STPI includes 10 items for assessing each trait anxiety, depression, anger, and curiosity (e.g., "I am quick tempered;" "I feel gloomy") and 10 items for assessing each state anxiety, depression, anger, and curiosity (e.g., "I am jittery;" "I feel curious"). All items are rated on a 4-point scale (e.g., "Not at all" to "Very much so"). Reliability and validity for this measure have been previously established (Jacobs et al., 1988; Van Wijk, 2014). Trait affect was examined as a covariate and state affect (specifically, state anxiety, depression, and anger) were used as outcome variables. Internal consistency in the current study was found to be acceptable: state anger, α = .92; state anxiety, α = .88; state curiosity, α = .72; state depression, α = .78; trait anger, α = .84; trait anxiety, α = .87; trait curiosity, α = .76; and trait depression, α = .90.

Personality

Participants were administered The Big Five Inventory (BFI), a 44-item self-report inventory designed to measure an individual on the Big Five Factors (dimensions) of personality (Goldberg, 1993): extraversion, agreeableness, conscientiousness, neuroticism, and openness. Items are rated on a 5-point scale from 1 (disagree strongly) to 5 (agree strongly). Test-retest reliability for the BFI subscales has been found to average .84 (Rammstedt & John, 2007). Further, internal consistency has been found to be acceptable: extraversion, α = .88; agreeableness, α = .79; conscientiousness, α = .82; neuroticism, α = .84; and openness, α = .81 (Benet-Martínez & John, 1998). See Appendix C. Similarly, internal consistency in the current study was found to be acceptable: extraversion, α = .87; agreeableness, α = .67; conscientiousness, α = .73; neuroticism, α = .77; and openness, α = .71.

History of Discrimination

Previous experiences with discrimination were measured using the Perceived Ethnic Discrimination Questionnaire (PEDQ; Contrada et al., 2001). The PEDQ is a 22-item instrument designed to measure ethnicity-related stress by measuring the frequency of various acts of ethnic discrimination in all ethnicities. This seven-point rating scale (ranging from "never" to "very often") asks participants to indicate how often they have ever had these experiences over the past three months. The complete brief PEDQ contains a total score, as well as additional subscales: 1) disvaluation, 2) threat/aggression, 3) verbal rejection, and 4) avoidance. Five items were intended to measure exclusion and denial of equal treatment (items 7, 8, 9, 10, 11), but they did not factor well in the initial study (Contrada et al., 2001) and therefore are not included in scoring. Higher scores indicate more experiences of ethnic discrimination/racism. See Appendix D. Internal consistency was been found to be adequate in the current study: total score, $\alpha = .93$; verbal rejection, $\alpha = .79$; disvaluation, $\alpha = .91$; avoidance, $\alpha = .76$; and threat/aggression, $\alpha = .91$.

History of Stereotype Concern

Previous experiences of stereotype threat or concern regarding confirming stereotypes about their ethnic group were measured using the Stereotype Confirmation Concern Scale (SCCS). The SCCS (Contrada et al., 2001) is an 11-item measure of participants' fears that they are confirming a stereotype. Participants rate how frequently over the past 3 months they have been "concerned that by _____ you might appear to be confirming a stereotype." Items are rated on a 7-point Likert type scale of 1 (never) to 7 (always). Total scores range from 11 to 77 and higher scores represent greater concern.

The SCCS has demonstrated excellent internal consistency, α = .91 (Contrada et al.,

2001). See Appendix E. In the current study, the SCCS demonstrated high internal

consistency, α = .93.

History of Police Encounters and Legal Involvement

In order to assess participants previous contact with police officers and prior legal

involvement, participants were asked whether they have been arrested or convicted of a

crime. They were also asked to describe any previous encounters with police officers as

well as any previous encounters they may have heard from family, friends, or

acquaintances. See Appendix F.

Legal Legitimacy

The measure of legal legitimacy follows from measures used by Tyler (1997) and

Tyler and Huo (2002) and evaluates individual's feelings of obligation to obey the rules

and decisions associated with legal institutions and authorities (See Appendix G). Using a

four-point Likert-type scale (Strongly disagree, Somewhat disagree, Somewhat agree,

Strongly agree), participants indicated their agreement with 11 statements related to

opinions of legal proceedings and agents (e.g., "I feel proud of the police" and "Court

decisions here are almost always fair.") The mean of these items were used in the

analysis with higher scores indicating higher levels of perceived legitimacy of the law.

Previous psychometric analyses of this scale indicated adequate internal consistency, α =

.80 (Schubert et al., 2004). Reliability in the current study was adeuqate, α = .88.

Testosterone and Cortisol

Testosterone and cortisol were measured using saliva samples before and after the experimental and control induction task. Participants had been asked to not ingest anything other than water in the hour prior to testing. Testosterone and cortisol were calculated between 8 am and 6 pm. 50% of the participants provided the initial sample between 8 am and 12 pm; 33.8% provided the initial sample between 12 pm and 4 pm; and 16.2% provided the initial sample between 4 pm and 6 pm. The groups (experimental and control) did not differ on timing of saliva sample collection: $\chi^2 (2, N = 142) = 3.25, p = .20$ Following standard procedure (Salimetrics, 2018), participants were asked to collect saliva in their mouths and then spit slowly into a cryotube (one vial of roughly 2.5 mL of saliva). Participants were provided with sugar-free gum in order to enhance saliva production. All samples were collected after 8:00 a.m. to control for changes due to diurnal rhythm, and the time of the collection was recorded. The saliva samples were placed on ice and refrigerated until transportation. They were kept at -80°F for storage.

Saliva samples were analyzed using commercially available testosterone and cortisol enzyme immunoassay kits (Salimetrics LLC—State College, PA). Each sample was assayed in duplicate, with the average being taken for analyses. Sensitivity of the cortisol kit is 0.003 to 3.0 µg/dL, with an average recovery for known cortisol concentrations of 100.8%. Sensitivity of the testosterone kit is 1 to 600 pg/mL, with an average recovery for known testosterone concentrations of 105.3%. Samples were re-analyzed if the measurement fell outside the range of the standard calibrator or outside the range of the curve. Additionally, the coefficient of variation (%CV) was calculated for each sample as the percent of the standard deviation of the replicate measurements

divided by their mean. Typically, for replicates, one might expect a %CV value to be less than 15. Thus, samples were re-analyzed if the %CV was greater than 15.

Baseline and post-stressor hormone scores were analyzed to determine their skewness. Baseline cortisol (skewness = 1.6) and follow-up cortisol (skewness = 1.84) were both slightly skewed. Baseline testosterone (skewness = 1.04) and follow-up testosterone (skewness = 1.09) were generally normally distributed. Two outliers were calculated and removed from subsequent analyses. As such, the skewness was more normally distributed: baseline cortisol (skewness = 1.6), follow-up cortisol (skewness = 1.04), baseline testosterone (skewness = 0.80) and follow-up testosterone (skewness = 1.09). Additionally, a ratio of testosterone to cortisol was calculated using the follow-up testosterone and cortisiol levels. However, this calculation produced a skewed variable (skewness = 3.26). As a result, the variable was transformed and skewness reduced (skewness = 0.39).

Adverse Events

The Adverse Childhood Experiences (ACEs) Questionnaire (Felitti et al., 1998), a 10-item measure used to measure childhood trauma, was used as a measure of adverse events. The questionnaire assesses 10 types of childhood trauma: physical abuse, verbal abuse, sexual abuse, physical neglect, emotional neglect, a parent who's an alcoholic, a mother who's a victim of domestic violence, a family member in jail, a family member diagnosed with a mental illness, and the disappearance of a parent through divorce, death or abandonment. As exposure to repeated stressful events can lead to chronic HPA dysregulation and thus changes in coritosl (Kalmakis, Meyer, Chiodo, & Leung, 2015), it

was important to include a measure of adverse events to account for potential

discrepencies in cortisol. Reliability in the current study was adeuqate, α = .74.

Procedure

First, an introduction to the purposes and procedures of the project was given

including information concerning data use, storage, confidentiality, and the voluntary

nature of study participation. Second, participants were given time to ask questions.

Contact information of the team was provided to participants if later questions arise.

Third, for those that chose to participate, a written consent form was reviewed and

signed. Next, the participants were provided with an identification number that

determined whether he was enrolled in the control or experimental condition as well as

the order of tasks to be completed. Next, all participants provided a passive drool saliva

sample (one vial of roughly 2.5 mL of saliva), lasting approximately 15 seconds in order

to measure baseline cortisol/testosterone levels. Next, participants' handgrip strength was

measured as the maximum voluntary contraction (kilo-grams) sustained for at least 3

seconds. Participants' dominant hand was measured first (three times) followed by their

non-dominant hand. Next, the participants completed control measures (i.e., The Big Five

Inventory, The Brief Aggression Questionnaire) using a Qualtrics survey.

The experiment then followed the procedures outlined by Najdowski et al. (2015).

Specifically, participants completed demographic measures first because describing one's

race/ethnicity was expected to prime participants' racial/ethnic identity, which facilitates

the induction of stereotype threat in minority participants (Steele & Aronson, 1995).

Next, participants completed the stereotype-induction (or control) task (randomized to

condition). Those assigned to the experimental condition participated in active imagery

concerning hypothetical police encounter and were provided instructions as outlined by Najdowski et al. (2015). Specifically, participants were told to read a paragraph slowly and carefully and to imagine what it would be like if they were in the situation described (see Appendix H). Those assigned to the control condition participated in active imagery concerning a control scenario and were provided the same instructions as outlined by Najdowski et al. (2015) (see Appendix I).

Following the stereotype-induction task, a manipulation check was employed to examine whether the participants adequately understood the paragraph and to control for and/or exclude any participants who did not (see Appendix J). Participants were asked: "How would you feel? What would you be thinking? How would you react? What do you imagine the police officer would do next?" This task also helped assess stereotype threat activation. In fact, responses were considered to indicate stereotype threat activation if they mentioned a link between race and a stereotype type of criminality.

Next, participants completed a word-stem completion task to further assess stereotype activation, following Najdowski et al. (2015), Goff, Steele, and Davies (2008), and Steele and Aronson (1995). Eight stereotype-related words (i.e., criminal, guns, drugs, poor, gangs, ghetto, thugs, and violent) were used. For each of those words, two or three letter spaces were omitted so that the word stem could be completed with other, non-stereotype-related words (e.g., _R_ _INAL). These target word stems were intermixed randomly with 12 filler word stems that cannot be completed as words that would fit the stereotype (i.e., product, lunch, sheet, glove, blowing, sharing, reason, eraser, mover, funny, house, and stick). Participants were instructed to complete all 20-word stems with the first real words that came to their minds and to work quickly as they

completed this task. Stereotype activation was calculated as the ratio of target word stems the participant filled out in a stereotype-relevant manner (e.g., CRIMINAL as opposed to ORIGINAL) divided by the total number of target word stems the participant completed. Thus, higher scores on this measure reflect greater activation of the criminal stereotype.

Following the stereotype threat induction task, participants viewed a portion of a brief documentary about plants. This task was included to allow adequate time (i.e., 25 minutes) to pass between the stereotype threat induction (or control induction) and the collection of testosterone and cortisol so any changes in hormones could be detected. As changes in cortisol and testosterone are measurable in 20-30 minutes, passive drool saliva was collected for the second time after approximately 25 minutes (one vial of roughly 2.5 mL of saliva for both testosterone and cortisol). Participants then completed the social-cognition task, the aggression task, handgrip strength (for the second time), and self-report measures of affective states in a randomized order on a computer using Qualtrics and E-Prime software. While completing those tasks, the participants were continuously reminded to "continue to imagine how you would feel in this situation as you complete this questionnaire," as was done in Najdowski et al. (2015). Next, participants completed self-report measures of previous experiences of discrimination, stereotype concern, legal encounters, legal legitimacy, attachment, and exposure to adverse events to consider as confounds. Finally, participants were debriefed regarding the deception in the study (i.e., the computer game), and participants were informed that they would be given their research participation credits.

Analytic Plan

      The plan of analysis was carried out in a series of linked steps. First, using SPSS, standardized scores were used to identify univariate outliers. Next, MANOVA and chi-square tests were conducted to test for group differences on key variables. Following this step, Pearson correlation coefficients were calculated to assess the association between possible control variables and key study variables. The purpose of this step was to ensure the necessity of subsequent multivariate analyses and the inclusion of control variables.

