

Stereotype Threat and Undergraduate Writing Performance

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## **Abstract**

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Although research speaks to the relationships between stereotype threat and academic performance, and race-based psychosocial variables and academic performance, little research thus far has investigated these variables simultaneously. To address this gap in the literature, the current study examined the impact of a negative stereotype induction on persuasive writing performance and post-task self-perceptions of academic performance in a sample of Black, White, and Hispanic undergraduate students. Unique to the current study is an additional investigation which reviewed the role racial/ethnic centrality plays in the relationship between stereotype threat and writing performance. A researcher generated measure of persuasive writing was administered to assess writing skills, and was scored based on a holistic quality scale with reported efficacy in the literature. Racial/ethnic centrality was assessed via the Multidimensional Inventory of Black Identity, whereas post-task perceptions of academic ability were garnered via a survey used in prior stereotype threat research. Participants were randomly assigned to either a stereotype induced or stereotype not induced condition, and completed study measures either in person, or online. Findings were not indicative of statistically significant differences in persuasive writing scores across experimental conditions; however, race/ethnic and gender differences were noted. Furthermore, Black participants in the stereotype induced condition were found to report more negative self-perceptions of writing ability. Racial/ethnic differences in racial/ethnic centrality were found, with Black and Hispanic participants self-reporting higher racial/ethnic centrality when compared to their White peers. Lastly, a statistically significant

interaction effect for racial/ethnic identity by racial/ethnic centrality by stereotype condition was found for persuasive writing performance.

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## **Dedication**

To the late James H. Bolden, beloved parent, grandparent, and friend.

## **Chapter 1: Introduction to the Racial/Ethnic Achievement Gap**

Throughout their academic careers, students belonging to Black and Hispanic populations tend to display lower academic outcomes than their White counterparts. They exhibit poorer school achievement (Demo & Parker, 1987; Reardon & Galindo, 2009), and lower scores on standardized academic tests (Herring, 1989; Steele & Aronson, 1995; Rodriguez, 2014). Studies have documented significant effects that socioeconomic status (Schultz, 1993), quality of domestic and community living (Sanbonmatsu et al., 2005) and lack of educational opportunity can have on Black and Hispanic academic achievement. Importantly, research has suggested that even when these factors are held constant, the academic performance of Black and Hispanic students still falls behind that of White individuals. This may indicate that these factors exacerbate the effects of other variables that affect the academic achievement gap. One hypothesis that has been offered to explain the achievement lag is that it may be attributable to testing and learning environments that are construed by students as biased against them. For example, seminal work by Jensen (1980) found that although minority students may exhibit similar SAT scores when compared to their White peers, their performance on other achievement measures, including grades, retention in school, and graduation rate, are not comparable. This finding suggests that utilizing single measures of academic performance may be insufficient for the purpose of understanding minority underachievement.

It has been hypothesized that race-based psychosocial factors are an important contributor to academic achievement gaps (Powell & Arriola, 2003). Some studies point to relationships between socioeconomic status, social class, competency beliefs, and the ability to successfully complete tasks (Marsh & Parker, 1984). Additionally, psychological frameworks have been proposed to explain other factors which may inform achievement differentials,

including: stereotype threat (Steele & Aronson, 1995; Steele, 1997; Taylor & Walton, 2011; Rodriguez, 2014), variations in student motivation, and domain identification (Cokley, 2002; Steele, 1997; Woodcock et al., 2012). Research based on this work points in turn to effects of ethnicity/race in a school environment, its impact on one's sense of belonging and engagement (Singh et al., 2010; McGill et al., 2012; Cole & Yip, 2008), contingencies on self-worth (Hope et al., 2013), and views concerning stereotypes (Bowen et al., 2013; Smith & Hung, 2008; Steele et al., 2002). Another relevant factor in understanding academic disparities is the development of personal identity among racial/ethnic minority youth (Okeke et al., 2009). However, despite these various hypotheses, there is a shortage of empirical research on the role of any of them in explaining the achievement gap.

It is clear that additional research is needed for a better understanding of the nature of the academic achievement gap; such research is critically important in order to promote more consistent positive outcomes for students belonging to at-risk populations. The aim of this dissertation study is to examine the relationship between racial/ethnic identity, stereotype threat, psychosocial variables, and academic performance (operationalized as writing ability).

### **1.1. Minority Literacy Performance**

In academic settings, minority performance in literacy is a core issue, and inadequate literacy skills are considered a major contributor to the educational crisis involving school-aged minority students (Cabrera & Trotti, 2014; Goldenberg et al., 1992; Reardon et al., 2012). There is research which suggests their demonstrated shortcomings in literacy may stem from a lack of early academic enrichment experiences (Gonzalez et al., 2011). Those from socioeconomically disadvantaged backgrounds are less likely to receive quality cognitive input from an early age (Hart & Risley, 1995; Ready, 2010). Those children also receive less exposure to text and

diverse vocabulary, in addition to less sophisticated language input (Neuman, 2007). These nonoptimal emerging learning experiences place low socioeconomic and minority children at an early disadvantage. As such, not all students enter school equally prepared to learn. This disparity suggests the achievement gap is present before formal education begins (Gonzalez et al., 2011). It is important for students belonging to underserved and underrepresented groups to receive enrichment to fill the cultural and educational gaps that may be present in their early development. Christensen et al. (2014) note that early childhood enrichment experiences are associated with better cognitive functioning and diminish the impact socioeconomic status has on cognitive performance.

The gap in literacy performance continues to persist throughout the minority students educational careers. According to the United States Department of Education's National Center for Education Statistics (NCES), the Black-White eighth grade reading gap in 2015 was not measurably different from the reading gap in 1992 (i.e., 26 points; NCES, 2017). Conversely, NCES (2017) reports that in 2015, the Hispanic-White reading gap was 21 points. Later in their academic careers, on average, Black and Hispanic students enter high school with literacy skills three years behind their White peers (Reardon et al., 2012). NCES (2017) reports similar achievement differentials as occurring near the end of minority students' formative academic careers. According to their data, in 2015, the Black-White twelfth-grade reading gap was larger than it was in 1992 (i.e., 30 points versus 24 points); the Hispanic-White reading gap was not significant different from 1992 (i.e. 20 points). Students from low-income households are at an even greater risk of possessing underdeveloped literacy skills, and are typically five years behind their high income counterparts (Reardon et al., 2012). This is important to note, as the majority

of children facing poverty are from Black (37%) or Hispanic (31%) backgrounds (based on 2014 data; NCES, 2017).

These achievement differentials also are noted in standardized test performance. According to the NCES (United States Department of Education, 2016), Black and Hispanic seniors consistently demonstrated lesser writing achievement on the SAT, between the years of 1986 and 2015, when compared to their White peers. Reardon et al. (2012) suggest that these academic gaps are far too wide to be closed by remedial instruction in high school, placing these students at a gross disadvantage in post-secondary education. Findings from the Educational Testing Service (ETS, 2019) affirm that standardized performance differences in literacy skills also are present at the post-secondary level, as those who identify as White (or Asian) performed better on the Graduate Record Examination's (GRE) measure of analytical writing when compared to those who identified as other racial/ethnic groups (including those of Black and Hispanic backgrounds) between the years of 2017-2018.

Furthermore, illiteracy and criminality are noted in the literature as being closely related. For example, in 2003, the NCES (United States Department of Education, 2003) conducted the National Assessment of Adult Literacy Prison Survey, and found that incarcerated individuals are disproportionately illiterate when compared to their non-incarcerated adult peers. O' Cummings et al. (2010) also note that there is a disproportion in the rates of incarcerated youth who have not acquired sufficient literacy skills. They suggest that youth with low literacy skills are not only at higher risk of interacting with the juvenile justice system, but also are at a greater risk for poorer outcomes post-incarceration. Thus, determining the contributing factors to Black and Hispanic academic outcomes, and devising viable interventions and school programs to

motivate students, may serve as a means to address some of the current disparities in the public education and criminal justice systems.

## ***1.2. The Process of Writing***

The current study focuses on writing skills, an important aspect of literacy. Wilson et al. (2016) define writing as a complex skill that demands the coordination of various functions. Writing demands discourse knowledge, including an understanding of the topic, the genre, and language to be used. Writing ability also depends on cognitive processes (e.g., planning, translating, reviewing; Wilson et al., 2016). According to Flower and Hayes (1981), planning involves the generation of ideas, organization, and goal setting. Translation is the process of generating one's ideas and concepts into visible language (i.e., text; Flower & Hayes, 1981). Flower and Hayes (1981) further note that reviewing is comprised of two subprocesses: evaluation and revision, and may be a conscious process in which writers select text to read in order to facilitate further translation of ideas or to evaluate and repair any gaps in the text. Affective processes (i.e., motivation, disposition and self-efficacy, self-regulation), and fluency and accuracy (i.e., handwriting, keyboarding, spelling, grammar, sentence construction skills), are also necessary in order to communicate meaning to an audience for a specific purpose (Wilson et al., 2016).

Hayes (1996) would refer to these functions of writing as individual components that are internal to the writer. Hayes (1996) expanded on these functions by considering external factors found in the task environment, which is comprised of the social and physical environments. The social environment concerns a writer's collaborators, audience, and the instructional context. The physical environment pertains to the writing medium, and the text as it is being written, which subsequently influences one's writing (Hayes, 1996). In school settings, an important form of

writing is persuasive writing (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010). This genre was used in the current study.

### ***Persuasive Writing***

A persuasive essay is written to attempt to convince a reader of a position, belief or course of action (Ferretti et al., 2009; Howell et al., 2017; Toulmin, 2003; Uccelli et al., 2013). A distinction has been made between persuasive and argumentative essays, with the former simply stating a position and the latter also stating an opposing position and a rebuttal (Hillocks, 2011). There are differences in the ways in which these terms are used in the literature; for the purpose of the current research, the term “persuasive” was used to refer to both persuasive and argumentative writing.

A well written persuasive essay is structured to include the writer’s thesis about a topic, accurate claims with supporting data, counterclaims, rebuttals, and a conclusion (Uccelli et al., 2013). Berman and Nir-Sagiv (2004) suggested that because persuasive writing demands a specific argumentation structure to format one’s ideas, it poses novel cognitive challenges for students. They must go beyond simply stating their emotions or reactions by indicating their position and certainty of their claims regarding a specific event or idea (Berman & Nir-Sagiv, 2004). Midgette et al. (2008) further noted persuasive writing requires students to engage in a dialogue with an unseen audience. When engaged in persuasive writing, the writer must anticipate how the reader will interpret their writing and that the reader may have opposing views. The writer must then acknowledge any opposing views by providing supporting details, and then rebut it (Midgette & Haria, 2016). In order to understand how to approach a persuasive writing task, proficient writers employ a genre-specific schema. Wolfe (2011) defined a schema as a learned, culturally derived set of expectations and questions that are evoked by the texts we



engage with. Proficient writers are able to use a schema to create important subgoals to sufficiently address a persuasive writing task, such as supporting each claim, considering the audience, and acknowledging the counterargument.

Studies have investigated persuasive writing skills at the undergraduate level, and have found that many students have difficulty with this genre (Nussbaum & Kardash, 2005). Oppenheimer et al. (2017) noted statistically significant gender differences for persuasive writing ability in an undergraduate sample during a longitudinal investigation of writing skills throughout college. Notably, the challenges students face with persuasive writing likely are evident at earlier stages of development. For example, the National Assessment of Education Progress (NAEP; United States Department of Education, 2012) has found that 43% of fourth graders and 34% of eighth graders did not produce proficient persuasive essays. Additional research corroborates the struggles middle school students face when addressing persuasive writing tasks (Graham & Harris, 2013). In part, these challenges may be attributable to the higher-order abstract thinking that is demanded when engaging in persuasive writing (Boyle & Hindman, 2015). Vatterott (2006) suggests this form of reasoning aligns with Piaget's formal-operational thought stage of development, which begins in adolescence, and is rarely fully achieved until high school.

Nussbaum and Kardash (2005) investigated ways to bolster undergraduate persuasive writing skills. Specifically, they aimed to encourage average-achieving undergraduate students to include more counterarguments when writing argumentative texts by utilizing Ferretti et al.'s (2000) work on goal-directed prompts. Participants generated essays in control, reason, and counterclaim/rebuttal conditions, in response to the following prompt: "Does watching TV cause children to become more violent?" Essays were coded using Inch and Warnick's (2002)

conceptualization of a standard analytic model for argumentation, which focuses on how claims are structured to form arguments, counterarguments, rebuttals, and supporting reasons, which are classic components of argumentative text (Toulmin, 2003). Their analyses indicated significant differences in the marginal means for the essay elements across conditions. For example, in the counterclaim/rebuttal condition the following results were found: Primary claims:  $M = 1.81, p < .05$ ; Counterclaims:  $M = 1.36, p < .01$ ) when compared to the control condition (e.g., Primary claims:  $M = 1.73, p > .05$ ; Counterclaims:  $M = .064, p > .05$ ) and reason group (e.g., Primary claims:  $M = 2.12, p > .05$ ; Counterclaims:  $M = .92, p > .05$ ; Nussbaum & Kardash, 2005). This finding suggested even typically functioning post-secondary students have difficulty addressing certain aspects of persuasive writing without explicit guidance.

Research conducted by Ferretti et al. (2000) centered on means to improve the persuasive writing of students with and without learning disabilities. A sample of  $n = 124$  typically-functioning and learning disabled 4<sup>th</sup> and 6<sup>th</sup> graders were randomly assigned to two goal conditions (general and elaborated) when completing a persuasive writing task. These students were sourced from a combined urban/suburban school district in the mid-Atlantic region of the United States. Students in both goal conditions were required to choose a side and write two statements. The first was to their teacher regarding whether students should be given more homework. The second was to the Parent-Teacher Association concerning whether students should be allowed to watch violent television. Those in the general goal condition were simply tasked with persuading the audience to agree with them. In contrast, students in the elaborated goal condition were given the same general goal, in addition to explicit subgoals based on elements of argumentative discourse. These subgoals directed students to include (a) a statement of their belief, (b) two or three reasons, (c) examples or supporting information for each reason,

(d) two or three reasons why others may disagree with their stance, and (e) why those opposing reasons are incorrect.

To score the students' responses, Ferretti et al. (2000) employed a seven-point holistic quality rubric, which was also used in this dissertation. The rubric judged the effectiveness of the students' text in convincing members to take some action or to change their thoughts about a controversial issue. This rubric also assessed students' responses for elements of argumentative discourse (e.g., propositions, reasons for the proposition, elaborations of propositions and reasons, alternative propositions, etc.). Results of an Analysis of Variance (ANOVA) indicated a significant grade-by-goal effect ( $p = .039$ ); the elaborated goal condition was found to only improve the writing of the 6<sup>th</sup> grade students. Furthermore, a main effect for goal condition on writing quality was significant,  $p = .008$ . Overall, these findings suggested that providing older students with an elaborated goal might enhance their ability to include argumentative elements in their text, which in turn might improve the persuasiveness of their writing (Ferretti et al., 2000).

Uccelli et al. (2013) examined language predictors of persuasive writing quality in 51 essays written by ethnically and socioeconomically diverse high school seniors as part of their regular course work. The essays were composed within a 25-minute limit, similar to the SAT's timed conditions, and were in response to prompts similar to those on the SAT. Essay quality was hand-scored on a 10-point holistic scale and linguistic features were analyzed using an automated language analysis system (Child Language Data Exchange System; CHILDES). A series of regression analyses on the linguistic features tested whether the frequency of organizational markers (i.e., includes those that signal the sequence of claims, introduce an example or paraphrase, index interclauses, or explicitly discuss the author's conclusion) and epistemic hedges (i.e., markers that index a cautious attitude regarding one's claims/assertions)

could provide additional predictive power beyond text length and lexico-grammatical intricacy alone (i.e., this includes the variety of words in text, frequency of content words, and the number of words per clause). The final regression model provided support for these predictors - length, lexico-grammatical intricacy, organizational markers, and epistemic hedges were found to be statistically significant indicators of persuasive writing quality ( $p < .05$ ). Uccelli et al. (2013) suggested that these predictors of persuasive writing quality likely were associated with the linguistic expectations educators have for their students. Overall, their findings might prove relevant for the development of writing curriculum, as students may benefit from receiving explicit instruction to improve their understanding and presentation of the linguistic elements found to be significant predictors in this work.

In summary, prior research has investigated both products of and processes used in persuasive writing, and suggests that it is a complex task demanding the coordination of multiple functions. Prior investigations also note methods used to improve persuasive writing skills at various stages of development. Furthermore, literature has considered the characteristics of proficient persuasive writing, the development of discourse knowledge, underlying cognitive processes, and differences in scoring methods.

### **1.3. Conceptual Framework**

The current study adopts a social-psychological perspective which considers the ramifications of specific aspects of an individual's social identity in academic domains. It is claimed that social identity is formed through how people are viewed as group members and/or through other's perceptions of them. Youth are sometimes, "morbidly preoccupied with what they appear to be in the eyes of others" (Erikson, 1968, 1994). This regard for self, and perceptions of how persons feel they are viewed by others, led to the hypothesis that race-based

psychosocial factors, given their saliency across all facets of life, have the potential to hinder or bolster academic outcomes. This may be particularly applicable in areas where one's racial group is stereotyped or stigmatized (e.g. Black individuals in the domain of literacy). The underlying premise of this perspective is based on social-cognitive theory (Bandura, 1989) which posits that individual behaviors and cognitions are influenced by an interaction between personal perceptions and the social environment.

Minority youth have been found to hold beliefs that there are certain expectations belonging to those of particular racial/ethnic groups (Spencer, 1984). These expectations vary and can be shaped by race-based stereotypes or perceived racial differences in ability. Stereotypes are defined as widely held beliefs that typically oversimplify a particular individual, group of individuals, or object (Merriam-Webster, n.d.). Stereotypes can be expressed behaviorally as microaggressions, which are everyday verbal, nonverbal, and environmental slights that communicate hostile, derogatory, or negative messages to target recipients based solely on group affiliation (Yearwood, 2013). These concepts are related to racism and discrimination and are hypothesized to function as developmental mediators for those belonging to the target groups (Constantine & Blackmon, 2002). They have been reported to result in deleterious effects on academic self-concept and performance (Evans et al., 2011), and to have the potential to affect the racial climate, or overall racial environment of a particular setting (Solorzano et al., 2000).

#### **1.4. Stereotype Threat**

Psychological frameworks based on the influence of stereotypes on functioning have been proposed to explain the racial academic-achievement gap, including stereotype threat (Steele, 1997; Steele & Aronson, 1995; Taylor & Walton, 2011). It is defined as a self-relevant

situational threat individuals experience when there is pressure or anxiety because of the potential the situation has to confirm a negative stereotype (Steele & Aronson, 1995). The effects of stereotype threat are theorized to originate from concerns for the self (personal identity stereotype threat) or from concerns for the group (social identity stereotype threat; Laar et al., 2008).

