2-9-2024

Spontaneous Self-Affirmation and Social Context as Moderators Between Stereotype Threat and Online Academic Performance

Katrina Hilton
Walden University

Walden University

College of Psychology and Community Services

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Katrina Hilton

has been found to be complete and satisfactory in all respects,
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the review committee have been made.

Review Committee
Dr. Peggy Gallaher, Committee Chairperson, Psychology Faculty
Dr. Brandon Cosley, Committee Member, Psychology Faculty

Chief Academic Officer and Provost
Sue Subocz, Ph.D.

Walden University
2024

Abstract

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by

Katrina Hilton

MA, Walden University, 2009

BS, Augusta State University, 2003

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Teaching Psychology

Walden University

February 2024

Abstract

Despite years of progress, there remains an academic achievement gap among minority and non-minority students in all levels of education. A possible reason for the persistent achievement gap is stereotype threat, which is a situational predicament that prompts individuals to perform in ways that mirror the stereotypes associated with their social groups. Self-affirmation interventions are often used to disrupt the effects of stereotype threat, as students are taught how to focus on their strengths and values to help improve their self-concepts. However, spontaneous self-affirmation techniques may be more impactful because students are able to automatically self-affirm in any psychologically threatening situation. Although stereotype threat and self-affirmation have been examined in in-person classrooms, few studies have examined the concepts in online learning contexts. This quantitative study, with a theoretical foundation rooted in stereotype threat theory, self-affirmation theory, and social presence theory, examined how spontaneous self-affirmation and context (synchronous and asynchronous online learning formats) moderated the relationship between stereotype threat and online academic performance. The ethnic stigma consciousness subscale from the Social Identities and Attitudes Scale, the Spontaneous Self-Affirmation Measure, and the background section of the College Student Experience Questionnaire were used to collect the data. Hierarchical multiple regression was used to test the moderation effects. Results from the study indicated that spontaneous self-affirmation and context do not moderate the relationship between stereotype threat and online academic performance. Nonetheless, these findings could impact positive social change by stimulating additional relevant research in the future.

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Dedication

This dissertation is dedicated to my loving uncle, Solomon Collins. He always believed in me and supported my academic endeavors. My father passed away when I was nine years old, and my uncle became the closest thing I had to a father. He was a lifeline for me until he passed away in 2022 after a battle with cancer. I know he is smiling proudly down on me. I love you.

Acknowledgments

I want to acknowledge my committee, Dr. Peggy Gallaher (chair) and Dr. Brandon Cosley (committee member) for their efforts. They were invaluable throughout this process, and I will be forever grateful for their patience and guidance. I would also like to thank my mother, Carrie Hilton, for her unwavering love and support, without which completing my Ph.D. would not have been possible. Additionally, I must thank my best friend, Kerisa Coleman, for motivating me whenever I felt like giving up. Finally, to my friend and classmate, Wendy Mann, I must say that God puts the right people in your life at the right time. You have played a pivotal role in my journey, and I could never thank you enough.

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Chapter 1: Introduction to the Study

Introduction

Online learning is becoming increasingly popular around the world. Whether as a permanent learning modality or a temporary alternative to face-to-face learning (as witnessed during the COVID-19 pandemic of 2020), online learning offers students the opportunity to accomplish their educational goals from virtually any location. Prior to the pandemic, enrollment in traditional, on-campus postsecondary institutions was reportedly declining (Seaman et al., 2018). Also, the percentage of learners taking at least one online class has increased to more than 30%; it is projected that online learning will become mainstream by the year 2025 (Palvia et al., 2018). As the number of online postsecondary learners continues to increase, so do the challenges related to retention and persistence. Because of the ongoing academic achievement gap among college-level minorities and their non-minority peers, understanding factors that contribute to low retention and persistence may help ensure the academic success of all students (Khan et al., 2021).

Two constructs that have been found to directly impact both academic achievement and retention are stereotype threat and self-affirmation (Borman et al., 2021; Casad et al., 2021; Johnson-Ahorlu, 2022; Meador, 2018). Stereotype threat in educational settings occurs when the awareness of a negative stereotype associated with a person's social group inhibits his or her academic performance (Platts & Hoosier, 2020). It is considered a situational occurrence that is influenced by contextual cues; in online learning, these contextual cues can differ based on the learning format. Further, self-affirmation, often used to undermine the effects of stereotype threat, is the process of

affirming one's values and positive characteristics when faced with psychological threats (Lokhande et al., 2019). Self-affirmation can occur through manipulated interventions, or it can occur spontaneously (Harris et al., 2019). In this quantitative study, I examined the moderating influence of spontaneous self-affirmation on the relationship between stereotype threat and academic performance in online college-level courses. Additionally, I examined how context or learning format moderates the relationship, as well.

In this chapter, I introduce the topic of the study, providing a brief background and the problem statement. I also discuss the purpose of the project and the research questions and corresponding null and alternative hypotheses. The theoretical framework, nature of the study, and definition of terms are presented as well. In the last sections of the chapter, I explain the assumptions, scope and delimitations, limitations, and significance of the study. Finally, the chapter concludes with a summary of my main points.

Background

In the classroom, knowledge of a negative stereotype associated with a student's social group can impede his or her academic performance, resulting in what is known as stereotype threat (Platts & Hoosier, 2020). For example, African American students who fear conforming to negative stereotypes about African Americans and intellectual assessments may unintentionally underperform on such assessments. The worry or concern about confirming the stereotype can impair the students' cognitive abilities, undermining their performance on the assessment (VanLandingham et al., 2022).

Because stereotype threat is considered a contributing factor to the academic achievement gap, researchers continue to explore effective methods for counteracting its effects (Borman et al., 2021; Casad et al., 2018). Research suggests that contextual and situational cues can play a role in stereotype threat (Dennehy et al., 2018; Wu et al., 2020). For instance, in both face-to-face and online learning environments in which a racial or gender minority is physically outnumbered, he or she may be reminded of his or her minority status and the stereotypes associated with that status, which can make the student more susceptible to stereotype threat (Chang et al., 2019; van Veelen et al., 2019). However, the level of susceptibility may differ in online classes, depending on whether they are synchronous or asynchronous, as these two types of classes have different contextual cues.

One of the most consistently used interventions against stereotype threat is self-affirmation. Self-affirmation is defined as the process of affirming one's positive personal attributes to refute threats to his or her self-integrity (Lokhande & Müller, 2019). Self-affirmation is sometimes used in classrooms as a method of intervention, usually in the form of values writing exercises designed to prompt students to critically think about their values and positive attributes. Such exercises are thought to help protect the students from psychological threats to their sense of self-worth, ultimately encouraging them to perform at a higher level in their classes (Borman et al., 2021). Self-affirmation has also been known to occur naturally or spontaneously. Spontaneous self-affirmation happens when individuals self-affirm when faced with daily threats without the aid of outside intervention methods (Harris et al., 2019; Lannin et al., 2021; Web et al., 2020).

Although existing research provides some evidence that stereotype threat may be present in virtual learning environments (e.g., Chang et al., 2019; Fordham et al., 2020), it is still not known to what extent self-affirmation and social context cues act as moderators between stereotype threat and online academic performance in college-level courses. The current study helped close this gap in knowledge.

Problem Statement

In 2019, there were more than 7,000,000 students enrolled in postsecondary distance learning courses around the nation (National Center for Education Statistics, 2019). Due to the COVID-19 pandemic, the number of online college-level students increased as a result of colleges and universities transitioning to online and blended learning formats during the height of the pandemic. While many of these institutions have since returned to in-person learning, the pandemic continues to persist and predictions about what post-pandemic higher education will look like have emerged. One belief is that more colleges and universities will offer blended or hybrid education in which students will engage in both online and face-to-face learning (Bashir et al., 2021; Singh et al., 2021). It is also possible that more adult students will seek out additional opportunities for distance learning due to their positive online learning experiences during the pandemic (Clary et al., 2022). Either way, there will likely be an increase in online education in the very near future.

With an increase in online learning comes the possibility of high attrition rates and the challenge of how to increase retention (Adedoyin & Soykan, 2020; Radovan, 2019). Attrition rates in online colleges are higher than those in traditional formats, with

40-80% of students failing to successfully complete their courses (Bawa, 2016); further, minority students comprise a large portion of this percentage (Salvo et al., 2017). The attrition rates suggest that many minority students may require interventions to help increase their retention in online classes. The attrition rates also signify an ongoing academic performance gap among minority students and their non-minority counterparts. Before interventions can be implemented, it is necessary to understand the factors that impact minority academic success. Research indicates that interpersonal factors, such as stereotype threat, are detrimental to minority academic achievement (Isik et al., 2018). The effects of stereotype threat on academic performance have been extensively examined in traditional classroom settings (e.g., Borman et al., 2021; Merillat et al., 2018). However, there is a limited body of research that examines stereotype threat in online learning environments, and the existing studies focus primarily on STEM (science, technology, engineering, and mathematics) courses and programs (e.g., Fordham et al., 2020). Also, those studies do not consider the possible influence of a student's online learning format, such as whether the student is taking synchronous or asynchronous classes. Differences in the learning format may impact the prevalence of stereotype threat in the online classroom, as stereotype threat is a situational construct that is impacted by context (Lyons et al., 2018).

Although self-affirmation interventions are widely used methods for combatting stereotype threat in face-to-face classrooms, the results have not been consistent across studies (Liu et al., 2021). Despite the inconsistent findings, self-affirmation is believed to help strengthen students' self-efficacy and to help enhance their positive self-concept.

Consequently, research on self-affirmation and online learning is minimal, and studies on spontaneous self-affirmation in the online learning environment is even more scarce. Therefore, there is a need for a closer examination of how stereotype threat manifests in online learning environments, how the contextual cues in synchronous and asynchronous classes influence the presence of stereotype threat in online courses, and how spontaneous self-affirmation helps temper the negative effects of stereotype threat in online classrooms.

Purpose of the Study

The purpose of this quantitative study was to examine how context and self-affirmation moderate the relationship between stereotype threat and academic performance in online courses. Quantitative, cross-sectional survey research was used to examine the relationship between the constructs. Questionnaires were administered to assess the participants' vulnerability to stereotype threat, their online learning format (synchronous or asynchronous), how they use self-affirmation (specifically spontaneous self-affirmation), and their academic performance. The questionnaires also recorded the participants' race, gender, and age. These constructs were used to protect against covariate interaction effects. Furthermore, this study was unique because it examined the impact of stereotype threat and self-affirmation on students' overall academic performance in both synchronous and asynchronous online courses.

Research Questions and Hypotheses

RQ_1 Quantitative: To what extent is the relationship between stereotype threat, as measured by ethnic stigma consciousness, and the academic performance, as measured

by cumulative grade point average of online minority students, moderated by spontaneous self-affirmation when controlling for age?

H_0: Spontaneous self-affirmation does not moderate the relationship between stereotype threat vulnerability and online academic performance.

H_1: Spontaneous self-affirmation moderates the relationship between stereotype threat vulnerability and online academic performance.

RQ_2: Quantitative: To what extent is the relationship between stereotype threat, as measured by ethnic stigma consciousness, and academic success, as measured by cumulative grade point average in online courses, moderated by differences in synchronous and asynchronous contextual cues when controlling for age?

H_0: The relationship between stereotype threat vulnerability and online academic performance is not moderated by the contextual cues present in synchronous and asynchronous online courses.

H_1: The relationship between stereotype threat vulnerability and online academic performance is moderated by the contextual cues present in synchronous and asynchronous online courses.

Theoretical Framework

Steele's (1988) self-affirmation theory, stereotype threat (Steele & Arson,1995), and social presence theory (Short et al., 1976) were used for the theoretical framework. Self-affirmation theory is the belief that to preserve a person's self-concept, he or she can focus on his or her values and strengths when faced with threats to his or her sense of self (Lannin et al., 2021; Steele, 1988). Stereotype threat theory is the idea that people who

identify with a stigmatized group can unintentionally conform to the stereotypes associated with the group (Doyle & Thompson, 2021; Steele & Arson, 1995). Both self-affirmation and stereotype threat have been used in previous research to address the academic achievement gap; the general belief is that self-affirmation interventions can decrease the negative effects of stereotype threat on academic performance in minority students (e.g., Borman, 2017; Goyer et al., 2017). This assertion alludes to a possible moderated relationship between self-affirmation, stereotype threat, and academic performance, where the level of self-affirmation influences the impact that stereotype threat has on academic performance. Further, another possible factor that impacts the relationship between stereotype threat and academic performance is context (Baysu & Phalet, 2019). Therefore, social presence theory was used to help explain the role of contextual cues, including technology-based mediums, in human communicative exchanges like those involved in learning (Short et al., 1976; Tu, 2000). The study's theoretical framework is discussed in more detail in Chapter 2.