      Next, to test the moderated-mediation hypotheses, structural equation models were analyzed using Mplus, version 8.1 (Muthén & Muthén, 2017). Full Information Maximum Likelihood (FIML) estimation was utilized to handle any missing values (Enders & Bandalos, 2001). FIML is a recommended approach to handling missing data as it uses the observed responses to supplement the loss of information due to missing responses (Enders, 2010). Four multiple indicator, multiple cause (MIMIC) models were tested examining affective states and aggression as outcome variables (see Figures 1, 2, 3, and 4; note, observed variables are in boxes and latent variables are in circles).
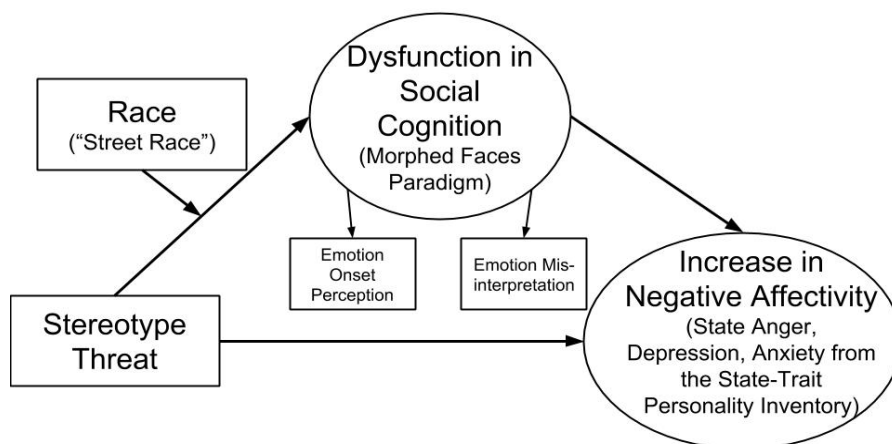
Figure 1

Hypothesized Model with Negative Affect as the Outcome and Social Cognition as a
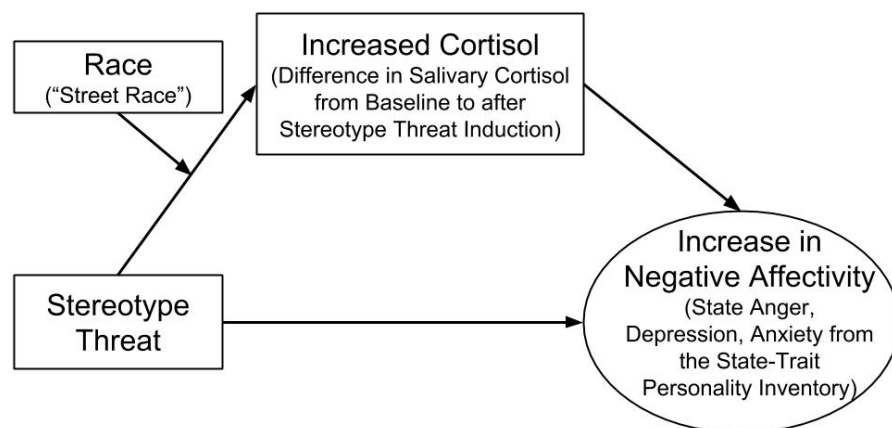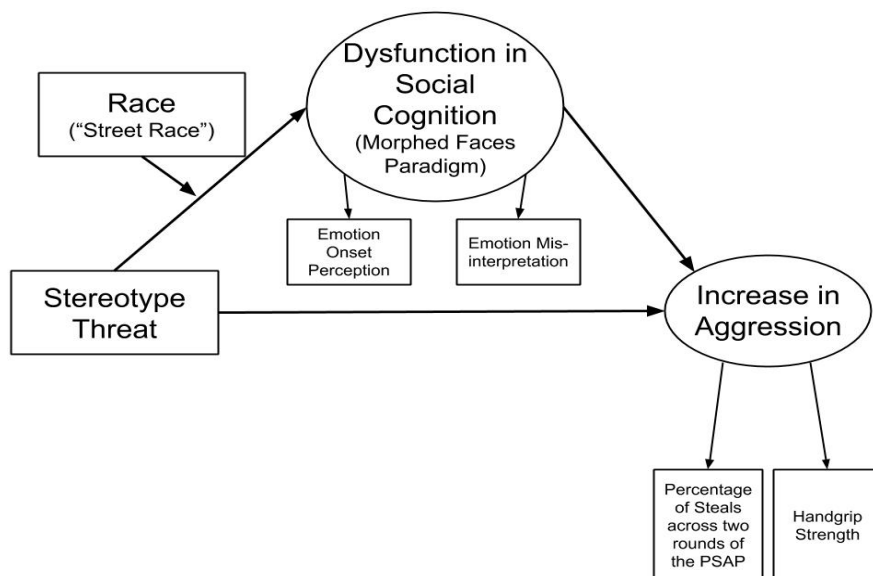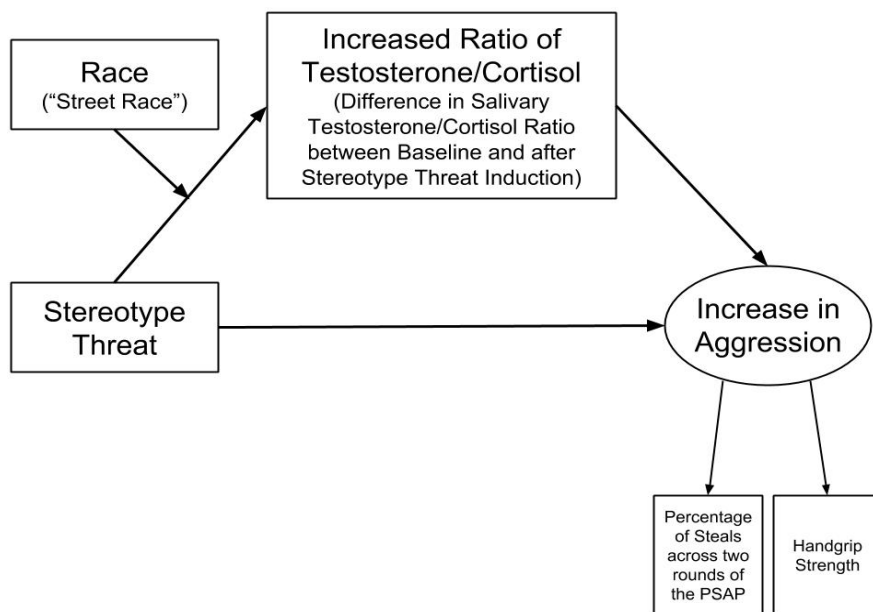
Mediator.

Figure 2

Hypothesized Model with Negative Affect as the Outcome and Cortisol as a Mediator

Figure 3

Hypothesized Model with Aggression as the Outcome and Social Cognition as a Mediator

Figure 4

Hypothesized Model with Aggression as the Outcome and Cortisol as a Mediator

The MIMIC model is a special case of SEM and is used when factors with effect indicators are regressed on one or more dichotomous cause indictors that represent group membership condition, such as one coded 0 = control and 1 = stereotype threat (Kline, 2011). Product interaction terms between stereotype threat and race/ethnicity were created to test moderator effects, and mediation was tested via algorithms included in Mplus implementing the Sobel test with asymptotic bootstrapped confidence intervals to produce accurate standard errors for indirect effects (Shrout & Bolger, 2002). Model fit was assessed using the model χ^2, root- mean-square error of approximation (RMSEA) and the comparative fit index (CFI). Based on previous research (Hu & Bentler, 1999), cut-off points for model fit criteria were CFI >.90 and RMSEA <.08.

Sample size estimates were based on a power analysis using Montecarlo simulation algorithms performed in Mplus (version 8.1) using parameter estimates provided by Wolf, Harrington, Clark, and Miller (2013) and effect sizes for direct and mediated effects from Balsamo et al. (2013), Heuer et al., (2010), and Marsh, et al. (2002). The simulations revealed that for a sample size of 300 with small to moderate effect sizes (β = .25) estimated for direct effects and a small effect size for the mediation pathway (β = .06) power was approximately .80. Including a medium-sized moderator effect of β = .25 yielded power exceeding .80, and a moderator effect of .80 produced power of approximately .80. These estimates are in line with currently published results (Najdowski et al., 2015). It should be noted that the current study was ultimately underpowered with a smaller sample size due to data collection constraints caused by the COVID-19 pandemic.

CHAPTER III

Results

Group Differences

Means and standard deviations of variables of interest are presented in Table 1.

Table 1

Means, Standard Deviations, and Ranges of Study Variables

	Group Membership Condition								Total	Range
	Experimental				Control					
	White	Black	Hispanic	Total	White	Black	Hispanic	Total		
Age	19.65	19.62	19.35	19.56	19.54	19.76	20.40	19.86	19.71	18-26
	(1.74)	(1.89)	(1.46)	(1.68)	(1.99)	(2.14)	(2.30)	(2.13)	(1.92)	
Word Stem	0.25	0.26	0.23	0.25	0.19	0.19	0.11	0.16	0.21	0-0.71
	(0.18)	(0.22)	(0.18)	(0.19)	(0.18)	(0.14)	(0.11)	(0.15)	(0.18)	
Extraversion	24.41	25.06	25.84	24.93	26.25	27.85	26.29	26.72	25.81	9-40
	(7.02)	(6.15)	(5.51)	(6.41)	(8.43)	(5.07)	(6.43)	(6.93)	(6.70)	
Agreeable-ness	33.46	34.69	34.35	33.97	33.39	35.48	33.62	34.09	34.03	21-45
	(4.97)	(4.96)	(4.70)	(4.86)	(5.22)	(4.85)	(5.27)	(5.14)	(4.98)	
Neuroticism	23.27	19.00	21.84	21.94	20.93	20.19	20.52	20.59	21.27	9-34
	(5.72)	(5.49)	(5.29)	(5.73)	(6.12)	(5.23)	(5.80)	(5.69)	(5.74)	
Openness	36.03	37.69	36.45	36.51	35.85	39.76	37.95	37.68	37.08	21-49
	(5.88)	(5.67)	(5.30)	(5.64)	(5.68)	(4.01)	(4.47)	(5.06)	(5.38)	
Conscientious-ness	32.00	33.63	32.70	32.56	31.54	34.14	31.90	32.43	32.49	20-43
	(5.20)	(4.72)	(5.69)	(5.21)	(4.62)	(4.80)	(5.36)	(4.97)	(5.07)	
BAQ	2.78	2.55	2.95	2.78	2.77	2.93	2.82	2.83	2.80	1.25-
	(0.54)	(0.73)	(0.64)	(0.62)	(0.65	(0.46)	(0.67)	(0.60)	(0.61)	4.50

	Group Membership Condition								Total	Range
	Experimental				Control					
	White	Black	Hispanic	Total	White	Black	Hispanic	Total		
Emotion-Accuracy	0.56	0.61	0.60	0.58	0.57	0.46	0.56	0.54	0.56	0.11-
	(0.14)	(0.17)	(0.15)	(0.15)	(0.16)	(0.20)	(0.19)	(0.18)	(0.17)	0.84
Emotion-Response Time (sec)	42.83	44.50	43.44	43.36	42.00	34.66	41.43	39.70	41.53	4.48-
	(14.64)	(14.49)	(15.06)	(14.52)	(17.57)	(21.46)	(15.88)	(18.33)	(16.58)	86.66
PSAP Steals Percentage	7.56	7.15	6.76	7.25	6.14	8.42	7.65	7.23	7.61	0-25.76
	(4.81)	(3.81)	(4.54)	(4.48)	(4.81)	(6.09)	(6.57)	(5.75)	(6.69)	
HGS Baseline	79.54	92.30	70.30	79.81	85.07	82.46	87.20	84.96	82.31	42.08-
	(20.07)	(23.20)	(23.29)	(22.73)	(22.14)	(19.18)	(20.98)	(20.74)	(21.86)	147.15
HGS Follow-Up	75.33	92.87	63.42	75.91	76.95	78.67	78.84	78.03	76.94	35.85-
	(21.63)	(26.07)	(22.48)	(24.83)	(23.37)	(21.89)	(19.56)	(21.54)	(23.23)	150.83
State Anger	11.70	12.75	11.45	11.86	16.46	15.11	14.05	15.36	13.53	10-36
	(2.69)	(3.09)	(3.62)	(3.05)	(8.15)	(6.96)	(5.08)	(6.99)	(5.58)	
State Depression	19.42	19.31	16.40	18.56	17.77	16.25	18.48	17.54	18.06	10-29
	(4.54)	(4.84)	(3.07)	(4.41)	(5.11)	(3.70)	(4.49)	(4.55)	(4.49)	
State Curiosity	28.09	25.67	26.30	27.06	26.36	25.95	26.62	26.32	26.69	18-40
	(3.89)	(5.15)	(5.08)	(4.59)	(5.88)	(5.49)	(5.55)	(5.59)	(5.11)	
State Anxiety	21.32	23.06	17.70	20.71	19.96	17.00	21.00	19.46	20.11	10-32
	(7.85)	(6.46)	(5.23)	(7.12)	(5.80)	(4.31)	(6.00)	(5.64)	(6.46)	
Trait Anger	17.74	15.38	18.15	17.32	19.71	17.38	18.33	18.60	17.96	10-32
	(4.41)	(3.16)	(6.31)	(4.85)	(5.50)	(4.94)	(6.43)	(5.65)	(5.28)	