Research suggests that there are several consequences of stereotype threat including: emotional detriment, psychosocial stress, overperformance, and underperformance (Steele, 1997). Appel and Kronberger (2012), and Taylor and Walton (2011) purport that the impact of stereotype threat transcends test-taking and situational conditions, and can impair an individual's ability to attain skills from the onset. Other literature notes detrimental short-term health effects related to stereotype threat (Blascovich et al., 2001) and poorer long-term health outcomes for individuals who attempt to manage chronic stereotype threat by exerting excess effort/overperforming (i.e., "John Henryism"; James et al., 1992). There is also literature which notes that prolonged exposure to stereotype threat leads to academic domain disidentification, a phenomenon in which students do not evaluate themselves based on their academic performance (i.e., their self-concept is not influenced by academic achievement; Osborne, 1997; Cokley, 2002; Cokley et al., 2012; Hope et al., 2013; McClain & Cokley, 2017). If left unresolved, disidentification from a domain can lead to domain abandonment (Woodcock et al., 2012; Beasley & Fischer, 2012).

Additional research concerning stereotype threat reinforces its pervasive nature, as it has been found to influence individuals based on their gender (e.g. women; Spencer et al., 1999; Hoyt & Murphy, 2016; Koch et al., 2008; Martens et al., 2006), and sexuality (e.g. homosexuality; Bosson, Haymovitz, & Pinel, 2004). It is also theorized to impact disparities in

healthcare utilization among individuals belonging to particular social identity groups (e.g., LGBTQ; Fingerhut & Abdou, 2017).

### ***Hypothesized Multi-Threat Framework***

Shapiro and Neuberg (2007) proposed a multi-threat framework of stereotype threat, which is comprised of two elements: the target of the stereotype threat (i.e., the self and one's group), and the source of the stereotype threat (i.e., self-perceptions, outgroup members, and ingroup members). A total of six distinct stereotype threats emerge from Shapiro and Neuberg's (2007) framework, which they posit forms the core of the broader stereotype threat construct. They further suggest that their multi-threat framework provides a foundation for understanding novel and uncharacterized stereotype threats.

The first *self-categorized* stereotype threat is a *self-concept threat*. It is defined as the fear an individual holds of seeing themselves as possessing a negative stereotypic characteristic. An *own-reputation threat* (outgroup) is the fear of being judged or treated unjustly by members of the outgroup because they perceive that one confirms a negative stereotype. An *own-reputation threat* (ingroup) is the fear of being stereotypically characterized by members of one's ingroup, in a manner in which they may judge, discriminate, or treat one unfavorably.

Conversely, Shapiro and Neuberg (2007) describe the *group-concept threat* as the first type of group targeted stereotype threat. This threat is the fear that one's behavior will confirm self-held beliefs that one's group is legitimately lesser than another group. In turn, a *group-reputation threat* (outgroup) comes from the fear that one's behavior will reinforce the negative stereotypes about one's group in the mind of outgroup members. Lastly, the *group-reputation threat* (ingroup) comes from the fear that one's performance will verify negative stereotypes about one's group in the minds of other ingroup members.

Given the variety of published stereotype threat studies, Shapiro and Neuberg's (2007) framework offers a means to categorize the operationalizations of stereotype threat that appear in the literature. According to Shapiro and Neuberg (2007), a better system of categorization for stereotype threat induction methods will lead to a better understanding of the different conditions that engage different threats, the consequences which come from these threats, and the development of interventions to mitigate their influence on an individual's functioning.

### ***Stereotype Threat and Academic Performance***

Steele and Aronson (1995) examined the processes thought to underlie stereotype threat in a sample of 114 Black and White sophomores at Stanford University. Participants were randomly-assigned to three different conditions and were administered twenty-seven difficult verbal items and three challenging anagram questions from the GRE. Stereotype threat induction was operationalized based on three different modes of task presentation. In the first condition the task was presented as a measure of intellectual ability (*ability-diagnostic*). It was hypothesized that the racial stereotype relevant to Black participants' performance would be established, inducing stereotype threat. The second condition framed the test as a *non ability-diagnostic*, where the participants believed they were completing a problem-solving task. This condition was presumed to make the stereotype concerning ability irrelevant to Black student performance, reducing the stereotype threat. The third condition was a non-diagnostic sub-condition denoted as a *non-ability diagnostic-challenge*. This condition was thought by the researchers to pose a significant challenge even to students with high verbal intelligence. It was predicted that Black students would only demonstrate a lesser degree of proficiency in the ability-diagnostic condition, when compared to White students.



When Black students were compared across conditions, Bonferroni contrasts with SAT scores as a covariate indicated that those in the diagnostic condition performed significantly worse than participants in either the nondiagnostic condition,  $t(107) = 2.88, p < .01$ , or the challenge condition,  $t(107) = 2.63, p < .01$ . Additionally, Black participants performed significantly worse than White participants in the diagnostic condition  $t(107) = 2.64, p < .01$  (Steele & Aronson, 1995). Based on an ANCOVA on the number of items participants got correct, using self-reported SAT scores as the covariate (Black,  $M = 592$ ; White,  $M = 632$ ) revealed a significant race main effect,  $F(1, 107) = 5.22, p < .03$ , with White participants performing higher than Black participants (Steele & Aronson, 1995). Steele and Aronson (1995) also report that even when the Black participants in their sample attempted to increase their effort in response to the stereotype threat, their performance suffered. These data support the notion that group differences in cognitive ability and intellectual performance on administered tasks can reflect differing levels of situational burden placed on an individual (Croizet et al., 2004).

Concerning limitations of their work, it is important to discuss their sample's representativeness. Given its specificity, it is possible that their findings may not be generalizable to Black and White populations which differ in educational achievement, socioeconomic status, or regional location. For example, Black sophomores at Stanford University most likely possess characteristics which are highly selective and afford them greater academic success when compared to the average Black individual of a similar age.

Rodriguez (2014) later found that the detrimental impact of stereotype threat on standardized test performance also held true for urban college-bound Hispanic students, who came from socioeconomically disadvantaged households (i.e., the average household income of

the students was \$31,000). 62 participants were administered the verbal section of a selected SAT exam, and were allotted 40 minutes to complete 40 multiple-choice questions, in either a high-threat or low-threat condition. Those in the high-threat condition read a segment from *Education Week* concerning the racial/ethnic educational achievement gap before completing the task, which was described as assessing academic ability; those in the low-threat condition completed the task based on standard SAT administration procedures. All participants then completed a written post-task survey which asked them to provide self-reports on their academic performance. Findings were comparable to those reported by Steele and Aronson (1995). Hispanic students in the high-threat group answered an average of about 2.27 questions less than those in the low-threat group (i.e., High-threat:  $M = 17.66$ ; Low-threat:  $M = 19.93$ ), which was significant at the  $p < .05$  level (Rodriguez, 2014). It was noted that although the difference in means was seemingly marginal, it could play a huge role during high-stakes testing. It is important consider these findings in conjunction with noted limitations of this research. Firstly, there are limitations with utilizing self-reported data regarding an individual's academic functioning. For instance, literature reports lower accuracy of self-reports among lower achieving groups and those with lower academic self-efficacy (Caskie et al., 2014). It is also important to note that Rodriguez (2014) did not report the specific frequency of participants who reported experiencing performance anxiety and/or pressure to perform, which are noted consequences of being exposed to stereotype threat. Furthermore, Rodriguez's (2014) sample was comprised of a small sample of individuals from a specific urban district who were members of a particular college transitional program. This likely impacts the generalizability of the findings. Nonetheless, Rodriguez (2014) suggests that the implications of stereotype threat on achievement may play out when completing day-to-day tasks, as well. This may be particularly

true in academic environments where negative stereotypes are reinforced, making students vulnerable to the threat's effects (Walton & Spencer, 2009).

### ***Stereotype Threat and Learning***

Research has also been conducted to determine whether stereotype threat can influence a racial minority's ability to comprehend novel information (Taylor & Walton, 2011). If stereotype threat was found to affect the degree to which a person acquires knowledge, it would suggest that the threat has the potential to influence performance in traditionally non-threatening situations (e.g., in learning conditions). To address these hypotheses, Taylor and Walton (2011) studied the effects of participant race on performance in a sample of 76 Black and White undergraduate students, under two learning conditions, and two recall conditions. Performance was operationalized as one's ability to study and define twenty-four rare English-language words from the 2003 Scripps Howard National Spelling Bee List, and from the *Oxford English Dictionary*. These words were selected based on the ability of 20 typical non-participant undergraduates to define them. The final set of words for their study was defined with a success rate of less than 20 percent. The first learning condition, *learning-threat*, framed the study as an investigation of, "how well people from different backgrounds learn," and indicated that, "different people learn differently and we are interested in how well you learn and retain new information." The task would reportedly provide "a genuine assessment" of students', "learning abilities and limitations." In contrast, a *non-learning threat* condition was implemented, and students in this condition were instructed that the task examined psychological factors that influence learning styles, and that there is variance in how individuals acquire knowledge. Students were allotted 10 minutes in each condition to study the target words. They then were administered a recall task under one of two conditions, one to two weeks after the first exposure

(Taylor & Walton, 2011). The first recall condition, *performance-no-threat condition*, involved two tasks, and was designed to prevent stereotype threat induction. Students “warmed up” by recalling and matching 12 out of the 24 original target words, and were told that the task was to gain a deeper understanding of their learning style. Students then completed two “tests” under a *performance-threat* condition, and were informed that the 12 administered words were specifically selected to genuinely evaluate their verbal reasoning ability and provide a representation of their verbal abilities and limitations (Taylor & Walton, 2011).

Findings were consistent with Steele and Aronson’s (1995) work, as there was a condition effect on Black student performance, with minimal condition effects evident for White students. Specifically, statistically significant evidence was found that Black students were observed to recall approximately half as many words correctly in the learning-threat condition, in comparison to when no threat was evident  $t(70) = 2.32, p = .023, d = 0.83$ . White student performance was not notably affected by condition. Furthermore, cross-race comparisons found that Black students defined fewer words correctly than did White students in the learning-threat condition,  $t(70) = 1.27, p = .21$ , but more words correctly in the learning-no-threat condition,  $t(70) = 1.99, p = .052, d = 0.68$  (Taylor & Walton, 2011). This study is significant in understanding the implications of race and ethnicity in Black student underachievement, as it provided evidence that stereotype threat not only affects intellectual performance on measures of achievement, but it also influences one’s capacity for knowledge acquisition.

Limitations of this study are important to address. Specifically, the research authors did not explicitly describe the manipulation check employed in their work to ensure the internal validity of their experiment, although they noted that students were “debriefed.” As such, it is difficult for the reader to surmise that their manipulation of stereotype threat was the only factor

that influenced the presented outcomes. Furthermore, although the research authors collected demographic information that was used as covariates, they did not explicitly speak to all of this descriptive information (i.e., SAT verbal score, socioeconomic status, and year in school), which brings into question the diversity of their sample with respect to these variables.

Overall, Taylor and Walton's (2011) findings provide support that stereotype threat not only affects performance, but also may influence one's ability to learn novel information. It is believed that these cognitive and learning deficits resulting from exposure to stereotype threat are in part due to the expenditure of mental energy at more than just the given task (Schmader & Beilock, 2012). Relatedly, Schuster et al. (2015) found that women subjected to stereotype threat during a math task demonstrated efforts to suppress the negative thoughts and emotions that arise as a result of the threat. The resources needed to suppress thoughts related to stereotype threat are a part of active meta-cognitive functioning, including efforts to regulate one's performance, which limits the remaining cognitive funds one has to meet demands.

### ***Stereotype Threat and Domain Identification***

Studies examining disidentification in academic settings note that success in academic settings is contingent upon whether students take the academic domain into account as they come to a sense of their value as a human being (in other words, as they determine their level of self-concept; Osborne, 1997). This phenomenon implies that there may be negative consequences for the development of self-concept if academic performance is not included in a person's concept of self-worth. One of these negative consequences may be *academic disidentification*, in which individuals who feel socially stigmatized disregard the academic domain in their formulation of self-concept (Cokley, 2002; Osborne, 1997). In particular, Osborne (1997) proposed that people

who felt stigmatized based on group affiliation, such as being from a racial minority group, tend to demonstrate academic disidentification.

Osbourne (1997) conducted a study which drew data on Black, Hispanic, and White students from a representative sample culled by the National Education Longitudinal Study (NELS). This ongoing research collected data on 24,599 8<sup>th</sup> grade students, but Osbourne (1997) only collected data on Black, White, and Hispanic participants who participated in the base year, first-year, and second-year follow-ups. Specifically, a sample of 1062 Black males, 1070 Black females, 632 Hispanic males, 694 Hispanic females, 5,868 White males, and 5711 White females were selected. Grade point average (GPA) was measured via four self-reported items, on a scale from 1 (poor) to 8 (high performance). Global self-esteem, defined as the general value one places on him or herself (Rosenberg, 1965), was then measured using seven items from the Rosenberg Self-Esteem Scale (Rosenberg, 1965). Osbourne's (1997) work aimed to determine if the self-perceptions of the participants were impacted by their academic outcomes.

Osborne (1997) found that those who disidentified with academics were not influenced by academic outcomes. Post-hoc tests after repeated-measures analyses of covariance revealed a statistically significant interaction between participant race and time  $F = 125.33, p < .0001$  (Osborne, 1997). Specifically, the trend for reported grades remained steady for White participants, but declined markedly for Black participants; a relative decline was noted in the Hispanic group. In contrast, the self-esteem scores for Black participants were the highest across all time points, even when compared to their White counterparts (Osborne, 1997). Whereas White participants reported stable self-esteem across timepoints, African-American participants reported an increase in self-esteem between 8<sup>th</sup> and 10<sup>th</sup> grade; a drop in self-esteem then was reported as occurring in the 12<sup>th</sup> grade. This pattern emerged, despite their reported decrease in

achievement scores. Osborne (1997) also parsed participants by gender. Notably, Black male correlations showed the most dramatic and significant decline over time, from being equivalent in magnitude to comparison groups during 8<sup>th</sup> grade, to not significantly different from 0 by 12<sup>th</sup> grade (e.g. self-esteem and achievement base year:  $p < .001$ ; 1<sup>st</sup> follow-up:  $p < .001$ ; 2<sup>nd</sup> follow-up: not significant).

It was found that, fundamentally, students who disidentify with their academic experiences can fail to achieve in school, without any detriment to their overall self-esteem (Osborne, 1997). As mentioned above, Black males showed the most unsettling results. The correlation between self-esteem and academic performance outcomes became increasingly negative as secondary school progressed, with their self-concepts barely being affected by the poor outcomes of their educational pursuits. Osborne (1997) argued that these findings were characteristic of academic disidentification.

With regard to limitations, although individuals with lower achievement statuses tend to be less accurate in their self-perceptions of ability (Mabe & West, 1982; Caskie et al., 2014), this is not seen as a drawback for Osborne's (1997) work, as those who engage in disidentification have been proven and are expected to have incongruence between their perceptions of self-concept compared to their perceptions of the disidentified domain. However, one design flaw worth noting concerns the uneven sampling of Black, Hispanic, and White individuals, which may have contributed to heterogeneity of variance between the selected racial/ethnic groups.

Later research extended the work on academic identification by utilizing a college sample (Cokley, 2002). In a cross-sectional study, Cokley (2002) analyzed the academic self-concepts of 358 Black students and 229 White students. Participants were pooled from historically Black (HBCUs), and predominantly White universities (PWCUs), respectively. Cokley (2002)

employed a measure of academic self-concept, in addition to the Rosenberg Self-Esteem Scale (Rosenberg, 1965). Academic achievement was obtained through participant self-reports concerning their GPA.

Correlational analyses were conducted between the participants' academic self-concept, GPA, and self-esteem, with comparisons made between upperclassmen (i.e. juniors and seniors) to underclassmen (i.e., freshmen to sophomores). Cokley's (2002) results verified Osborne's (1997) work. Lower academic achievement was found for Black participants. The mean GPA for Black participants was 2.73 (SD = 0.46), and the mean GPA for White students was 3.05 (SD = 0.59;  $F(1, 586) = 51.62; p < .001$ ). Furthermore, the mean for Black participants self-esteem ratings was 3.50 (SD = 0.43), whereas the mean for White participants was 3.16 (SD = 0.52;  $F(1, 586) = 73.43; p < .0001$ ). Additionally, there were significant differences in academic self-concept between Black and White students (Cokley, 2002). While Black students had a mean of 118.87 (SD = 14.63), White students had a mean of 113.31 (SD = 16.27),  $F(1, 586) = 18.84; p < .001$ ). Findings indicated that academic disidentification was present at the college level.

Furthermore, Cokley (2002) found that although Black and White underclassmen both identified with academics, Black upperclassmen did not, as the correlation between academic self-concept and GPA decreased from .466 to .329. This is in contrast to the correlation for self-concept and GPA between White under and upperclassmen, which increased from .374 to .476. Among Black male students, the relationship between academic self-concept and scholastic achievement (measured by their GPA) diminished, in direct contrast to the relationship exhibited by White females (Cokley, 2002), despite similar global self-concept ratings. Cokley (2002) argued that the findings provided partial support for the notion that academic disidentification is stronger within Black males, when compared to White female students.



Upon review of Cokley's (2002) research, limitations became apparent. As Cokley (2002) notes, his methodology may have been improved by conducting isolated analyses on samples from ethnically homogenous environments. Furthermore, additional discussion was needed concerning how racial climate (i.e. the overall racial environment of an institution; Solorzano et al., 2000) impacted the research, due to the racial/ethnic composition of the participants' respective schools. This is important as Cokley's (2002) participants were college-aged, and prior literature has indicated how racial climate informs Black persistence, graduation rates, achievement, and transfer rates to graduate or professional institutions (Solorzano et al., 2000). Lastly, firm conclusions concerning causality with regard to academic disidentification cannot be made, because the data was cross-sectional and correlational.

Proposals supporting the theory of domain disidentification have been made by researchers within the context of specific academic domains. For example, it was suggested that chronic exposure to stereotype threat may lead to science and broader STEM domain disidentification and eventual domain abandonment (Woodcock et al., 2012).

In a study conducted by Woodcock et al. (2012), archival data were used, as participants were sourced using the first three academic years of data from *The Science Study*, a longitudinal panel study of 1,420 predominantly Black and Hispanic/Latino(a) science students from 50 colleges and universities across the United States with the aim of tracking the educational and career trajectories of minority students. Woodcock et al. (2012) employed measures concerning stereotype threat (i.e., Stereotype Vulnerability Scale; Spencer, 1994), a scientific identity scale used in prior research (Chemers et al., 2011) and a question which asked participants the extent to which they intended to pursue a career in the scientific field.

Findings indicated that there was evidence of the perception of stereotype threat among the Black participants during each year (Woodcock et al., 2012). Specifically, Black participants reported significantly higher levels of stereotype threat  $t(273) = 3.23, p = .001, d = .58$ , despite being pooled from institutions where their racial and ethnic groups were the majority (Woodcock et al., 2012). However, it was found that the hypothesized effect of stereotype threat on identity was nonsignificant ( $\beta = -.09, b = -0.05, SE = 0.04, p = .11$ ; Woodcock et al., 2012). Essentially, domain abandonment and disidentification were not supported for Black participants. Woodcock et al. (2012) posited that contextual factors shape an individual's experience when subjected to stereotype threat. Specifically, it was argued that when individuals who are members of a majority population experience stereotype threat, they may be more apt to maintain a positive domain-specific self-concept due to a positive ingroup identity (Woodcock et al., 2012). Of note, specific limitations are worth noting. Their study supported the notion that behaviors presented by those belonging to stigmatized groups when faced with stereotype threat are highly dependent on the context. This brings into question the generalizability of their results in relation to other stigmatized groups seeking to achieve in other academic domains. Furthermore, their participants were considered "high-achieving" which also limits the generalizability of their findings when compared to racial/ethnic minorities of lesser academic aptitudes.