Nature of the Study

This study is non-experimental and quantitative, with a correlational research design and hierarchical multiple regression as the analysis method. Correlational research allowed me to examine the relationship between the independent and dependent variables, and hierarchical multiple regression enabled me to determine if that relationship is moderated by a third variable (Fairchild & McQuillin, 2010). Therefore, both the design and analysis method are consistent with the problem statement, purpose, and research questions.

The dependent variable in the study is the students' academic performance, and the independent variable is stereotype threat. The moderating variables are self-affirmation and context; age, race, and gender were considered covariates. Three brief cross-sectional measures were used to collect data related to these variables and covariates. The Social Identities and Attitudes Scale (SIAS; Picho & Brown, 2011) was used to measure stereotype threat, and the Spontaneous Self-Affirmation Measure (SSAM; Harris et al., 2019) was used to measure self-affirmation. Academic performance and learning context were assessed using portions of the College Student Experience Questionnaire, fourth edition (CSEQ; Pace & Kuh, 1998). The questionnaires were completed by college students completing online courses. The collected data were analyzed using IBM SPSS Statistics.

Definition of Terms

Academic performance: This term is used to describe a student's achievement across several academic domains. It is a measurement of student success expressed in terms of the student's cumulative grade point average or CGPA (Grass et al., 2017; Taylor et al., 2013).

Context: Refers to a student's learning environment. More specifically, it refers to whether a student attends an online course that meets synchronously or asynchronously. Synchronous courses require all students and instructors to meet in "real-time," while asynchronous courses allow students to attend class at their leisure (Fabriz et al., 2021; Martin et al., 2021).

Online learning: Defined as technology-based learning that occurs virtually via the internet (Wei & Chou, 2020).

Spontaneous self-affirmation: Occurs when a person naturally or automatically reflects on their values and strengths to protect their self-concept when faced with threats to their self-identity (Harris et al., 2019; Lannin et al., 2021).

Stereotype threat: Is a term that is used to describe the risk of validating negative stereotypes associated with a person's social group (Liu et al., 2021; Steele & Arson, 1995). In this study, the focus is on stereotype threat associated with marginalized racial and ethnic groups.

Assumptions

There were several assumptions for the present study. The first assumption was that the designated representative at each university would email the questionnaire to all currently enrolled students. Next, I assumed that the students would respond truthfully to the questionnaire items and that their responses are representative of the experiences of the general population. Further, I assumed that cumulative GPA is a true indicator of student academic performance.

Scope and Delimitations

The scope of the study was confined to online students enrolled in postsecondary institutions. The sample was comprised of students enrolled in degree-seeking programs that offer synchronous or asynchronous online courses or both. The students were completing fully online programs or blended programs that include both in-person and online classes. However, students enrolled in courses that were not online were excluded

from the study. Because the study was targeted at online college students, participation from students not completing online courses was not needed.

Three questionnaires were used to collect the required data. The questionnaires have all been used in previous studies and have established validity and reliability. Two of the instruments, the 13-item SSAM and the 30-item SIAS, use only Likert scale items, which should help maintain the continuity of the responses. The SIAS consists of six subscales; however, only the 5-item ethnic stigma consciousness (ESC) subscale was used because of its relevance to the study. Although there are other indicators of academic performance, such as tests scores and grade transcripts, cumulative GPA was used because it is a simple way of gauging how well a student has performed across their courses during their time at the institution. Cumulative GPA was self-reported by the students using an open-ended item added to the CSEQ. Only the background section of the CSEQ was used because it asks questions related to the respondents' demographics and grades.

Limitations

Because of the design and methodology used in the study, there were some limitations. Using cross-sectional, correlational research does not allow causal relationships to be established. Therefore, to avoid threats to internal validity, the focus of the study was on correlational relationships between the variables rather than causation. Also, the cross-sectional nature of the study, as well as the convenience sampling method that was used, may have impacted the generalizability of the results, which may have posed a threat to external validity. To address this threat, generalizations were restricted

to the target population. Additionally, violations of some of the assumptions related to hierarchical multiple regression impacted the accuracy of the results of the study.

Significance

The results of this investigation highlighted the impact of stereotype threat on minorities enrolled at online universities, as well as how self-affirmation can be used to help improve the academic performance of those students. Findings from this research could help online universities in assisting minority students who have poor academic performance, thus increasing retention, persistence, and graduation rates. Moreover, racial disparities and the achievement gap continue to intrigue teachers, policymakers, psychologists, and other agents of social change. Because the achievement gap extends to postsecondary education, ensuring that online college students have fair educational advantages can help decrease or close the performance gap.

Summary

As online education continues to grow and evolve, understanding the factors that impact student success in the online learning environment will become more important. Like in traditional college courses, retention, attrition, and student academic performance are concerns in online courses. Research suggests that psychological threats to a student's self-integrity, such as stereotype threat, can negatively affect his or her performance in the classroom; self-affirmation can be used to disrupt the impact of psychological threats (Binning et al., 2021). Therefore, the current study examined the moderating effects that spontaneous self-affirmation can have on the relationship between stereotype threat and academic performance in online postsecondary classes. The role that context or online

learning format (whether the course is synchronous or asynchronous) plays in the relationship was examined, as well.

Chapter 1 provided an overview of the research study. The problem and purpose statements, as well as the research questions and hypotheses were presented. Additionally, I discussed the theoretical framework, nature of the study, definition of terms, and assumptions in this chapter. The scope and delimitations, limitations, and significance of the study were presented, as well.

Chapter 2 is a review of the theoretical framework behind the study. Relevant literature related to self-affirmation theory, stereotype threat theory, and social presence theory is discussed. I also describe the literature search strategy used for the study. Further, a review of recent literature is provided to demonstrate what is known about the association between stereotype threat, self-affirmation, and online academic performance. Recent literature associated with the contextual cues in online classes (both synchronous and asynchronous) is also reviewed.

Chapter 2: Literature Review

Introduction

The academic achievement gap between minority and non-minority students reflects an ongoing disparity within the U.S. educational system. This disparity is evident in primary schools and universities alike, and the exact cause of the disparity has yet to be identified (Ratcliff et al., 2016). However, several possible factors are thought to contribute to the achievement gap, including racial, gender, and socioeconomic stereotyping (Alfarhan & Dauletova, 2019; Borman et al., 2016; Borman et al., 2021; Zhang et al., 2020). Further, researchers have speculated that the academic achievement gap occurs in both traditional, face-to-face classrooms and online classrooms (Bowe et al., 2017; Merillat et al., 2018; Tawfik et al., 2016; Wladis et al., 2015).

In response to the academic achievement gap, significant attention has been focused on two factors, stereotype threat and self-affirmation. Stereotype threat occurs when members of a group become aware of their group-specific stereotypes and perform accordingly (Bedyńska et al., 2020). Self-affirmation is often used as an intervention method in which a person focuses on their strengths when faced with threats to his or her self-concept. Because of its effectiveness at restoring a person's positive self-concept, self-affirmation has been used as a technique for mitigating the effects of stereotype threat in the classroom (Borman, 2021). In fact, current research suggests that mitigating the effects of stereotype threat with self-affirmation interventions can improve academic performance in minority students (Lokhande, & Müller, 2019; Quintana & Mahgoub, 2016).

The relationship between self-affirmation, stereotype threat, and academic performance has been examined predominately in in-person learning environments. Therefore, the purpose of the current study was to examine the degree of this relationship in online courses, specifically in synchronous and asynchronous online college courses. This chapter includes a description of the strategy used to locate pertinent research for the study. It also includes an overview of the theoretical framework, which consists of stereotype threat theory, self-affirmation theory, and social presence theory. The history, origin, and relevance of each theory are presented. Additionally, an extensive review of current literature is provided to illustrate what is currently known about the relationship between stereotype threat, self-affirmation, and academic performance in online classes. Current literature related to the contextual cues present in synchronous and asynchronous online courses is reviewed, as well.

Literature Search Strategy

Before engaging in this research study, an exhaustive literature review was performed. To locate relevant scholarly sources for this literature review, several databases and search engines were used including Thoreau, Education Source, ERIC, PsychInfo, Academic Search Complete, SocINDEX with Full Text databases, and Google Scholar. The National Center for Education Statistics was also used to identify important statistics related to currently enrolled online college students. Key search terms and Boolean operators that were used included *racial disparities AND academic performance, academic achievement gap, academic performance OR academic success OR educational achievement AND minorities AND stereotype threat, Coleman report,*

online education OR online learning OR distance learning OR virtual learning, *synchronous online learning, asynchronous online learning, self-affirmation, values affirmation, stereotype threat OR stereotype theory, stereotype threat AND mechanisms, stereotype threat AND criticism, stereotype threat AND confirmation bias, social context cues, social presence,* and *social presence theory*.

When searching for pertinent literature (including articles, dissertations, and professional/academic conferences), results were initially limited to full-text, peer-reviewed scholarly journals ranging from 2015-2022. However, to locate additional relevant research, the search was extended to include full-text, peer-reviewed scholarly journals published as far back as 2005. Seminal sources related to self-affirmation, stereotype threat, and social presence theory were identified in searches that expanded to 1955.

Theoretical Foundation

The theoretical foundation of this study was comprised of three theories: stereotype threat theory (Steele & Aronson, 1995), self-affirmation theory (Steele, 1988), and social presence theory (Short et al., 1976). Stereotype threat theory asserts that individuals who identify with a stigmatized group or population are often unknowingly primed to conform to the stereotypes assigned to the group (Merillat et al., 2018; Steele & Aronson, 1995). Self-affirmation theory suggests that when a person's sense of self-worth is at risk, the individual can focus on other strengths to preserve or restore their sense of self (Burd & Burrow, 2017; Steele, 1988); further, self-affirmation has been found to mitigate the effects of stereotype threat in a variety of environments, including

learning environments (Borman et al., 2016). Further, social presence theory describes how people communicate and perceive each other during an interaction (usually mediated by a technology-based medium) and the resulting interpersonal relationships (Short et al., 1976). Tu (2000) asserted that social presence has three primary dimensions, one of which is social context. Social context is a key factor in stereotype threat, as contextual cues are thought to activate it.

Overview of Stereotype Threat Theory

Stereotype threat theory is often used to explain why minority groups sometimes underperform on certain tasks (including scholastic and intellectual tasks) when compared to majority groups (Steele & Aronson, 1995). Under this theory, it is believed that stereotype threat impacts the self-concept, self-efficacy, and social identity of individuals belonging to stereotyped groups (Platts & Hoosier, 2020; Schwery & Schweinle, 2016; Slobodnikova & Randolph-Seng, 2021; Tellhed & Adolfsson, 2018). The influence of stereotype threat can lead to a self-fulfilling prophesy effect in which the impacted individuals perform in ways that conform to the negative stereotypes associated with their social group; minority groups are thought to be impacted more than their counterparts. While it has been applied in various domains, ranging from sports to health care (Chang et al., 2021; Phelan et al., 2019), stereotype threat theory originated in a research study related to intellectual test performance (Steele & Aronson, 1995). Therefore, it has been used extensively to explain the disparities in education based on race and ethnicity, gender, and socioeconomic status (Casad et al., 2017; Casad et al., 2018).