	Group Membership Condition								Total	Range
	Experimental				Control					
	White	Black	Hispanic	Total	White	Black	Hispanic	Total		
Trait Depression	19.76 (5.02)	18.31 (6.55)	16.55 (3.69)	18.56 (5.20)	17.43 (6.08)	17.24 (4.97)	17.80 (5.24)	17.48 (5.44)	18.04 (5.33)	10-38
Trait Curiosity	27.84 (4.73)	25.47 (5.05)	27.05 (3.75)	27.13 (4.58)	28.25 (5.05)	27.65 (3.80)	28.10 (4.66)	28.03 (4.54)	27.57 (4.57)	16-40
Trait Anxiety	21.86 (5.53)	18.69 (5.96)	19.65 (6.12)	20.54 (5.87)	21.07 (6.20)	18.90 (5.46)	20.52 (6.47)	20.26 (6.05)	20.40 (5.94)	10-34
PEDQ Total	1.67 (0.78)	2.75 (1.21)	2.27 (0.95)	2.04 (1.00)	1.79 (0.58)	2.28 (1.34)	1.94 (0.74)	1.98 (0.91)	2.01 (0.96)	1.00-6.58
Legal Legitimacy	2.73 (0.57)	2.27 (0.52)	2.75 (0.64)	2.64 (0.61)	2.85 (0.59)	2.23 (0.66)	2.58 (0.57)	2.60 (0.64)	2.62 (0.62)	1.00-3.91
Stereotype Concern	1.80 (1.03)	2.75 (1.43)	2.53 (1.59)	2.18 (1.33)	1.88 (0.80)	2.46 (1.48)	2.13 (1.59)	2.13 (1.30)	2.16 (1.31)	1.00-6.27
ACES Total	1.73 (2.14)	1.29 (1.82)	1.79 (2.04)	1.66 (2.04)	1.74 (1.91)	1.70 (1.78)	1.95 (2.33)	1.79 (1.99)	1.72 (2.01)	0-8.00
Cortisol - Baseline	0.30 (0.21)	0.28 (0.15)	0.28 (0.25)	0.29 (0.21)	0.34 (0.23)	0.32 (0.31)	0.23 (0.15)	0.30 (0.24)	0.29 (0.22)	0.01-1.13
Cortisol – Follow-up	0.21 (0.12)	0.20 (0.09)	0.16 (0.10)	0.19 (0.11)	0.24 (0.12)	0.21 (0.11)	0.15 (0.08)	0.21 (0.11)	0.20 (0.11)	0.02-0.58
Testosterone - Baseline	163.99 (61.68)	173.91 (75.61)	154.94 (77.77)	163.69 (68.80)	157.02 (67.18)	175.85 (51.12)	148.11 (54.07)	159.77 (59.19)	161.78 (64.11)	55.52-350.20
Testosterone – Follow-up	148.59 (61.07)	162.57 (86.92)	156.48 (67.97)	153.81 (68.49)	140.96 (56.04)	169.05 (80.26)	138.79 (50.29)	148.74 (63.32)	151.33 (65.83)	36.27-451.90

Chi-square tests were conducted to compare the experimental and control group conditions on income, education, and types of communities in which they resided. The percentage of participants in each group did not differ by income, χ^2 (7, $N = 142$) = 1.71, $p = .97$; education, χ^2 (3, $N = 143$) = 4.80, $p = .19$; nor types of communities, χ^2 (3, $N = 142$) = 5.89, $p = .12$. Regarding interactions with police, 8.6% of participants reported being arrested previously; 46.9% of participants reported having been approached or stopped by police in the last 12 months, 25.2% reported having been approached or stopped by police but not in the last 12 months, and 25.2% reported having never been stopped or approached by the police. These percentages did not differ by group condition: arrests, χ^2 (1, $N = 140$) = 1.22, $p = .27$; approached by the police, χ^2 (1, $N = 139$) = 0.42, $p = .81$.

A MANOVA was conducted in order to examine differences between the White participant group and BIPOC participant group on outcome measures and various potential control variables (i.e., age, baseline cortisol, follow-up cortisol, change in cortisol, baseline testosterone, follow-up testosterone, ratio of testosterone/cortisol, trait aggression, trait affective states, state affective states, PSAP aggression, emotion accuracy, emotion reaction time, personality factors, baseline handgrip strength, history of discrimination, history of stereotype concern, legal legitimacy). There was a statistically significant difference on these factors based upon race/ethnic group, $F(29, 68) = 1.65$, $p = .05$; Wilk's $\Lambda = 0.59$, partial $\eta^2 = .41$. Specifically, there were specific differences in follow-up cortisol, $F(1, 96) = 6.37$, $p = .01$; ratio of testosterone/cortisol, $F(1, 96) = 7.52$, $p = .01$; history of discrimination, $F(1, 96) = 9.22$, $p = .003$; legal legitimacy, $F(1, 96) = 4.04$, $p = .05$; and history of stereotype concern, $F(1, 96) = 6.58$, p

= .01. Overall, BIPOC participants reported a greater history of discrimination, a greater history of stereotype concern, and lower views of legal legitimacy. BIPOC participants also showed a larger ratio of testosterone to cortisol as well as lower levels of cortisol at follow-up.

A MANOVA was conducted in order to examine differences between the experimental and control group conditions on outcome measures and various potential control variables (i.e., age, baseline cortisol, follow-up cortisol, change in cortisol, baseline testosterone, follow-up testosterone, ratio of testosterone/cortisol, trait aggression, trait affective states, state affective states, PSAP aggression, emotion accuracy, emotion reaction time, personality factors, baseline handgrip strength, history of discrimination, history of stereotype concern, legal legitimacy). There were no statistically significant differences on these factors based upon group condition, $F(29, 68)$ = 1.41, p = .13; Wilk's Λ = 0.63, partial η^2 = .38.

Stereotype Threat Activation

A t-test was conducted to determine whether the two group conditions differed with regard to word stem completion. The experimental group condition (M = 0.25, SD = 0.19) compared to the control group condition (M = 0.16, SD = 0.15) demonstrated significantly higher scores on the word stem completion, $t(136.07)$ = 2.1, p = .004, indicating the experimental group showed greater activation of the criminal stereotype.

In response to questions of "How would you feel? What would you be thinking? How would you react?" following the stereotype activation vignette, only two participants in the experimental group condition made spontaneous references to either

the stereotype of criminality or concern about being perceived as a criminal because of a stereotype about a group to which they belonged.

Analysis of Potential Control Variables

Next, Pearson correlation coefficients were calculated (see Table 2).

Table 2

Correlations Between Key Study Variables

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1. Age	—																											
2. Extra-version	0.01	—																										
3. Agreeabl e-ness	0.13	0.11	—																									
4. Neurotic-ism	-0.05	-0.38**	-0.24**	—																								
5. Open-ness	0.04	0.30**	0.13	-0.12	—																							
6. Conscien-tiousness	0.06	0.14	0.14	-0.31**	0.11	—																						
7. BAQ	-0.09	0.07	-0.44**	0.36**	-0.06	-0.16	—																					
8. Emotion-Accuracy	0.11	-0.08	-0.04	-0.022	-0.17*	0.03	-0.15	—																				
9. Emotion-Response Time (sec)	0.18*	-0.13	0.02	-0.13	-0.15	0.10	-0.21*	0.82**	—																			
10. PSAP Steals	0.03	-0.02	.010	0.11	0.10	-0.12	0.02	-0.12	-0.19*	—																		
11. HGS Baseline	0.20*	0.10	0.02	-0.21*	0.01	0.12	-0.10	0.07	0.05	-0.09	—																	
12. HGS Follow-Up	0.19*	0.09	0.05	-0.22**	-0.01	0.16	-0.09	0.13	0.09	-0.07	0.92**	—																
13. State Anger	-0.07	-0.10	-0.04	0.24**	0.07	-0.17*	0.21*	-0.16	-0.16	0.10	-0.08	-0.15	—															
14. State Depressi on	-0.04	-0.30**	-0.14	0.42**	-0.10	-0.34**	0.17*	-0.03	-0.10	0.03	-0.08	-0.07	0.49**	—														
15. State Curiosity	-0.02	0.10	0.05	-0.20*	0.15	0.05	-0.24**	0.11	0.08	0.12	0.06	0.08	-0.34**	-0.29**	—													

(continued)

Measure	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
16. State Anxiety	0.08	-0.25**	0.08	0.39**	0.11	-0.18*	0.03	-0.04	-0.11	0.26**	-0.03	-0.05	0.45**	0.61**	-0.06	—												
17. Trait Anger	-0.08	-0.10	-0.36**	0.47**	0.00	-0.16	0.67**	-0.08	-0.17	0.02	-0.15	-0.19*	0.45**	0.29**	-0.21*	0.22**	—											
18. Trait Depression	-0.13	-0.38**	-0.21*	0.61**	-0.19*	-0.28**	0.31**	0.06	-0.02	0.02	-0.06	-0.06	0.26**	0.66**	-0.13	0.33**	0.42**	—										
19. Trait Curiosity	0.08	0.44**	0.18*	-0.21*	0.48**	0.11	-0.17*	0.06	0.06	-0.01	0.08	0.09	-0.11	-0.32**	0.48**	-0.05	-0.19*	-0.41**	—									
20. Trait Anxiety	-0.15	-0.41**	-0.18*	0.69**	-0.11	-0.39**	0.23**	0.01	-0.07	0.08	-0.18*	-0.18*	0.31**	0.55**	-0.15	0.42**	0.48**	0.81**	-0.31**	—								
21. PEDQ Total	-0.03	0.17	-0.02	-0.02	0.19*	0.13	0.21*	-0.09	-0.12	0.09	0.04	0.05	0.09	0.03	-0.04	0.12	0.23**	0.04	0.03	0.08	—							
22. Legal Legitimacy	-0.03	-0.02	0.01	-0.17	-0.18*	0.11	-0.08	0.12	0.16	-0.19*	0.08	0.12	-0.20*	-0.27**	0.15	-0.31**	-0.08	-0.26**	0.11	-0.16	-0.19*	—						
23. Stereotype Concern	-0.08	0.02	-0.01	0.13	0.06	-0.20*	0.24**	-0.06	-0.10	0.21*	-0.05	-0.01	0.05	0.09	0.00	0.15	0.23**	0.16	-0.07	0.14	0.54**	-0.19*	—					
24. ACES Total	0.10	0.06	0.09	0.25**	0.25**	-0.15	0.21*	-0.03	-0.09	0.05	-0.04	0.00	-0.03	0.17	-0.07	0.16	0.14	0.18*	0.07	0.19*	0.14	-0.17	0.02	—				
25. Cortisol - Baseline	0.12	0.11	-0.03	0.05	0.01	-0.02	-0.01	0.08	0.08	0.03	0.00	-0.03	-0.01	-0.03	0.16	-0.04	0.05	0.01	0.01	-0.04	0.04	-0.07	0.02	0.13	—			
26. Cortisol – Follow-up	-0.02	0.12	0.02	-0.03	0.03	0.02	0.01	0.12	0.15	-0.01	0.04	0.04	0.06	-0.04	0.19*	-0.02	0.06	0.06	0.11	-0.01	0.07	-0.11	0.06	0.03	0.72**	—		
27. Testosterone - Baseline	-0.15	-0.01	-0.12	0.08	0.04	-0.07	0.02	0.04	0.10	-0.01	0.03	0.03	-0.03	0.06	0.14	-0.11	-0.06	0.21*	0.08	0.05	0.08	-0.16	0.04	0.14	0.34**	0.27**	—	
28. Testosterone – Follow-up	-0.22**	-0.07	-0.10	0.12	0.08	-0.04	0.10	-0.01	0.06	-0.01	0.00	0.02	0.04	0.09	0.07	-0.03	0.08	0.28**	0.02	0.17*	0.17*	-0.06	0.17	0.11	0.18*	0.18*	0.84**	—

*Note: * p < .05; ** p < .01*

Variables were included as controls if they evidenced moderate correlation ($r \geq$ 0.3) with outcome or mediating variables, in particular: legal legitimacy, personality factors (i.e., The Big Five Inventory factors: extraversion, agreeableness, conscientiousness, neuroticism, and openness), trait affective states (i.e., trait anger, anxiety, curiosity, and depression from the STPI), baseline handgrip strength, and baseline measures of cortisol and testosterone.

Model 1

The first model sought to examine the effect of stereotype threat (as measured by group condition) on negative affect. In this model, social cognition served as a mediator and street race served as a moderator for the relation between group membership condition and social cognition. As such, a negative affect latent variable (using state anger, anxiety, and depression) was used as the dependent variable. Model fit analyses for that latent variable indicated good model fit, CFI = 1.00 and RMSEA = 0.00. Social cognition was originally conceptualized as a latent variable using emotion accuracy and reaction time. However, due to concerns of multicollinearity given high correlations between the two variables ($r = 0.82$), social cognition was thus entered as an observed variable using only emotion accuracy. In this analysis, control variables included legal legitimacy, personality factors (i.e., The Big Five Inventory factors: extraversion, agreeableness, conscientiousness, neuroticism, and openness) and trait affective states (i.e., trait anger, anxiety, curiosity, and depression from the STPI).