In summary, Steele (1997) notes that chronic activation of stereotype threat within any given domain can result in disidentification. Schmader et al. (2008) elaborated on the relationship between stereotype threat and identity development, suggesting that stereotype threat is one form of stigma that plays an integral role as an individual forms their self-concept (Schmader et al., 2008). Schmader et al. (2008) further describe a reciprocal relationship between self-concept and stereotype threat; stereotype threat is based on a cognitive disparity

between the self, an individual's identity, and the ability/performance domain in question. Appel and Kronberger (2012) suggest that an individual can buffer the aversive nature of stereotype threat by weakening the association they have with stereotyped domains, which is likely one predeterminant of disidentification. However, this outcome is not ideal, as it can lead many competent and bright minority students to fail in reaching their academic potential due to reasons that are not based on their ability (Steele, 1997). To lessen the possibility of academic disidentification, Steele (1997) notes that it is important to minimize racial stigma in educational settings. Part of reducing racial stigma may involve intervening on behalf of students to address effects of stereotypes (e.g. stereotype threat). This may improve the academic achievement among minority students.

### ***Limitations of Stereotype Threat Studies***

Nguyen and Ryan (2008) conducted a meta-analysis of experimental stereotype threat research concerning minority and female samples. This meta-analysis incorporated 116 studies from 1995 to 2006, including seminal work (e.g., Steele & Aronson, 1995). Nguyen and Ryan (2008) calculated the overall effect size ( $d = .26$ ) for stereotype threat across these studies, which was comparable to findings from an earlier meta-analysis conducted by Walton and Cohen (2003). However, Nguyen and Ryan (2008) reported that the variability in the effect sizes across the reviewed studies was substantial. This heterogeneity in effect sizes also is noted in other meta-analyses (i.e., Walton and Cohen, 2003). Literature on stereotype threat is considered to be "mixed" (Ganley et al., 2013). Nguyen and Ryan (2008) attribute some of this heterogeneity to methodological inconsistencies in the way hypothesized moderators of stereotype threat are operationalized across studies (e.g., test difficulty). Nguyen and Ryan (2008) stressed the need

for more consistent and comprehensive studies of factors that are assumed to moderate the relationship of stereotype threat on performance and functioning.

Although earlier stereotype threat literature purports more positive and significant findings (which are summarized in meta-analytic reviews, such as Nguyen and Ryan, 2008), recent research notes concerns regarding the replicability of stereotype threat effects (Finnigan & Corker, 2016). Finnigan and Corker (2016) reported that they closely replicated a study conducted by Chalabaev et al. (2012), investigating if performance avoidance goals (i.e., a goal where one works to avoid failing in front of others) moderate stereotype threat on women's math performance. With regard to differences between studies, Finnigan and Corker (2016) recruited a larger sample of adult female participants who completed the study online ( $N = 590$ ), in comparison to Chalabaev et al. (2012;  $N = 86$  and  $58$ ), who recruited undergraduate female participants that completed the study in person. Finnigan and Corker (2016) opted to simplify their research design by choosing not to manipulate particular variables (i.e., performance approach goals). Finnigan and Corker (2016) did not report any other outstanding differences between their study and Chalabaev et al.'s (2012). They indicated that their findings did not suggest the presence of significant stereotype main effects, nor did performance avoidance goals yield a significant moderation effect, despite their recruitment of a larger sample. They report that the findings of their study, "casts doubt on the magnitude of the stereotype threat effect" (Finnigan & Corker, 2016, pg. 41). Overall, Finnigan and Corker's (2016) study speaks to issues with replicability related to gender-based stereotype threat research, and their challenges in reproducing findings bring into question stereotype threat's general robustness as a construct (Ganley et al., 2013).

Research authors (e.g. Zigerell, 2017) also suggest that some of the earlier research may have been impacted by publication bias. For example, Zigerell (2017) found, after a reanalysis of data from Nguyen and Ryan's (2008) review, that less methodologically precise studies had larger effect sizes when compared to those that were more accurate. Zigerell (2017) also found that effect sizes of studies from manuscripts co-authored by Steele and Aronson were found to consistently have larger than average effect sizes when compared to other research. However, Zigerell's (2017) reanalysis of Nguyen and Ryan's (2008) earlier work yielded notably divergent conclusions regarding publication bias and the effects of stereotype threat (Ryan & Nguyen, 2017). Findings across these studies highlight the importance of additional literature regarding the variables that may moderate the relationship between stereotype threat and target outcomes, in addition to data which speaks to the null effects in stereotype threat research (Zigerell, 2017; Ryan & Nguyen, 2017).

### **1.5. Psychosocial Variables**

Psychosocial variables encompass a broad range of factors related to a person's psychological state and social environment that can have beneficial or negative consequences for physiological and/or behavioral outcomes (Long & Cumming, 2013). Racial centrality was investigated in the current study, and is a psychosocial variable related to one's social identity (Okeke et al., 2009) that is described in detail in the following sections.

#### **Social Identity**

Social identity theory (Tajfel & Turner, 1979) can be used as a framework to understand how Black and Hispanic youth may develop their social identity. In the context of group conflict, social identity theory notes that minority in-group identification will be reinforced if: the

majority is perceived to be biased towards their ingroup and discriminatory towards minority groups (Tajfel & Turner, 2004). It is plausible that members of racially/ethnically minority groups may perceive members of the majority to be biased and/or discriminatory. In the United States, Black and Hispanic people have been subjected to multiple forms of systematic and institutional oppression (e.g., slavery, poverty, racism). Forms of oppression persist in various spaces, and Stewart et al. (2019) note that minority youth feel themselves to be victims of unjust treatment based on their racial/ethnic background. Branscombe et al. (1999) note that for some minority groups (e.g., Black individuals), in-group identification can alleviate some of the negative outcomes associated with an individual viewing themselves as a victim of societal prejudice.

### ***Minority Racial/Ethnic Identity***

In minority populations, racial identity has been found to be an important subcomponent of overall social identity. It is associated with self-esteem (Elion et al., 2012; Hughes & Demo, 1989; Lige et al., 2017) and academic performance (Altschul et al., 2006) and resolve (Zirkel & Johnson, 2016). Racial identity has been described to be multidimensional in nature (Sellers et al., 1998). This conception of racial identity suggests it is comprised of four dimensions which include: racial identity salience, racial centrality, ideology, and regard. Racial identity salience concerns the extent to which a person's race is a relevant part of her or his self-concept at a particular moment in time. The centrality dimension refers to the degree to which a person defines her or himself with regard to race; this dimension was investigated in the current study. Ideology is associated with the way individuals view political-economic issues, cultural-social issues, intergroup relations, and attitudes toward the dominant social group. The last dimension, regard, refers to a person's affective and evaluative judgment of her or his race. Through these

dimensions, Sellers et al. (1998) argue their model extends identity theory (Stryker & Serpe, 1982, 1994), as they consider the impact of culture and history on the development of one's racial identity.

To test this model, Sellers et al. (1997) selected 71-items sourced from existing measures of racial identity to create the Multidimensional Inventory of Black Identity (MIBI; e.g., Baldwin & Bell, 1985; Terrell & Terrell, 1981). The original version of the MIBI consisted of seven subscales which were subsumed by three larger scales representing the stable aspects of racial identity: Centrality (i.e., the centrality subscale), Regard (i.e., private regard and public regard), Ideology (i.e., assimilationist, humanist, nationalist, oppressed minority). Each item was scored on a seven-point Likert scale, ranging from strongly disagree (1) to strongly agree (7). This measure's reliability and validity was tested by employing 474 Black students (68% female; 60% freshman; 185 students were from an HBCU), while 289 attended a primarily White postsecondary institution.

The MIBI was administered to all participants. The appropriateness of the subscales was assessed via the Kaiser-Meyer-Olkin test (KMO; Norusis, 1985). Factor analyses indicated that although the KMO was inadequate for a factor solution for items across all scales, individual scale analyses yielded adequate results (KMO = .86, .83, and .61 for Ideology, Centrality, and Regard, respectively). This suggested that the MIBI represents three interrelated constructs as opposed to an overall unitary construct. Results of factor analyses were then used select 56 of the original 71 items from the MIBI that best represented the subscales; resultant factor loadings for the shorter measure were reportedly moderate (.40-.64). Internal consistency was also supported, as the Cronbach's alpha coefficients for the subscales of the shorter test ranged from .60-.79; these data were similar across the two participating schools in their study. Of note, only six of

the seven subscales were empirically-supported; the public regard subscale was removed due to its poor internal consistency.

As the current study concerns Black, Hispanic and White populations, it is important to select measures that are reliable across racial/ethnic groups. Notably, Johnson et al. (2005) have tested the use of the MIBI across racial/ethnic groups. They utilized a sample of  $n = 703$  first-semester college freshman (550 White, 112 Hispanics, and 41 Native Americans), who completed the aforementioned revised version of the MIBI (see Appendix A for the revised and adapted MIBI centrality scale utilized in the current study). The wording of the MIBI was adapted for this study to apply to other racial/ethnic groups by replacing the term “Blacks” with blank spaces for every item. Prior to administration of these altered items, the participants’ racial/ethnic identity was primed as they were asked to identify their racial/ethnic background by selecting one of the following response options: White, Asian, Hispanic, Black, Native American, biracial, or international. Johnson et al. (2005) note that participants self-identification of their racial/ethnic group was used to form the three aforementioned racial groups.

With regard to findings applicable to the current study, for Hispanic participants, findings indicated that the internal consistency of the MIBI was suitable (i.e., Cronbach’s alphas were .67 for Centrality, and .78 for Private and Public Regard). With regard to White participants, findings also supported the internal stability of the MIBI (i.e., Cronbach alphas were .75 for Centrality, .72 for Public Regard, and .82 for Private Regard).

It is important to note limitations of Johnson et al.’s (2005) work. Johnson et al. (2005) utilized a sample of first-semester college Freshman, which made their sample relatively homogenous with respect to age; this limits the generalizability of their findings. Furthermore,



Johnson et al. (2005) report that there were a number of White participants that did not respond to the MIBI (approximately 44 individuals), which may have biased or skewed their results.

### ***White Identity***

Johnson et al. (2005) indicate that one should not assume White individuals perceive their race/ethnicity as playing the same role in their lives as their minority counterparts. This notion was qualified by the fact that there were a number of White participants in their study who did not respond to the MIBI. Johnson et al. (2005) advocated for the need for more conscious awareness of race and ethnicity in populations of White college-aged individuals, who may overlook the implications of their social identity, resulting unconscious discriminatory and unjust practices against outgroup members.

These concerns raised by Johnson et al. (2005) are related to White privilege. Literature on White privilege posits that White individuals are socialized not to acknowledge their racial/ethnic identities in their entirety, and may overlook particular assets and societal gains afforded to them by their racial/ethnic affiliation (McIntosh, 1990). Chavez & Guido-DiBrito (1999, pg. 39) corroborate that for many White Americans, “Ethnicity is usually invisible and unconscious,” because social norms have been built to align with their racial, ethnic, and cultural frameworks (e.g., “American Culture”; Chavez & Guido-DiBrito, 1999).

When discussing White identity, it is also important to mention the concept of “White guilt.” Lewis (1967) discussed the notion of White guilt and said, “We feel ourselves to be involved in an iniquitous social system and to share a corporate guilt” (pg. 48). Although not extensively studied, Swim and Miller (1999) conducted four studies investigating feelings of White guilt, and found that the range and variability of White guilt confirms the existence of such self-reproach for some White individuals. Steele (1990) also discusses White guilt, and

notes that White individuals must manage anxiety that stems from their awareness of White privilege, in combination with the, “inevitable gratitude one feels for being White, rather than Black in America” (Steele, 1990, pg. 499).

Although earlier literature suggests that White individuals tend to omit their racial/ethnic identity, more recent research (Knowles et al., 2014) suggests that White individuals can experience their racial identity on a conscious level. Knowles et al. (2014) note psychological threats that can arise from White racial identity including: *meritocratic threat* and *group image threat*. The meritocratic threat arises when a White individual acknowledges the possibility that their achievements in life may not have been fully earned based on their efforts. In turn, a group image threat is defined as a threat which originates from being affiliated with a social group that benefits from unequitable societal gains.

### ***Racial Centrality***

With respect to psychosocial factors related to minority racial identity, prior literature also notes the importance of racial centrality. Racial centrality is the extent to which an individual emphasizes their membership in a racial group (Okeke et al., 2009). Arndt et al. (2002) report that centrality, in general, likely is an important moderator in whether an individual “defends or denies,” that identity when subjected to a perceived threat. Racial centrality has been examined in order to determine its relationship to stereotypes and identity development, using the aforementioned MIBI (Sellers et al., 1997).

Okeke et al. (2009) examined stereotype endorsement (i.e. whether one agrees with a particular stereotype concerning a group with whom they are affiliated), in samples of 7<sup>th</sup> and 8<sup>th</sup> grade Black students in one of two studies by controlling for academic achievement, and using racial centrality as a moderating variable. This study employed 237 Black students from five

middle schools in the Southeastern region of the United States. Okeke et al. (2009) measured the endorsement of academic race-based stereotypes through visual analogue scales as participants marked lines ranked from 0 to 100 which rated each participant's perceptions of the academic competence of members belonging to various social groups (e.g. boys, girls; Okeke et al. 2009). Participants provided ratings for six items using the aforementioned scales. Notably, contrasting social groups were not presented in consecutive order (e.g. Black and White social groups) to prevent order effects. Self-ratings of academic self-concept were measured by circling a ranked stick figure in a column of 25 total figures, with higher scores indicating higher degrees of academic self-concept. Racial centrality was assessed via the Multidimensional Inventory of African-American Identity (MIBI; Sellers et al., 1998). End-of-year academic outcomes were assessed using end-of-grade standardized assessments, and the participants' parents reported their educational level on a ten point scale, ranging from less than high school to a doctorate degree. Based on a regression analysis, which was conducted to determine the effects of academic race-based stereotype endorsement and race centrality on academic self-concept, the model was statistically significant [ $F(8, 236) = 7.07, p < .001$ ; Okeke et al., 2009)].

There was also a statistically significant moderating effect found for racial centrality on academic race-based stereotype endorsement based on the full regression model [ $F(9, 236) = 7.69, p < .001$ ; Okeke et al., 2009)]. Lastly, Okeke et al. (2009) found an interaction effect between stereotype endorsement and one's degree of racial centrality ( $\beta = -.19, p < .01$ ).

The analyses strongly suggested that students who believed their ethnicity was central to their personal identity had lower self-perceptions concerning their academic competence if they endorsed race-based stereotypes. This relates to minority student underachievement, as beliefs about competence influence achievement outcomes, and those with lesser-developed self-

concepts will find it challenging to persevere during difficult stages in their academic careers. Okeke et al. (2009) found that those who did not align racial qualities with their social identities did not exhibit lowered academic self-concepts, even if they endorsed the same negative stereotypes. This illustrates the complex nature of how race shapes identity development. Okeke et al. (2009) posited that low racial centrality might serve as a protective factor against race-based academic stereotypes, at a time in students' lives that is critical in establishing outcomes for future educational pursuits. However, Okeke et al. (2009) also explained that the consequences of racial centrality are circumstantial, as it plays varying roles in influencing students' attitudes, beliefs, and behavioral outcomes. Thus, low racial centrality may also be detrimental in certain instances, as it can result in a disconnect during intra-racial interactions.

Despite Okeke et al.'s (2009) findings, specific limitations were presented. Notably, causal inferences regarding stereotype endorsement and self-perceptions could not be made due to the cross-sectional design of their study. Furthermore, according to Okeke et al. (2009), given the age of the participants, it is important to consider the malleability that exists in their self-perceptions of competence and achievement. As such, this research would benefit from a longitudinal design, to assess the relationship between self-perceptions and stereotypes, over time, as youth develop.

A further contribution to an understanding of racial centrality was made by Hope et al. (2013) who analyzed patterns of global self-concept, global self-esteem, and achievement among 324 Black college students as they progressed through their freshman year of college in schools located in a large midwestern city and suburb, in addition to a southeastern suburban area. Prior research suggested that the quality of the relationship between an individual's self-esteem, self-concept, and the academic domain in question can have significant implications regarding their

motivation, psychological adjustment, and academic outcomes (Brockner, 1984). Hope et al.'s (2013) model considered how academic identification's components (i.e. global self-esteem and academic achievement) are related to a student's racial identity (i.e. racial centrality and racial regard). They hypothesized that within-group variation would be evident of academic identification and disidentification. In order to test their hypotheses, Hope et al. (2013) employed the Rosenberg Self-Esteem Scale (Rosenberg, 1965), cumulative high school GPA at the beginning the participants' freshman year, the Academic Contingencies of Self-Worth scale (Crocker et al., 2003), and 1<sup>st</sup> year GPA at the end of the participants' freshman year of college. Additionally, anxiety and racial centrality were also assessed.

Findings supported their hypothesis, as within-group variation was discovered, based on four distinct academic identification profiles. The first, high self-esteem/high achieving ( $n = 93$ , 28.7%) was characterized by relatively high self-esteem ( $z = 0.68$ ) and high school GPA ( $z = 0.83$ ; Hope et al., 2013). A low self-esteem/low-achieving cluster was also discovered ( $n = 35$ , 10.8%). Students in this cluster endorsed less than average self-esteem ( $z = -2.28$ ) and lower high school GPA ( $z = -0.59$ ). Furthermore, a high self-esteem/low-achieving group was evident ( $n = 118$ , 36.4%) that had above average self-esteem ( $z = 0.49$ ) despite their lower than average high school GPA ( $z = -0.59$ ; Hope et al., 2013). Hope et al. (2013) indicated that this group is representative of the academically disidentified youth noted in previous literature (e.g., Osbourne, 1997). Lastly, a low self-esteem/high-achieving group emerged ( $n = 78$ , 24.1%) and was characterized by low self-esteem ( $z = -0.69$ ) and higher than average high school GPA, when compared to the other participants. Interestingly, this group also could be considered academically disidentified, despite the observed relationship being the inverse of what is typically displayed in classically disidentified individuals (Hope et al., 2013). Through their

analysis, Hope et al. (2013) described a paradox in scholarship and Black student achievement. They posited that a Black student's academic success is dependent upon a strong relationship between self-esteem, self-concept, and academic performance. Consequently, Black students can experience definite academic and psychological detriments as a result of strongly connecting their self-esteem and self-concept to academic achievement.

Upon review of this study, several considerations are important to present. As with previously reviewed work, this study employed matriculated college students that most likely were academic identified to some degree. Furthermore, they employed a nonrandom sample of first-year participants from predominantly White universities, which severely limits the generalizability of their findings to other populations and settings.