Origins of Stereotype Threat Theory

Stereotype threat is a social psychological theory that evolved from the work of Steele and Aronson (1995). In their seminal article, "Stereotype Threat and the Intellectual Test Performance of African Americans," the researchers described stereotype threat as a predicament that can affect any individual who belongs to a negatively stereotyped group. According to their theory, popular negative stereotypes that associate a social group (e.g., age, race, ethnicity, gender, and social class) with a given ability or task are detrimental to a person's self-evaluation of his or her own skills or intellectual capacity (Steele & Aronson, 1995). The targets of a stereotype may perceive its prevalence as indicative of their true ability and how others view them, making the individuals vulnerable to threats to their sense of self, and ultimately, their performance in specific domains by way of anxiety, self-doubt, and self-threat; targets who do not accept the stereotype as true can be impacted as well (Albuquerque et al., 2017). Stereotype threat is also thought to impact the targets' working memory, further impacting their task performance (Bedyńska et al., 2020; Wu & Zhao, 2021). Additionally, stereotype threat can result in de-identification, where the impacted person disengages from the stereotyped task or domain, which is also detrimental to his or her performance on that task or domain (Kumi-Yeboah & Smith, 2016).

Steele and Aronson (1995) examined stereotype threat in relation to standardized testing. They hypothesized that anxiety and self-threat experienced by African Americans under stereotype threat during standardized testing can impair their performance on measures of intelligence by reducing their working memory. To test their theory, they

administered an abridged version of the verbal section from the Graduate Record Examination (GRE) to both African American and Caucasian university students. The participants were randomly assigned to groups, with one group being primed for stereotype threat, as they were told that the test would measure their intellectual ability (stereotype threat group), and the other advised that the test was either a problem-solving activity or a challenge (non-stereotype group). When the exam results of both groups were compared, it was discovered that African American participants in the stereotype threat group scored lower on the verbal exam than their cohorts in the non-stereotype threat group and Caucasian participants in general. The results were indicative of a relationship between being explicitly reminded of one's association with a stereotyped group and his or her subsequent performance.

In 1999, Steele and his colleagues expanded their focus to gender stereotype threat. Like racial stereotype threat, the researchers suggested that stereotype threat can interfere with the performance of women in mathematics, a domain that is traditionally dominated by males. The participants, both male and female, completed a test similar to the GRE (Spencer et al., 1999); however, unlike in Steele and Aronson's original study, the test was quantitative instead of a verbal skills test. In one group, the participants were primed for stereotype threat when they were advised that gender differences had been found in previous results of the test; in the other group, stereotype threat was not activated. A comparison of the two groups' test scores suggested that the females exposed to stereotype threat scored lower on the advanced math assessment than males, supporting Steele and Aronson's initial findings on racial stereotypes.

Overview of Self-Affirmation Theory

Self-affirmation theory suggests that individuals are motivated to preserve their self-image and self-integrity (Steele, 1988). Threats to their self-image or integrity can result in cognitive dissonance, and to help resolve that dissonance, the individuals may focus more on their values, morals, and other positive traits (Steele, 1988). Engaging in this process helps people adapt to perceived threats and restore their sense of self-worth and positive self-regard. Although self-affirmation can be applied in a variety of situations, such as in the workplace and in weight loss and exercise programs (Jiang, 2018; Shin et al., 2021), it has been found especially useful in pedagogical settings, particularly as an intervention method for students experiencing stereotype threat (Borman et al., 2016; Burd & Burrow, 2017; Goyer et al., 2018).

Origins of Self-Affirmation Theory

Self-affirmation theory is rooted in early research related to the "self," as key concepts relevant to the theory are self-esteem, self-concept, self-integrity, self-regard, and self-efficacy. Steele, credited with creating self-affirmation, referenced the works of self-theorists such as James (1890), Allport (1955), and Bandura (1977) in his seminal article as he described the nature of self-affirmation (Steele, 1988). James (1890) is associated with the concept of self-worth and is known for coining the term, self-esteem. He helped explain behaviors that humans engage in to help preserve their self-esteem. Allport (1955), in his research on personality, also described the preservation of what he called the "proprium," commonly known as the self. Bandura (1977), however, focused

more on self-efficacy, a person's belief in their own abilities; self-efficacy is believed to impact both self-concept and self-esteem.

While the studies of James, Allport, and Bandura were influential in the inception of self-affirmation theory, Steele (1988) was particularly influenced by Festinger's (1957) work on cognitive dissonance and smoking cessation. Festinger examined how cognitive dissonance influences a smoker's decision to continue or stop smoking. To expand the research on the self, Steele (1988) examined the process that people undergo when responding to threats to their self-systems. Using Festinger's (1957) observations of cognitive dissonance, he proposed that people require a sense of stability within their self-systems, and disruptions to this stability are perceived as threats. The result of this dilemma is a dissonance or discord that can be resolved through positive realizations about other aspects of the individuals' self-worth that "affirm" their self-integrity and self-consistency. Therefore, rather than using rationalizations to refute the threat to their self-integrity, the individuals consider other positive traits they possess to help them preserve their positive view of themselves. This process forms the basis of what Steele termed "self-affirmation."

In his study of self-affirmation, Steele (1988) evaluated previous experiments related to cognitive dissonance and the use of positive affirmations. From his evaluation, Steele identified several major themes:

1. The objective of using self-affirmation is to help an individual preserve his or her self-adequacy and self-integrity, not to stop or prevent threats to the self.

2. Self-affirmation is not a defense mechanism or a means for distorting reality, rather, it is a way to objectively evaluate self-threats.
3. The self is a resilient entity, and self-affirmation helps people adapt to self-threats and reduce damage to global self-integrity.
4. Threats to the self can evolve from the actions and judgments of others, our own actions, and thoughts in response to events.
5. Reaffirming an area of the self that is not targeted by the threat can help restore optimal self-integrity.
6. Self-affirmation is a biopsychosocial process that may prompt activity in areas of the brain designated for self-regulation.

With these themes in mind, Steele (1988) concluded that self-affirmation stems from the motivation to sustain a continuous view of the self as moral and just. It is an active process in which people consciously evaluate their beliefs and values to affirm their positive self-concept. Therefore, when presented with knowledge that contradicts their self-view, such as learning how other's feel about or perceive them, individuals may try to confirm some aspect of their self-system (e.g., self-esteem or self-efficacy) to help dissolve the discrepancy between the contradicting knowledge (which is identified as a threat) and their self-perception (Steele, 1988).

Overview of Social Presence Theory

To date, there is no single or definitive definition of social presence (Oh et al., 2018). Also, the term has been applied to both in-person interactions and in telecommunications. Contemporary researchers typically associate social presence with a

person's visibility in an online environment, such as a social media or online learning platform (Lim & Lee-Won, 2017; Richardson et al., 2017). Consequently, social presence entails more than visibility. It encompasses the socio-emotional aspects of a person that allows him or her to be perceived as a "real person" within a virtual environment (Bickle et al., 2019; Kreijns et al., 2021). Social presence theory is largely attributed to Short et al. (1976). In their research, Short and his colleagues examined the relationship between telecommunication and social cues. The researchers' primary focus was how social cues that are evident during face-to-face interaction can be translated without physical proximity (Short et al., 1976).

Origins of Social Presence Theory

Social presence is a convoluted term that is heavily rooted in sociology and social psychology, specifically in interpersonal communication and symbolic interactionism. Its inception can be traced back to early work on intimacy, immediacy, and face-to-face intercommunication. Argyle and Dean (1965) identified the role of intimacy, which entails eye contact, facial expressions, physical proximity, etc., in in-person social interaction. They argued that without intimacy, two people cannot successfully communicate, as cues such as eye contact help signify to one communicator that the other is present and invested in the interaction. Weiner and Mehrabian (1968) noted that like intimacy, effective interpersonal interactions require immediacy or nonverbal behaviors and responses.

Short et al. (1976) were among the first to use social presence in reference to telecommunications. They transformed social presence from a concept into a theory that

helps explain the extent to which a person identifies another person as “salient” or “present” when interacting via a telecommunications medium. In their seminal book, they suggested that people experience physical and emotional connection differently depending upon the medium used to communicate (Short et al., 1976). Social presence was said to occur naturally in face-to-face communication because the communicators are physically present, and the face-to-face environment provides opportunities for both intimacy and immediacy. However, in technology-based communication, social presence can be low or high depending upon the medium. Mediums with low levels of social presence, such as video communications, are ones with little to no intimacy and immediacy, while mediums with high levels of social presence, like audio and text communications, have higher levels of intimacy and immediacy (Lowenthal, 2009; Short et al., 1976).

Over the years, various aspects of social presence have been explored, including its impact on cognitive performance. For instance, previous research suggests that in some contexts, increased social presence can help enhance cognitive performance through cooperative learning, while in other contexts, high levels of social presence can heighten anxiety and negatively impact cognitive performance (Felnhofer et al., 2019; Maresh et al., 2017; Oyarzun et al., 2018). Further, although the relationship between social presence and stereotype threat (also believed to impact cognitive performance) has not been established in existing literature, social presence has been coupled with concepts similar to stereotype threat, such as social-evaluative threat (Felnhofer et al., 2019; Maresh et al., 2017). Like stereotype threat, social-evaluative threat can elicit psycho-

emotional responses in individuals, which can impede their intellectual or cognitive performance (Craw et al., 2021). These psycho-emotional responses can increase in social settings high in social presence including virtual settings, as individuals' fear of being negatively evaluated by their peers may be intensified (Maresh et al., 2017; Sigurvinsdottir et al., 2021). Therefore, because stereotype threat is directly related to how a person believes they are viewed by others, its relationship with social presence may be similar to that between social-evaluative threat and social presence.

Relevance of Stereotype Threat, Self-Affirmation, and Social Presence

Both stereotype threat theory and self-affirmation theory frequently appear in research related to academic performance and minorities (Borman, 2017; Borman et al., 2016; Bowe et al. 2017; Chang et al., 2019). These two theories help explain the mechanisms that may influence how well a group of students performs in certain contexts and under specific circumstances. Further, because the current study targeted online learning environments, it was necessary to understand the difference in contextual cues between the two primary modes of online learning, synchronous and asynchronous learning; understanding the differences in the contextual cues may shed light on how stereotype threat emerges in varying learning contexts. The key contextual difference between synchronous and asynchronous classrooms is the level of social presence (Racheva, 2019). While it was initially developed to explain human interactions via telephonic or video devices, social presence theory is now used to describe interactions in online environments, especially in online learning (Kreijns et al., 2021; Park & Kim, 2021; Turner et al., 2020), making it an appropriate addition to the theoretical framework.

Literature Review

Research on the relationship between stereotype threat, self-affirmation interventions, and academic performance has been largely motivated by the academic achievement gap. The achievement gap is a social problem that has existed for decades and continues to demand attention and resolution. Researchers and educators alike have strived to close the academic achievement gap and have considered a variety of strategies for minimizing or eliminating the negative effects of stereotype threat; teaching students how to use self-affirmation is one of those strategies. Further, based on recent research, stereotype threat may be present in both traditional and virtual environments (Holst, 2016; Kumi-Yeboah & Smith, 2016; Quintana & Mahgoub, 2016; Wladis et al., 2015). The following review is an examination of current literature on the academic achievement gap and its connection to stereotype threat, the influence of learning context on stereotype threat, and the effectiveness of self-affirmation in mitigating stereotype threat in virtual environments.

Overview of the Academic Achievement Gap

The academic achievement gap refers to the disproportion in educational outcomes among minority or disenfranchised students and their non-minority counterparts (Byrd, 2020); it has been found to occur in all grade levels, including post-secondary education. In general, an achievement gap can exist among groups that differ in gender, race and ethnicity, class or social status, language proficiency, and intellectual disability (Alfarhan & Dauletova, 2019; DeVries & Tkatchov, 2017; Soland & Sandilos, 2021; Zhang et al., 2020). Further, the academic achievement gap is thought to exist in

other nations. For instance, Park and Cho (2021) conducted a content analysis study of 11 articles that examined racial and ethnic academic achievement gaps in South Korean schools; each of those articles was an analysis of a national study on standardized testing scores in primary and secondary schools. The content analysis revealed that a variety of factors may contribute to the academic achievement gap in South Korea, including cultural differences and stereotype threat. Additionally, research on the academic achievement gap has extended to countries such as Italy, England, Germany, and Slovakia (Angoli et al., 2021; Hadden et al., 2020; Mok et al., 2017; Slobodnikova & Randolph-Seng, 2021). Like Park and Cho's study, these studies indicate that socio-cultural factors may reinforce the academic achievement gap.