Path models were analyzed using Mplus, version 8.1 (Muthén & Muthén, 2017) to estimate the significance of direct, indirect (mediational), and conditional indirect effects (moderated mediation) on negative affect. Overall, the model fit was poor, CFI =

0.15 and RMSEA = 0.19, χ^2 (125) = 747.41, $p < .001$. However, this model fit was likely

due to the small magnitude of the path coefficients. Additionally, the analyses primarily

examined specific hypothesized relations between variables of interest, and therefore,

model fit considerations were secondary. In terms of specific relations, neither group

membership condition (β = -0.12, b = -0.43, SE = 0.89, p = .63) nor social cognition (β = -

0.07, b =-1.58, SE = 2.23, p = .48) were directly associated with negative affect. Likewise,

neither group membership condition (β = 0.09, b =0.01, SE = 0.04, p = .73) nor

race/ethnicity (β = 0.27, b =0.05, SE = 0.04, p = .20) were directly associated with social

cognition. However, there was a marginally significant interaction effect of group

membership condition and race/ethnicity on social cognition (β = -0.63, b =-

0.11, SE = 0.06, p = .06). See Exploratory Analyses for more information. There was no

evidence of a significant indirect effect of group membership condition on negative affect

via social cognition (b =-0.02, SE = 0.11, p = .85). Likewise, there was no evidence of

significant conditional indirect effects for each race/ethnicity group: white, b =-

0.02, SE = 0.11, p = .85; BIPOC, b =0.15, SE = 0.23, p = .53. There was also no evidence

of significant conditional total effects for the race/ethnicity groups: white, b =-

0.45, SE = 0.90, p = .61; BIPOC, b =-0.29, SE = 0.91, p = .74.

Model 2

The second model sought to examine the effect of stereotype threat (as measured

by group membership condition) on negative affect. However, in this model, change in

cortisol (between follow-up and baseline) served as a mediator. Street race continued to

serve as a moderator for the relation between group membership condition and cortisol.

As such, the negative affect latent variable (using state anger, anxiety, and depression)

was used as the dependent variable. First, a one-way ANOVA was conducted to compare the effect of timing on baseline and follow-up cortisol measurements. There was a significant effect of timing on both baseline cortisol, $F(2,139) = 26.81$, $p < .001$, and follow-up cortisol, $F(2,137) = 14.79$, $p < .001$. As such, time of saliva collection was included as a control variable in subsequent analyses. Additional controls also included legal legitimacy, personality factors (i.e., The Big Five Inventory factors: extraversion, agreeableness, conscientiousness, neuroticism, and openness) and trait affective states (i.e., trait anger, anxiety, curiosity, and depression from the STPI).

Overall, the model fit was poor, CFI = 0.14 and RMSEA = 0.19, χ^2 (125) = 736.05, $p < .001$. As stated previously, this model fit was likely due to the small magnitude of the path coefficients. Additionally, the analyses primarily examined specific hypothesized relations between variables of interest, and therefore, model fit considerations were secondary. In terms of specific relations, neither group membership condition ($\beta = -0.06$, $b = -0.35$, $SE = 0.90$, $p = .70$) nor change in cortisol ($\beta = 0.04$, $b = 0.95$, $SE = 2.16$, $p = .66$) were directly associated with negative affect. Likewise, neither group membership condition ($\beta = -0.08$, $b = -0.03$, $SE = 0.04$, $p = .47$) nor race/ethnicity ($\beta = -0.11$, $b = -0.04$, $SE = 0.03$, $p = .31$) were directly associated with change in cortisol. There was no evidence of a significant interaction of group membership condition and race/ethnicity on change in cortisol ($\beta = 0.10$, $b = 0.03$, $SE = 0.05$, $p = .54$). There was no evidence of a significant indirect effect of group membership condition on negative affect via change in cortisol ($b = -0.03$, $SE = 0.10$, $p = .81$). Likewise, there was no evidence of significant conditional indirect effects for each race/ethnicity group: white, $b = -0.03$, $SE = 0.10$, $p = .81$; BIPOC,

$b = 0.01$, $SE = 0.09$, $p = .95$. There was also no evidence of conditional total effects for the race/ethnicity groups: white, $b = -0.38$, $SE = 0.90$, $p = .68$; BIPOC, $b = -0.35$, $SE = 0.90$, $p = .70$.

Model 3

The third model sought to examine the effect of stereotype threat (as measured by group membership condition) on aggression. In this model, social cognition served as a mediator and street race served as a moderator for the relation between group membership and social cognition. As such, an aggression latent variable (using the PSAP and follow-up handgrip strength) was used as the dependent variable. As with previous models, social cognition was originally conceptualized as a latent variable using emotion accuracy and reaction time. However, due to concerns of multicollinearity given high correlations between the two variables ($r = 0.82$), social cognition was thus entered as an observed variable using only emotion accuracy. In this analysis, control variables included baseline handgrip strength.

Path models were analyzed using Mplus, version 8.1 (Muthén & Muthén, 2017) to estimate the significance of direct, indirect (mediational), and conditional indirect effects (moderated mediation) on aggression. Overall, the model fit was poor, CFI = 0.02 and RMSEA = 0.42, χ^2 (11) = 281.07, $p < .001$. Neither group membership condition ($\beta = 0.16$, $b = 2.16$, $SE = 3.53$, $p = .54$) nor social cognition ($\beta = 0.48$, $b = 19.37$, $SE = 11.20$, $p = .08$) were directly associated with aggression. Likewise, neither group membership condition ($\beta = 0.04$, $b = 0.01$, $SE = 0.04$, $p = .74$) nor race/ethnicity ($\beta = 0.13$, $b = 0.04$, $SE = 0.04$, $p = .23$) were directly associated with social cognition. However, there was a marginally significant interaction effect of group membership

condition and race/ethnicity on social cognition (b =-0.11, SE = 0.06, p = .06); see

Exploratory Analyses. There was no evidence of a significant indirect effect of group

membership condition on negative affect via social cognition (β = -0.28,

b =0.25, SE = 0.91, p = .79). Likewise, there was no evidence of significant conditional

indirect effects for each race/ethnicity group: white, b =0.25, SE = 0.91, p = .79; BIPOC,

b =-1.76, SE = 1.34, p = .19. There were also no conditional total effects for the

race/ethnicity groups: white, b =-2.41, SE = 3.68, p = .51; BIPOC, b =0.41, SE = 3.51, p =

.91.

Model 4

      The fourth model sought to examine the effect of stereotype threat (as measured

by group membership condition) on aggression. However, in this model, the ratio of

testosterone to cortisol (at follow-up) served as a mediator. Street race continued to serve

as a moderator for the relation between group membership and testosterone to cortisol

ratio. An aggression latent variable (using the PSAP and follow-up handgrip strength)

was used as the dependent variable. First, a one-way ANOVA was conducted to compare

the effect of timing on the testosterone to cortisol ratio. There was a significant effect of

timing on testosterone to cortisol ratio, $F(2,139) = 4.43$, p = .01. As such, time of saliva

collection was included as a control variable in subsequent analyses. Additional controls

also included baseline measures of cortisol and testosterone as well as baseline measures

of handgrip strength.

      Overall, the model fit was poor, CFI = 0.01 and RMSEA = 0.28, χ^2 (35) =

428.11, $p < .001$. Neither group membership condition (β = 0.06, b = 2.11, SE = 3.97, p =

.96) nor testosterone to cortisol ratio (β = -0.01, b =-0.17, SE = 3.00, p = .66) were

directly associated with aggression. Likewise, neither group membership condition ($\beta = -0.14$, $b = -0.19$, $SE = 0.16$, $p = .23$) nor race/ethnicity ($\beta = 0.15$, $b = 0.23$, $SE = 0.17$, $p = .18$) were directly associated with testosterone to cortisol ratio. There was no evidence of a significant interaction between group membership condition and race/ethnicity on testosterone to cortisol ratio ($\beta = 0.17$, $b = 0.23$, $SE = 0.23$, $p = .31$). There was no evidence of a significant indirect effect of group membership condition on negative affect via testosterone to cortisol ratio ($b = 0.03$, $SE = 0.72$, $p = .96$). Likewise, there was no evidence of significant conditional indirect effects for each race/ethnicity group: white, $b = 0.03$, $SE = 0.72$, $p = .96$; BIPOC, $b = -0.01$, $SE = 0.50$, $p = .99$. There was also no evidence of significant conditional total effects for the race/ethnicity groups: white, $b = 2.14$, $SE = 3.91$, $p = .58$; BIPOC, $b = 2.10$, $SE = 4.00$, $p = .60$.

Experimental Analyses

Given the marginally significant interaction noted between group membership condition and race/ethnicity on social cognition, a simple moderation model was conducted to explore this effect. Simple slope analyses indicated that group membership was significantly associated with social cognition ($b = -0.09$, $SE = 0.04$, $p = .02$) in the BIPOC group but not in the White group ($b = 0.01$, $SE = 0.04$, $p = .74$). Further analysis revealed that in the experimental group, BIPOC status was related to enhanced social cognition whereas no such relation was found among White participants.

Though sample sizes for race/ethnicity subgroups (i.e., White, Black, Hispanic) required collapse into BIPOC versus White for planned analyses, exploratory analyses sought to examine the effect of group condition (i.e., experiment versus control) on outcome variables within these three subgroups. A two-way MANOVA was conducted in

order to examine the interaction effect between race/ethnicity (i.e., White, Black, Hispanic) and group condition membership (i.e., experimental or control) on the combined dependent variables (i.e., emotion accuracy, emotion reaction time, change in cortisol, ratio of testosterone to cortisol, state anxiety, state anger, state depression, follow-up handgrip strength).

Overall, there was a statistically significant interaction effect on the combined dependent variables, $F(16, 232) = 2.59$, $p = .001$; Wilk's $\Lambda = 0.72$. Main effect analyses revealed a statistically significant interaction effect of race/ethnicity and group membership condition on state anxiety, $F(2, 123) = 5.10$, $p = .007$ and a marginally statistically significant interaction effect of race/ethnicity and group membership condition on state depression, $F(2, 123) = 2.80$, $p = .07$. Given the significant interaction effect of race/ethnicity and group membership condition on state anxiety, follow-up analyses were conducted to evaluate the differences between the group membership conditions for each racial/ethnic group. The only significant difference between the experimental condition and the control condition on state anxiety was found among Black participants, $F(1, 33) = 10.96$, $p = .002$. A review of the group means indicated that Black participants in the experimental condition ($M = 23.06$) had a significantly higher level of state anxiety than Black participants in the control condition ($M = 17.00$).

CHAPTER IV

Discussion

Overall, the broad aim of this study was to empirically test the downstream effects of stereotype threat induction (based on Najdowski et al., 2015). Specifically, this study sought to test the mechanisms (i.e., neurobiology and social cognition) linking stereotype threat to subsequent mental health outcomes (i.e., aggression and negative affect). First, this study sought to examine whether the previously documented relation between stereotype threat and aggression/negative affective states is mediated by cortisol and testosterone levels. Second, this study sought examine whether dysfunction in social cognition mediates the relation between stereotype threat and negative affective states and state aggression.

Broadly, our results did not indicate significant relations among the variables of interest. In particular, stereotype threat condition did not have a direct effect on aggression or negative affect (except within the BIPOC group in exploratory analyses). Further, neither social cognition nor an increase in cortisol mediated a relation between stereotype threat condition and affect; and likewise, neither social cognition nor an increase in the testosterone/cortisol ratio mediated the relation between stereotype threat condition and aggression. In addition, the relation between stereotype threat condition and cortisol, the relation between stereotype threat condition and the testosterone/cortisol ratio, and the relation between stereotype threat condition and social cognition were not significantly moderated by race/ethnicity. Finally, the full mediation models were not moderated by race/ethnicity.

Though the hypothesized models were not supported, evidence of a marginally significant moderation effect of race/ethnicity on the relation between stereotype threat condition and social cognition did emerge. Further analyses revealed that group membership condition significantly related to social cognition in the BIPOC group but not in the White group such that within the BIPOC group, the experimental condition was related to greater social cognition. Though this finding should be interpreted with caution, it indicates that BIPOC group had better social cognitive abilities when they were in the stereotype threat group than when they were in the control group. Likewise, additional exploratory analyses revealed that state anxiety differed between the stereotype threat condition group and the control condition group but only among Black participants. Finally, the experimental group condition compared to the control group condition showed greater activation of the criminal stereotype as measured by a word-stem completion task.

Thus, despite the lack of significant relations among the variables of interest in the structural equation modeling, this study provided important information regarding stereotype threat induction and the possible downstream effects. First, this study showed that the stereotype threat induction task developed by Najdowski and colleagues (2015) can produce activation of the criminal stereotype. It should be noted that this effect was found for all racial groups—white and BIPOC—which indicates that the belief one would be stereotyped or viewed as a criminal during the induction task is not race/ethnicity-specific. In fact, only two participants made specific and spontaneous comments indicating they would fear being stereotyped as a criminal based on their race/ethnicity. However, this finding regarding the word-stem task aligns with results from Najdowski

and colleagues (2015). In their study, they found that the word-stem completion task reflected similar levels of stereotype activation for Black and White men (Najdowski et al., 2015). Likewise, they found that Black and White men reported similar expectations regarding the officer's actions in the induction procedure (Najdowski et al., 2015). Therefore, it is possible that because stereotypes of men in general include negative attributes related to aggression (Steinberg & Diekman, 2016), all participants in the experimental group condition experienced an activation of threat.