### **Racial Socialization**

Racial socialization may be understood as the way parents transfer information, values, traditions, and perceptions about race to their offspring (Hughes et al., 2006). Demo and Hughes (1990) maintain that racial socialization experiences, such as parental messages about the implications and meaning of being Black in society, are central to shaping a Black child's racial identity, and have been found to begin as early as six years of age (Hughes, 2003). Hughes et al. (2006) note that racial socialization is comprised of two dimensions: cultural socialization (i.e., ethnic pride, history, and heritage) and preparation for bias (i.e., messages regarding discrimination and racial bias). Peters (1985) suggests that a lack of racial socialization leaves one unprepared to sufficiently implement methods to mitigate the detrimental effects of racially biased experiences. According to Peters (1985), through racial socialization, Black parents play an essential role in mitigating and mediating racially biased experiences. Through an analysis of Black families, Peter's (1985) posited that fostering self-respect and pride concerning Black

racial identity forms the basis of a Black parent's child-rearing practices. Of note, Hughes (2003) found that there were no statistically significant differences in the frequency of cultural socialization parent-to-child practices between Black and Hispanic individuals; as such, it is possible that Hispanic families utilize racial socialization practices to a similar extent as their Black counterparts.

### **1.6. Summary of Literature's Main Findings**

Although stereotype threat is often described to be pervasive in nature, competing literature suggests it may not be as robust as earlier studies purport (Ganley et al., 2013). There are issues related to heterogeneous effect sizes (Nguyen and Ryan, 2008; Walton and Cohen, 2003), replicability (Finnigan & Corker, 2016) and publication bias (Zigerell, 2017) that bring into question stereotype threat's validity. Research stresses the need for more consistent and comprehensive studies of factors that are assumed to moderate the relationship of stereotype threat on performance and functioning in order to better hypothesize, test, and understand its effects (Nguyen & Ryan, 2008).

Research on race-based psychosocial variables suggests that self-esteem and academic achievement are related to racial identity for minority individuals (i.e. racial centrality and racial regard; Hope et al., 2013). In turn, racial centrality has been found to play a moderating role for individuals of color on the relationship between academic race-based stereotype endorsement and self-perceptions of academic ability (Okeke et al., 2009). As such, racial centrality is an important variable in understanding the relationship between stereotypes and the performance of students of color in evaluative contexts.

Conversely, there was a paucity of literature which spoke to the role these race-based psychosocial variables for individuals identifying as White. Limited research regarding White

privilege and White guilt may provide the basis of understanding White identity formation and the role their race/ethnicity may have in evaluative settings.

### **1.7. Purpose of the Current Research**

Minority individuals have been found to endorse traditional race-based stereotypes (Evans et al., 2011), and demonstrate lesser performance when exposed to negative stereotypes in evaluative contexts (e.g., Steele & Aronson, 1995; Taylor & Walton, 2011; Rodriguez, 2014). Findings of previous literature highlights the importance of investigating the relationship between racial centrality and academic performance in the presence of negative stereotypes (Okeke et al., 2009). However, there is limited research at the undergraduate level which investigates the relationship between stereotypes, racial centrality, and academic performance using a randomized between-subjects design. The current study aims to fill this gap in the literature.

### **Research Questions and Hypotheses**

This dissertation study aimed to answer the following **four research questions**:

1. Within a sample of Black, Hispanic, and White undergraduate students, what are the relationships between gender, racial/ethnic identity, racial/ethnic centrality, persuasive writing ability, post-task self-perceptions of writing ability, and school type?
2. Will self-perceptions of writing ability differ according to whether a stereotype was induced?
3. Will persuasive writing performance differ according to whether a stereotype was induced?



4. Does racial/ethnic centrality moderate the effect of a stereotype induction on writing performance?

This dissertation study also sought to test the following **three hypotheses**:

1. Black and Hispanic participants subjected to a stereotype induction will underperform on the measure of persuasive writing when compared to their non-subjected counterparts.
2. Black and Hispanic participants subjected to a stereotype induction will self-report more negative self-perceptions of writing ability when compared to their non-subjected counterparts.
3. Racial/ethnic centrality serves as a statistically significant moderator for the relationship of the stereotype induction on persuasive writing performance.

## Chapter 2: Method

### 2.1. Pilot Study

An exploratory pilot investigation was conducted to test the practicality of the methods used in the current study. Specifically, the pilot study sought to determine if the procedures used to recruit participants and administer measures were feasible for a larger dissertation study. The pilot study also aimed to answer the following research questions: (1) Within a sample of African American and Hispanic/Latino students, what are the relationships between stereotype threat and writing performance? (2) Will persuasive writing performance differ according to whether stereotype threat was induced? and (3) Do self-efficacy, self-concept, and/or ethnic identity moderate the effect of stereotype threat on writing performance?

The study employed a sample of Black and Hispanic ( $n = 24$ ) students who had recently graduated from high school, and were about to enter college. They attended college preparatory classes at two campuses in a large city in the Northeast United States. One campus was suburban, and the other was urban. Twelve participants attended each campus, and all participants were at least 18 years of age. Participants were assigned to two conditions, stereotype threat induced (STI), and stereotype threat not induced (STNI). Participants who were assigned to the STI condition received the stereotype induction, and those in the STNI condition did not receive the stereotype induction.

Participants were asked to write a persuasive essay responding to a prompt created by the current author based on the work of Ferretti et al. (2009); Howell et al. (2017); Toulmin (2003); Uccelli et al. (2013); Sypher et al. (2002); MacArthur et al. (2015); Perin et al. (2013); and Perin et al. (2016). Participants also completed self-report instruments assessing reading self-efficacy (self-efficacy subscale of the Motivation Reading Questionnaire; Wigfield & Guthrie, 1995), and

reading self-concept (The Reading Self-Concept Scale; Chapman & Tunmer, 1995). Writing self-efficacy and self-concept measures adapted from these reading scales were also administered. Furthermore, participants completed a measure of ethnic identity/affiliation (The Multi-Ethnic Identity Measure, MEIM; Phinney, 1992), and were administered standardized measures of academic achievement to assess their general reading (Silent Reading Fluency subtest of the KTEA-III; Kaufman & Kaufman, 2014) and writing skills (Sentence Writing Fluency; WJ-IV ACH; Schrank et al., 2014). The dependent variable in the pilot study was holistic persuasive writing quality, which was scored on a seven-point holistic quality scale (adapted from Ferretti et al., 2000; MacArthur et al., 2015; and White & Vanneman, 2000).

Findings indicated statistically significant positive correlations between how participants felt about their ethnic identity, based on the MEIM, and writing self-efficacy; writing and reading self-efficacy; writing and reading self-concept; and writing self-efficacy and writing self-concept. Results of an ANCOVA, indicated that the main effect of stereotype threat on persuasive writing performance was not significant when controlling for pre-test writing performance ( $F = .658, p = .426$ ). Furthermore, the results of the ANCOVA did not indicate statistically significant moderation effects for the psychosocial variables of interest (i.e., self-efficacy, self-concept, and ethnic identity), when controlling for significant between-group differences in pre-test general writing skills. It is important to note that the sample size used in the pilot study likely was too small to find significant differences between groups. Nonetheless, the methods employed in the pilot study were found to be feasible. Overall, the researcher was able to recruit participants, successfully implement a stereotype type threat manipulation, administer all measures, and analyze the data to address the research questions.

Several limitations arose from the pilot study: (1) Sample size was likely too small to detect significant effects, (2) logistical difficulties made random assignment unmanageable, (3) the study simply verbalized instructions to induce the stereotype threat, which demanded the participant's full attention, and was dependent on the participants' listening comprehension skills, and (4) fatigue effects may have impacted the results, as students completed the persuasive writing task following a timed measure of writing fluency. Overall, findings and limitations noted from the pilot study lent themselves to the development of methodological improvements that were needed to allow for a better tests of the hypothesis in the main study, as described in the following sections.

## **2.2. Main Study**

Participants in the current study were randomly assigned to stereotype induced (SI) and stereotype not-induced (SNI) conditions, as discussed in the *Design* section below. Those in the SNI were not presented the stereotype, while those assigned to the SI condition received the stereotype induction prior to completing the measure of persuasive writing.

### ***Determination of Sample Size***

Sample size was determined from a power analysis using G\*Power (Faul et al., 2007). Before conducting the power analysis, the researcher calculated the effect size of the treatment effect from the pilot study (i.e., Cohen's  $d$ ) using the holistic persuasive writing quality means and pooled standard deviations of the STI and STNI groups. For the pilot study, Cohen's  $d$  was found to be .19. The average effect size across 116 studies on the impact of stereotype threat on minority and female test performance was  $d = .26$  (Nguyen & Ryan, 2008). Nguyen and Ryan (2008) noted considerable variability in the effect sizes; the effect sizes of the studies utilized in

the metanalysis ranged -2.74 to 0.74. Concerns regarding publication bias (Zigerell, 2017) and replicability (Finnigan & Corker, 2016) have also been raised. Nonetheless, the average observed effect of stereotype threat studies was selected for use in the a-priori power analysis, as Nguyen and Ryan (2008) found an effect size that was comparable to earlier work ( $d = .29$ ; Walton & Cohen, 2003). Furthermore, the pilot study also had limitations, which may have lowered the accuracy of the effect size estimate. When calculating the required sample size, I used an alpha of 0.05, a power of 0.95, and an effect size of  $d = .26$  for an ANOVA procedure. The a priori power analysis indicated that the minimum sample size required to find a statistically significant result at the  $p < .05$  level was 195.

### ***Selection Criteria***

Participants in the current study were required to (1) be at least 18 years of age at the time of participation; (2) be fluent in spoken English (3) be enrolled in undergraduate courses at a postsecondary institution located in the United States; (4) be of Black, Hispanic, or White race/ethnicity; and (4) provide written consent following guidelines of Teachers College's Institutional Review Board (IRB). It is noted that the sample contained both native and non-native English speakers; the latter were all fluent in the English language. Individuals also were not eligible to be participants in the current study if they did not provide informed consent as required by Teachers College's Institutional Review Board.

### ***Recruitment Procedures***

A total of  $N = 220$  undergraduate students were recruited as potential participants for the current study from one private suburban four-year college and two public urban community colleges in the Northeast United States. Participants were recruited in the spring, summer, and

fall of 2019. I first was granted access to conduct research at the private college in January of 2019. I later obtained consent to conduct research at the public institutions in July and August of 2019.

To recruit participants, I submitted my research materials to each institution's IRB compliance manager or research chair. Once IRB approval was granted, I recruited students from the following departments: Higher Education Opportunity Program (HEOP), College Science and Technology Entry Program (CSTEP), Residential Life, Communications and the Arts, Psychology, Nursing, and Education. In order to recruit students from these departments, I met with respective department coordinators, program coordinators, and professors in-person, after sending emails to schedule appointments. Those initial emails were also used to gauge each department's interest in assisting me in my recruitment. At times, it was necessary for me to meet with department chairs, prior to interfacing with other administration and faculty. After meeting with members of each department, and gaining their approval to speak to their students, I coordinated times where I visited scheduled classes to discuss the study with students to gauge their interest. They were told, "I am doctoral student from Columbia University interested in working with you as part of a research study involving college students. I would like to work with you outside of class time in the coming weeks to complete questionnaires and writing activities with you. In return for your participation, you can choose to enter a raffle to win one of 25 \$25 dollar gift cards." Notably, some students also received psychology research credit, if their educational program required that they participate in a research study. After that brief introductory statement was made, I provided interested students with informed consent forms. All students were provided time to read over the form and ask questions. In-person participants were recruited for both individual and group task administration (see *Procedures*).

Participants were also recruited online to complete a virtual administration of the study measures (see *Procedures*). I first contacted the professors who permitted me to visit their classrooms for group task administration, and asked if they would be willing to distribute the digital version of the study to eligible students who were enrolled in their other classes. These prospective participants were provided with an anonymous link to a digital version of the study, which was created using Qualtrics. After communicating with professors who previously allowed me to conduct the study in their classrooms, I distributed the link to Psychology and Communication and the Arts professors at the three institutions, in addition to the private institution's HEOP and CSTEP program coordinators. The link was also distributed through the private institution's SONA Systems cloud-based participant management system, which was accessible to all students enrolled in Psychology courses, who needed research credit. While tabling, I also provided the Qualtrics link to students who were unable to schedule in-person sessions. Lastly, the anonymous link was provided to students who participated in the research, asking them to forward the link to peers who may be interested. All online participants were asked to complete the online administration of the study in one session. For online participants, after completing necessary measures, the survey automatically presented the full-text of the debriefing script shown in *Appendix G* below.

### ***Excluded Cases***

Based on the selection criteria, a total of  $n = 29$  individuals were excluded from the main analyses, as they were not of a racial/ethnic background of interest to the current study, and the current study's manipulation was designed for specific racial/ethnic groups. Specifically, 22 of these individuals self-identified as being "bi-racial" or "mixed," and reported Black, White, or Hispanic as one of their component races/ethnicities. Conversely, three individuals reported

being of Asian background, and four people self-identified as Indian. These participants were recruited at times where I visited and administered tasks to whole classrooms during instructional periods (see *Procedures*). Their descriptive data are spoken to in the *Discussion* section for exploratory purposes.

### ***Participants in Final Sample***

The final sample size for the current study is  $N = 191$ , used for the main analyses. The sample is comprised of 46 Black (63% female), 107 Hispanic (76% female) and 38 White (79% female) students. Mean age was 21.0 years ( $SD = 4.76$ ; range = 18 to 57 years). With regard to school type, 63% of participants attended the private four-year college (of those participants, Freshman = 19%; Sophomore = 15%, Junior = 21%, Senior = 35%, and Unreported = 10%), and 37% attended the public community colleges (Freshman = 1%, Sophomore = 3%, Junior = 7%, Senior = 3%, Unreported = 86%). There was no attrition across the treatment or control groups.

### ***Independent and Dependent Variables***

The current study focuses on three independent variables (i.e., stereotype threat, racial/ethnic identity, and racial centrality), and two dependent variables (holistic persuasive writing quality and self-perceptions of writing ability). The measured independent variable was racial centrality. The dependent variables included holistic persuasive writing quality and self-perceptions of writing ability. The manner in which these variables were assessed is described in the *Measures* section.

### ***Measures***

Three researcher-designed measures reported in prior literature were administered (*Appendices A, D, E, and F*). The tested independent measures were racial/ethnic centrality and



post-task self-perceptions of writing performance. The former construct was assessed using an adapted version of the racial centrality scale from the Multidimensional Inventory of Black Identity (MIBI, Sellers et al., 1998; Johnson et al., 2005). Johnson et al. (2005) report the MIBI has cross-race and cross-ethnic applicability when administered to non-Black individuals (i.e., White and Latino). Post-task self-perceptions were assessed using a survey based on the work of Rodriguez (2014). Academic literacy was assessed using a persuasive writing task based on the work of Ferretti et al. (2009); Howell et al. (2017); Toulmin (2003); Uccelli et al. (2013); Sypher et al. (2002); MacArthur et al. (2015); Perin et al. (2013); and Perin et al. (2016).

**Holistic Persuasive Writing Quality.** The persuasive prompt used in the current study is as follows, “Should all students in school have to wear school uniforms?” This prompt was chosen because it concerns a controversial topic that has been discussed in recent literature (e.g., Ahrens & Siegel, 2019) and is familiar in American society. Using a familiar topic may provide some control for the participants’ background knowledge. The presentation of this prompt varied based on which experimental condition participants were assigned to, which is described in *Stereotype Induction and Control Conditions*.

Participants’ responses to the persuasive writing task were scored on a seven-point holistic quality scale; these holistic quality scores served as the sole outcome measure in the current study. The seven-point holistic quality scale was adapted from a measure that has been used frequently and proven effective in prior research (Ferretti et al., 2000; MacArthur et al., 2015; Midgette & Haria, 2016; Perin et al., 2017). The rubric directed raters to judge the overall persuasiveness of each writing sample, i.e., the effectiveness of each paper to influence an audience to take a particular view concerning the issue described in the prompt. When making these judgments, raters were instructed to consider the degree to which the participants stated a

clear opinion, provided supporting reasons that were elaborated upon with relevant details, and organized their text, keeping appropriate word choice, and transitions in mind.

The current author and a Masters-level research assistant with a background in literacy assessment who was unfamiliar with the design and purpose of the study scored all of the writing samples. The writing samples were coded in order to protect the participants' identities. The current researcher trained the research assistant in three sessions. During the first training session, the researcher discussed the persuasive writing prompt and explained the criteria that were to be evaluated when analyzing each writing sample, in order to orient the research assistant to the rubric. As aforementioned, there were  $n = 29$  individuals who did not meet the selection criteria due to their racial backgrounds who submitted informed consent; their data were collected during whole-class administration sessions, and were utilized for scoring practice. As noted, the data associated with these excluded participants also were then analyzed for descriptive purposes (see *Discussion* section). The raters reviewed each of the samples independently, recorded their score, and reconvened to discuss their impressions. Raters then were tasked with scoring one-half of the writing samples independently, and scoring discrepancies were discussed in the next meeting. After the second meeting, the researcher and the research assistant scored the remaining writing samples independently, and reconvened in the third meeting to discuss and resolve rationale for discrepant scores. Based on Landis & Koch's (1977a) benchmarks for inter-rater reliability, substantial agreement was found, Cohen's  $\kappa = .629$ . This value is also considered to be an acceptable inter-rater reliability statistic, based on more recent literature (Stemler & Tsai, 2008) which proposes a minimum of .50. The percentage of exact agreement was 73.2%; agreement within one point was 99%. An average of the scores

of the two raters were used in the analyses, in accordance with procedures used in recent literature (Ferretti & Lewis, 2019).

**Racial/Ethnic Centrality.** Racial/ethnic centrality is the extent to which an individual perceives their race/ethnicity to be an integral part of their self-concept (Sellers et al., 1998). Racial centrality has been examined in order to determine its relationship to stereotypes and identity development, using the aforementioned Multidimensional Inventory of Black Identity (MIBI, Sellers et al., 1998). The use of the Centrality scale of the MIBI as an indication of racial centrality perceptions was deemed feasible based on prior research (Okeke et al., 2009). Research concerning the cross-race and cross-ethnic applicability of the MIBI indicated it maintains its internal consistency when used with other racial and ethnic groups (i.e., Latino and White populations; Johnson et al., 2005; Cronbach's alphas were .67 and .75 for the Centrality scale, respectively). As such, participants were administered the eight-item racial centrality subscale of the MIBI. As with prior research, the word "Black" was replaced with a blank space to improve the applicability of the scale for other races/ethnicities (Johnson et al., 2005). Prior to responding to the centrality scale items, participants were asked to identify their racial/ethnic identity. Participants were then told by the researcher to answer the questions based on the race/ethnicity they self-identified as on the scale. The scale raw score for the participants is the sum of the eight responses they provide. In accordance with the MIBI's scoring instructions, each participant's average score was used in hypothesis testing (Sellers, 2013). Of note, participants' self-reported racial/ethnic identities were used to group participants by race/ethnicity during data analyses.

**Self-Perception of Writing Skills.** A post-task five-question written-response survey developed by Rodriguez (2014) was administered to assess participants' perceptions of their

performance on the persuasive writing task (see Appendix F). Specifically, the survey was designed to assess the participants' self-perceptions of their performance, and factors that may have impacted it while they were writing their persuasive essays.