While the term "achievement gap" has been used to describe academic disparities between a wide variety of groups, it was initially used to describe achievement disparities between African American and Caucasian students and was first described (although indirectly) in what became known as the Coleman Report in 1966 (Rivkin, 2017). The Coleman Report, also referred to as the Equality of Educational Opportunity, emerged as an effort to understand the impact of school segregation on the learning opportunities for African Americans (Hill, 2017; Rivkin, 2017). It was conducted the same year that the Elementary and Secondary Education Act (ESEA, 1965) was passed, which was aimed at helping underprivileged schools and disadvantaged students. The initiative was created by Congress in support of the Civil Rights Act of 1964 and in response to differences in the standardized testing scores of African American and Caucasian students, and like the

ESEA, it was one of the first strides toward ensuring equal and quality education for African American students.

Conducted in 1965, the Coleman Report was completed in less than two years and consisted of 66,000 instructors and 600,000 students from 4,000 elementary, middle, and high schools (Coleman, 1966). Data were collected via questionnaires and pertained largely to standardized testing outcomes from both African American and Caucasian students. Coleman's goals were to analyze the outcomes, to understand the impact of desegregation on those outcomes, and to understand the factors that impact children's ability to learn. Based on the results of the study, it was deduced that although schools had been desegregated, some African American students were still at an educational disadvantage when compared to Caucasian students. In general, African American students did not score as high on the standardized tests as their Caucasian peers. However, the higher-achieving African American students attended predominately Caucasian schools with a surplus of resources, possibly indicating that access to more or better resources impacts academic achievement. In addition to better resources, Coleman concluded that socioeconomics, family background, and self-efficacy are factors that impact student learning.

The Coleman Report was significant in the movement to help African Americans have successful educational experiences and outcomes and it was a catalyst for the continued research into the academic achievement gap. It highlighted the differences in academic opportunities and outcomes and drew the public's attention to academic achievement disparities. Decades later the research continues, and other constructs have

been noted as possible factors that help maintain the achievement gap. For instance, researchers, such as Steele and Aronson (1995), further examined social psychological factors that may exacerbate the academic achievement gap; at the forefront of this research is the concept of stereotype threat.

Stereotype Threat and America's Academic Achievement Gap

In general, the racial academic achievement gap may signal that there is something amiss in the U.S. educational system. One of the controversies surrounding this particular academic achievement gap is how much stereotype threat contributes to it. In 1995, Steele and Aronson conducted the first study that named stereotype threat as a possible reason for the racial academic achievement gap. They characterized stereotype threat as a "self-evaluative threat" that can possibly undermine the performance of anyone who belongs to a stigmatized or stereotyped social group (Steele & Aronson, 1995, p. 797). In their study, African American participants who were primed for stereotype threat scored lower on a series of verbal ability assessments than Caucasian participants; priming occurred when the participants were told that the assessments would measure their intellectual abilities. A few years later, in a follow-up study, Spencer et al. (1999) extended Steele and Aronson's research to the gender academic gap and found that the female participants who were primed for stereotype threat scored lower on math assessments than the male participants; simply telling the female participants that gender differences had been found in early results of the test. These groundbreaking studies triggered a wave of research designed to understand stereotype threat in a variety of domains and in combination with other psycho-emotional factors, such as motivation,

self-esteem, self-efficacy, and anxiety. Subsequent studies have targeted stereotype threat in areas such as healthcare, sports, and various educational domains (e.g., Borman, 2017; Bowe et al., 2017; Chang et al., 2021; Emanuel et al., 2018; Falk et al., 2015; Phelan et al., 2019).

Context Influences Stereotype Threat

Context or environment is a key feature of stereotype threat. Because the construct has been deemed situational, examining the setting in which it takes place has been a central focus of recent research (Casad et al., 2018; Fordham et al., 2020; Wen et al., 2016). Regarding pedagogical settings, most researchers have explored how stereotype threat affects students in traditional, face-to-face classrooms. These studies have been conducted in classrooms in different school districts and grade levels (Borman, 2017; Bowe et al., 2017; Tellhed & Adolfsson, 2018). However, as Bick et al. (2022) suggest, research on how stereotype threat impacts online students is less abundant. Further, the context of online learning, synchronous or asynchronous, has not been explored in terms of stereotype threat and academic performance.

Stereotype Threat in Traditional Classroom Settings

Historically, stereotype threat has been examined in traditional learning contexts (Borman, 2017; Spencer et al., 1999; Steele & Aronson, 1995; Merillat et al., 2018). Traditional learning requires students to meet in person at a specific, physical location and at a specific time (Paul & Jefferson, 2019). In this learning environment, students are expected to have a high level of engagement and interaction with each other and with the instructor. However, this face-to-face interaction, while beneficial in many respects, may

leave some students susceptible to impediments, such as stereotype threat (Fiske et al., 2014).

Stereotype threat is said to occur in environments where individuals fear confirming widely accepted negative stereotypes about social groups with which they identify (Steele & Aronson, 1995). Traditional classrooms are often ideal settings for stereotype threat because of the contextual or environmental cues within the environment (Cheryan et al., 2014). Further, these contextual cues help make some learning environments more prone to stereotype threat than others. Such contextual cues can remind students that they belong to stereotyped or marginal social groups (Padhi, 2016). Therefore, the learning environment itself can impact whether a student experiences stereotype threat. For instance, being outnumbered in terms of gender, race, ethnicity, etc. in a work or educational environment has been found to increase stereotype threat vulnerability in gender and racial minorities (Albuquerque et al., 2017; Holst, 2016; van Veelen et al., 2019). Ben-Zeev et al. (2005) found evidence of this phenomenon in their study, as their female participants performed worse on math tasks when they were in an environment in which they were outnumbered by males. Similarly, Holst (2016) found that African American males may perform worse on standardized tests when they are the minority in a physical classroom. Thus, when a stigmatized minority group is also the minority within a physical classroom, stereotype threat may have a significant impact on performance.

Another aspect of the traditional classroom that may activate stereotype threat is the arrangement of the physical classroom. Researchers have shown that the physical

space designated for learning can impact student learning and achievement (Granito & Santana, 2016; Zandvliet & Broekhuizen, 2017). For example, seating arrangements where students are seemingly grouped by their race, ethnicity, gender, etc. or wall-art associated with specific social identities can be interpreted by minority students as indicative of the instructor's implicit biases (Chang et al., 2019; Cheryan et al., 2009; Cheryan et al., 2014). These cues may activate stereotype threat in the same way as social presence, by reminding students of their marginalized status and their group-specific stereotypes.

Stereotype Threat in Online Classroom Settings

Online learning, also referred to as e-learning, virtual learning, or distance learning, takes place either synchronously or asynchronously via an electronic medium, typically an internet-enabled computer or mobile device (Zalat et al., 2021). Synchronous online learning is "real-time" learning allows students to learn and engage with their classmates and instructors at the same time. It is akin to traditional, face-to-face learning except that the students learn remotely from any location they choose. Many students prefer this form of online learning because it mimics how learning occurs in in-person classrooms (Dahlstrom-Hakki et al., 2020; Malik et al., 2017). Dedicated technologies, such as live video conferencing and webinars, virtual reality, and interactive chatrooms enable students to see, hear, and interact with each other. Contrastingly, asynchronous learning does not occur in real-time. Students can learn at their own pace and can choose the time and location that is best for them. Therefore, unlike synchronous learning, students who learn asynchronously do not learn at the same time. Learning management

systems with prerecorded videos and online discussion threads are primary modes of asynchronous learning.

Gender Stereotype Threat. Studies on stereotype threat in the online learning environment are limited, and those that exist often focus more on gender stereotype threat than any other form of stereotype threat (e.g., Chang et al., 2019; Wladis et al., 2015). The focus on gender stereotype threat may be due in part to the number of female students enrolled in online college-level courses. As Wladis et al. (2015) suggest, female online learners typically outnumber males in most online college programs. Further, in studies of gender stereotype threat in online college courses, especially in STEM (science, technology, engineering, and math) courses, women have been found to underperform on assigned tasks while under stereotype threat. For instance, Chang et al. (2019) conducted a study of 89 female STEM and non-STEM university students. The students utilized realistic gaming avatars in a virtual classroom to engage in a 10-minute math lesson with a male or female avatar instructor. The participants believed that they were learning synchronously from an individual in another room; however, the instructing avatar was not a "live" person, but a pre-programmed avatar. It was found that participants who learned from a male instructor who exhibited sexist, non-verbal behaviors scored lower on subsequent assessments than the other participants, suggesting that the instructor's sexist, non-verbal behaviors evoked negative emotions and gender stereotype threat some of the students (Chang et al., 2019).

Albuquerque et al. (2017) found results similar to Chang et al.'s (2019) in their study of stereotype threat, anxiety, and performance in online gamified educational

environments. They asked 82 male and 45 female participants to complete an anxiety questionnaire (pretest and posttest) and a gamified quiz. The participants were assigned to one of three learning systems ("no stereotype threat," "stereotyped for males," or "stereotyped for females") and instructed to select an avatar before completing the quiz. Females in the male-stereotyped group reported higher levels of anxiety in the posttest than females in the other two groups. Differences in the performance levels on the quiz were found, although they were not explicitly discussed in the study. This signifies a possible correlation between stereotype threat, anxiety, and performance, an assertion that has been supported by research on gender stereotype threat and online gaming. For example, Vermeulen et al. (2016) assigned 100 females to three different gaming conditions ("stereotype neutral," "stereotype boost," or "stereotype threat") with cues, such as avatars and gender-specific names, to combat or elicit stereotype threat. In the neutral condition, scores with no names were presented on a leaderboard, while the stereotype boost condition contained a leaderboard displaying females with the highest-ranking scores, and the stereotype threat condition had a leaderboard with high-ranking males. The researchers found that the females in the stereotype threat condition scored lower on gaming measures and reported having higher anxiety levels than females in the other two groups.

Racial and Ethnic Stereotype Threat. In a rare study of racial stereotype threat in online college courses, Kumi-Yeboah and Smith (2016) found racial and ethnic minority students to be negatively impacted by stereotype threat. The study consisted of 149 minority online college students who identified themselves as either Hispanic,

African America, Pacific Islander, Native American, or Asian; the students' majors ranged from Arts and Science to Humanities. The goal of the study was to examine the connection between academic performance and learner satisfaction with distance learning; however, the study was underpinned by stereotype threat theory. Unlike other studies (e.g., Chang et al., 2016; Dioux et al., 2016; Kaye et al., 2018; Lungwitz et al., 2018; Spencer et al., 1999; Steele & Aronson, 1995), Kumi-Yeboah and Smith's study did not include priming or manipulation to activate stereotype threat. Rather, they collected survey data related to the participants' experiences in their online courses. The results of the study indicated that when students held positive self-identification, they performed better in their online classes (e.g., higher grades and higher engagement); however, when they felt misunderstood or perceived poorly by their classmates due to their cultural differences, their performance was lower (Kumi-Yeboah & Smith, 2016). Concurrent with the basic tenants of stereotype threat theory, the results suggest that when some students believed their social group was being stereotyped, their academic performance was negatively impacted (Kumi-Yeboah & Smith, 2016).

Asynchronous Versus Synchronous. Although there may be differences in how it manifests in asynchronous and synchronous online learning contexts, existing studies fail to compare stereotype threat in these two environments. However, subtle cues drawn from previous research may indicate that stereotype threat can occur in both synchronous and asynchronous online learning contexts (e.g., Chang et al., 2015; Kumi-Yeboah & Smith, 2016). In Chang et al.'s (2015) study, the participants were led to believe that they were working in a synchronous environment interacting with a real person in real-time;

the effects of stereotype threat were evident in the virtual classroom in the study. Consequently, Kumi-Yeboah & Smith's (2016) study was of students enrolled in asynchronous online courses who discussed their levels of satisfaction with participating in online discussion boards; stereotype threat was observed in this study, as well.