Second, the results of this study suggest that BIPOC participants had better social cognitive abilities when they underwent the stereotype threat induction. Overall, this is the first study to examine the impact of stereotype threat on social cognitive abilities. Although it was hypothesized that the stereotype threat induction would lead to deficits in social cognition, results indicated that for BIPOC participants, stereotype threat induction led to improved social cognition, though these results should be interpreted cautiously. These results may be due, in part, to healthy paranoia or hypervigilance. Healthy paranoia is a healthy, normative, and adaptive response to racism perceived by Black Americans (Grier & Cobbs, 1968; Whaley, 2001) and describes the inclination of Black individuals to mistrust White in numerous areas (i.e., education, business, law, interpersonal relations, etc.). Additionally, research has suggested that Black men may experience posttraumatic stress related symptoms (such as hypervigilance) following the viewing, reading, or hearing of racial traumatic events, especially in relation to police encounters (Lipscomb et al., 2019). Therefore, it is possible that due to a history of race-related stress and racial injustices, BIPOC participants have developed a heightened sense of alertness when they perceive their safety to be in jeopardy (as may be the case during

police encounters). As such, under this threat, BIPOC participants' focus on the threat improves such that they show greater accuracy in detecting emotions. In fact, accuracy in detecting emotion could be critical in potentially threatening situations, such as police encounters. Future research should expand upon these findings and examine social cognition in stereotype threat encounters more in depth.

Finally, this study found that Black participants endorsed greater anxiety following a stereotype threat induction than following a control condition. These results suggest that stereotype threat in a police encounter may lead to an increase in anxiety that is specific to Black men. In fact, this result was not found among White nor Hispanic participants. While previous research has documented a link between stereotype threat and anticipated anxiety among Black participants (Najdowski et al., 2015), this study is the first to link stereotype threat in a police encounter with in-vivo experiences of anxiety. These results suggest that stereotype threat in police encounters may produce outcomes that are specific to Black men. These findings are particularly important as repeated experiences with anxiety-provoking stereotype threat situations may disrupt the HPA axis (Gold et al., 2005) or lead to longer term physical or mental health problems. Additionally, anxiety as a result of this stereotype threat may produce behaviors that police commonly perceive as suspicious (i.e., avoid eye contact or averted gaze). Therefore, this anxiety may put Black men at greater risk of being perceived as guilty or suspicious than White men. While the current study did not find evidence of a link between stereotype threat and cortisol levels, future research should further examine anxiety-related physiological arousal such as blood pressure or heart rate variability. In addition, future research should continue to examine the impact of police encounters as

well as stereotype threat on hormonal changes as numerous health consequences are associated with dysregulation of the HPA axis and abnormal cortisol levels (Keller et al., 2006; Xiong & Zhang, 2013).

Despite these findings, several limitations must be noted with regard to the results reported in the present study and represent important areas for future research. The lack of significant findings related to the models of stereotype threat and various outcomes may be due to several factors. For one, the lack of significant relations may be due to potential methodological and sample size constraints. A priori sample size estimates revealed that for a sample size of 300 with small to moderate effect sizes ($\beta = .25$) estimated for direct effects and a small effect size for the mediation pathway ($\beta = .06$) power was approximately .80, and the final sample for analyses was considerably smaller than 300. Due to the COVID-19 pandemic, data collection had to be prematurely discontinued. As a result, group sizes remained small. Thus, it is likely that the power to detect any effects was limited. In fact, the Hispanic and black participant groups had to be collapsed into one group (BIPOC) in order to improve group size differences. As these groups are not homogenous, combining the groups removed the potential to examine any differences between them. Likewise, combining the groups may have masked potential effects. For example, it is possible that Black, but not Hispanic, participants experienced effects of stereotype threat on biological and cognitive processes. However, by combining the Black participants with the Hispanic participants, these effects may have been obscured. Thus, future research should continue to examine the impact, if any, of stereotype threat on mental health outcomes and behaviors among Black and Hispanic men, seeking larger samples for analyses. As the current study only documented a

difference in anxiety between group conditions for Black men, it is possible that Hispanic men do not undergo the same stereotype threat processes. However, future research is needed to further elucidate these relations. Likewise, the current study used street race as a measure of race/ethnicity. These findings should be replicated to analyze various measures of race/ethnicity (i.e., socially assigned race and perceived race). In the current study, 19 participants identified different street, socially assigned, and perceived races/ethnicities. Of these participants, a majority indicated their street race/ethnicity was White while their socially assigned or perceived race/ethnicity was Hispanic.

Additionally, it is possible that there were issues with measurement and stereotype threat activation. For instance, several measures were obtained using self-report. While all attempts were made to ensure confidentiality, as with all self-report measures, accuracy can be called into question due to the potential for response bias and shared method variance. However, the study also included behavioral and physiological measures. In addition, it may have been difficult to for participants to imagine themselves in a very specific hypothetical police encounter; and likewise, despite repeated reminders to continue to imagine what it would be like if they were in that scenario, participants may have forgotten about the scenario when they completed additional measures and tasks. Future research should improve on our design by using more realistic circumstances, such as a stimulated police encounter. Additionally, it is unclear whether the vignette and current study truly activated stereotype threat in Black and Hispanic young adults. Results from the word-stem competition task indicate greater stereotype threat activation among the experimental group than the control group. However, the spontaneous indication of stereotype threat was lacking. Therefore, it is possible that the

thought of being perceived as a criminal by police is not race-specific; though, race-specific outcomes (i.e., anxiety) occur.   In fact, Najdowski and colleagues found that Black and White men reported similar expectations regarding the officer's actions in the induction procedure. It is possible that simply being a young male produced this effect.

Further, the current study used participants at a university located in a rural environment which may have impacted the participants' view of the police encounter. Likewise, the participants primarily consisted of students with psychology or criminal justice majors which may have impacted the results. In fact, a university student population may a very different stereotyped threat perception than the general or criminal population, thus limiting generalizability of the results. While stereotypes of men in general include negative attributes related to aggression (Steinberg & Diekman, 2016), it is possible that a group with greater contact with the legal system is able to recall the stereotype of criminality better. Therefore, future research should examine the impact of stereotype threat in the general population as well as with justice-involved individuals. In addition, future research should examine the roles that stereotype concern, perceived discrimination, and views of legal legitimacy on the impact of stereotype threat on various outcomes. For instance, it is possible that individuals who have greater stereotype concern, more experiences of perceived discrimination, and/or low views of legal legitimacy experience the negative impact of stereotype threat to a greater degree. In fact, in the current study, legal legitimacy was correlated to both state anxiety and depression such that lower legal legitimacy was related to greater state anxiety and depression. Further, BIPOC participants reported lower levels of legal legitimacy overall. As a result, it is possible that views related to the legal system play a role in the relation to stereotype

threat and negative affect. In addition, legal legitimacy was found to be correlated with trait depression. Previous research has found a causal relationship between procedural justice (which includes legal legitimacy) and psychological well-being among prisoners (Beijersbergen et al., 2014). However, future research should further examine the impact of legal legitimacy on mental health outcomes in the community. Additionally, given that approximately one-half to three-quarters of offenders are rearrested and one-quarter are reincarcerated (Hunt & Dumville, 2016), it would be important to understand the impact that stereotype threat may have on offenders and their risk for recidivism.

Finally, it is possible that the various tasks and measures did not accurately measure the outcome variables. For instance, it is possible that the PSAP did not measure aggression in this sample or that because the task was unrelated to the threat of the scenario (i.e., a police encounter), it did not detect significant differences among the groups. Likewise, the task of social cognition primarily relied on the participants' ability to detect emotion. It would be beneficial for future research to include various measures of social cognition, including tasks in which participants are required to attribute mental states, such as intentions, to others.

Despite these limitations and confounding factors, the present study provided several novel contributions. This study was the first to test social cognition specifically as a cognitive domain that could be impacted by stereotype threat with downstream effects on mental health symptoms. Second, few studies have examined the neurobiological effects of stereotype threat, and to date, no studies have examined whether the links between stereotype threat and behavior and affective states are mediated by physiology. Further, at present, the bulk of the literature is focused on stereotypes of Black Americans

in educational or health care settings with relatively little attention to Hispanic individuals, or with any race in criminal justice settings. Finally, no study has explored the effect of stereotype threat in such a police encounter on cortisol, testosterone, social cognition, and psychopathology in racial/ethnic minority young adults.

Broadly, these findings indicate that stereotype threat can confer risk for psychopathology among BIPOC and there remains a critical need to continue to examine the impact of stereotype threat in legal encounters. Continued research may help further understand the psychological processes that contribute to biases in the judicial system, an important step in improving racial equality as innocent BIPOC may be targeted by police because of stereotype-threat-induced behavior and thus are at risk for miscarriages of justice (Davis & Leo, 2013; Norris & Bonventre, 2015). Likewise, continued research will further elucidate the negative impact that stereotype threat in legal encounters may have on the mental and physical health of BIPOC men.

REFERENCES

Apps, M. A. J., Rushworth, M. F. S., & Chang, S. W. C. (2016). The anterior cingulate gyrus and social cognition: Tracking the motivation of others. *Neuron*, *90*(4), 692–707. https://doi.org/10.1016/j.neuron.2016.04.018

Asnaani, A., Richey, J. A., Dimaite, R., Hinton, D. E., & Hofmann, S. G. (2010). A cross-ethnic comparison of lifetime prevalence rates of anxiety disorders. *The Journal of Nervous and Mental Disease*, *198*(8), 551–555. https://doi.org/10.1097/NMD.0b013e3181ea169f

August, K. J., & Sorkin, D. H. (2010). Racial and ethnic disparities in indicators of physical health status: Do they still exist throughout late life? *Journal of the American Geriatrics Society*, *58*(10), 2009–2015. https://doi.org/10.1111/j.1532-5415.2010.03033.x

Balsamo, M., Romanelli, R., Innamorati, M., Ciccarese, G., Carlucci, L., & Saggino, A. (2013). The state-trait anxiety inventory: Shadows and lights on its construct validity. *Journal of Psychopathology and Behavioral Assessment*, *35*(4), 475–486. https://doi.org/10.1007/s10862-013-9354-5

Bateman, A., & Fonagy, P. (2010). Mentalization based treatment for borderline personality disorder. *World Psychiatry*, *9*(1), 11–15.

Beijersbergen, K. A., Dirkzwager, A. J. E., Eichelsheim, V. I., Laan, P. H. van der, & Nieuwbeerta, P. (2014). Procedural justice and prisoners' mental health problems: A longitudinal study. *Criminal Behaviour and Mental Health*, *24*(2), 100–112. https://doi.org/10.1002/cbm.1881

Beilock, S. L., Rydell, R. J., & McConnell, A. R. (2007). Stereotype threat and working memory: Mechanisms, alleviation, and spillover. *Journal of Experimental Psychology. General*, *136*(2), 256–276. https://doi.org/10.1037/0096-3445.136.2.256

Benet-Martínez, V., & John, O. P. (1998). Los Cinco Grandes across cultures and ethnic groups: Multitrait-multimethod analyses of the Big Five in Spanish and English. *Journal of Personality and Social Psychology*, *75*(3), 729–750. https://doi.org/10.1037/0022-3514.75.3.729

Blascovich, J., Spencer, S. J., Quinn, D., & Steele, C. (2001). African Americans and high blood pressure: The role of stereotype threat. *Psychological Science*, *12*(3), 225–229. https://doi.org/10.1111/1467-9280.00340

Bosson, J. K., Haymovitz, E. L., & Pinel, E. C. (2004). When saying and doing diverge: The effects of stereotype threat on self-reported versus non-verbal anxiety. *Journal of Experimental Social Psychology*, *40*(2), 247–255. https://doi.org/10.1016/S0022-1031(03)00099-4

Brody, G. H., Chen, Y.-F., Murry, V. M., Ge, X., Simons, R. L., Gibbons, F. X., … Cutrona, C. E. (2006). Perceived discrimination and the adjustment of African American youths: A five-year longitudinal analysis with contextual moderation effects. *Child Development*, *77*(5), 1170–1189. https://doi.org/10.1111/j.1467-8624.2006.00927.x

Brondolo, E., Kelly, K. P., Coakley, V., Gordon, T., Thompson, S., Levy, E., … Contrada, R. J. (2005). The perceived ethnic discrimination questionnaire: Development and preliminary validation of a community version1. *Journal of*

Applied Social Psychology, *35*(2), 335–365. https://doi.org/10.1111/j.1559-1816.2005.tb02124.x

Broudy, R., Brondolo, E., Coakley, V., Brady, N., Cassells, A., Tobin, J. N., & Sweeney, M. (2007). Perceived ethnic discrimination in relation to daily moods and negative social interactions. *Journal of Behavioral Medicine*, *30*(1), 31–43. https://doi.org/10.1007/s10865-006-9081-4

Brunson, R. K. (2007). "Police don't like Black people": African-American young men's accumulated police experiences. *Criminology & Public Policy*, *6*(1), 71–101. https://doi.org/10.1111/j.1745-9133.2007.00423.x

Cherek, D. R., Moeller, F. G., Schnapp, W., & Dougherty, D. M. (1997). Studies of violent and nonviolent male parolees: I. Laboratory and psychometric measurements of aggression. *Biological Psychiatry*, *41*(5), 514–522. https://doi.org/10.1016/S0006-3223(96)00059-5