Specifically, participants' responses to the third and fourth questions on the post-task survey were used as a manipulation check to determine the saliency and effectiveness of the stereotype threat induction. The third question was "Did you feel any pressure to perform well on the persuasive writing task?" and the fourth question was "Did you feel any performance anxiety while completing the persuasive writing task?" These two questions were selected because there is empirical evidence for variables that influence the relationship between stereotype threat and performance, such as anxiety and negative thinking (e.g., Cadinu et al., 2005; Pennington et al., 2016; Spencer et al., 2016). These post-survey data were also dummy coded to be used in statistical analyses for hypothesis testing.

### ***Design***

Participants were randomly assigned to Stereotype Induced (SI) and (SNI) groups in order to test the relationship between stereotype induction and academic literacy, here operationalized as persuasive writing performance. Those in the SI condition were presented a stereotype induction prior to completing the persuasive writing task. In turn, individuals in the SNI condition were not presented a stereotype prior to being administered the persuasive writing prompt. The groups were compared on one dependent variable (i.e., holistic persuasive writing quality as measured by a persuasive writing task), taking into consideration the experimental condition, participant race and gender, and racial/ethnic centrality. A separate analysis also investigated differences in self-perceptions of writing ability across the SI and SNI groups.

**Stereotype Threat Induction (SI).** Prior research (e.g., Steele & Aronson, 1995; Taylor & Walton, 2011; Rodriguez, 2014) has been effective in inducing stereotype threat in college-aged and college-bound samples, and the methodology is commonly employed throughout the literature. For example, Steele and Aronson (1995) provided participants with simultaneous written and oral prompts in order to induce stereotype threat, which was proven to be an effective means of induction. Rodriguez (2014) induced stereotype threat in a college-bound sample by requiring students to read an article published in Education Week (Ansell, 2004) concerning the academic achievement gap. Although Rodriguez's (2014) mode of induction was effective, an analysis of the reading comprehension demands of that method by the current researcher suggested that they could be simplified to minimize the impact of reading comprehension skills on the saliency of the stereotype at the time of its induction. As I did not utilize a measure of reading skill, I chose to make the induction method as simple as possible, to better control for the influence of reading comprehension skills on the stereotype threat induction, and subsequent persuasive writing quality scores. As such, the manner of induction was adapted from prior research that has proven efficacy – the text was simplified to basic points that were presented in bulleted form. The induction was designed to make stereotypes concerning Black and Hispanic literacy performance relevant for college students during the completion of the persuasive writing task. Prior to beginning the persuasive writing task, participants in the stereotype induced condition were presented with the following material in the written form. The ideas were drawn from an article published in Education Week (Ansell, 2004) that was also used as an effective means of induction in prior research (Rodriguez, 2014). It concerns the racial-achievement gap in education (see the *Appendix C* for full excerpt):

*Some groups of students perform better than others in school.*

*This creates a gap between groups of students.*

*White students often perform better than Black and Hispanic students in reading, writing, and math.*

*For example, on reading tests, White students score more than 20-points higher than Black and Hispanics.*

*There are still gaps between race groups today.*

As alluded to above, the method of stereotype induction used in the current study is slightly different from that used in prior research. As the reading skills of the current sample were expected to vary, with some participants having low reading skills, it was decided to induce stereotype threat with the current sample using simplified visual means. In addition, because the content of the stereotype material was presented in bulleted form, it was thought to reduce the reading demands to a minimum, to accommodate the needs of any individual with low reading skills.

Upon reading the list above, participants in the stereotype induced (SI) group were presumed to become more aware of their racial/ethnic identity by internalizing the racial/ethnic stereotypes assumed to be made salient by the above reading, which was culled from a larger article that was successful in inducing a stereotype threat effect in a Hispanic college-bound sample (Rodriguez, 2014). Furthermore, participants in the stereotype induced condition were informed that the measure of persuasive writing skills specifically assesses their true academic ability. This was included in the written instructions for the persuasive writing task. Specifically, participants in this condition read the following prompt: *“Should all students in school have to wear school uniforms?” Please write a response stating whether you agree or disagree with this statement,*

*and give reasons for your opinion. Remember, this task is a test of your true academic ability.*

The rationale for communicating this information is that those students who believed their performance on the given persuasive writing task is indicative of their *true academic ability* are more likely to be impaired by negative stereotypes, such as those noted in the bulleted list above (Laar et al., 2008; Steele, 1997).

**Control Condition: Stereotype Not Induced (SNI).** Participants assigned to the SNI (control) condition were provided a generic list of information to read before completing the persuasive writing task. The list is as follows:

*You're an undergraduate student.*

*You're being asked to write a persuasive writing response.*

*Persuasive writing usually includes your opinion.*

*Persuasive writing also normally includes reasons for your opinion.*

Prior to receiving instructions for the persuasive writing task, the researcher provided a written prompt to participants, adapted from prior research (Rodriguez, 2014). Specifically, they read that the purpose of the persuasive writing task was to develop future persuasive writing tasks for undergraduate students. Participants in this group then received the following instructions for the persuasive writing task: *“Should all students in school have to wear school uniforms?” Please write a response stating whether you agree or disagree with this statement, and give reasons for your opinion. Remember, your participation in completing this task is to develop future persuasive writing tasks for undergraduate students.* Therefore, students in the stereotype-not-induced condition (SNI) were given instructions with no mention of the persuasive writing task being a reflection of their true academic ability or performance. It is important to note that the latter two details provided to participants assigned to the SNI condition

provided them with indicators on how to write a persuasive essay that the SI group did not receive in their bulleted list. Although this may be a potential limitation of the current study, both groups were told, *“please write a response stating whether you agree or disagree with this statement, and give reasons for your opinion.”*

### ***Description of Person Administering Measures***

Given the sensitive nature of the current focus (stereotype threat), it is relevant to mention that I am of Black racial background. This fact may have affected the performance of participants, who included Black, Hispanic and White persons, especially in the SI condition. Davis and Silver (2003) found race-of-interviewer effects when administering a factual telephone survey which assessed political knowledge under threatening and nonthreatening conditions. Specifically, Black participants garnered significantly higher scores when questioned by an interviewer they perceived to be Black, when compared to interviewers whom they perceived to be White. Similarly, Thames et al. (2013) found race effects when they conducted an in-person study involving stereotype threat. They found that Black participants who reported high levels of perceived discrimination performed significantly worse on memory tests when tested by a White examiner, when compared to being tested by a Black examiner. These studies exemplify how the race of a researcher/examiner can influence performance of participants based on their race/ethnicity. It is likely that these race effects also apply to the current study, as participants were aware of their racial/ethnic identity, and my racial identity at the time of task administration.

### ***Randomization Check***



A randomization check was conducted via Pearson’s Chi-Square Tests of Independence with respect to participants' demographic data and the stereotype induction. Table 1 displays Chi-Square Tests of Independence for race/ethnicity by stereotype condition, race/ethnicity by gender, gender by stereotype condition, administration mode by stereotype condition, and school year by stereotype condition. Crosstabulations for these variable combinations did not indicate low cell frequencies (i.e., no cells were found to have an expected value below five). As such, Chi-square tests of independence (seen in Table 1) were conducted as a randomization check.

**Table 1**

*Randomization Check for Race/Ethnicity, Gender, School Year, and Stereotype Condition*

*Variables*

	$\chi^2$	<i>df</i>	<i>p</i>
Race/Ethnicity & Stereotype Condition	1.99	2	.370
Race/Ethnicity & Gender	3.41	2	.182
Gender & Stereotype Condition	2.18	1	.140
Administration Mode & Stereotype Condition	2.69	2	.261
School Type & Stereotype Condition	.142	1	.706

Results of the Chi-square tests of independence suggest that there was no significant association between race/ethnicity and stereotype condition; gender and stereotype condition; stereotype condition and administration mode (i.e., individual in-person, group-in person, and online); school type and stereotype condition; or racial/ethnic group and gender. As such, the randomization procedures utilized in the current study were successful.

***Manipulation Check***

A manipulation check also was conducted via an independent samples *t*-test comparing the post-task survey data across experimental conditions. Results of this check are displayed in Table 2.

**Table 2**

*Manipulation Check- Comparing Post-Task Survey Data Across Experimental Conditions*

Variable	Stereotype Induced		Stereotype Not Induced		<i>t</i>	<i>df</i>	<i>p</i>	<i>Cohen's d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
Post-Task Survey Responses	.49	.50	.42	.49	-.977	186	.330	.14

Findings in Table 2 indicate that there was no statistically significant differences between the SI and SNI groups with respect to their post-task survey responses regarding pressure to perform well and performance anxiety. It is important to note that the employed manipulation check in the current study differs from the manipulation check procedures in other stereotype threat literature. For example, Pennington et al. (2018) presented a “Yes or No” question related to their stereotype threat prime to their participants after inducing the threat. It read, “Do you know of a negative stereotype regarding females being less competent as gamers compared to males?” Utilizing a similar manipulation check format in future research may serve as a more direct and accurate means to determine if participants were aware of a stereotype induction.

***Procedures***

All participants first provided written consent following guidelines of Teachers College’s IRB. Participants then were administered study measures either online or in-person (individually or in groups).

**Task Administration.** All in-person participants were required to attend one testing session, lasting no longer than approximately 60 minutes (including the introduction of the study, discussion and receipt of informed consent, administration of the experimental measures, and debriefing). All online participants were also expected to complete the study measures in one session, lasting no longer than approximately 60 minutes (including the introduction of the study, review and digitally agree to the informed consent, administration of the experimental measures, and reading the debriefing script). The following sections describe the in-person individual, in-person group, and online data collection procedures.

**Individual Administration.** 10% of participants attended one-to-one appointments that took place in the private college's library. These participants were recruited from classrooms in the private college, and through tabling in lecture halls that I gained access to through the private college's Office of Student Affairs.

For scheduled one-to-one in-person appointments, once consent was obtained, I randomly assigned participants to SI and SNI subgroups, and informed them of the date they were to participate in the study. At the time of their appointment, participants were provided with a packet, that had instructions which were designed to either induce, or not induce, a stereotype threat. These packets were randomly sorted prior to test administration, so there was no specific order dictating whether participants received the stereotype induction. All participants completed the tasks in the following order: the persuasive writing task, the post-task written-response survey that was administered to examine the students' self-perceptions and performance regarding their persuasive writing ability, and The Racial Centrality Scale of the Multidimensional Inventory of Black Identity. After completing the survey, each participant was debriefed on the purpose of the study and the fundamental tenets of stereotype threat (a

debriefing script can be found in the *Appendix G*). Although I sought to collect data from multiple students at once outside of class time, doing so proved logistically unfeasible, due to the variance in student availability.

**In-Person Administration (Group).** To expedite the data collection process, I reconnected with professors in the Psychology departments across the three institutions, requesting time to work with whole classrooms during scheduled class time. Professors who agreed to that arrangement spoke to me in advance of each class visit, and provided me with 60 minutes, on average, to discuss the research study, obtain informed consent, administer the measures to whole classes, and debrief the students. A total of 64% of participants completed the study in-person in a group administration format.

When administering measures to whole classrooms, I randomly distributed the packets of measures to students who provided informed consent, so some students received the stereotype threat induction, and others did not (e.g., I alternated between the SI and SNI conditions when distributing the packets). All participants completed the tasks in the following order: the persuasive writing task, the post-task written-response survey that was administered to examine the students' self-perceptions and performance regarding their persuasive writing ability, and The Racial Centrality Scale of the Multidimensional Inventory of Black Identity. After completing the survey, all participants were debriefed on the purpose of the study and the fundamental tenets of stereotype threat (a debriefing script can be found in the *Appendix G*).

### ***Virtual Administration for Online Participants***

To supplement the in-person administration procedures, a total of 23% of participants completed measures digitally. The digital administration adaptation was approved by the Teachers College IRB as a modification of the study. During the digital administration, students

were given a digital copy of the consent form on the first page of the Qualtrics page, which they had to review, and agree to, prior to being permitted to continue on to the administered measures. The researcher also enabled the “anonymize responses” feature in Qualtrics before online data collection, in order to hide the participants’ IP Address and location data, for added security. In order to randomize online participants to the two conditions, I utilized the advanced randomization feature in Qualtrics to randomize the presentation of the stereotype induction bulleted list, and the stereotype induction persuasive writing prompt. This feature allowed no two consecutive participants to be placed in the same condition.

### ***Pooling of Participants***

Descriptively, a total of 123 participants completed the study in-person (group). These participants were 21 years of age on average. They garnered a mean persuasive writing quality score of 4.37 (SD = .976; Variance = .953); a racial/ethnic centrality score of 4.31 (SD = 1.03; Variance = 1.06); and a post-task survey response average of .48 (SD = .50; Variance = .251). With regard to gender, 28.5% of these participants were male. Concerning racial/ethnic identity, 22% were Black, 65.9% were Hispanic, and 12.2% were White.

Conversely, a total of 19 participants completed the study in-person (individually). These participants were 22 years of age on average. They garnered a mean persuasive writing quality score of 4.58 (SD = .821; Variance = .674); a racial/ethnic centrality score of 4.14 (SD = .923; Variance = .853); and a post-task survey response average of .471 (SD = .514; Variance = .265). With regard to gender, 26.3% of these participants were male. Concerning racial/ethnic identity, 21.1% were Black, 47.4% were Hispanic, and 31.6% were White.

Lastly, a total of 49 participants completed the study online. These participants were 21 years of age on average. They garnered a mean persuasive writing quality score of 4.54 (SD =

1.22; Variance = 1.48); a racial/ethnic centrality score of 3.94 (SD = 1.05; Variance = 1.11); and a post-task survey response average of .43 (SD = .50; Variance = .250). With regard to gender, 22.4% of these participants were male. Concerning racial/ethnic identity, 30.6% were Black, 34.7% were Hispanic, and 34.7% were White.

Analyses were conducted to test for between group differences between participants that completed the study online versus in-person, in order to determine if I could pool participants across administration modes. Table 3 displays the results of these *t*-tests.

**Table 3**

*Persuasive Writing, Racial/Ethnic Centrality, and Self-Perception Differences Across Online and In-Person Participants*

Variable	In-Person		Online		<i>t</i> ( <i>df</i> )	<i>p</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Persuasive Writing	4.40	.96	4.54	1.22	-.727* (69.47)	.470	.12
Racial/Ethnic Centrality	4.29	1.01	3.93	1.05	2.06 (189)	.041	.33
Post-Task Survey	.475	.50	.423	.50	.556 (186)	.579	.10

*Note.* Equal variances were not assumed across groups based on a statistically significant Levene’s Test  $F= 5.983, p=.015$ .

Results listed in Table 3 suggest that there are no statistically significant differences in the dependent variables persuasive writing performance or post-task survey responses between participants across administration modes. Although a statistically significant difference in racial centrality was found between the in-person and virtual participants, the effect size was noted as being below the average effect size value for educational (i.e.,  $d = .40$ ; Hattie, 2009) and social psychology research (i.e.,  $d \approx .40$ ; Richard et al., 2003). These works are also cited in more

recent text regarding their findings (i.e., Cumming & Calin-Jageman, 2017). As such, the in-person and online participant data were pooled for statistical analyses.

### Chapter 3: Results

This section begins with a description of the sample (Tables 4-5) and proceeds to report findings for the four research questions.

#### 3.1. Descriptive Demographic Data

Table 4 shows demographics, schools attended, and the assigned conditions for the whole sample ( $N = 191$ ).

**Table 4**

*Sample Demographics*

Demographic	Frequency	%	<i>M</i>	<i>SD</i>	Range
<b><u>Age</u></b>			21.47	4.76	18-57
18-24 years	172	90.1			
25-44 years	17	8.9			
45-64 years	2	1.00			
<b><u>Gender</u></b>					
Male	51	26.7			
Female	140	73.3			
<b><u>Year</u></b>					
Freshman	24	12.60			
Sophomore	20	10.50			
Junior	31	16.20			
Senior	44	23.0			
Not Specified	72	37.7			

**Race/Ethnicity**

Black	46	24.1
Hispanic	107	56.0
White	38	19.9

**School Type**

Public Community College	70	36.6
Private Four-Year College	121	63.4

**Condition**

Stereotype Induced	88	46.10
Stereotype Not Induced	103	53.90

Table 5 displays the means and standard deviations for the administered measures for the whole sample (N = 191), categorized by demographics, school attended, and assigned study condition.

**Table 5**

*Sample Means (and Standard Deviations) Across Administered Measures*

Demographic	Racial/Ethnic Centrality	Persuasive Writing Quality	Post-Task Survey Responses
<b><u>Gender</u></b>			
Male	3.97 (1.06)	4.21 (.921)	.400 (.495)
Female	4.28 (1.02)	4.52 (1.06)	.485 (.502)
<b><u>Year</u></b>			
Freshman	4.08 (.915)	4.39 (1.10)	.375 (.494)
Sophomore	3.88 (1.02)	4.52 (1.03)	.350 (.489)
Junior	4.25 (.962)	4.32 (1.16)	.516 (.508)
Senior	4.32 (1.07)	4.70 (1.08)	.536 (.505)



Not Specified	4.22 (1.09)	4.31 (.898)	.458 (.502)
<b><u>Race/Ethnicity</u></b>			
Black	4.73 (.86)	4.26 (.97)	.422 (.49)
Hispanic	4.29 (.95)	4.27 (.87)	.439 (.49)
White	3.28 (.87)	5.11 (1.23)	.583 (.500)
<b><u>School Type</u></b>			
Community College	4.26 (1.02)	4.51 (1.07)	.504 (.502)
Private College	4.09 (1.05)	4.30 (.949)	.391 (.491)
<b><u>Condition</u></b>			
Stereotype Not Induced	4.25 (1.03)	4.48 (.99)	.424 (.497)
Stereotype Induced	4.15 (1.04)	4.40 (1.07)	.495 (.502)

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### 3.2. Research Question One

The first research question examined the relationships between race/ethnicity, racial/ethnic centrality, stereotype induction, and writing performance, based on findings from prior research. Specifically, established research speaks to the relationships between race/ethnicity and racial/ethnic centrality (Okeke et al., 2009; Hope et al., 2013), race/ethnicity and stereotype threat (Steele & Aronson, 1995; Taylor & Walton, 2011; Rodriguez, 2014), and racial/ethnic centrality and negative stereotype endorsement (Okeke et al., 2009). The first research question also investigated relationships between these variables and gender, writing performance, and self-perceptions of writing ability, given the paucity of literature that evaluates these relationships at the undergraduate level. The analyses for the first research question involved a series of correlations, *t*-tests, ANOVA procedures, and a calculation of effect sizes between study variables with two independent groups (i.e., Cohen's *d*). The results of these analyses are reported by statistical procedure.

## ***Correlations***

Bivariate Pearson correlations were computed for holistic persuasive writing quality and racial/ethnic centrality, as seen in Table 6. First, boxplots were generated to visually inspect for extreme outliers (those more than three *SD* away from the mean). No extreme outliers were noted. An inspection of histograms also indicated that both variables followed a relatively normal distribution. Persuasive writing quality and racial/ethnic centrality were both found to be fairly symmetrical and the extremity of the tails of the distributions for the two variables also was found to be acceptable based on the *z*-score rule of thumb (*z*-scores within the range of  $\pm 3.29$ ) for medium sized samples,  $50 < n < 300$  (Kim, 2013). Specifically, racial/ethnic centrality had a skewness value of  $-.222$  with a standard error  $.13$ , which computes to a *z*-score of  $-1.26$ . Racial/ethnic centrality also had a kurtosis of  $-.053$  with a standard error of  $.35$ , which equals a *z*-score of  $-.15$ . In turn, holistic persuasive writing quality had a skewness value of  $.35$  with a standard error of  $.17$ , which equals a *z*-score of  $2.05$ , and a kurtosis of  $-.363$  with a standard error of  $.350$  (*z*-score =  $-1.03$ ).