Social Presence as a Social Context Cue: The Impact on Stereotype Threat

Although researchers have identified several mechanisms that may increase stereotype threat vulnerability in minority students, context remains one of the most impactful factors (Casad & Bryant, 2016). Interestingly, social presence does not appear in research alongside stereotype threat. Social presence, a construct relevant to social settings or contexts, is an integral part of collaborative learning (Chen et al., 2018). In traditional classrooms, social presence is more easily perceived, as students and instructors are physically present, tangible entities (Chen et al., 2018). The physical and cultural differences of everyone are outwardly apparent in this context. Because stereotype threat has been found to occur in contexts in which students are reminded of their social group affiliations (Steele & Aronson, 1995), such diverse environments can be an instigating force for stereotype threat. Whereas some research suggests that diversity can help mitigate stereotype threat (Rikers, 2016), other research suggests that diversity can reinforce confirmation bias which can reaffirm stereotypes (Bai et al., 2020; Peters, 2020). Also, diversity does not automatically translate into inclusion; therefore, if minority students do not feel that their identities are valued, they may feel excluded in diverse environments. Exclusion in the classroom can then remind students of their marginalized status and increase stereotype threat vulnerability (Padhi, 2016).

Online classrooms are also diverse, as students from different cultural backgrounds can “attend” class together remotely from virtually any location. Also, like in-person learning, social presence plays a large role in learning in an online environment (Clark et al., 2015). In fact, whether it takes place in-person or virtually, students often report greater satisfaction with their learning when there is increased social presence and interaction with their instructors and classmates (Gray & DiLoreto, 2016; Richardson et al., 2017). However, because of the lack of physical interaction in online classrooms, social presence may be more important in the e-learning environment due to the sense of connection it can provide for the students. Consequently, the degree of social presence may differ in online classrooms depending on whether the classes are synchronous or asynchronous (Chen et al., 2018; Racheva, 2019).

In synchronous online classes, social presence may be equal to that in traditional classes, especially in courses where video conferencing or virtual reality software is used, and all participants are visible to each other (Dahlstrom-Hakki, et al., 2020). Students in these courses can interact in real-time and can observe some of the non-verbal cues associated with the immediacy and intimacy aspects of social presence, such as eye contact and facial expressions. In asynchronous online classes, however, students often have the option to use 2D graphic avatars and pictures to represent them in the classroom (Fowler et al., 2018). Although avatars and photos help elevate the levels of social presence in asynchronous classes, social presence may still be stronger in synchronous e-learning because of the “live” interaction between students (Racheva, 2019).

When applied in virtual settings, social presence encompasses three dimensions: social context, online communication, and interactivity (Tu, 2000). While social presence can create a sense of connection and collaborative learning for students, the increased visibility might also increase the risk for stereotype threat and heighten the fear of being negatively evaluated (Maresh et al., 2017). Therefore, when conditions are favorable, stereotype threat in the online classroom can mimic that which occurs in the traditional classroom context, as evidenced by existing literature that purports that, like in live environments, individuals in online environments can experience stereotype threat when they are aware that they are the minority in the environment and are conscious of existing stereotypes associated with their gender or racial group (Albuquerque et al., 2017; Chang et al., 2019).

Moreover, because social presence levels differ in synchronous and asynchronous online courses, the question arises of whether being perceived as a "real" person can make someone more susceptible to stereotype threat. If so, then it may be possible that students enrolled in synchronous courses are more vulnerable to stereotype threat than those in asynchronous classes, as synchronous courses are thought to be higher in social presence than asynchronous courses (Racheva, 2019). Kumi-Yeboah and Smith's (2016) study provides subtle support for this assertion. In their study, some participants reported feeling more comfortable and confident in their online class environment than they would in a traditional classroom. The students claimed they were more likely to assert their presence and remain engaged in the online discussion boards (usually used in asynchronous environments) than they would be to participate in discussions face-to-

face, which could indicate that they might not perceive social presence as a threat in their learning environment. Therefore, as suggested in some studies, environments with increased social presence, such as in-person and synchronous classrooms, can escalate anxiety and fear of being negatively evaluated, resulting in negative impacts on working memory (Felnhofer et al., 2019; Maresh et al., 2017). It is noteworthy that in synchronous classrooms, objects in the instructor and other students' backgrounds can serve as additional contextual cues that may activate stereotype threat (Cheryan et al., 2014). These cues could be viewed as symbolic of stereotypes held by members of the class and could exacerbate the impact that social presence has on stereotype threat activation (Cheryan et al., 2014).

Criticism of Stereotype Threat

Critics of stereotype threat argue that its impact on the academic achievement gap is questionable for a variety of reasons. One of the reasons is that the results of studies on stereotype threat and academic performance are not replicable. For instance, in some recent studies of stereotype threat on females in math courses, no effects were found (Agnoli et al., 2021; Pennington et al., 2019). It has also been argued that stereotype threat has likely been overstated due to publication bias and studies with inflated or incorrectly interpreted results (Flore et al., 2018; Pennington et al., 2019; Picho-Kiroga et al., 2021; Shewach et al., 2019). These individuals contend that studies that support stereotype threat effects on achievement are published more often than those that contradict the phenomenon (Pennington et al., 2019). The implication here is that the inequity between published studies that support and refute stereotype threat's role in the

academic achievement gap (including those in which no effect is found) misleads the public, giving the impression that stereotype threat is more influential than it really is. Also, the disproportion of published studies causes metanalysis studies of the effect of stereotype threat on academic performance to report false results (Shewach et al., 2019).

Other skeptics claim that the impact of stereotype threat is mostly situational and that factors, such as socioeconomic status, parental or family support, and access to much needed educational resources, are more likely to create racial achievement gaps (Durante & Fiske, 2017; Flore et al., 2018). Further, they argue that stereotype threat is not a singular construct, rather, it is multifaceted and mediated and moderated by an uncertain number of factors (Flore et al., 2015; Flore et al., 2018; Pennington et al., 2016; Pennington et al., 2019). For instance, in research on gender-related stereotype threat, Pennington et al. (2018) used a multi-threat framework to describe the different forms of stereotype threat (e.g., self-as-target stereotype threat and group-as-target stereotype threat) experienced by female online gamers. Under this framework, stereotype threat is not only related to a person's social group, but to their individual performance or abilities, as well (Pennington et al., 2016; Pennington et al., 2018).

Some researchers have also criticized the perceived lack of field experiments related to stereotype threat and academic performance. Their argument is that existing research on the relationship between stereotype threat effects and academic performance is limited to laboratory or controlled environments (Pennington et al., 2018; Shewach et al., 2019). Further, they contend that the results of many of these studies (especially the studies that pertain to standardized testing) are artificial and would not occur in the real

world (Shewach et al., 2019). Purportedly, the conditions under which stereotype threat is activated in laboratory settings (e.g., presenting participants with a stereotype prior to a task or assessment) are not likely to exist outside of the laboratory, suggesting that the impact of social priming during experiments may be short-lived and not representative of what takes place in natural settings.

Response to Criticism

Stereotype threat has been met with skepticism since it was introduced in 1995. Therefore, current research has evolved in direct response to skeptics who attempt to devalue the power of stereotype threat. Researchers who support stereotype threat have been charged with providing support for Steele and Aronson's research, while simultaneously addressing the doubt that has been cast on the reliability and validity of stereotype threat-related studies (e.g., Borman, 2017; Casad & Bryant, 2016).

Although Steele and Aronson supported their initial study with follow-up research, such as how stereotypes affect intellect and the relationship between stereotype threat and collective threat (Steele, 1997; Steele et al., 2005), their work continues to be targeted by critics. Whaley (1998) was one of the first to question stereotype threat's role in the academic underperformance of African Americans, suggesting that there were issues with internal and external validity and generalizability in stereotype threat research, a sentiment that he also argued in one of his most recent studies (Whaley 2018). Steele countered Whaley's initial criticism in his commentary, "Stereotyping and its Threats are Real." In this commentary, Steele asserted that his work was not only internally and externally valid, but generalizable, as well (Steele, 1998).

Other researchers have also addressed the criticism of stereotype threat. For instance, Casad and Bryant (2016) argued that although critics of stereotype threat claim there is a lack of field research surrounding the topic, their literature review revealed multiple field studies that support the relevance of stereotype threat both in and outside of the laboratory setting. Further, Borman (2017) responded to criticism that stereotype threat studies are not replicable. He indicated that some researchers have failed to replicate the results of other stereotype threat experiments because they did not take context into account. Therefore, if a stereotype threat experiment is conducted in a learning context in which minority students are statistically the majority, stereotype threat may be low.

Self-Affirmation: From Theory to Intervention

Steele's (1988) self-affirmation theory suggests that when people encounter threats to their self-concept, their innate need to maintain their self-value will propel them to affirm the aspects of themselves that they view as moral and good. This process is believed to help restore any imbalance within the person's self-system that may have been caused by the threat. While the theory has been used to explain how people cope with threats to their self-concept, it has been translated into an intervention method to combat such threats in contexts ranging from healthcare to education (e.g., Borman, 2017; Borman et al., 2016; Fox et al., 2017; Goyer et al., 2017; Hadden et al., 2020; Jordt et al., 2017).

In the traditional classroom, self-affirmation has been found to help students who are vulnerable to stereotype threat achieve increased academic success, including test

performance (Borman et al., 2016). For instance, Lokhande and Müller (2019) discovered that brief self-affirmation writing interventions (short writing tasks about the students' personal values) helped improve the math test scores of female and ethnic minority high school students. Borman et al. (2016) found self-affirmation writing interventions to help improve the grade point average (GPA) and standardized math test scores of seventh-grade minority students. Further, Robinson (2014), in his case study of two female education students, found self-affirmation writing exercises to help students persist and complete their college-level programs. In the online learning context, Kizilcec et al. (2017) indicated that affirmation interventions also buffer the effects of stereotype and identity threats on students enrolled in massive open online courses (MOOCs). In their study, students enrolled in online ESL (English as a second language) courses, displayed better academic performance after completing affirmations writing activities.

How do Self-Affirmation Interventions Work?

As self-affirmation theory posits, people have a need to maintain a stable self-system (Steele, 1988). Therefore, this need requires individuals to find ways to adapt to the new information and its impact on their self-integrity. Intervention methods for coping with threats to self-integrity or self-concept typically fall under one of three categories: belief-based interventions, identity-based interventions, and resilience-based interventions (Liu et al., 2021). Belief-based interventions help individuals alter their beliefs about the threat, while identity-based interventions help the individuals disassociate their identities from their group identities (Liu et al., 2021). Resilience-based interventions, such as self-affirmation interventions, focus on increasing individuals'

resilience, and ultimately, their ability to combat self-threats (Liu et al., 2021). Unlike interventions categorized as belief-based and identity-based, self-affirmation methods do not require individuals to make changes, rather, they encourage people to accept themselves and their strengths, making them more resilient against threats like negative stereotypes. Therefore, in classroom settings, students subjected to self-affirmation interventions learn to view themselves in totality, not in relation to the perceived threat, helping them to perform more efficiently in stereotyped domains (Liu et al., 2021).

Self-Affirmation and the Brain. Self-affirmation has been found to counter the anxiety and negative effects experienced by individuals under stereotype threat and other instances of self-threat (Robinson, 2014). By reaffirming aspects of self-integrity, self-affirmation interventions can help restore a person's self-confidence, which may decrease anxiety and enhance performance. However, research indicates that there are specific neural processes associated with self-affirmation (Dutcher, et al., 2016; Falk et al., 2015; Harris et al., 2017). As expressed by Cascio et al. (2016), activity increases in brain structures related to rewards and positive valuation (e.g., the medial prefrontal cortex and posterior cingulate cortex) and emotion regulation (e.g., the ventrolateral prefrontal cortex and anterior cingulate cortex) during self-affirmation. However, the increases in activity are more substantial during self-affirmation interventions that emphasize future success. Cascio et al. (2016) explain that focusing on future success reinforces the positive effects of affirming one's values, which may be more impactful than values affirmation alone.

Self-Affirmation and Components of the Self. At its core, self-affirmation is primarily focused on how individuals cope with threats to their self-systems and their identities (Steele, 1988). In the online learning environment, components of the self, such as self-motivation, self-belief, and self-efficacy are considered essential to academic success (Dos Santos, 2020; Simons et al., 2018). Although they are also essential in brick-and-mortar classrooms, these constructs may be especially important in online classrooms where academic success depends largely on a student's self-directed learning and self-regulation abilities (Bradley et al., 2017; Kumi-Yeboah & Smith, 2016). Self-affirmation interventions are used to help strengthen these areas of the self (Kinias & Sim, 2016), helping students combat stereotype threat and improve their academic performance.