Choi, Y., Harachi, T. W., Gillmore, M. R., & Catalano, R. F. (2006). Are multiracial adolescents at greater risk? Comparisons of rates, patterns, and correlates of substance use and violence between monoracial and multiracial adolescents. *The American Journal of Orthopsychiatry*, *76*(1), 86–97. https://doi.org/10.1037/0002-9432.76.1.86

Coccaro, E. F., Fanning, J., & Lee, R. (2017). Development of a social emotional information processing assessment for adults (SEIP-Q). *Aggressive Behavior*, *43*(1), 47–59. https://doi.org/10.1002/ab.21661

Contrada, R. J., Ashmore, R. D., Gary, M. L., Coups, E., Egeth, J. D., Sewell, A., … Chasse, V. (2001). Measures of ethnicity-related stress: Psychometric properties,

ethnic group differences, and associations with well-being. *Journal of Applied Social Psychology*, *31*(9), 1775–1820. https://doi.org/10.1111/j.1559-1816.2001.tb00205.x

Crick, N. R., & Dodge, K. A. (1994). A review and reformulation of social information-processing mechanisms in children's social adjustment. *Psychological Bulletin*, *115*(1), 74–101. https://doi.org/10.1037/0033-2909.115.1.74

Crutchfield, R. D., Skinner, M. L., Haggerty, K. P., McGlynn, A., & Catalano, R. F. (2012). Racial disparity in police contacts. *Race and Justice*, *2*(3). https://doi.org/10.1177/2153368712448063

Davis, D., & Leo, R. A. (2013). Acute suggestibility in police interrogation. In A. M. Ridley, F. Gabbert, & D. J. L. Rooy (Eds.), *Suggestibility in Legal Contexts* (pp. 171–195). John Wiley & Sons, Ltd. https://doi.org/10.1002/9781118432907.ch9

Davis, S. K., Liu, Y., & Gibbons, G. H. (2003). Disparities in trends of hospitalization for potentially preventable chronic conditions among African Americans during the 1990s: implications and benchmarks. *American Journal of Public Health*, *93*(3), 447–455.

Dickerson, S. S., & Kemeny, M. E. (2004). Acute stressors and cortisol responses: A theoretical integration and synthesis of laboratory research. *Psychological Bulletin*, *130*(3), 355–391. https://doi.org/10.1037/0033-2909.130.3.355

Dill, K. E., Anderson, C. A., Anderson, K. B., & Deuser, W. E. (1997). Effects of aggressive personality on social expectations and social perceptions. *Journal of Research in Personality*, *31*(2), 272–292. https://doi.org/10.1006/jrpe.1997.2183

Djuric, Z., Bird, C. E., Furumoto-Dawson, A., Rauscher, G. H., Ruffin, M. T., Stowe, R.

    P., … Masi, C. M. (2008). Biomarkers of psychological stress in health disparities

    research. *The Open Biomarkers Journal*, *1*, 7–19.

    https://doi.org/10.2174/1875318300801010007

Dodge, K. A., & Crick, N. R. (1990). Social information-processing bases of aggressive

    behavior in children   ,

    social information-processing bases of aggressive behavior in children.

    Personality and Social Psychology Bulletin, *16*(1), 8–22.

    https://doi.org/10.1177/0146167290161002

Eckhardt, C. I., & Cohen, D. J. (1997). Attention to anger-relevant and irrelevant stimuli

    following naturalistic insult. *Personality and Individual Differences*, *23*(4), 619–

    629. https://doi.org/10.1016/S0191-8869(97)00074-3

Enders, C. K., & Bandalos, D. L. (2001). The relative performance of full information

    maximum likelihood estimation for missing data in structural equation models.

    Structural Equation Modeling: A Multidisciplinary Journal, *8*(3), 430–457.

    https://doi.org/10.1207/S15328007SEM0803_5

Enders, C. K. (2010). *Applied Missing Data Analysis*. Guilford Press.

Engel, R. S. (2003). Explaining suspects' resistance and disrespect toward police. *Journal*

    of Criminal Justice, *31*(5), 475–492. https://doi.org/10.1016/S0047-

    2352(03)00052-7

Epps, J., & Kendall, P. C. (1995). Hostile attributional bias in adults. *Cognitive Therapy*

    and Research, *19*(2), 159–178. https://doi.org/10.1007/BF02229692

Faravelli, C., Lo Sauro, C., Lelli, L., Pietrini, F., Lazzeretti, L., Godini, L., … Ricca, V. (2012). The role of life events and HPA axis in anxiety disorders: a review. *Current Pharmaceutical Design*, *18*(35), 5663–5674.

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The Adverse Childhood Experiences (ACE) Study. *American journal of preventive medicine*, *14*(4), 245–258. https://doi.org/10.1016/s0749-3797(98)00017-8

Fess, E.E.. (1992). Grip strength, In: Casanova J.S, eds. Clinical assessment recommendations, 2nd ed., Chicago, American Society of Hand Therapists, 1992, 41-45.

Fonagy, P., Gergely, G., & Jurist, E. L. (2004). *Affect Regulation, Mentalization and the Development of the Self*. Karnac Books.

Garber, J., Keiley, M. K., & Martin, C. (2002). Developmental trajectories of adolescents' depressive symptoms: predictors of change. *Journal of Consulting and Clinical Psychology*, *70*(1), 79–95.

Gąsior, J. S., Pawłowski, M., Williams, C. A., Dąbrowski, M. J., & Rameckers, E. A. (2018). Assessment of maximal isometric hand grip strength in school-aged children. *Open Medicine*, *13*, 22–28. https://doi.org/10.1515/med-2018-0004

Gelman, A., Fagan, J., & Kiss, A. (2007). An analysis of the New York City police department's "stop-and-frisk" policy in the context of claims of racial bias. *Journal of the American Statistical Association*, *102*(479), 813–823. https://doi.org/10.1198/016214506000001040

Geniole, S. N., Busseri, M. A., & McCormick, C. M. (2013). Testosterone dynamics and psychopathic personality traits independently predict antagonistic behavior towards the perceived loser of a competitive interaction. *Hormones and Behavior*, *64*(5), 790–798. https://doi.org/10.1016/j.yhbeh.2013.09.005

Geniole, S. N., MacDonell, E. T., & McCormick, C. M. (2017). The Point Subtraction Aggression Paradigm as a laboratory tool for investigating the neuroendocrinology of aggression and competition. *Hormones and Behavior*, *92*(Supplement C), 103–116. https://doi.org/10.1016/j.yhbeh.2016.04.006

Goff, P. A., Steele, C. M., & Davies, P. G. (2008). The space between us: Stereotype threat and distance in interracial contexts. *Journal of Personality and Social Psychology*, *94*(1), 91–107. https://doi.org/10.1037/0022-3514.94.1.91

Gold, S. M., Dziobek, I., Rogers, K., Bayoumy, A., McHugh, P. F., & Convit, A. (2005). Hypertension and hypothalamo-pituitary-adrenal axis hyperactivity affect frontal lobe integrity. *The Journal of Clinical Endocrinology & Metabolism*, *90*(6), 3262–3267. https://doi.org/10.1210/jc.2004-2181

Grier, W. H., & Cobbs, P. M. (1968). Black rage. New York: Basic Books

Heuer, K., Lange, W.-G., Isaac, L., Rinck, M., & Becker, E. S. (2010). Morphed emotional faces: Emotion detection and misinterpretation in social anxiety. *Journal of Behavior Therapy and Experimental Psychiatry*, *41*(4), 418–425. https://doi.org/10.1016/j.jbtep.2010.04.005

Hu, L. & Bentler, P. (1999) Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1-55, DOI: 10.1080/10705519909540118

Inzlicht, M., & Kang, S. K. (2010). Stereotype threat spillover: How coping with threats to social identity affects aggression, eating, decision making, and attention. *Journal of Personality and Social Psychology*, *99*(3), 467–481. https://doi.org/10.1037/a0018951

Jacobs, G. A., Latham, L. E., & Brown, M. S. (1988). Test-retest reliability of the State-Trait Personality Inventory and the Anger Expression Scale. *Anxiety Research*, *1*(3), 263–265. https://doi.org/10.1080/08917778808248724

Joormann, J., & Gotlib, I. H. (2006). Is this happiness I see? Biases in the identification of emotional facial expressions in depression and social phobia. *Journal of Abnormal Psychology*, *115*(4), 705–714. https://doi.org/10.1037/0021-843X.115.4.705

Josephs, R. A., Newman, M. L., Brown, R. P., & Beer, J. M. (2003). Status, testosterone, and human intellectual performance: Stereotype threat as status concern. *Psychological Science*, *14*(2), 158–163. https://doi.org/10.1111/1467-9280.t01-1-01435

Kahn, K. B., Lee, J. K., Renauer, B., Henning, K. R., & Stewart, G. (2017). The effects of perceived phenotypic racial stereotypicality and social identity threat on racial minorities' attitudes about police. *The Journal of Social Psychology*, *157*(4), 416–428. https://doi.org/10.1080/00224545.2016.1215967

Kalmakis, K. A., Meyer, J. S., Chiodo, L., & Leung, K. (2015). Adverse childhood experiences and chronic hypothalamic-pituitary-adrenal activity. *Stress*, *18*(4), 446–450. https://doi.org/10.3109/10253890.2015.1023791

Keller, P. A., McCluskey, A., Morgan, J., & O'connor, S. M. J. (2006). The role of the

    HPA axis in psychiatric disorders and CRF antagonists as potential treatments.

    Archiv Der Pharmazie, *339*(7), 346–355. https://doi.org/10.1002/ardp.200600021

Kline, R. B. (2011). *Principles and Practice of Structural Equation Modeling*. Guilford

    Publications.

Kochel, T. R., Wilson, D. B., & Mastrofski, S. D. (2011). Effect of suspect race on

    officers' arrest decisions. *Criminology*, *49*(2), 473–512.

    https://doi.org/10.1111/j.1745-9125.2011.00230.x

Krendl, A. C., Richeson, J. A., Kelley, W. M., & Heatherton, T. F. (2008). The negative

    consequences of threat: a functional magnetic resonance imaging investigation of

    the neural mechanisms underlying women's underperformance in math.

    Psychological Science, *19*(2), 168–175. https://doi.org/10.1111/j.1467-

    9280.2008.02063.x

Landrine, H., & Klonoff, E. A. (1996). The cchedule of racist events: A measure of racial

    discrimination and a study of its negative physical and mental health

    consequences. *Journal of Black Psychology*, *22*(2), 144–168.

    https://doi.org/10.1177/00957984960222002

Lansford, J. E., Malone, P. S., Dodge, K. A., Pettit, G. S., & Bates, J. E. (2010).

    Developmental cascades of peer rejection, social information processing biases,

    and aggression during middle childhood. *Development and Psychopathology*,

    22(3), 593–602. https://doi.org/10.1017/S0954579410000301

Lipscomb, A. E., Emeka, M., Bracy, I., Stevenson, V., Lira, A., Gomez, Y. B., &

    Riggins, J. (2019). Black male hunting! A phenomenological study exploring the

secondary impact of police induced trauma on the Black man's psyche in the United States. *Journal of Sociology*, *7*(1), 11-18.

López, N., Vargas, E., Juarez, M., Cacari-Stone, L., & Bettez, S. (2018). What's your "street race"? Leveraging multidimensional measures of race and intersectionality for examining physical and mental health status among Latinxs. *Sociology of Race and Ethnicity*, *4*(1), 49–66. https://doi.org/10.1177/2332649217708798

Lovallo, W. R., & Thomas, T. L. (2000). Stress hormones in psychophysiological research: Emotional, behavioral, and cognitive implications. In *Handbook of psychophysiology, 2nd ed* (pp. 342–367). New York, NY, US: Cambridge University Press.