**Table 6**

*Pearson Correlations for the Continuous Study Variables*

Variable	<i>M</i>	<i>SD</i>	<i>R</i>	<i>p</i>
Racial/Ethnic Centrality	4.19	1.03	-	-
Persuasive Writing Quality	4.44	1.03	-.09	.216

No significant correlation was found between racial/ethnic centrality and persuasive writing quality.

## ***Independent Samples t-tests***

Table 7 shows the results of *t*-tests that evaluated gender differences in persuasive writing, racial/ethnic centrality, and self-perceptions of writing ability from the post-task survey.

**Table 7**

*Persuasive Writing, Racial/Ethnic Centrality, & Post-Task Survey Differences Across Gender Groups*

Variable	Male		Female		<i>t</i> (189)*	<i>p</i>	<i>Cohen's d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Persuasive Writing	4.21	.91	4.52	1.06	-2.02*	.046	.31
Racial/Ethnic Centrality	3.97	1.06	4.28	1.02	-1.83	.068	.29
Post-Task Survey	.400	.495	.486	.501	-1.04**	.300	.17

\*The degrees of freedom for holistic persuasive writing quality were 102.32. Equal variances were not assumed across groups based on a statistically significant Levene's Test  $F = 5.10, p = .025$ .

\*\* The degrees of freedom for post-task survey responses were 87.91. Equal variances were not assumed across groups based on a statistically significant Levene's Test  $F = 5.14, p = .025$ .

Results listed in Table 7 did not suggest the presence of a statistically significant difference in racial/ethnic centrality between males in females in the sample. There also were no statistically significant gender differences in post-task survey responses, specifically regarding the two target questions. However, statistically significant differences were found between males' and females' persuasive writing quality; females in the current sample scored an average of .32 points higher than males on the persuasive writing measure. As such, gender was included as an independent variable in an ancillary ANOVA procedure, which tested the interaction between gender by race/ethnicity by racial/ethnic centrality by stereotype induction on persuasive writing performance (see *Exploratory Analyses*).

**Table 8**

*Persuasive Writing, Racial/Ethnic Centrality, and Post-Task Survey Differences Across School Type*

Variable	Private School		Community College		$t(df)$	$p$	Cohen's $d$
	$M$	$SD$	$M$	$SD$			
Persuasive Writing	4.51	1.07	4.30	.949	1.33 (189)	.185	.20
Racial/Ethnic Centrality	4.26	1.02	4.09	1.06	1.024 (189)	.307	.16
Post-Task Survey	.504	.502	.391	.491	1.49 (144.63)*	.134	.22

*Note.* Equal variances were not assumed across groups based on a statistically significant Levene's Test  $F = 5.801, p = .017$ .

Results listed in Table 8 suggest that there are no statistically significant differences in racial/ethnic centrality, persuasive writing performance, or post-task survey responses between private school and community college participants.

### ***One-Way Analysis of Variance (ANOVA)***

Several one-way ANOVAs were conducted to compare differences between racial/ethnic groups (i.e., Black, Hispanic, and White) in terms of persuasive writing quality, racial/ethnic centrality, and post-task survey responses.

There was a statistically significant effect of race/ethnicity on persuasive writing quality,  $F = 11.549, p < .0001$ . There was also a significant effect of race/ethnicity on racial/ethnic centrality scores,  $F = 27.42, p < .0001$ . However, there was not a significant effect of race/ethnicity on self-reports during a post-task survey,  $F = 1.318, p = .270$ . As noted, participants' responses to two of the post-task survey responses were coded; these responses concerned whether participants self-reported experiencing anxiety and/or pressure to perform during the persuasive writing task. Table 9 displays the results of Tukey HSD post-hoc comparison tests.

**Table 9***Post-hoc Comparisons of Race/Ethnicity and Persuasive Writing*

Race/Ethnicity	<i>n</i>	<i>M</i>	<i>SD</i>	Tukey HSD		
				Black	Hispanic	White
Black	46	4.26	.97	--	.998	<.0001
Hispanic	107	4.27	.87	.998	--	<.0001
White	38	5.11	1.23	<.0001	<.0001	--

The difference between Black and White participants' persuasive writing scores was statistically significant; on average, Black participants scored .85 points less than their White counterparts on the measure of persuasive writing. There was also evidence suggesting a statistically significant difference between the Hispanic and White participants' persuasive writing scores; Hispanic participants, on average, scored .84 points less than their White counterparts. However, there was no statistically significant difference between Black and Hispanic participants in terms of their holistic persuasive writing quality. In summary, Hispanic and Black groups did not differ from one another with respect to their holistic persuasive writing quality, but individuals belonging to those racial/ethnic groups performed significantly lower than their White counterparts. Due to these noted differences, racial/ethnic background was entered into subsequent analyses for *Research Question Four*.

**Table 10***Post-Hoc Comparisons of Race/Ethnicity and Racial/Ethnic Centrality*

Race/Ethnicity	<i>n</i>	<i>Mean</i>	<i>SD</i>	Tukey HSD		
				Black	Hispanic	White
Black	46	4.73	.86	--	.021	<.001
Hispanic	107	4.29	.95	.021	--	<.001

White	38	3.28	.88	<.001	<.001	--
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Table 10 displays the results of Tukey HSD tests to confirm where the differences lied between racial/ethnic groups with regard to racial/ethnic centrality. Results suggest a statistically significant difference between Black and Hispanic participants,  $p = .021$ ; on average, Black participants' racial centrality scores were .44 points higher than their Hispanic counterparts. There was also a notable difference between Black and White participants,  $p < .001$ ; Black participants averaged 1.45 points higher on the racial/ethnic centrality scale. Hispanic participants also differed significantly from their White counterparts  $p < .001$ ; Hispanic individuals averaged 1.01 points higher on the racial/ethnic centrality scale. Overall, these results indicate that Black participants averaged higher racial/ethnic centrality scores when compared to their Hispanic and White counterparts. In turn, Hispanic participants also garnered higher racial/ethnic centrality scores when compared to their White counterparts.

Overall, findings across the statistical analyses for the first research question suggest that there were statistically significant differences across gender and racial/ethnic groups with respect to persuasive writing quality. Specifically women garnered higher scores than men in the sample, and White participants garnered higher scores when compared to their Black and Hispanic counterparts. With regard to racial/ethnic centrality, statistically significant racial/ethnic differences were found, as Black participants garnered higher racial/ethnic centrality ratings when compared to their Hispanic and White counterparts; in turn, Hispanic participants garnered significantly higher scores than White individuals in the sample.

### 3.3. Research Question Two

The second research question investigated whether self-perceptions of writing ability differed according to whether a stereotype was induced. As noted, self-perceptions of writing

ability were operationalized based on responses participants reported to the third and fourth questions on the post-task writing survey. The third question was, “Did you feel any pressure to perform well on the persuasive writing task?” and the fourth question was, “Did you feel any performance anxiety while completing the persuasive writing task?” These two questions were selected and dummy coded for statistical analyses because they relate to the empirically-supported variables that influence the relationship between stereotype threat and performance (e.g., anxiety and negative thinking; Cadinu et al., 2005; Pennington et al., 2016; Spencer et al., 2016). Table 11 displays the differences in post-task survey responses by racial/ethnic group, across the experimental conditions.

**Table 11**

*Group Differences in Post-Task Survey Responses by Racial/Ethnic Background*

Race/Ethnicity	Stereotype Induced		Stereotype Not Induced		<i>t</i>	<i>df</i>	<i>p</i>	<i>Cohen's d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
Black	.62	.49	.25	.44	-2.63	43	.01	0.79
Hispanic	.42	.49	.46	.50	.483	105	.63	0.08
White	.60	.50	.56	.51	.667	34	.83	0.08

According to Table 11, statistically significant differences in post-task survey responses were found between Black participants in the SI condition when compared to those in the SNI condition. This suggests that Black participants in the SI condition, on average, self-reported experiencing more performance anxiety and/or pressure to perform well on the persuasive writing task, when compared to Black peers in the SNI condition that were not subjected to the stereotype induction. In comparison, there were no statistically significant differences for Hispanic and White participants in the sample. Overall, findings partially supported the

hypothesis that Black and Hispanic participants subjected to a negative stereotype induction would self-report more negative self-perceptions of persuasive writing ability when compared to their non-induced peers.

### 3.4. Research Question Three

The third research question asked: Will persuasive writing performance differ according to whether a stereotype was induced? This question aligns with prior research which investigated the relationship between stereotype threat and performance in samples of college-bound and undergraduate students (e.g., Steele & Aronson, 1995; Taylor & Walton, 2011; Rodriguez, 2014). Table 12 displays the group differences in holistic persuasive writing quality across the SI and SNI groups, by racial/ethnic background, which directly tests the hypothesis that Black and Hispanic participants subjected to a stereotype induction will underperform on the measure of persuasive writing when compared to their non-subjected counterparts.

**Table 12**

*Group Differences in Holistic Persuasive Writing Quality by Racial/Ethnic Background*

Race/Ethnicity	Stereotype Induced		Stereotype Not Induced		<i>t</i>	<i>df</i>	<i>p</i>	<i>Cohen's d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
Black	4.24	1.09	4.28	.88	.144	44	.886	0.04
Hispanic	4.23	.85	4.33	.90	.628	105	.532	0.11
White	5.12	1.36	5.11	1.11	-.034	36	.973	0.01

Findings displayed in Table 12 suggest that there are no statistically significant differences in holistic persuasive quality scores by race/ethnicity, across the SI and SNI groups.



As such, the hypothesis that Black and Hispanic participants subjected to a negative stereotype would perform worse than their non-subjected counterparts, is rejected.

### **3.5. Research Question Four**

The fourth research question asks whether racial/ethnic centrality moderates the effect of a stereotype induction on writing performance. In order to examine this question, three-way ANOVA procedures were used to test if racial/ethnic centrality serves as a statistically significant moderator for the relationship between racial/ethnic identity and stereotype induction on persuasive writing quality.

The variables used in three-way ANOVA satisfied the basic requirements necessary for it to be run. The dependent variable, persuasive writing quality, was measured at the continuous level. Furthermore, the selected independent variables consisted of two or more categorical groups, and there is no relationship between the observations in each group of the independent variable or between the groups themselves. Upon inspection of boxplots, no significant outliers were noted in any cell of the design. Based on Shapiro-Wilk's test of normality, persuasive writing quality scores were normally distributed ( $p > .05$ ) except for the following groups: Minority individuals in the SNI condition with racial/ethnic centrality scores of 3.38, 4.13, and 4.50,  $p < .001$ ; Minority individuals in the condition with a racial/ethnic centrality scores of 3.63, 4.63, 4.88, 5.38, and 5.50,  $p \leq .001$ . However, I proceeded with the three-way ANOVA due to the robustness of ANOVA procedures to issues of non-normality (Mena et al. 2017; Schmider et al., 2010). Lastly, there was homogeneity of variances for persuasive writing quality for all group combinations of racial/ethnic identity, racial/ethnic centrality, and stereotype condition, as assessed by Levene's Test for equality of variances,  $p = .085$ .

The overall  $F$ -test for the corrected model suggests that the model, as a whole, accounts for some of the observed variance in persuasive writing quality  $F(7, 183) = 4.62, p < .0001$ . A statistically significant three-way interaction was found between race/ethnicity (coded White versus Minority) by racial/ethnic centrality by stereotype condition (coded stereotype threat or no stereotype threat) on persuasive writing performance,  $F(1, 183) = 7.01, p = .009$ , observed power = .750. There were also statistically significant two-way interactions between stereotype condition by racial/ethnic centrality  $F(1, 183) = 5.303, p = .022$ , observed power = .630 and race/ethnicity and the stereotype condition  $F(1, 183) = 6.284, p = .013$ , observed power = .703. There was also a statistically significant main effect for stereotype condition on persuasive writing performance ( $p = .049$ ), observed power = .503. It is important to note that similar significant findings are noted when controlling for participants' post-task survey responses regarding self-perceptions of pressure to perform and performance anxiety.

Given the differences between Black and Hispanic racial/ethnic groups in the target research domain, I also tested the third hypothesis by analyzing a three-way interaction for racial/ethnic identity (coding White, Hispanic, and Black separately), racial/ethnic centrality, and stereotype induction (coded as stereotype vs no stereotype induction). Based on Shapiro-Wilk's test of normality, persuasive writing quality scores were normally distributed ( $p > .05$ ) except for the following groups: Black participants in the group with a racial/ethnic centrality score of 4.75; Hispanic participants in the group with a racial/ethnic centrality score of 5.25,  $p < .001$ ; Hispanic participants in the group with a racial/ethnic centrality score of 3.63, 4.13, and 4.88,  $p < .001$ . However, I proceeded with the three-way ANOVA due to the robustness of ANOVA procedures to issues of non-normality (Mena et al. 2017; Schmider et al., 2010). There was homogeneity of variances for persuasive writing quality for all group combinations of

racial/ethnic identity, racial/ethnic centrality, and stereotype condition, as assessed by Levene's Test for equality of variances,  $p = .091$ .

Similar to the first three-way ANOVA, the overall  $F$ -test for the corrected model suggests that the model, as a whole, accounts for some of the observed variance in persuasive writing quality  $F(11, 179) = 2.92, p = .001$ . A statistically significant three-way interaction was found between race/ethnicity (coded Black, Hispanic, and White) by racial/ethnic centrality by stereotype condition (coded stereotype threat or no stereotype threat) on persuasive writing performance,  $F(2, 179) = 3.56, p = .030$ , observed power = .655. A significant two-way interaction for stereotype condition by racial/ethnic identity also was found,  $F(2, 179) = 3.16, p = .045$ , observed power = .601. Again, the corrected model and the same interactions were found to be significant when controlling for participants' post-task survey responses regarding self-perceptions of pressure to perform and performance anxiety.

Overall, the three-way ANOVAs that were conducted analyzed the interaction between racial/ethnic identity, racial/ethnic centrality, and stereotype condition on persuasive writing performance. There was a significant interaction effect for racial/ethnic identity by racial/ethnic centrality by stereotype condition when race/ethnicity was coded as "White versus Minority" and when race/ethnicity was coded separately as "White, Black, and Hispanic." The findings of these three-way ANOVAs support the third hypothesis that racial/ethnic centrality serves as a statistically significant moderator for the relationship between a stereotype induction and writing performance.

## Chapter 4: Discussion

The current study contributes new evidence to a growing body of literature by exploring the role of race-based psychosocial variables in the relationship between stereotype threat and writing skills in a college population.

Findings for the first research question suggest that there were statistically significant differences across gender and racial/ethnic groups with respect to persuasive writing quality. Specifically, women garnered higher scores than men, and White participants achieved higher scores when compared to their Black and Hispanic counterparts. With regard to racial/ethnic centrality, statistically significant racial/ethnic differences were found, as Black participants self-reported higher racial/ethnic centrality ratings when compared to their Hispanic and White counterparts; in turn, Hispanic participants reported significantly higher ratings when compared to the White individuals in the sample.

Data related to the second research question indicate that Black participants exposed to a negative stereotype reported experiencing greater pressure to perform well and performance anxiety when compared to their non-subjected peers. This finding partially supported the hypothesis that Black and Hispanic participants exposed to a negative stereotype induction would self-report experiencing significantly more pressure to perform and/or performance anxiety when compared to non-induced peers.

In turn, findings related to the third research question were not indicative of statistically significant differences in persuasive writing quality based on stereotype induction. As such, the hypothesis that Black and Hispanic participants subjected to a stereotype induction would demonstrate lesser persuasive writing performance when compared to their non-subjected counterparts was rejected.

Lastly, findings from the fourth research question provided evidence for the last hypothesis, suggesting that racial/ethnic centrality serves as a statistically significant moderator for the relationship between stereotype threat on writing performance. These findings are discussed by research question in the sections that follow.

#### **4.1. Research Question One: Within A Sample of Black, Hispanic, and White Undergraduate Students, What Are the Relationships Between Race/Ethnicity, Racial/Ethnic Centrality, Stereotype Induction, and Writing Performance?**

##### ***Racial/Ethnic Differences in Racial/Ethnic Centrality***

Statistically significant racial/ethnic differences in racial/ethnic centrality were found in the current study. Specifically, Black participants in the sample self-reported higher racial centrality ratings when compared to their Hispanic and White counterparts; in turn, Hispanic participants also self-reported higher racial centrality ratings when compared to their White peers. These findings are in accordance with prior research conducted by Johnson et al. (2005) which assessed the cross-race and cross-ethnic applicability of the Multidimensional Inventory of Black Identity (MIBI). Johnson et al. (2005) found statistically significant differences in racial/ethnic centrality on the MIBI between Latino and White individuals in their sample; it was noted that a portion of their White participants did not complete the MIBI, which may have skewed their findings. Of note, the current research extends Johnson et al.'s (2005) work, as it incorporates an added comparison involving Black participants, and had a 100% response rate for the White participants in the sample.

### *Differences in Racial/Ethnic Centrality by Administration Method*

The current study also extended other earlier work regarding racial/ethnic centrality (Okeke et al., 2009) by examining differences in racial/ethnic centrality ratings across in-person and online administration modes. Findings indicated that online participants reported having lesser racial/ethnic centrality when compared to their in-person peers. This finding is unique in the field of racial/ethnic centrality research, as the current study appears to be the first which directly investigates the relationship between self-reported racial/ethnic centrality ratings and administration mode.

**Racial/Ethnicity Centrality Ratings by Administration Method and Split by Race/Ethnicity.** To gain a better understanding of the statistically significant difference in racial/ethnic centrality across administration modes, the online and in-person groups were split based on race/ethnicity. This was done as an exploratory analysis due to the statistically significant differences in racial/ethnic centrality that were found across racial/ethnic backgrounds. Table 13 displays the results of the independent samples *t*-test:

**Table 13**

*Racial/Ethnic Group Differences in Racial/Ethnic Centrality by Administration Mode*

Race/Ethnicity	In-Person		Online		<i>t</i>	<i>df</i>	<i>p</i>	<i>Cohen's d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
Black	4.89	.90	4.39	.65	1.92	44	.062	.64
Hispanic	4.31	.91	4.21	1.15	.388	105	.699	.09
White	3.29	.84	3.26	.94	.113	36	.910	.03

Findings in Table 13 suggest that across online and in-person administration formats, the difference between Black participants' racial/ethnic centrality ratings approached significance;

the effect size also is noted to be large. Conversely, the findings related to Hispanic and White participants did not approach statistical significance, and yielded small to negligible effect sizes. It is possible that Black participants who completed the study in-person had more racial/ethnic cues, which primed their self-perceptions of race/ethnicity (e.g., some Black participants completed the measures in the presence of other Black peers, all in-person participants completed the measures in my presence). Additional research is needed to determine the role administration mode plays in the relationship between racial/ethnic identity and racial/ethnic centrality/self-reporting of racial/ethnic centrality.