Failed Intervention Attempts

Self-affirmation interventions, while proven effective in some studies, have had minimal to no effect in other studies. For instance, Protzko and Aronson (2016) found no impact of their affirmation intervention on the academic performance of minorities in two different schools. Though their study was a modified replica of one conducted by Cohen et al. (2006) in which self-affirmation interventions improved the final grade of minority middle school students, Protzko and Aronson reported no significant impact on the participants' end of the term GPA. Dee (2015) was also unable to duplicate Cohen et al.'s (2006) results in his large-scale study of 2,500 middle school students. Additionally, Hanselman et al. (2017) failed to find significant effects of self-affirmation writing

interventions on GPA in their study of seventh and eighth-grade students, despite having found contrary evidence in their previous study (Borman et al., 2016).

Borman (2017) and Protzko and Aronson (2016) speculate that context might play a large part in whether self-affirmation interventions are successful. Borman (2017) contends that like stereotype threat, the effects of affirmation interventions may not be observable in contexts where minorities are numerically the majority. However, Protzko and Aronson (2016), suggest that self-affirmation interventions may be effective in environments "where the percentage of negatively stereotyped students is far from half of the student population" (p. 506). In either scenario, context seems to impair the effectiveness of self-affirmation interventions. Hanselman et al. (2017) added that the effects of self-affirmation may be fragile and that certain unidentified conditions may be required for successful intervention. Moreover, because self-affirmation interventions are not universal, there is a question of whether some interventions are more or less effective in specific contexts (Liu et al., 2021). As Cascio et al. (2016) demonstrated, self-affirmation interventions that emphasize future success over past success stimulate stronger brain activity, suggesting that future-based self-affirmation interventions may be more impactful.

Spontaneous Self-Affirmation

Although self-affirmation was found to mitigate the negative impact of stereotype threat on academic performance in some studies (Borman et al., 2016; Goyer et al., 2017; Lokhande & Müller, 2019), a continuing concern is how to ensure that the effects of self-affirmation persist (Brady et al., 2016). Therefore, unlike many of the existing studies on

self-affirmation and stereotype threat, the current study assesses self-affirmation in terms of spontaneous self-affirmation. Spontaneous self-affirmation occurs when individuals respond to threats to their self-systems naturally and automatically (Emanuel et al., 2018). In contrast to controlled settings, the individuals reflect on their positive attributes (e.g., values, beliefs, competencies, and goals) without having to engage in intervention methods, such as values affirmation writing assignments (Emanuel et al., 2018).

Spontaneous self-affirmation can occur when people are faced with everyday threats to their self-integrity or identity (Harris et al., 2019; Taber et al., 2016). Some studies have examined how the role of spontaneous self-affirmation impacts health. Emanuel et al. (2018) found that minorities, namely African Americans and Hispanics, who spontaneously self-affirm generally reported better mental health. Taber et al. (2016) conducted a study in which participants, former cancer patients, who reported frequent spontaneous self-affirmation also reported greater happiness and openness to information from their healthcare providers. Brady et al. (2016), on the other hand, examined spontaneous self-affirmation in terms of education. Their two-part study revealed that after a brief values affirmation writing exercise, the minority students (all Latino) reported higher grades and academic performance two years later. Participant essays, used as measures of spontaneous self-affirmation, indicated that these students had learned to instinctively affirm their self-values when faced with self-threats, possibly attributing to their enhanced classroom performance (Brady et al., 2016).

Summary and Conclusions

Research suggests that stereotype threat negatively affects the academic performance of minority students (Merillat et al., 2018; Platts & Hoosier, 2020; Tellhed & Adolfsson, 2018). Stereotype threat has even been cited as a contributing factor to what is known as the academic achievement gap, which exists between different groups of minority and majority students (Borman et al., 2016; Darnon et al., 2017; Jordt et al., 2017). The precise mechanism that underpins stereotype threat has yet to be determined; however, studies suggest that the anxiety caused by this phenomenon can be disruptive to the affected individual's self-system and working memory (Bedyńska et al., 2020). Contextual cues, such as social presence are also thought to influence if and how people experience stereotype threat. Further, research indicates that self-affirmation can be used as an intervention to counteract the negative effects of stereotype threat on individual performance in academic settings (Borman, 2017; Borman et al., 2016; Goyer et al., 2017; Hadden et al., 2020; Liu et al., 2021; Lokhande & Müller, 2019). Self-affirmation can also occur spontaneously or naturally, as individuals self-affirm in the face of a self-threat without the use of typical affirmation or values writing interventions (Brady et al., 2016).

Research has been conducted on stereotype threat and self-affirmation in laboratory and traditional classroom settings (Borman et al., 2016; Spencer et al., 1999; Steele & Aronson, 1995). These studies indicate that stereotype threat manifests in face-to-face learning and all grade levels. However, few studies have focused on stereotype threat in online college settings, and studies that compare stereotype threat vulnerability

in synchronous and asynchronous online college courses are non-existent. Therefore, the current study expands on the existing literature surrounding stereotype threat and self-affirmation in online classrooms, while also filling the gap in knowledge related to whether stereotype threat vulnerability varies in synchronous and asynchronous online learning contexts.

In Chapter 2, I offered an in-depth review of literature related to the theories and constructs central to the current study. An overview of the history and origins of stereotype threat, self-affirmation, and social presence was provided; criticism of stereotype threat theory and self-affirmation theory was discussed, as well. I also examined the academic achievement gap and the relationship between it and stereotype threat. The role that social presence, a contextual or situational construct, plays in stereotype threat and how self-affirmation is used to minimize the impact of stereotype threat was also discussed. Additionally, I discussed gaps in the literature, such as the lack of studies that compare stereotype threat in various online contexts, and how my study will help fill those gaps. In Chapter 3, I provide a framework for the structure of the study, elaborating on the quantitative design and methodology to be employed to examine the moderating relationships between self-affirmation, context, stereotype threat, and online academic performance.

Chapter 3: Research Method

Introduction

The purpose of this study was to examine the relationship between self-affirmation, stereotype threat, and academic performance in online classrooms. More specifically, the intent was to determine whether self-affirmation moderates the effects of stereotype threat on minority students in online courses. The purpose was also to examine the impact of context or learning format (asynchronous and synchronous) on the relationship between stereotype threat and academic performance in online classes.

This chapter presents the proposed research design and methodology for the study. Details regarding the variables and a rationale for the chosen design are provided. The target population, sampling strategy, and recruitment procedures are also discussed. Additionally, the data collection procedures, including a review of the collection of questionnaires and scales are provided. Further, the data analysis plan, possible threats to validity, and ethical considerations are discussed. A summary of the design and methodology concludes the chapter.

Research Design and Rationale

Quantitative, non-experimental research was selected for the study. Because quantitative research is a deductive approach in which a researcher can examine statistical relationships (Creswell & Plano Clark, 2018), it was more appropriate than qualitative research for this study. Three theories, self-affirmation theory, stereotype threat theory, and social presence theory, were used to examine the relationship between the variables in the current research. To assess the relationship among the variables, a

correlational design was used. Unlike an experimental research design, a correlational design is used to observe the link between variables rather than to determine whether one variable causes another (Curtis et al., 2016; Seeram, 2019). Also, the present study did not require random assignment or a control group. The variables were quantifiable, and the purpose of the study was to examine the relationship between the variables. Therefore, the variables did not require manipulation, only to be measured.

The independent or predictor variable in the study was stereotype threat, while academic performance was the dependent or outcome variable. Two moderator variables, self-affirmation and context, were included. Also, age, gender, and race served as covariates. The covariates were used to help account for any impact that demographic factors may have on the outcome of the study.

Two research questions were used to determine whether the relationship between stereotype threat and academic performance in online classrooms is moderated by self-affirmation and context (synchronous or asynchronous courses). Moderation analysis was used to address both research questions. Moderation analysis allows a researcher to determine whether the relationship between two variables is influenced by a third variable (Fairchild & McQuillin, 2010). According to Liu and Yuan (2021), "A statistical moderation implies that the size of a focal relationship between a predictor *X* and an outcome variable *Y* depends on the value of a third variable *Z*, called the moderator" (p. 680). In the current study, two moderated relationships were examined with stereotype threat as variable *X*, academic performance as variable *Y*, and self-affirmation and context both serving as variable *Z*. Further, previous research related to stereotype threat and

academic performance has focused on various factors thought to moderate the relationship between the two (e.g., Picho & Brown, 2011; Rice et al., 2013). Therefore, using moderation analysis in this study helped enhance the existing body of literature by allowing me to explore other possible moderating factors.

The current research was cross-sectional. This form of survey research allows self-report data to be collected once, rather than longitudinally (Creswell & Creswell, 2018). The participants were not studied continuously, and data were collected in one sitting. This made cross-sectional survey research ideal in this study, as it helped minimize the time and resource constraints associated with long-term designs, such as longitudinal studies (Caruana et al., 2015). Also, the areas to be crossed were the participants' ages, races/ethnicities, year in college, and learning format. The assumption was that those factors may influence the level of stereotype threat experienced by the participants. After the data were collected, it was examined to identify any patterns that indicated a potential correlation between the type of online course a student attended, the level of stereotype threat reported, the use of self-affirmation, and overall academic performance.

Methodology

Population

The primary purpose of the proposed quantitative study was to examine how self-affirmation impacts the relationship between stereotype threat and academic performance in online (synchronous and asynchronous) classroom environments. The target population for the study consisted of both male and female students enrolled in an

undergraduate, graduate, or postgraduate program. Participants were at least 18 years of age with access to the internet and an internet-accessible device.

Sampling Method and Sampling Procedures

Sampling Method

Non-probability sampling was used for the study. Unlike probability sampling, non-probability sampling does not include random selection, which helps ensure that all members of the target population have an equal chance of being selected for the study (Creswell & Creswell, 2018; Vehovar et al., 2016). As a result, non-probability sampling is sometimes criticized for its lack of representativeness, limited generalizability, and possible selection bias (Catania et al., 2015). While these may be plausible concerns or disadvantages of non-probability sampling, there are advantages that made it a logical choice for the current study. For instance, non-probability sampling is less time-consuming and less costly than probability sampling methods (Vehovar et al., 2016).

There are several non-probability sampling subcategories including convenience, purposive, quota, self-selection, and snowball. Of these subcategories, convenience sampling was the most appropriate for this study. The invitation was emailed to some respondents and either posted online or on campus for others. This allowed potential respondents to choose whether they wanted to participate, which also categorized my sampling method as volunteer sampling; volunteer sampling is a form of convenience sampling (Vehovar et al., 2016). Convenience sampling is often utilized when a researcher contacts potential participants via email (Tyrer & Heyman, 2016), which was one of the methods of recruitment that I employed. Using convenience sampling allowed

me to limit the scope of my sampling efforts to solely students engaging in online learning (either synchronous or asynchronous) and minimize the time required for sample selection and recruitment. Because convenience sampling does not require strict guidelines or parameters, I was able to continue my data collection efforts until the necessary sample size was obtained. Furthermore, although convenience sampling is often considered vulnerable to sampling error (Creswell & Creswell, 2018; Phillips, 2015), the sample was collected from multiple research sites, and the desired sample size exceeded the recommended minimum sample size. Increasing the sample size in a study is one way to avoid sampling error (Innocenti et al., 2021; Mascha & Vetter, 2018).

Sampling Procedure

Sampling procedures entail the methods that were used to assemble the sample population for the study. To gain access to the participants at the research sites, it was necessary to first obtain permission from the institutions' administrators. I sent an email to the campus administrators explaining the nature of the study and why their institution was selected. The email also requested that upon agreement, I would be provided with an assigned contact who would email the invitation and link to the online questionnaire instruments to the students.

Sampling Frame

Invitations to participate were emailed to all students enrolled in programs at the research sites. However, my target population was students enrolled in online programs and/or courses. Both students taking synchronous and asynchronous online courses were included. Additionally, students needed to have completed at least one academic year at

their respective universities so that they could report their cumulative grade point average. Thus, students who were enrolled in their programs for less than a year were excluded.