Marsh, D. M., Dougherty, D. M., Moeller, F. G., Swann, A. C., & Spiga, R. (2002). Laboratory-measured aggressive behavior of women: Acute tryptophan depletion and augmentation. *Published Online: 14 September 2001; | doi:10.1016/S0893-133X(01)00369-4*, *26*(5), 660–671. https://doi.org/10.1016/S0893-133X(01)00369-4

Matheson, K., & Cole, B. M. (2004). Coping with a threatened group identity: Psychosocial and neuroendocrine responses. *Journal of Experimental Social Psychology*, *40*(6), 777–786. https://doi.org/10.1016/j.jesp.2004.04.002

Mays, V. M., Cochran, S. D., & Barnes, N. W. (2007). Race, race-based discrimination, and health outcomes among African Americans. *Annual Review of Psychology*, *58*, 201–225. https://doi.org/10.1146/annurev.psych.57.102904.190212

McGuire, T. G., & Miranda, J. (2008). New evidence regarding racial and ethnic disparities in mental health: Policy implications. *Health Affairs*, *27*(2), 393–403. https://doi.org/10.1377/hlthaff.27.2.393

McNulty, T. L., & Bellair, P. E. (2003). Explaining racial and ethnic differences in serious adolescent violent behavior. *Criminology*, *41*(3), 709–747. https://doi.org/10.1111/j.1745-9125.2003.tb01002.x

Mensah, G. A., Mokdad, A. H., Ford, E. S., Greenlund, K. J., & Croft, J. B. (2005). State of disparities in cardiovascular health in the United States. *Circulation*, *111*(10), 1233–1241. https://doi.org/10.1161/01.CIR.0000158136.76824.04

Miller, G. E., Chen, E., & Zhou, E. S. (2007). If it goes up, must it come down? Chronic stress and the hypothalamic-pituitary-adrenocortical axis in humans. *Psychological Bulletin*, *133*(1), 25–45. https://doi.org/10.1037/0033-2909.133.1.25

Montoya, E. R., Terburg, D., Bos, P. A., & van Honk, J. (2012). Testosterone, cortisol, and serotonin as key regulators of social aggression: A review and theoretical perspective. *Motivation and Emotion*, *36*(1), 65–73. https://doi.org/10.1007/s11031-011-9264-3

Najdowski, C. J., Bottoms, B. L., & Goff, P. A. (2015). Stereotype threat and racial differences in citizens' experiences of police encounters. *Law and Human Behavior*, *39*(5), 463–477. https://doi.org/10.1037/lhb0000140

Niedenthal, P. M., Halberstadt, J. B., Margolin, J., & Innes-Ker, Å. H. (2000). Emotional state and the detection of change in facial expression of emotion. *European Journal of Social Psychology*, *30*(2), 211–222.

https://doi.org/10.1002/(SICI)1099-0992(200003/04)30:2<211::AID-EJSP988>3.0.CO;2-3

Norris, R. J., & Bonventre, C. L. (2015). Advancing wrongful conviction scholarship: Toward new conceptual frameworks. *Justice Quarterly*, *32*(6), 929–949. https://doi.org/10.1080/07418825.2013.827232

Pierson, E., Simoiu, C., Overgoor, J., Corbett-Davies, S., Jenson, D., Shoemaker, A., Ramachandran, V., Barghouty, P., Phillips, C., Shroff, R., & Goel, S. (2020). A large-scale analysis of racial disparities in police stops across the United States. *Nature Human Behaviour*, *4*(7), 736–745. https://doi.org/10.1038/s41562-020-0858-1

Rammstedt, B., & John, O. P. (2007). Measuring personality in one minute or less: A 10-item short version of the Big Five Inventory in English and German. *Journal of Research in Personality*, *41*(1), 203–212. https://doi.org/10.1016/j.jrp.2006.02.001

Rattan, A., Levine, C. S., Dweck, C. S., & Eberhardt, J. L. (2012). Race and the fragility of the legal distinction between juveniles and adults. *PLoS ONE*, *7*(5), e36680. https://doi.org/10.1371/journal.pone.0036680

Richardson, L. (2015). Police racial violence: Lessons from social psychology. *Fordham Law Review*, *83*(6), 2961.

Rosenbaum, D. P., Schuck, A. M., Costello, S. K., Hawkins, D. F., & Ring, M. K. (2005). Attitudes toward the police: The effects of direct and vicarious experience. *Police Quarterly*, *8*(3), 343–365. https://doi.org/10.1177/1098611104271085

Schmader, T., Johns, M., & Forbes, C. (2008). An integrated process model of stereotype threat effects on performance. *Psychological Review*, *115*(2), 336–356. https://doi.org/10.1037/0033-295X.115.2.336

Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods*, *7*(4), 422–445.

Smith, D. A., Visher, C. A., & Davidson, L. A. (1984). Equity and discretionary justice: The influence of race on police arrest decisions. *The Journal of Criminal Law and Criminology (1973-)*, (1), 234.

Smith, P., & Waterman, M. (2003). Processing bias for aggression words in forensic and nonforensic samples. *Cognition and Emotion*, *17*(5), 681–701. https://doi.org/10.1080/02699930302281

Spielberger, C. D., Gorsuch, R. L., & Lushene, R. E. (1970). Manual for the State-Trait Anxiety Inventory. Retrieved from http://ubir.buffalo.edu/xmlui/handle/10477/2895

Steele, C. M., & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African Americans. *Journal of Personality and Social Psychology*, *69*(5), 797–811. https://doi.org/10.1037/0022-3514.69.5.797

Steinberg, M., & Diekman, A. B. (2016). The double-edged sword of stereotypes of men. In Y. J. Wong & S. R. Wester (Eds.), *APA handbooks in psychology. APA handbook of men and masculinities* (p. 433–456). American Psychological Association. https://doi.org/10.1037/14594-020

Suarez, L., & Bell-Dolan, D. (2001). The relationship of child worry to cognitive biases: Threat interpretation and likelihood of event occurrence. *Behavior Therapy*, *32*(3), 425–442. https://doi.org/10.1016/S0005-7894(01)80029-0

Terburg, D., Morgan, B., & van Honk, J. (2009). The testosterone–cortisol ratio: A hormonal marker for proneness to social aggression. *International Journal of Law and Psychiatry*, *32*, 216–223. https://doi.org/10.1016/j.ijlp.2009.04.008

Thoits, P. A. (2010). Stress and health: Major findings and policy implications. *Journal of Health and Social Behavior*, *51*(1_suppl), S41–S53. https://doi.org/10.1177/0022146510383499

Trampisch, U.S., Franke, J., Jedamzik, N., Hinrichs, T., & Platen, P. (2012). Optimal Jamar dynamometer handle position to assess maximal isometric hand grip strength in epidemiological studies. *Journal of Hand Surgery*, *37*(11). doi: 10.1016/j.jhsa.2012.08.014. PMID: 23101534.

Van Wijk, C. H. (2014). The use of Spielberger's State-Trait Personality Inventory (trait anxiety subscale) with naval subaquatic specialists. *International Journal of Occupational Medicine and Environmental Health*, *27*(6), 959–966. https://doi.org/10.2478/s13382-014-0321-5

Webster, G. D., Dewall, C. N., Pond, R. S., Deckman, T., Jonason, P. K., Le, B. M., … Bator, R. J. (2014). The brief aggression questionnaire: psychometric and behavioral evidence for an efficient measure of trait aggression. *Aggressive Behavior*, *40*(2), 120–139. https://doi.org/10.1002/ab.21507

Webster, G. D., DeWall, C. N., Pond, R. S., Deckman, T., Jonason, P. K., Le, B. M., … Bator, R. J. (2015). The Brief Aggression Questionnaire: Structure, validity,

reliability, and generalizability. *Journal of Personality Assessment*, *97*(6), 638–649. https://doi.org/10.1080/00223891.2015.1044093

Weitzer, R., & Tuch, S. A. (2004). Race and perceptions of police misconduct. *Social Problems*, *51*(3), 305–325. https://doi.org/10.1525/sp.2004.51.3.305

Whaley, A. L. (2001). Cultural mistrust: An important psychological construct for diagnosis and treatment of African Americans. *Professional Psychology: Research and Practice, 32*(6), 555-562. http://dx.doi.org/10.1037/0735-7028.32.6.555

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. *Educational and Psychological Measurement*, *76*(6), 913–934. https://doi.org/10.1177/0013164413495237

Williams, D. R., González, H. M., Neighbors, H., Nesse, R., Abelson, J. M., Sweetman, J., & Jackson, J. S. (2007). Prevalence and distribution of major depressive disorder in African Americans, Caribbean Blacks, and Non-Hispanic Whites: Results from the national survey of American life. *Archives of General Psychiatry*, *64*(3), 305–315. https://doi.org/10.1001/archpsyc.64.3.305

Williams, D. R., Neighbors, H. W., & Jackson, J. S. (2003). Racial/Ethnic discrimination and health: Findings from community studies. *American Journal of Public Health*, *93*(2), 200–208.

Williams, D. R., Yan Yu, Jackson, J. S., & Anderson, N. B. (1997). Racial differences in physical and mental health: Socio-economic status, stress and discrimination.

Journal of Health Psychology, *2*(3), 335–351.

https://doi.org/10.1177/135910539700200305

Xiong, F., & Zhang, L. (2013). Role of the hypothalamic-pituitary-adrenal axis in

developmental programming of health and disease. *Frontiers in*

Neuroendocrinology, *34*(1), 27–46. https://doi.org/10.1016/j.yfrne.2012.11.002

APPENDIX A

Demographics Questionnaire

1. What is your date of birth?

2. What is your racial/ethnic background?

3. Are you from a Hispanic ethnic group (yes or no)?

4. Are you from a Black ethnic group (yes or no)?

5. What is your "street race," or how you believe other Americans perceive your race at the level of the street?

6. What is socially assigned race or how you believe others usually classify your race in the United States?

7. What is your self-perceived race or how you usually self-classify your race on questionnaires?

8. What is the highest grade (or year) of regular school you have completed? (check one.)

Elementary/Middle School: __01 __02 __03 __04 __05 __06 __07 __08

High School: __09 __10 __11 __12

College/Junior College: __13 __14 __15 __16

Graduate School: __17 __18 __19 __20+

9. Which of these categories best describes your total combined family income for your household for the past 12 months? This should include income (before taxes) from all sources, wages, rent from properties, social security, disability and/or veteran's benefits, unemployment benefits, workman's compensation, help from relatives (including child payments and alimony), and so on.

__ <$25,000

__$25,000-<$50,000

__$50,000-<$75,000

__$75,000-<$100,000

__ $100,000-<$150,000

__ ≥$150,000

__ Don't Know/Not sure

__ Decline to respond

APPENDIX B

Brief Aggression Questionnaire

For each of the 12 items, rate how characteristic it is of you.

1 = extremely uncharacteristic of me
2 = uncharacteristic of me
3 = neither characteristic nor uncharacteristic of me
4 = characteristic of me
5 = extremely characteristic of me

1. I tell my friends openly when I disagree with them.
2. Given enough provocation, I may hit another person.
3. When people annoy me, I may tell them what I think of them.
4. Other people always seem to get the breaks.
5. I am an even-tempered person.*
6. My friends say that I'm somewhat argumentative.
7. If I have to resort to violence to protect my rights, I will.
8. Sometimes I fly off the handle for no good reason.
9. Sometimes I fly off the handle for no good reason.
10. I sometimes feel that people are laughing at me behind my back.
11. I have trouble controlling my temper.
12. When people are especially nice, I wonder what they want.

* = Reverse coded item

APPENDIX C

The Big Five Inventory (BFI)

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please write a number next to each statement to indicate the extent to which you agree or disagree with that statement.

Disagree strongly	Disagree a little	Neither agree nor disagree	Agree a little	Agree strongly
1	2	3	4	5

<u>I see Myself as Someone Who...</u>

_____1. Is talkative
_____2. Tends to find fault with others
_____3. Does a thorough job
_____4. Is depressed, blue
_____5. Is original, comes up with new ideas
_____6. Is reserved
_____7. Is helpful and unselfish with others
_____8. Can be somewhat careless
_____9. Is relaxed, handles stress well
_____10. Is curious about many different things
_____11. Is full of energy
_____12. Starts quarrels with others
_____13. Is a reliable worker
_____14. Can be tense
_____15. Is ingenious, a deep thinker
_____16. Generates a lot of enthusiasm
_____17. Has a forgiving nature
_____18. Tends to be disorganized
_____19. Worries a lot
_____20. Has an active imagination
_____21. Tends to be quiet
_____22. Is generally trusting
_____23. Tends to be lazy
_____24. Is emotionally stable, not easily upset
_____25. Is inventive

_____26. Has an assertive personality
_____27. Can be cold and aloof
_____28. Perseveres until the task is finished
_____29. Can be moody
_____30. Values artistic, aesthetic experiences
_____31. Is sometimes shy, inhibited
_____32. Is considerate and kind to almost everyone
_____33. Does things efficiently
_____34. Remains calm in tense situations
_____35. Prefers work that is routine
_____36. Is outgoing, sociable
_____37. Is sometimes rude to others
_____38. Makes plans and follows through with them
_____39. Gets nervous easily
_____40. Likes to reflect, play with ideas
_____41. Has few artistic interests
_____42. Likes to cooperate with others
_____43. Is easily distracted
_____44. Is sophisticated in art, music, or literature

APPENDIX D

Perceived Ethnic Discrimination Questionnaire (PEDQ)

Please think back ***over the past three months*** and then, unless instructed otherwise, for each item below indicate how often the event occurred using the following scale:

1	2	3	4	5	6	7
	never		sometimes	very often		

Write the rating (from 1 to 7) on the line provided in front of each item.

We would like to know about acts of discrimination that have been directed against or toward you personally during the past two months. Please respond to the following questions using the 7-point scale above.

Verbal rejection
1. ___ How often have you been subjected to offensive ethnic comments aimed directly at you, spoken either in your presence or behind your back?
2. ___ How often have you been exposed to offensive comments about your ethnic group (e.g. stereotypic statements, offensive jokes), spoken either in your presence or behind your back?
3. ___ How often have you been subjected to ethnic name calling (e.g. "wop", "nigger")?

Avoidance
4. ___ How often have others avoided physical contact with you because of your ethnicity?
5. ___ How often have others avoided social contact with you because of your ethnicity?
6. ___ How often have others outside of your ethnic group made you feel as though you don't fit in because of your dress, speech, or other characteristics related to your ethnicity?