### ***Racial/Ethnic Differences in Writing Skills***

Furthermore, the current study suggests the presence of significant racial/ethnic differences in writing skills in an undergraduate sample. ETS (2019) notes that similar racial/ethnic differences in writing ability exist on measures of standardized achievement (e.g., GRE) for college-aged individuals. For instance, those who identified as White performed better on the GRE measure of analytical writing between July of 2017 and June of 2018 when compared to those who identified as other racial/ethnic groups (including those of Black and Hispanic backgrounds). The current study extends research in this domain by noting statistically significant racial/ethnic differences in writing ability when utilizing unstandardized measures of literacy skills.

**Exploratory Racial/Ethnic Writing Skill Analyses.** As noted, there were  $n = 29$  participants who were excluded from the main data analyses due to their racial/ethnic background not being of interest to the current study; these individuals were recruited via the in-person group/whole-classroom administration procedures. Their data were analyzed solely for descriptive purposes.

**Mixed.** A total of  $n = 22$  individuals self-identified as being mixed (with at least one of their component races/ethnicities being White, Black, or Hispanic). The mean age of the mixed participants is 20 years (minimum = 18; maximum = 33). Mixed participants averaged a holistic persuasive writing quality score of 4.75 (SD = 1.15; Variance = 1.32). Their mean racial/ethnic centrality score is 4.11 (SD = 1.17; Variance = 1.38). Their mean post-task survey response score was .22 (SD = .42; Variance = .184).

Although the mixed participants had at least one component identity that aligned with the current study, they were not utilized in the main analyses due to findings regarding stereotype threat in mixed populations, and literature which speaks to the malleability of their racial/ethnic identity across contexts. According to Rockquemore et al. (2009), in certain instances, biracial individuals may identify only with their minority (i.e., Black) or majority (i.e., White) background. Wilton et al. (2013) found that biracial individuals may engage in racial identity shifting (i.e., identifying with one component identity over another) in response to threats as a protective mechanism. Shih et al. (2007) discovered that Black/White multiracial individuals were less vulnerable to racial stereotypes than individuals that identify as monoracial. Gaither et al. (2015) noted that a biracial individual may present with more developed performance depending on which racial identity is primed by a stereotype induction (i.e., stereotype boost). Notably, research also notes that biracial children demonstrate a pro-White racial bias, even when race is not made salient, when compared to monoracial youth (Neto & Pavia, 1998). As such, priming racial identity may result in those who identify as biracial (e.g., Black and White) to identify more strongly with being White. Given these findings, I opted not to employ mixed/biracial individuals in the main analyses.



**Asian.** Three individuals in the current study self-identified as being Asian. The mean age of Asian participants is 25 years (minimum= 20; maximum= 30). The Asian participants averaged a holistic persuasive writing quality score of 3.83 (SD= .29; Variance= .08), a racial/ethnic centrality score of 4.50 (SD= 1.08; Variance= 1.17), and post-task survey responses of 0.00 (SD= .00; Variance= .00).

**Indian.** There also are four individuals who identified as being Indian in the current study. The average age of Indian participants is 23 years (minimum= 18; maximum= 33). The Indian participants averaged a holistic persuasive writing quality score of 3.00 (SD= 1.82; Variance= 3.33); a racial/ethnic centrality score of 4.03 (SD= 1.08; Variance= 1.17); and post-task survey response score of .250 (SD= .50; Variance= .250). The latter two groups were not employed in the current study due to a lack of applicability the induced stereotype threat was expected to have for individuals of their racial/ethnic backgrounds, and due to the small respective group sizes.

### ***Gender Differences in Writing Skills***

Lastly, findings from the current study indicate the presence of statistically significant gender differences in persuasive writing skills at the undergraduate level. This finding is in accordance with prior literature, as Oppenheimer et al. (2017) found statistically significant gender differences in the persuasive writing performance of undergraduates during a longitudinal investigation of writing skills throughout college.

#### **4.2. Research Question Two: Will Self-perceptions of Writing Ability Differ According to Whether a Stereotype Was Induced?**

Although the current study's findings did not exactly align with prior literature that notes differences in post-task survey responses across experimental conditions for Hispanic participants (Rodriguez, 2014), similar data were noted for Black participants. Specifically, it was found that Black participants in the SI condition, on average, self-reported experiencing more performance anxiety and/or pressure to perform well on the persuasive writing task, when compared to Black peers in the SNI condition. This finding partially supported the hypothesis that Black and Hispanic participants exposed to a negative stereotype induction would report significant differences in self-perceptions of writing ability when compared to non-induced peers. It is important to note that the current study extended Rodriguez's (2014) work, by applying the post-task survey to other racial/ethnic groups.

#### **4.3. Research Question Three: Will Persuasive Writing Performance Differ According to Whether a Stereotype Was Induced?**

Black and Hispanic participants subjected to a stereotype induction were hypothesized to underperform on the measure of persuasive writing when compared to their non-subjected counterparts. However, findings did not support this hypothesis, as there was no statistically significant difference in persuasive writing quality across the experimental conditions, although prior research been successful in inducing race/ethnicity-based stereotype threats in college-bound (Rodriguez, 2014) and college samples (Steele & Aronson, 1995; Taylor & Walton, 2011). Potential limitations and influencing factors are discussed in the subsections that follow.

#### ***Task Differences***

When rejecting the hypothesis for the third research question, it is important to consider the differences between the measure of performance used current study when compared to prior work. Prior studies have either employed measures of standardized performance (i.e., GRE & SAT, Steele & Aronson, 1995; Rodriguez, 2014) or selected tasks that were defined as being difficult based on the success rate of typically functioning non-participants (e.g., Taylor & Walton, 2011). In comparison, the current study utilized a persuasive writing task that may have been perceived as low-stakes by participants, and may not have been challenging or authentic enough in nature to allow for a test of stereotype induction effects. Neville and Croizet (2007) suggest that the impact of a negative stereotype on performance will more likely arise when individuals confront difficult tasks involving the stereotype.

### ***Research Setting***

It is possible that the real world setting, which included the participants' classrooms, mitigated the effects of the threat's induction. At the time of data collection, participants may have already perceived their classroom, and the college environment as a whole, as being an evaluative setting. This would have made relevant stereotypes salient prior to the experimental induction. Jordan and Lovett (2007) posit that when conducting research on stereotype threat in real-world settings, relevant stereotypes could be activated prior to the experimental manipulation, minimizing or nullifying the effects of an experimental threat induction.

### ***Logistical Challenges***

Furthermore, due to logistical challenges, the current study did not employ racial stratification at the time of administration. This is because I was unable to ensure that members of the majority were present at all times. This may have impacted the current study's findings, as

much of the research on stereotype threat employs both minority and majority participants. Having the presence of outgroup members may trigger perceptions related to public regard and one's sense of belonging (Cohen & Garcia, 2008; Cole & Yip, 2008; McGill et al., 2012; Singh et al., 2010; Loeb & Hurd, 2019). Research findings in these areas support the notion that completing a task under stereotype threat conditions in the presence of an outgroup member would be a significant factor in determining how well one can adjust and perform in academic settings. It is possible that the lack of consistent outgroup presence may have mitigated concerns related to public regard and one's sense of belonging, lessening the saliency and/or influence of the stereotype induction. Of note, even when members of the majority were present, they were familiar with their minority peers, as many of the participants completed the tasks within their usual classrooms. This also could have mitigated any potential effects of the stereotype induction.

### ***Method of Induction***

The saliency of the stereotype threat induction may have also been impacted by the method of induction. Although the manner of induction was conceived by adapting methodology from prior literature (Rodriguez, 2014), the current study did not employ simultaneous verbal and auditory prompts. Seminal research in this area (e.g., Steele & Aronson, 1995) includes some form of auditory instructions. Furthermore, individuals in the not induced condition were presented information which may have given them an advantage over their induced peers. Specifically, individuals in the not induced group read information regarding persuasive writing before generating their responses, "*Persuasive writing usually includes your opinion. Persuasive writing also normally includes reasons for your opinion.*" It is unclear whether this information provided an advantage to non-induced participants. As noted, both groups were told, "*please*

*write a response stating whether you agree or disagree with this statement, and give reasons for your opinion.”*

### ***Virtual Administration***

An additional aspect of this study that cannot be overlooked is that some participants completed the study virtually. Although there were no statistically significant mean differences between online and in-person participants with respect to persuasive writing quality, the nature of the online administration likely impacted the saliency of the stereotype induction.

### ***Researcher Race/Ethnicity***

Furthermore, it is important to consider the race of the researcher who administered the measures to participants. Huang (2009) found racial differences in vocabulary skills based on whether Black participants were tested by a Black or White interviewer. Specifically, Black respondents were found to test better when questioned by a Black interviewer; for White respondents, the race of the interviewer did not have a notable impact on performance. Although most Black participants were interviewed by White participants (which was noted to cause some unevenness in the results), the underlying premise regarding the importance of examiner-to-examinee race is still applicable to the current study. These findings are especially pertinent as some participants in the current study also completed the administered measures on an individual basis. Findings from a study conducted by Terrell and Terrell (1981) corroborate the impact of examiner/researcher race on participant performance. Specifically, Black students with high levels of cultural mistrust garnered lower scores on a standardized measure of intelligence when the examiner was White, when compared to when the examiner was Black. Similarly, Thames et al. (2013) conducted a study involving stereotype threat and found that Black participants who

reported high levels of perceived discrimination performed significantly worse on memory tests when tested by a White examiner. Findings across these studies exemplify how individual traits (e.g., psychosocial race-based variables) and environmental variables (e.g., the race of an examiner or researcher) can play a combined role in influencing performance under stereotype threat conditions.

### ***Exploratory Analysis***

Upon review of the order in which tasks in my study were administered, I determined that an exploratory analysis was warranted. Specifically, participants in the SI condition were presented information regarding the stereotype threat prior to completing the measure of racial/ethnic centrality, which may have primed them to think about their race/ethnicity differently when compared to their SNI peers. To check for potential priming effects, I ran an independent samples *t*-test comparing the SI and SNI group racial/ethnic centrality means. Findings did not suggest a statistically significant result,  $t(189) = .665, p = .507$ .

### **4.4. Research Question Four: Does Racial/Ethnic Centrality Moderate the Effect of A Stereotype Induction on Writing Performance?**

Three-way ANOVAs analyzed the interaction between racial/ethnic identity, racial/ethnic centrality, and stereotype condition on persuasive writing performance. There was a significant interaction effect for racial/ethnic identity by racial/ethnic centrality by stereotype condition. The findings of these three-way ANOVAs support the third hypothesis that racial/ethnic centrality serves as a statistically significant moderator for the relationship between a stereotype induction and writing performance. These findings represent a new contribution to the field of literature regarding stereotype threat. There appear to be no other current studies which investigate the role

racial centrality plays in the relationship between stereotype threat and writing performance in a population of undergraduates.

***Visual Inspection of Interaction Effect by Race/Ethnicity Across Study Conditions***

To better understand the interaction between racial/ethnic identity by racial/ethnic centrality by stereotype induction on persuasive writing performance, a series of figures were produced. Figures One and Two display the lines of best fit for racial/ethnic centrality on holistic persuasive writing quality by racial/ethnic subgroup across the stereotype conditions. These figures allow for a visual inspection of the significant interaction effects noted in the three-way ANOVA procedures.

**Figure 1**

*Relationship Between Racial/Ethnic Identity and Centrality When Stereotype Was Not Induced*

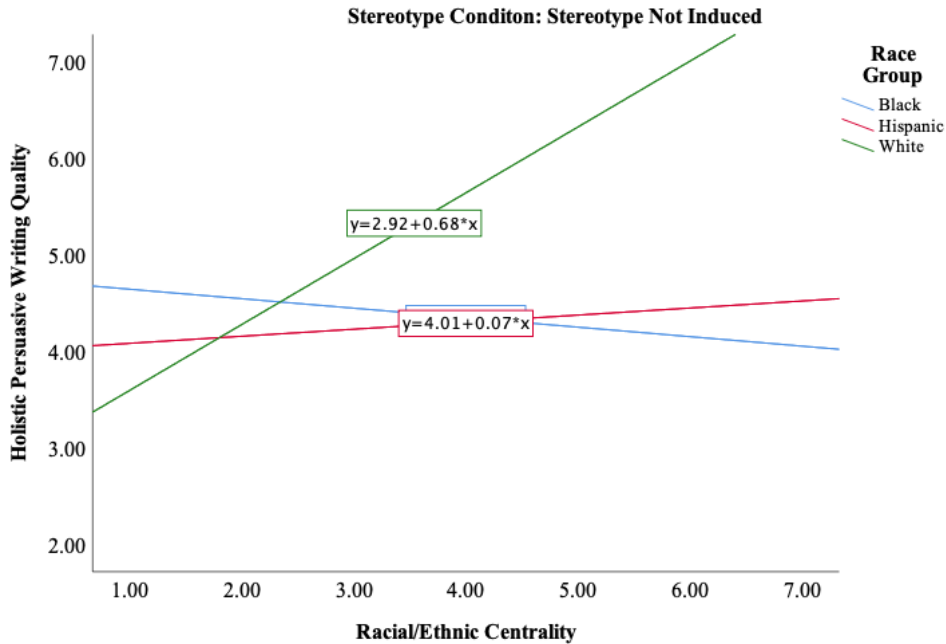


Figure One suggests that that when no stereotype was presented, White participants were expected to perform better on the measure of persuasive writing quality as their

racial/ethnic centrality ratings increased. A similar, yet negligible finding was noted for Hispanic participants. In comparison, Black participants in the no stereotype threat condition were expected to perform worse on the measure of persuasive writing quality as their racial/ethnic centrality ratings increased.

**Figure 2**

*Relationship Between Racial/Ethnic Identity and Centrality When Stereotype Was Induced*

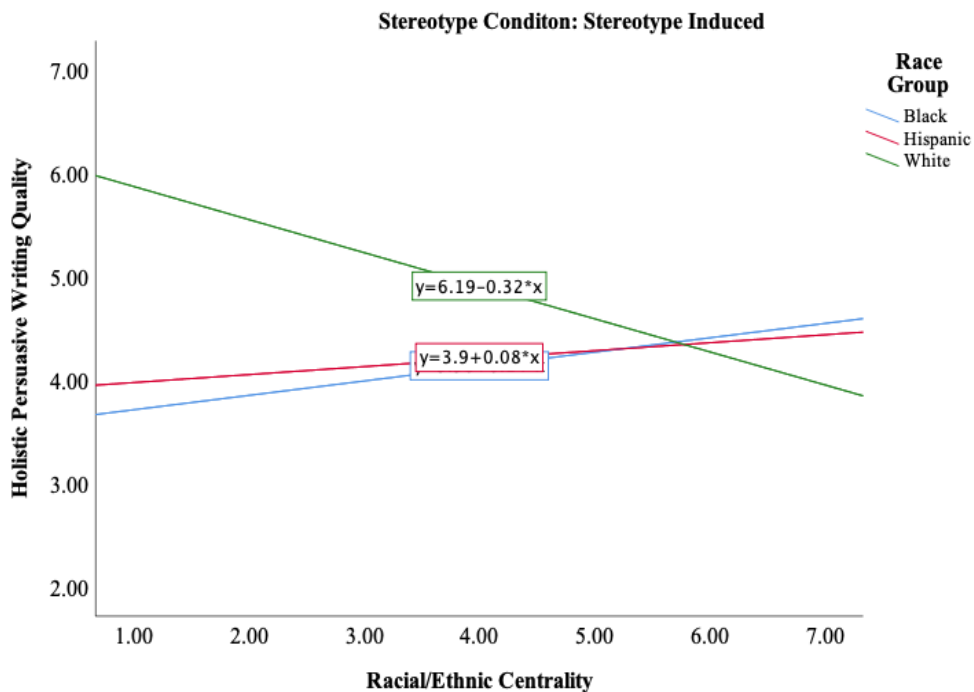


Figure Two suggests that that when the stereotype was presented, White participants were expected to perform worse on the measure of persuasive writing quality as their racial/ethnic centrality ratings increased. This finding runs counter to the common findings in the literature which suggest that White participants typically are not affected by stereotype inductions, especially those that do not target their racial group. In comparison, Black and Hispanic participants in the stereotype threat condition were expected to better, albeit negligibly, on the measure of persuasive writing quality as their racial/ethnic centrality ratings increased.



The patterns noted upon visually inspecting Figure One and Two are discussed in the subsections below.

**White.** White participants were expected to perform better on the measure of persuasive writing quality as their racial/ethnic centrality ratings increased when no stereotype was presented. It is possible that within the control group, White participants held implicit and unconscious bias in favor of their racial group, as being one that consistently performs better than Black and Hispanic individuals in academic settings. As such, those who rated their White identities as being more integral demonstrated better performance on the measure of persuasive writing. Literature regarding White privilege supports the notion that White individuals may engage in racial/ethnic-based behaviors on a more unconscious level.

However, the inverse relationship was noted in the stereotype induced condition; White participants were expected to perform worse on the measure of persuasive writing quality as their racial/ethnic centrality increased. This finding runs counter to the common findings in the literature which suggests that White participants typically are not affected by stereotype inductions, especially those that do not target their racial group. Although literature suggests that White individuals tend to omit their racial/ethnic identity, more recent research (e.g., Knowles et al., 2014) suggests that White individuals can experience their racial identity on a conscious level. Knowles et al. (2014) note psychological threats that can arise from White racial identity: *meritocratic threat* and *group image threat*. The meritocratic threat arises when a White individual acknowledges the possibility that their achievements in life may not have been fully earned based on their efforts. In turn, a group image threat is defined as a threat which originates from being affiliated with a social group that benefits from unequitable societal gains.

Literature on the subjects of White guilt, and meritocratic and group image threats, support the hypothesis that White participants in the current study who self-reported higher levels of racial/ethnic centrality may have experienced anxiety when they were explicitly made aware of the benefits afforded to them by their racial/ethnic status in the domain of writing. These benefits were made apparent when the stereotype was induced, as participants in the stereotype condition were told White individuals typically demonstrate more developed performances in the area of academia, and that these racial/ethnic gaps in performance are still noted today. As the current study appears to be the first noting such an interaction effect, additional research is needed to determine the generalizability of these findings to other populations and academic content areas.

**Hispanic.** Hispanic participants across both study conditions demonstrated a negligible relationship between their racial/ethnic identity, racial/ethnic centrality, and persuasive writing performance. Specifically, their persuasive writing quality was expected to increase, as their centrality ratings increased, regardless of which condition they were assigned to. These results are in contrast to the performance deficits one would expect when a minority individual identifies with a racial/ethnic identity that is characterized negatively in an academic/performance domain. Additional research is required to definitely discuss the nature and implications of Hispanic undergraduates' racial/ethnic identities in academic contexts, particularly in domains in which they are negatively stereotyped.

**Black.** A unique interaction pattern was observed among the Black racial group. For the Black participants who were not subjected to a stereotype induction, their racial centrality was negatively related to their persuasive writing scores. Essentially, when no explicit threat was presented, the Black individuals who strongly identified with their racial group presented with

performance deficits. This effect noted for the non-induced Black participants may be the result of awareness of implicit stereotypes in the domain of academia. Literature supports the presence of negative race-based academic stereotype endorsement in Black youth (Okeke et al., 2009); additional research is needed to determine if unconscious race-based academic stereotypes impact the performance of Black college students. It is also possible that Black participants in the control condition already perceived their classroom, and the college environment as a whole, as being an evaluative setting, causing “stereotype threat” effects to be present, although no explicit threat was presented (Jordan & Lovett, 2007).