Sample Size

The minimum sample size for the study was 160; however, the desired sample size was 300 to help minimize sampling error. The minimum sample size was determined using G*Power (Faul et al., 2007; Faul et al., 2009), which is a statistical software program that can be used to determine the sample size for a study (Faul et al., 2007). To obtain the sample size, the researcher selects the appropriate options from drop-down boxes related to the type of statistical analysis being used, the power, the alpha value, the number of predictor or independent variables, and the effect size (Faul et al., 2009). To calculate the sample size for this study, the following was selected: *F* tests; Linear multiple regression: Fixed model, R^2 deviation from zero; Effect size f^2 of 0.15, alpha level of 0.05, and 95% power. The value for the effect size, 0.15, was selected to represent a medium effect size, which is typical in multiple regression analyses. A value of 0.05 was selected as the alpha level because it is commonly used in data analysis and typically indicates that there is a 5% probability of making a Type I error (Uttley, 2019). Ninety-five percent power was chosen because, as indicated by Uttley (2019), the higher the power of a statistical test is, the lower the chance of a Type II error occurring.

Procedures for Recruitment, Informed Consent, and Data Collection

Recruitment

Before recruiting participants from the research sites, I sent an email to the administrators at the selected schools requesting access to their students. A letter of cooperation was obtained from the appropriate officials. To help maintain the students' privacy, I did not request direct access to the students' email addresses. Instead, I requested that a designated contact send the invitations via email through each university's email system. However, one of the institutions opted to provide me with a random list of emails and asked that I email the invitation myself.

Participant recruitment for the study occurred over the internet. Online college and university students of all backgrounds were recruited; therefore, demographic characteristics did not impact recruitment. The invitation was emailed to participants at the research sites via their university email addresses; it was also posted online and on the campus of one of the research sites. The invitation informed prospective participants of the opportunity to voluntarily participate in a non-compensated study about the relationship between self-affirmation, stereotype threat, and academic performance. All three terms were briefly explained, and the purpose of the study was described. Informed consent was discussed, and the deadline for participation was stated as well. If a participant wished to complete the questionnaire, there was a link embedded into the email that he or she could click and be taken directly to Microsoft Forms where the questionnaire was hosted. Because the study was cross-sectional, the participants were able to complete the questionnaire in one session.

Informed Consent

Informed consent was provided electronically prior to the respondents completing the survey. It reiterated the voluntary nature of the study, the opportunity to withdraw their consent to participate at any time, and how anonymity would be protected. The informed consent statement also detailed the goal of the study, the procedures, the risks and benefits of participation, and the steps to ensure privacy and confidentiality. My contact information was provided as well.

Data Collection

After deciding to participate in the study, respondents clicked the link provided in the invitation email. The link routed the respondents to the informed consent statement, which had to be reviewed before beginning the questionnaire. To consent to the study, participants clicked a dedicated button at the end of the informed consent statement indicating their consent to engage in the study. Once the respondents provided consent, they were taken to another webpage that introduced the questionnaire, including the length of time required for responding and a statement that participation in the study would not be compensated. The introduction page also provided instructions on how to complete the questionnaire. The introduction did not contain items related to demographics. While demographics such as age, race, and gender were relevant to the study, they were obtained through items in the questionnaire.

Three individual instruments were translated into an online questionnaire. The Social Identities and Attitudes Scale (SIAS; Picho & Brown, 2011) was used to measure stereotype threat, the Spontaneous Self-Affirmation Measure (SSAM; Harris et al., 2019)

assessed self-affirmation, and items from the College Student Experience Questionnaire (CSEQ; Pace & Kuh, 1998) were used to assess academic performance. The final version of the questionnaire was uploaded into Microsoft Forms, an online questionnaire and survey platform. Respondents were able to access the questionnaire at any time and from any location using an internet-capable device.

At the conclusion of the questionnaire, all respondents were debriefed upon exiting. The debriefing process is akin to informed consent and is important because it helps ensure that participants further understand what took place in the study, the purpose of the study, and how their responses will be used (Newman, 2016). Debriefing participants also helps minimize psychological distress associated with the study (Allen, 2017). Therefore, after each participant completed the last question in the questionnaire, he or she viewed a webpage that contained a debriefing statement. In the debriefing statement, the respondents were thanked for their participation. They were also provided with an overview of the study, including its intent and hypotheses, as well as how their responses and the results of the study would be used. I also included my contact information if the respondents had questions or concerns. After reviewing the debriefing statement, the respondents were then able to conclude their session. The study was predicted to last at least one month; however, the time was extended to obtain maximum response rates. No follow-ups with respondents were needed.

Instrumentation and Operationalization of Constructs

Instrumentation

Stereotype Threat

Picho and Brown's (2011) Social Identities and Attitudes Scale (SIAS) was used to measure stereotype threat. This scale was derived as a means for measuring what Steele and Aronson termed "stereotype threat." The instrument is a 30-item scale that measures an individual's susceptibility to six different constructs thought to elicit stereotype threat. Respondents rate the items using a 7-point Likert scale. Permission to administer the instrument in research was not required; however, I emailed the author for approval to include the instrument in the study. The six constructs or subscales included in the SIAS are gender identification, gender stigma consciousness, ethnic identification, ethnic stigma consciousness, math identification, and negative affect (Picho & Brown, 2011). Each subscale is scored separately, with no cumulative score computed after completion of the measure.

The gender identification subscale measures the extent to which a respondent holds his or her gender as key to his or her identity, while the gender stigma consciousness subscale assesses how aware the individual is of stereotypes related to his or her gender. Like the gender identification subscale, the ethnic identity subscale measures the extent to which the respondent holds his or her ethnicity as vital to his or her overall identity. The ethnic stigma consciousness (ESC) subscale assesses the person's awareness of race/ethnic-related stereotypes. The math identification subscale measures the level of importance the individual places on math, and the negative affect

subscale measures the negative feelings the individual associates with math-related tasks. In the present study, only the five items on the ethnic stigma consciousness subscale were used to measure stereotype threat, as this subscale was the most relevant to the goal of the research.

The SIAS takes about 5-minutes to complete and can be administered online or via paper and pencil. In Picho and Brown's (2011) study, the test was administered online to 200 university students; the test was originally developed to measure stereotype threat in science, technology, engineering, and math (STEM) domains. The researchers determined the subscales to be highly reliable, with reliability estimates ranging from .81 to .95 (Picho & Brown, 2011). Regarding validity, the SIAS items were found to be high in content validity, with content validity being evaluated by 10 validators and content validity indexes (CVIs) of .08 or higher. Evidence of discriminant, convergent, and construct validity was found as well (Picho & Brown, 2011; Smith & Cokley, 2016). Discriminant and convergent validity were supported by bivariate correlations as high as .70. Further, in a review of the SIAS, Smith and Cokley (2016) found support for construct validity using a series of group invariances tests.

Self-affirmation

In past studies, self-affirmation has been predominately treated as a state or situational variable (e.g., Borman et al., 2018; Goyer et al., 2017). However, in more recent literature, self-affirmation is thought to also occur as a trait or stable variable (Brady et al., 2016; Emanuel et al., 2018; Harris et al., 2019). In such studies, self-affirmation is viewed as more than a temporary or manipulated intervention, but rather an

instinctual or spontaneous ability to use positive declarations to combat threats to one's self-concept.

In the current study, the moderating influence of self-affirmation was assessed via the 13-item Spontaneous Self-Affirmation Measure (SSAM; Harris et al., 2019). This measure, which was first administered to university students, can be administered online and was designed to evaluate a respondent's inclination to respond to self-threat with personal affirmations associated with his or her positive attributes and variables (Harris et al., 2019). Respondents rate their responses using a 7-point ordinal Likert scale. The 13 items in the scale are scored along three subscales that reflect three core domains of self-affirmation (strengths, values, and social relations) (Harris et al., 2019). An overall average score for the SSAM subscales is computed and used to measure self-affirmation.

Reliability and validity values reported for the SSAM suggest that it consistently and appropriately measures spontaneous self-affirmation. Internal consistency for the measure was $\alpha = .93$. Further, the results of the factor analysis indicated a good model of fit with, "CFI = .99, and RMSEA = .05 ($\chi 2$ (60) = 124.73, $p < .001$)" (Harris et al., 2019, p. 596). The factor analysis helps establish the structural and construct validity of the SSAM scale and its subscales (Atkinson et al., 2011; Harris et al., 2019). Although permission was not required to use the SSAM, approval was sought and received.

Academic Performance

Academic performance was assessed using the respondents' self-reported cumulative grade point average (CGPA) for at least one full academic year and was rated along a 4-point scale, ranging from 0.0–4.0. CGPA is a student's overall grade point

average (GPA) across all semesters of enrollment at an institution. It is deemed a valid and reliable metric in college and universities (Dabaliz et al., 2017). CGPA has been found to have higher reliability and predictive validity than GPA (Bacon & Bean, 2006). Further, although the accuracy of self-reported grades has been questioned (Kuncel et al., 2005; Schwartz & Beaver, 2015), some studies suggest that self-reported CGPA correlates as high as .97 with the CGPA recorded in official school records (Bacon & Bean, 2006; Cassady, 2001); this supported the use of self-reported CGPA data in the current study.

The background section from the College Student Experience Questionnaire, fourth edition (CSEQ; Pace & Kuh, 1998) was used as the assessment. This section of the CSEQ asks respondents demographic questions, such as their age, gender, race, classification (e.g., freshman, sophomore, junior, etc.), and grades (e.g., A, A-, B+, etc.). The CSEQ was constructed to assess undergraduate college students' usage of educational facilities and resources, to assess the amount of effort the students invest in their overall learning experience, and to capture their perceptions of their desired learning outcomes and goals (Geisinger et al., 2005; Pace & Kuh, 1998). The questionnaire contains more than 150 items and assesses three aspects of the college experience: college activities, college environment, and estimate of gains (Pace & Kuh, 1998). It is estimated to last 30 minutes and can be completed via pencil and paper or online. Permission to modify and administer the instrument was obtained from the publisher via email before using it.

The CSEQ items related to college experience were not used, as they were not relevant to the current study. However, the items have been proven highly reliable. For example, the CSEQ scales have acceptable internal consistency, with coefficient alphas ranging from .70 to .92. Most of the inter-item correlation values range from .3 to .4 or higher (Gonyea et al., 2003). Further, the CSEQ has both construct and content validity. Concerning construct validity, the questionnaire is underpinned by student engagement theory (Braun et al., 2012). The scales were designed based on existing literature related to learning and development (Gonyea et al., 2003).

As evidence of content validity, the CSEQ has been used by various experts to evaluate key dimensions of postsecondary learning (e.g., Abera et al., 2020; Atuahene, 2021; Soeherman, 2010; Teoh et al., 2013). By its third edition, the CSEQ had been used by hundreds of higher learning institutions to understand the experiences of their undergraduate students (Kuh & Hu, 2001).

Context

Context was represented by the respondents' learning format. Learning format was assessed through questions added to the CSEQ Background items (e.g., Are you taking synchronous courses, asynchronous courses, or both?). In addition, other open-ended items were added to the questionnaire that asked respondents about their length of time in their program and their major.

Operationalization of Constructs

The operationalization of constructs or variables is an important part of the

research process. Operationalization entails translating a conceptual idea into an observable or measurable one (Andrade, 2021a; Andrade, 2021b). It is during operationalization that variables are defined in terms of how they will be measured, the scale(s) that will be used (e.g., nominal, ordinal, interval, etc.), and how scores will be computed and what they will represent. Therefore, the operational definitions of stereotype threat, academic performance, self-affirmation, and context are described in this section.

Stereotype Threat

Stereotype threat was operationalized as the level of risk of being impacted by ethnic stigma consciousness; this is also one of the six SIAS subscales created by Picho and Brown (2011). Stereotype threat theory arose from research that explored the impact of belonging to a stigmatized group on the academic performance of African American college students (Steele & Aronson, 1995). Therefore, because this study was concerned with race and ethnic stereotype threat, measuring stereotype threat in terms of ethnic stigma consciousness was logical. The ethnic stigma consciousness subscale consists of five questions rated on a 7-point ordinal Likert scale ranging from “Strongly Disagree” to “Strongly Agree.” The total of the selected responses reflects the respondents’ score on the subscale; each SIAS subscale is scored individually with no computed overall SIAS scale score. The lowest score on the subscale is 5 and the highest is 35. The respondents’ scores on the subscale were used to determine how impacted they were by stereotype threat as measured by ethnic stigma consciousness.