Exclusion
7. ___ How often have you been denied access to a public facility or organization because of your ethnicity?
8. ___ How often have you felt that certain places were off limits or that barriers were erected to keep you out of certain places because of your ethnicity?

Denial of equal treatment
9. ___ How often have you received unfair treatment from school officials because of your ethnicity?
10. ___ How often have you received unfair treatment from service people (e.g., waiters, bank tellers, security guards) because of your ethnicity?

11. ___ How often have you received unfair treatment from your superiors at a job (e.g. boss, supervisor) because of your ethnicity?

Devaluating action
12. ___ How often have others had low expectations of you because of your ethnicity?
13. ___ How often has it been implied or suggested that because of your ethnicity you must be unintelligent?
14. ___ How often has it been implied or suggested that because of your ethnicity you must be dishonest?
15. ___ How often has it been implied or suggested that because of your ethnicity you must be violent or dangerous?
16. ___ How often has it been implied or suggested that because of your ethnicity you must be dirty?
17. ___ How often has it been implied or suggested that because of your ethnicity you must be lazy?

Threat of violence
18. ___ How often have others threatened to hurt you because of your ethnicity?
19. ___ How often have others threatened to damage your property because of your ethnicity?

Aggression
20. ___ How often have others physically hurt you or intended to physically hurt you because of your ethnicity?
21. ___ How often have others damaged your property because of your ethnicity?
22. ___ How often have you been subjected to nonverbal harassment because of your ethnicity (e.g. being framed/set up, being given "the finger")?

PEDQ. Subscale scores are computed as the mean of item responses. Items are keyed to subscales as follows: Disvaluation (items 12, 13, 14, 15, 16, 17); Threat/Aggression (items 18, 19, 20, 21, 22); Verbal Rejection (items 1, 2, 3); Avoidance (items 4, 5, 6). A total score may be computed as the mean of the four subscale scores (or as the mean for the 17 keyed items). The 5 items measuring Exclusion and Denial of Equal Treatment (items 7, 8, 9, 10, 11) did not factor well and therefore do not figure into scoring in the JASP paper. However, it might be of interest to include them to further explore the factor structure of the full set of 22 items.

APPENDIX E

Stereotype Confirmation Concern Scale (SCCS)

Often times, members of an ethnic group are concerned that their behaviors or the things they do appear to confirm stereotypes about their ethnic group. Think back **_over the past three months_** and tell us how often you have been concerned about appearing to confirm a stereotype about your ethnic group. Select a response from the choices below.

1	2	3	4	5	6	7
Never			Sometimes			Always

1. ___ How often have you been concerned that by *eating certain foods* you might appear to be confirming a stereotype about your ethnic group?
2. ___ How often have you been concerned that by *talking a certain way* you might appear to be confirming a stereotype about your ethnic group?
3. ___ How often have you been concerned that by *dressing a certain way* you might appear to be confirming a stereotype about your ethnic group?
4. ___ How often have you been concerned that by *playing certain sports* you might appear to be confirming a stereotype about your ethnic group?
5. ___ How often have you been concerned that by *attending or participating in certain social activities* you might appear to be confirming a stereotype about your ethnic group?
6. ___ How often have you been concerned that by *taking your studies too seriously* you might appear to be confirming a stereotype about your ethnic group?
7. ___ How often have you been concerned that by *owning certain things* you might appear to be confirming a stereotype about your ethnic group?
8. ___ How often have you been concerned that by *shopping in certain stores or eating at certain restaurants* you might appear to be confirming a stereotype about your ethnic group?
9. ___ How often have you been concerned that *the way you look* (your physical appearance) might appear to confirm a stereotype about your ethnic group?
10. ___ How often have you been concerned that by *doing certain household tasks* you might appear   to be confirming a stereotype about your ethnic group?
11. ___ How often have you been concerned that by *revealing your socioeconomic status* you might appear to confirm a stereotype about your ethnic group?

APPENDIX F

1. Have you ever been arrested? Please don't count minor traffic violations.
    a. If yes, how old were you the first time?
    b. If yes, how many times have you been arrested for breaking the law?
2. Have you ever been convicted of a crime? Please don't count minor traffic violations.
    a. If yes, how old were you the first time?
    b. If yes, how many times have you been arrested for breaking the law?
3. Please tell me which of the following best describes any experiences you may have had being approached or stopped by the police. This might involve a police officer stopping you while you were driving or walking, or having an officer come to your home to question you about an incident.
    a. You have been approached or stopped by the police within the last 12 months.
    b. You have been approached or stopped by the police in the past, but not within the last 12 months.
    c. You have never been stopped or approached by the police. [GO STRAIGHT TO QUESTION 5]
4. On the last occasion you were approached by the police, how do you think you were treated? Would you say you were treated. . .
    a. Very well
    b. Reasonably well
    c. Neither well nor badly
    d. Somewhat badly
    e. Very badly
    f. Don't know
5. As far as you are aware, have any of the following people that you know been approached or stopped by the police within the last year?
    a. Members of your immediate family
        i. Yes
        ii. No
    b. Other family relatives
        i. Yes
        ii. No
    c. Friends or neighbors
        i. Yes
        ii. No
    d. Other acquaintances
        i. Yes
        ii. No

If more than one is picked, go to question 6.
If just one is picked, go straight to question 7.

6. Thinking about the last time you heard about one of these experiences, who did it involve? Was it. . .[READ LIST AND SELECT ONE]
    a. A member of your immediate family

       b. Another family relative
       c. A personal friend or neighbor
       d. Another acquaintance

7. And, on this occasion, how well did the person appear to have been treated by the police overall? Would you say they were treated. . .[READ LIST]
       a. Very well
       b. Reasonably well
       c. Neither well nor badly
       d. Somewhat badly
       e. Very badly
       f. Don't know

APPENDIX G

The Procedural Justice Inventory – Legitimacy

(1) Strongly disagree
(2) Somewhat disagree
(3) Somewhat agree
(4) Strongly agree

1. I have a great deal of respect for the police.
2. Overall, the police are honest.
3. I feel proud of the police.
4. I feel people should support the police.
5. The police should be allowed to hold a person suspected of a serious crime until they get enough evidence to charge them.
6. The police should be allowed to stop people on the street and require them to identify themselves.
7. The courts generally guarantee everyone a fair hearing (trial).
8. The basic rights of citizens are protected in the courts.
9. Many people convicted of crimes in the courts are actually innocent. [Reverse coded]
10. Overall, judges in the courts here are honest.
11. Court decisions here are almost always fair.

APPENDIX H

Stereotype Threat Induction

Take a few minutes to read the next paragraph slowly and carefully. Imagine what it would be like if you were in the situation described below. Try hard to put yourself in the situation and really think hard about how you would be feeling in the situation. Think long and hard about how you would react. Try to reflect upon the way you would feel if you were in these circumstances.

It's about 10:00 p.m. and you're on your way home for the night. You just left a friend's house and you're walking down the street carrying a backpack filled with various things you needed throughout the day. Only two more blocks and you'll be home. Before you cross the street to get to your building, a police officer walks out of the corner convenience store, a little ways in front of you. When he sees you, he stops and stands there. The officer is obviously watching you as you approach.

APPENDIX I

Control Condition

Take a few minutes to read the next paragraph slowly and carefully. Imagine what it would be like if you were in the situation described below. Try hard to put yourself in the situation and really think hard about how you would be feeling in the situation. Think long and hard about how you would react. Try to reflect upon the way you would feel if you were in these circumstances.

It's about 10:00 p.m. and you're on your way home for the night. You just left a friend's house and you're walking down the street carrying a backpack filled with various things you needed throughout the day. Only two more blocks and you'll be home. Before you cross the street to get to your building, you realize that you left your keys at your friend's house. You turn around and head back to grab them.

APPENDIX J

Manipulation Check/Stereotype Threat Spontaneous Reaction

1. How would you feel?

2. What would you be thinking?

3. How would you react?

4. What do you imagine the police officer would do next?

VITA

Anna Abate, M.A.

Education

Current	**Pre-Doctoral Clinical Internship (APA-Accredited)**
	Forensic Clinical Track
	University of North Carolina – Chapel Hill, NC
Expected August 2021	**Doctor of Philosophy, Clinical Psychology with a Forensic Emphasis**
	Sam Houston State University – Huntsville, TX
	American Psychological Association Accredited Clinical Psychology Program
	Dissertation: *The effect of stereotype threat in police encounters on behavioral and affective outcomes*
May 2017	**Master of Arts, Clinical Psychology with a Forensic Emphasis**
	Sam Houston State University – Huntsville, TX
	Thesis: *Perceptions of the legal system and recidivism: Investigating the mediating role of perceptions of chances for success in juvenile offenders*
May 2014	**Bachelor of Arts with Honors Psychology and History**
	University of North Carolina – Chapel Hill, NC

Grants

Source	National Institutes of Mental Health, 1F31MH117854-01A1
Title	The Effect of Stereotype Threat in Police Encounters on Behavioral and Affective Outcomes
Role	Principal Investigator
Award Amount	$104,730
Date	February 2019 – August 2020

Peer Review Publications

Published   Venta, A., Long, T., Bailey, C., Galicia, B., **Abate, A.**, Walker, J., & Salinas, K (2020). Measurement invariance of the Inventory of Peer and Parent Attachment among Latinx and Non-Latinx College Students. Accepted, *Psychological Assessment*.

Marshall, K., **Abate, A**., Venta, A. (2020). Houston strong: Linguistic analysis of resilience after hurricane harvey. Accepted, *Journal of Traumatic Stress Disorders & Treatment*.

Abate, A., Marek, R., Venta, A., Taylor, L., & Velez, L. (2019). The effectiveness of a home-based delivery of Triple P in high-risk families in rural areas. Accepted, *Journal of Child and Family Studies*.

Venta, A., Galicia, B., Bailey, C., **Abate, A.,** Marshall, K., Long, T**.** (2019) Attachment and loss in the context of U.S. immigration: Caregiver separation and characteristics of internal working models of attachment in high school students. Accepted, A*ttachment & Human Development*.

Venta, A., Harmon, J., **Abate, A.,** Marshall, K., & Mouton-Odum, S. (2019). Pilot data supporting an attachment-based theory of adolescent social media use. *Child and Adolescent Mental Health*. https://doi.org/10.1111/camh.12329

Muñoz, C. G., **Abate, A**., Sharp, C., & Venta, A. C. (2019). Factor structure and clinical utility of the Youth Psychopathic Traits Inventory in an inpatient sample. *Psychiatry Research*, *275*, 189–195. https://doi.org/10.1016/j.psychres.2019.03.031

Venta, A., Bailey, C., Muñoz, C., Godinez, E., Colin, Y., Arreola, A., **Abate, A**., Camins, J., Rivas, M., & Lawlace, S. (2019). Contribution of schools to mental health and resilience in recently immigrated youth. *School Psychology, 34*(2), 138–147. https://doi.org/10.1037/spq0000271

Marshall, K., **Abate, A**., & Venta, A. (2018). Posttraumatic stress symptoms and recidivism in serious juvenile offenders: Testing the mediating role of future orientation. *Journal of Child & Adolescent Trauma*. https://doi.org/10.1007/s40653-018-0234-8

Abate, A., & Venta, A. (2018). Perceptions of the legal system and recidivism: Investigating the mediating role of perceptions of chances for success in juvenile offenders. *Criminal Justice and Behavior*, *45*(4), 541–560. https://doi.org/10.1177/0093854817753264

Bailey, C., **Abate, A.,** Sharp, C., & Venta, A. (2018). Psychometric evaluation of the Inventory of Interpersonal Problems 32. *Bulletin of the Menninger Clinic*, *82*(2), 93–113. https://doi.org/10.1521/bumc.2018.82.2.93

Ball, E. M., **Abate, A. C**., Airrington, M. D., Taylor, L. K., & Venta, A. C (2018). When and how do race and ethnicity explain patterns of dysfunctional discipline? *Journal of Child and Family Studies, 27(3), 966-978. doi:10.1007/s10826-017-0931-1*

Abate, A., Marshall, K., Sharp, C., & Venta, A. (2017). Trauma and aggression: Investigating the mediating role of mentalizing in female and male inpatient adolescents. *Child Psychiatry and Human Development*, *48*(6), 881–890. https://doi.org/10.1007/s10578-017-0711-6

In Preparat-ion	**Abate, A.,** Bailey, C., & Venta, A (2020). Attachment and social support in Latinx young adults: Investigating the moderating role of *familismo*. Submitted, *Attachment and Human Behavior*.

Book Chapters

Published   Schiller, C. E., Johnson, S. L., **Abate, A. C.,** Schmidt, P. J., & Rubinow, D. R. (2016). Reproductive Steroid Regulation of Mood and Behavior. *Comprehensive Physiology*, *6*(3), 1135–1160. https://doi.org/10.1002/cphy.c150014

In Press   Venta, A. & **Abate, A**. (Under contract). Insecure attachment and related difficulties. In. A Venta, C. Sharp, P. Fonagy, & J. Fletchers (Eds.), Developmental Psychopathology. Hoboken, NJ: Wiley-Blackwell.