With regard to Black participants in the stereotype induced condition, literature suggests that Black individuals exposed to a negative performance-based stereotype may engage in an overperformance strategies to compensate for concerns related to the possibility that they may confirm the negative stereotype about their racial/ethnic group. Although related to chronic stereotype threat exposure, John Henryism (James et al., 1992; Steele, 2011) is defined as a coping strategy in which Black individuals who experience social stressors attempt to combat such stressors by exerting high levels of effort. This manner of overperformance may also explain the interaction pattern observed in the Black participants who were exposed to the negative stereotype induction in the current study.

### ***Exploratory Four-Way ANOVA Analysis***

Due to the significant difference in persuasive writing quality that was found across gender groups, I also conducted a four-way ANOVA including gender as a term in an ancillary analysis (i.e., gender by racial/ethnic identity by racial/ethnic centrality by stereotype condition on persuasive writing performance).

**Four-Way ANOVA.** Although the corrected models were significant,  $F(23,167) = 2.513$ ,  $p < .0001$  and  $F(15, 175) = 3.25$ ,  $p < .0001$ , the interaction terms for gender by race/ethnicity by racial/ethnic centrality by stereotype condition on persuasive writing performance were not statistically significant, regardless of whether race/ethnicity was coded as “White, Black, and Hispanic,”  $F(2, 167) = .691$ ,  $p = .077$  or “White versus Minority,”  $F(1, 175) = .637$ ,  $p = .426$ . As such, the tested three-way ANOVA procedures and their associated plots suffice in exploring the hypothesized interaction effect.

#### **4.5. Contributions**

There is a body of research which supports the hypothesis that stereotype threat results in performance detriments. However, much of this research fails to directly investigate potential mediating and moderating factors that may provide a deeper understanding of how stereotype threat operates. A lack of research in this area creates a gap, making it unclear as to how social scientists can intervene in order to mitigate its effects in real-world settings. As stereotype threat has been used as a framework to better understand the racial/ethnic achievement gap, these unexplored factors may be crucial in designing interventions to support underachieving students. The current study appears to be one of the very few to examine the role of psychosocial variables in conjunction with stereotype threat. It also appears to be the first to investigate racial/ethnic centrality in the relationship between stereotype threat and persuasive writing performance in a sample of Black, White, and Hispanic undergraduates. The current study also collected data on participant self-perceptions of performance after stereotype induction versus a non-induction condition, via a written post-task survey, which are often overlooked in the literature. Lastly, this dissertation extended the use of a racial/ethnic centrality scale via a virtual administration.

#### 4.6. Summary of Limitations

The findings of the current study have to be considered in light of several limitations. Due to logistical challenges: (1) The researcher was unable to stratify groups by race when administering measures, in order to ensure that all racial groups were present during data collection. (2) The stereotype was only induced via written text, without a simultaneous auditory prompt. (3) Individuals who did not receive the stereotype induction received two pieces of information which may have provided them with an advantage when compared to their subjected peers. Although this may be a potential limitation of the current study, both groups were told, *“please write a response stating whether you agree or disagree with this statement, and give reasons for your opinion.”* (4) Participants completed tasks within their usual educational settings, in the presence of familiar peers. (5) Some participants completed the administered measures virtually, without being in the presence of the researcher. (6) The post-task survey was an open-ended self-report measure, lacking in validity scales. As such, the post-task survey measure assumes that participants responded to the post-task survey honestly. Furthermore, although the open-ended nature of the post-task survey was thought to provide the participants with the freedom to elaborate on their experiences during the persuasive writing task, many participants replied to the post-task items using one-word or one-sentence answers. (7) The persuasive writing task was low-stakes, and may not have been challenging or authentic enough in nature to allow for a test of stereotype induction effects. Literature suggests that the impact of a negative stereotype on performance will more likely arise when individuals confront difficult tasks involving the stereotype (Neuville & Croizet, 2007).

#### **4.7. Conclusion**

The current study investigated the impact of a negative stereotype induction on the persuasive writing performance of Black, Hispanic, and White undergraduate students who attended both private and public institutions. Results suggest that no significant differences were noted in persuasive writing performance across the experimental and control conditions. However, there were significant racial and gender differences in persuasive writing quality. These findings support prior literature that speaks to racial/ethnic and gender differences in academic achievement at the undergraduate level. Racial/ethnic differences in centrality also were noted, as the Hispanic and Black participants had significantly higher racial centrality when compared to their White counterparts. This finding is corroborated by earlier literature which speaks to significant differences in centrality among racial/ethnic groups. With regard to post-task self-perceptions, Black individuals in the stereotype induced condition self-reported more negative self-perceptions of their writing performance when compared to their non-induced counterparts; similar observations were not made for the other racial/ethnic groups. The current study also tested if racial/ethnic centrality serves as a statistically significant moderator for the relationship of the stereotype induction on persuasive writing performance. The interaction of racial/ethnic identity by racial/ethnic centrality by stereotype induction on persuasive writing performance was found to be significant.

#### **4.8. Future Directions**

The current study has provided new findings in an under researched area regarding the role race-based psychosocial variables serve on the relationship between stereotype threat and writing performance. Additional research is needed to determine if the significant interaction effect for racial/ethnic centrality on performance in stereotype threat studies is present in other

racial/ethnic groups, school-aged populations, and/or other areas of academic functioning. Additional research is also needed to determine if online adaptations of race/ethnicity-based stereotype threat studies are comparable to the in-person formats.

Literature notes examiner/examinee race effects (e.g., Davis & Silver, 2003; Thames et al., 2013) that may have influenced the current study's findings. Future stereotype threat studies in the domain of academia would benefit from utilizing a within-subjects design, to test if the saliency of a stereotype induction differs based on the racial/ethnic background of a researcher/examiner, and to control for examiner-examinee race effects. Findings from a within-subject stereotype threat study would have implications in educational practice, as minority students may have instructors that differ in their racial/ethnic background across content areas.

Many of the quantitative studies which focus on stereotype threat fail to investigate participants' perceptions of the stereotype induction on their performance. The current study did collect such data although it is possible that the written-response format used did not allow for sufficient sourcing of information from participants. Future studies should employ verbal interviews that can be analyzed separately using qualitative methodology. Future studies would also benefit from administering measures of stereotype susceptibility (e.g., Social Identities and Attitudes Scale; SIAS, Picho & Brown, 2011) that would allow for a baseline measure of stereotype vulnerability, which can then be used as a covariate in subsequent analyses.

#### **4.9. Implications**

Although the current study did not find significant differences across experimental conditions, research has found that stereotypes can impact the performance of undergraduate minority students (e.g., Brown & Day, 2006; Steele & Aronson, 1995; Johnson-Ahorlu, 2012; Schmader & Johns, 2003; Sawyer & Hollis-Sawyer, 2005). Given that literature, it is important

for interventions to be developed which aim to reduce the effects of stereotype threat on undergraduate minority achievement. Research should consider the differences in how stereotype threat can be induced, and how its operationalization may dictate which intervention is most appropriate. For example, Good et al. (2003) effectively implemented an intervention which focused on shifting undergraduate students' perceptions as so they would view intelligence as being malleable. In that study, Black students who received the intervention reported more positive academic experiences and obtained higher grade point averages. Interventions to address stereotype threat can be implemented at the college level by professors, academic advisors, or college psychologists.

Similar to the current study, research notes that the racial/ethnic achievement gap is present at the undergraduate level of education, and has analyzed the factors which may perpetuate this gap (Lee, 2002; Martin et al., 2017). This is important to consider as for many low-income and minority individuals, the conferral of an undergraduate degree is purported as one of the main ways to achieve upwards social mobility (NCES, 1995). Morris (2018) also notes that postsecondary education is not only important at the individual level, but to American culture, the economy, and our nation's viability as a whole. Despite this notion, research discusses how post-secondary institutions continue to disadvantage minority students, particularly Black males (Harper, 2008). Harper et al. (2009) notes that in order to address these disparities, "policy makers in public and institutional sectors must be made aware of the structural barriers that produce racial disparities in college access and attainment" (pg. 409).

As such, prior literature and the current study's findings support the need for the development of academic achievement interventions for undergraduate minority students. Given the significant differences in academic performance between gender groups in the current study,



it is also suggested that postsecondary institutions focus on improving the academic achievement of undergraduate males, particularly in the area of literacy.

With regard to racial/ethnic centrality, the significant difference across racial/ethnic groups is important to consider, given its relationship with academic achievement among Black college students (Cokley & Moore, 2007). Research also notes the importance of considering gender when investigating racial/ethnic identity and academic achievement among Black undergraduate students (Cokley, 2001). In Latino undergraduate populations, a similar psychosocial variable, ethnic identity, moderates the effects of low socioeconomic status on academic achievement (Ong et al., 2006). These psychosocial variables not only impact the academic achievement of minority students, but also the impact of stress on their susceptibility to psychiatric symptoms (i.e., depression and suicidal ideation; Walker et al., 2008). Given the influence of these interrelated concepts on the academic achievement and psychological health of undergraduate minority students, it is suggested that college academic and psychological counselors work with minority students who demonstrate risk factors, in order to improve their academic persistence and provide them with strategies to cope with stress. Rigali-Oiler and Kurpius (2013) offer suggestions for college counselors working with minority students who are at-risk in terms of their academic persistence.

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**Appendix A: Multidimensional Inventory of Black Identity- Adapted Centrality Scale**

Name: \_\_\_\_\_

Class: \_\_\_\_\_

Year: \_\_\_\_\_

Boy\_\_\_\_ Girl\_\_\_\_

Age: \_\_\_\_\_

Race/Ethnicity: \_\_\_\_\_

1. Overall, being \_\_\_\_\_ has very little to do with how I feel about myself.

Strongly Disagree			Neutral			Strongly Agree
1	2	3	4	5	6	7

2. In general, being \_\_\_\_\_ is an important part of my self-image.

Strongly Disagree			Neutral			Strongly Agree
1	2	3	4	5	6	7

3. My destiny is tied to the destiny of other \_\_\_\_\_ people.

Strongly Disagree			Neutral			Strongly Agree
1	2	3	4	5	6	7

4. Being \_\_\_\_\_ is unimportant to my sense of what kind of person I am.

Strongly Disagree			Neutral			Strongly Agree
1	2	3	4	5	6	7

5. I have a strong sense of belonging to \_\_\_\_\_ people.

Strongly Disagree			Neutral			Strongly Agree
1	2	3	4	5	6	7

6. I have a strong attachment to other \_\_\_\_\_ people.

Strongly Disagree			Neutral			Strongly Agree
1	2	3	4	5	6	7

7. Being \_\_\_\_\_ is an important reflection of who I am.

Strongly Disagree			Neutral			Strongly Agree
1	2	3	4	5	6	7

8. Being \_\_\_\_\_ is not a major factor in my social relationships.

Strongly Disagree			Neutral			Strongly Agree
1	2	3	4	5	6	7

## **Appendix B: Persuasive Writing Holistic Quality Scoring Rubric**

### Scoring Compositions for Overall Quality

Your job is to evaluate the overall quality of the students' compositions. Many dimensions contribute to overall quality. Common criteria for good writing include Ideas or content, Organization, Word choice, Sentence fluency, and Conventions. Ideas are the substance of a piece of writing. Good writing includes a clear overall topic and subordinate ideas that make sense and that are clearly explained and elaborated. Organization is important to make the ideas in a paper clear and accessible to the reader. Well-written compositions usually include an introduction to the topic. Subordinate ideas should be clearly connected to the overall topic with appropriate transitions. Word choice is important both for clarity and style. Well-chosen words convey meaning clearly and enliven the writing. Poorly chosen words may be vague or repetitive. In some cases, word usage may be incorrect. Sentence fluency includes the flow of language and variety in sentences, as well as correct grammar and sentence structure. Finally, conventions are all the mechanical features of written language -- spelling, punctuation, and capitalization. Spelling and major punctuation errors have been corrected in these papers, so you will not need to consider them.

### Overall Quality

#### Score of 7

The composition has a clear overall topic elaborated with ideas that are supported with specific and relevant details. It is organized with an introduction, clearly sequenced ideas, smooth transitions, and a conclusion. Words are chosen that convey meaning clearly, and sentences are varied in form and length. There are few, if any, errors in grammar and usage.

### Score of 5

The composition has a clear overall topic with related ideas that are supported with details. Most of the ideas are elaborated to some degree. It is organized with an introduction, a sequence of ideas with some transitions, and at a conclusion. Word choice is generally appropriate, and there is some variety of sentences. There may be occasional errors in grammar or usage, but they do not interfere with understanding.

### Score of 3

The composition has a topic and a few related ideas but there is little elaboration. Ideas may not be explained well or may be a little difficult to understand. Organization may be weak and it may lack an introduction and transitions among ideas. Word choice may be repetitive or vague, and sentences may be simple or lack variety. Errors in grammar and usage may interfere with understanding or fluent reading.

### Score of 1

The composition has major problems of content and/or organization. It may lack a clear topic; it may have few ideas or the ideas may not make sense or be connected to the topic; it may be poorly organized and difficult to follow. There is little, if any, elaboration of ideas. Word choice may be repetitive or inappropriate, and sentences may be short and simple. There may be frequent errors in grammar and usage that interfere with understanding.

### **Appendix C: Education Week Excerpt (Ansell, 2004)**

*The “achievement gap” in education refers to the disparity in academic performance between groups of students. The achievement gap shows up in grades, standardized-test scores, course selection, dropout rates, and college-completion rates, among other success measures. It is most often used to describe the troubling performance gaps between Black and Hispanic students, at the lower end of the performance scale, and their non-Hispanic White peers.*

*Special analyses by the National Center for Education Statistics in 2009 and 2011 showed that Black and Hispanic students trailed their white peers by an average of more than 20 test-score points on the NAEP math and reading assessments at 4th and 8th grades, a difference of about two grade levels. These gaps persisted even though the score differentials between black and white students narrowed between 1992 and 2007.... (NCES, 2009, 2011).*

**Appendix D: Researcher-Generated Persuasive Writing Task: Condition Prompt**

Please read the following statements before moving to the next page:

- Some groups of students perform better than others in school.
- This creates a gap between groups of students.
- White students often perform better than Black and Hispanic students in reading, writing, and math.
- For example, on reading tests, White students score more than 20-points higher than Black and Hispanics.
- There are still gaps between race groups today.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

“Should all students in school have to wear school uniforms?” Please write a response stating whether you agree or disagree with this statement, and give reasons for your opinion. Remember, this task is a test of your true academic ability.”

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**Appendix E: Researcher-Generated Persuasive Writing Task: SNI Condition Prompt**

Please read the following statements before moving to the next page:

- You're an undergraduate student.
- You're being asked to write a persuasive writing response.
- Persuasive writing usually includes your opinion.
- Persuasive writing also normally includes reasons for your opinion.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

*“Should all students in school have to wear school uniforms?” Please write a response stating whether you agree or disagree with this statement, and give reasons for your opinion. Remember, your participation in completing this task is to develop future persuasive writing tasks for undergraduate students.”*

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**Appendix F: Post-Persuasive Writing Task Survey (Rodriguez, 2014)**

Name: \_\_\_\_\_

Race/Ethnicity: \_\_\_\_\_

1. How would you describe your level of confidence while writing your response?
2. While writing, did you experience any doubts or concerns about your writing ability? If so, please explain.
3. Did you feel any pressure to perform well on the persuasive writing task?
4. Did you feel any performance anxiety while writing completing the persuasive writing task?
5. If you responded “yes” to Question 3 or 4, why did you feel pressure and/or performance anxiety?

## **Appendix G: Debriefing Script**

Thank you for completing this research study. There is more to this study than what I have told you about it so far. Sometimes in psychological research it is necessary to not tell people about the true purpose of the study at the beginning. If we did, it may affect how they respond to the questions asked and the tasks involved, and this would change the results in way that may make them invalid. In some studies we want to get an idea of how people respond in their day-to-day life to certain situations, and sometimes the best way to do this is to not give all the details about the purpose of the study.

Now I would like to tell you exactly what the purpose of this study was. You were told that this study was being conducted because I wanted to know what undergraduate students think about reading and writing, and what you they typically think about who they are as individuals. I also said I wanted to see how you complete reading and writing tasks, similar to those you do in school. Lastly, I was interested in interviewing you about what you expect in school, whether you like school, and questions about your ethnicity and race.

Students' academic performance may be influenced by many things, both positive and negative. An example of a negative influence is "negative stereotypes." A "stereotype" is an overly-simplified idea that many people may have about a particular group of people or objects. An example of a negative stereotype is the expectation that a particular group of students, defined by their race or ethnicity, will not achieve as well as students in other racial or ethnic groups. Negative stereotypes can lead to misunderstanding and anxiety in school settings. Being aware of these negative stereotypes may produce distracting thoughts about confirming the stereotypes, and these anxieties, in turn, may lead to worsened academic performance. For instance, a girl tries out for an athletic competition in school. She is aware of the stereotype that

women are thought to be less athletic and physically adept when compared to males. As a result, she may find herself flustered and unable to perform her best. She may, furthermore, attribute her athletic failures to her being female and become discouraged in a way that male members do not when they experience the same frustration. This experience exemplifies *stereotype threat*.

Stereotype threat has been thought to be one of the causes of the academic achievement gap between minority and White students, particularly in the areas of reading and writing. This term is being defined for you because stereotype threat was involved in the persuasive writing task you were asked to complete. As such, not everyone completed the persuasive writing exercise under the same conditions- some were given general task directions, and some information on persuasive writing. Others received the same task directions, but were told the exercise was a measure of true ability. They also received information regarding the academic-achievement gap between minority and White students. These participants were placed in a situation that was designed to cause stereotype threat. Due to these differences, the task was not an equal test for everyone as some students completed the task under conditions where feelings about their race/ethnicity may have impacted their performance. So for those who were presented with information about their race/ethnicity before the persuasive writing task, the results likely underestimate your actual performance potential or abilities – as such, please do not give it another thought. This was all done so that we could simulate how one’s race/ethnicity can impact academic skills under real life conditions. We also wanted to obtain your natural responses to being in these circumstances.

Because this is an ongoing study and many other students will be involved, I ask that you not talk about this study’s true purpose that I just revealed to you with any other students. The reason I ask this is because if someone you talk to about this study is participating in a later

session, their reactions would not be as natural as if they had not known what the study was truly about. Even if you think that the person you are telling is not likely or eligible to participate in this study, they may tell someone else who may be participating. For this reason I would like to ask you to not say anything more about the study than what you were told at the beginning of the study and before you knew the true purpose.

Your participation in this research is very important. I realize though that finding out that I was not up front with you regarding the purpose of the study may affect your satisfaction with your participation, especially since you gave consent to a study that you thought had a different purpose.

I would like to hear from you and what you think about what you did today in this study, and your general impression about the tasks involved in this study. If you are not satisfied with this study and would not like me to use your data, then please let me know and I will remove it.

Please contact me via email at [gkg2110@tc.columbia.edu](mailto:gkg2110@tc.columbia.edu), or by telephone at 516-426-9043 if you'd like to provide your feedback regarding the study, or if you'd like to have your information removed from the data pool.

I hope that you found your experience participating in this study to be interesting and fun!