Academic Performance

Two methods for measuring student academic success or performance are grade point average (GPA) and cumulative grade point average (CGPA). A student's GPA is typically calculated for a particular quarter or semester and is derived by dividing the sum of the student's total scores by their number of credit hours (Ogundokun et al., 2019). Contrastingly, CGPA is the overall average of a student's grades at the institution and is thought to help predict that student's outcomes outside of the institution (Ogundokun et al., 2019; Taylor et al., 2013). While both GPA and CGPA are considered reliable measure of academic performance, CGPA provides a more comprehensive overview of academic performance (Bacon & Bean, 2006). Therefore, consistent with prior research studies on the academic performance indicators of college students (e.g., Bonsaksen et al., 2017; Grass et al., 2017), academic performance in this study was measured in terms of student CGPA.

The background section of Pace and Kuh's (1998) CSEQ was used as the instrument for capturing student CGPA; this section of the questionnaire collects demographic and biographical information from the students, including self-reported letter grades. An additional item was added to the assessment that allowed the participants to provide their CGPA. Cumulative grade point average, a continuous variable, was measured along an interval scale.

Self-affirmation

Self-affirmation has been defined as a person's ability to recall their strengths and values to help them cope with threats to their self-concept (Steele, 1988). It is often

considered a deliberate act that is often prompted by intervention methods, such as value-focused writing exercises. However, in this study, self-affirmation was measured in terms of spontaneous self-affirmation. Spontaneous self-affirmation differs from typical self-affirmation in that, individuals who spontaneously self-affirm do so naturally and without manipulation (e.g., writing interventions) when they encounter psychological threats (Brady et al., 2016; Emanual et al., 2018; Harris et al., 2019; Taber et al., 2016). Thus, self-affirmation was measured in terms of how naturally inclined an individual is to focus on their strong points and values when faced with a psychological threat (Borman et al., 2016; Borman et al., 2018).

The SSAM was used to measure spontaneous self-affirmation. Each participant received an average score on the SSAM, which was computed from their scores on the SSAM's three subscales (Strengths, Values, and Social Relations). Both the strengths and values subscales contain four items, while the social relations subscale contains 5 items. All three subscales are rated on a 7-point ordinal Likert scale. Harris et al. (2019) suggested the following formula for computing the SSAM score:

SSAM = (strengths + values + relations)/3

strengths = (SSAM 1 + SSAM 8 + SSAM 9 + SSAM 13)/4

values = (SSAM 2 + SSAM 3 + SSAM 5 + SSAM 12)/4

relations = (SSAM 4 + SSAM 7 + SSAM 6 + SSAM 10 + SSAM 11)/5

The item number that corresponds with each subscale is indicated in the parentheses (e.g., SSAM 1, SSAM 8, SSAM 9, etc.). The lowest possible score on the SSAM is 1, while the highest possible score is 7.

Context

Context, in this study, was measured in terms of a respondent's learning format. Learning format refers to how the respondent attends class and was classified into *synchronous*, *asynchronous*, and *both* categories. The categories were then expressed numerically according to the number of respondents who reported attending class synchronously versus those who attended asynchronously or were taking both synchronous and asynchronous courses. This allowed context to be treated as a dichotomous, categorical variable that was measured along a nominal scale.

Data Analysis Plan

Data analysis is an important stage in the research process. It is in this stage that the collected data is evaluated and analyzed for accuracy and interpretation. Before data is analyzed through statistical tests, it should be screened and cleaned so that missing or inaccurate values do not impact the results of the study (Abdulwahab et al., 2011). Data screening and cleaning also helps researchers identify possible violations of statistical tests.

Data Screening and Cleaning

The data were analyzed using IBM SPSS Statistics. SPSS Statistics is statistical software that is used to run a multitude of statistical tests, including multiple regression. Prior to running the analysis, I screened and cleaned my data. Data screening and cleaning are important to ensure the veracity of a dataset. The process of screening and cleaning data primarily entails checking the accuracy and completeness of the data (Abdulwahab et al., 2011; Van den Broeck et al., 2005). It is vital to detect incomplete

responses and coding and item scoring errors. Therefore, I examined the data for outliers and other anomalies in the dataset, deleting, replacing, or modifying them as appropriate. I also checked the distribution of the data to assess how widespread the values are in the dataset, which assisted with identifying missing values and outliers, as well as patterns or trends (Van de Broeck et al., 2005). This was accomplished by running a frequency distribution in SPSS.

Research Questions and Hypotheses

RQ_1: Quantitative: To what extent is the relationship between stereotype threat, as measured by ethnic stigma consciousness, and the academic performance, as measured by cumulative grade point average of online minority students, moderated by spontaneous self-affirmation when controlling for age?

H_0: Spontaneous self-affirmation does not moderate the relationship between stereotype threat vulnerability and online academic performance.

H_1: Spontaneous self-affirmation moderates the relationship between stereotype threat vulnerability and online academic performance.

RQ_2: Quantitative: To what extent is the relationship between stereotype threat, as measured by ethnic stigma consciousness, and academic success, as measured by cumulative grade point average in online courses, moderated by differences in synchronous and asynchronous contextual cues when controlling for age?

H_0: The relationship between stereotype threat vulnerability and online academic performance is not moderated by the contextual cues present in synchronous and asynchronous online courses.

H_1: The relationship between stereotype threat vulnerability and online academic performance is moderated by the contextual cues present in synchronous and asynchronous online courses.

Statistical Tests

Hierarchical regression, a form of moderated multiple regression was used to test the two hypotheses in the study. Moderated multiple regression (MMR), introduced by Saunders (1956), is in essence, a correlational analysis (McClelland et al., 2017). It is used when a researcher wants to examine the relationship between multiple predictor variables and one outcome variable (Creswell & Creswell, 2018). A basic model or equation for a moderated multiple regression is: $Y = \beta_0 + \beta_1 X + \beta_2 Z + \beta_3 X \bullet Z + \varepsilon$, where Y represents the outcome or dependent variable, X is the predictor or independent variable, Z is the moderator variable, β is the beta coefficient, β_0 is the intercept, and ε is the error term (Aguinis et al., 2005). In this study, hierarchical multiple regression was used to measure the strength of the relationship between two moderator variables (self-affirmation and context or learning format), stereotype threat, and academic performance. The collected data were filtered prior to the moderation analysis. Filtering the data allowed me to focus only on the minority cases (e.g., African Americans) for the first research question.

Hierarchical multiple regression follows the assumptions for multiple regression. Those assumptions are: (1) there is a linear relationship between the independent (predictor) and dependent (outcome) variables, (2) there is multivariate normality, (3) there is no multicollinearity in the data, (4) no autocorrelation in the data, (5)

homoscedasticity of error variances, and (6) there are no significant outliers in the data (Jeong & Jung, 2016). These assumptions must be met for the results of the statistical test to be accurate.

The linearity, normality, and homoscedasticity assumptions can be observed or tested using a scatterplot created in SPSS. A scatterplot shows whether the residuals are normally and equally distributed (normality and homoscedasticity) and if the resulting pattern of the residuals forms a straight line (linearity). The autocorrelation assumption refers to the independence of the residual values. This assumption is tested by the Durbin-Watson test in SPSS; the Durbin-Watson statistic ranges from 0.0-4.0, with values at or around 2 indicating the residuals are independent (Jeong & Jung, 2016). Further, the assumption of multicollinearity refers to whether there is high intercorrelation among the predictor or independent variables, which can result in inaccurately high confidence intervals that undermine the statistical significance of the outcome variable (Allen, 1997; Kim, 2019). Multicollinearity is tested by either checking the correlation coefficients in a correlation matrix or by generating variance inflation factors (VIF) in SPSS. Multicollinearity is present if the correlation coefficient values are more than .80 or if the VIF is more than 10 (Jeong & Jung, 2016; Kim, 2019). Simply removing the problematic variable(s) are methods for resolving multicollinearity.

Three covariates (age, gender, and race) were included in the study. In research studies, it is important to account for factors that may have a predictive impact on the outcome or dependent variable. Therefore, such factors must be controlled to ensure that any observed interactions are caused by the predictor and moderator variables (Creswell

& Creswell, 2018). Age, gender, and race are variables that have been studied as predictors in previous studies related to stereotype threat (e.g., Alfarhan & Dauletova, 2019; Bowe et al., 2017; Chasteen et al., 2005), thus, they were treated as control variables in the present study.

The resulting outputs for MMRs typically display values such as the slope (b), *t*-value, *F*-statistic, degrees of freedom, significance levels (*p*), beta coefficient (β), confidence intervals at 95%, Pearson's r, and coefficient of determination (R^2). These values were important in the present study because they indicate how well an independent (predictor) variable and the interaction between the independent and moderator variables predict the dependent (outcome) variable.

Threats to Validity

Heale and Twycorss (2015) describe validity as "the extent to which a concept is accurately measured in a quantitative study" (p. 66). There are different types of validity, such as external validity, internal validity, and construct validity. External validity is associated with representation and generalizability, while internal validity relates to whether the independent variable actually causes the dependent variable; construct validity refers to whether the instruments used accurately measure or capture the constructs they were designed to represent (Bedford & Spekle, 2018; Creswell & Creswell, 2018; Flannelly et al., 2018; Murad et al., 2019). Each form of validity has its own list of potential threats, and steps must be taken to ensure that the study measures what it is supposed to.

External Validity

Due to the design and data collection method selected for the current study, there was the possibility for external validity threats. External validity pertains to how generalizable the results of a study are (Creswell & Creswell, 2018; Murad et al., 2019). Cross-sectional designs and convenience sampling methods are methodological components typically considered low in generalizability (Setia, 2016; Spector, 2019). To account for this threat to validity, generalizations were only made about the target population and the correlation among the variables. Also, a larger sample than needed was obtained to counteract selection bias threats, which are often associated with convenience sampling (Innocenti et al., 2021; Mascha & Vetter, 2018). Additionally, the cross-sectional design helped prevent history or multiple-treatment interference threats because the instrument was only administered one time. Another possible threat to the study was interaction of setting and treatment. This threat refers to how the research environment influences the study results (Creswell & Creswell, 2018). In this study, respondents completed the questionnaires online from various locations; therefore, I did not have any knowledge of their setting and how it may have impacted their responses. To address this threat, the research can be repeated in a variety of settings to identify any differences in the results (Creswell & Creswell, 2018); this strategy may be feasible at a later date.

Internal Validity

Internal validity typically applies to experimental and quasi-experimental studies in which causal relationships are examined (Creswell & Creswell, 2018; Flannelly et al.,

2018). It refers specifically to whether the independent variable or some extraneous variable caused the dependent variable. Some common threats to internal validity are history, maturation, mortality, testing, and instrumentation; these threats relate to the participants and the methodological procedures employed during the study (Creswell & Creswell, 2018). The increased sample size and cross-sectional nature of the current study helped combat the aforementioned threats, as the questionnaire was completed in one session and did not involve a pretest or posttest. Also, the current study was concerned with correlational relationships and was not intended to establish cause-and-effect. Therefore, there were limited issues with internal validity.

Construct Validity

Construct validity describes how well an instrument or measure captures its intended construct or variable (Bedford & Spekle, 2018; Cruzes & ben Othmane, 2017). To avoid threats to construct validity in the current study, the operational definitions for the constructs and the instruments used were consistent with those used in existing literature. Further, the selected instruments were aligned with or based on the appropriate relevant theories. Because of the careful selection of instruments, any threats to construct validity were minimized.

Ethical Procedures

Like other research studies, the current study was not impervious to ethical issues. Therefore, I adhered to the guidelines set forth by the American Psychological Association. Prior to the study, any necessary agreements permitting access to the students were obtained from the appropriate university personnel. This agreement was

obtained in writing but through email. To protect the participants, I provided them with an informed consent statement that explained the research to be conducted, confidentiality and privacy assurances, and the right to withdraw consent at any time. A debriefing statement was also provided at the conclusion of the questionnaire that recapped the research and offered my contact information for follow-up questions and concerns.

The data were collected through Microsoft Forms and were kept confidential, as only I had access to the data and the account was password protected. The questionnaires were completed anonymously. Apart from one research site, the email invitations were sent by a contact at the universities. While the contact had access to the students' email addresses, they did not have access to the students' responses. Further, all respondents had a reasonable expectation of privacy. Although personally identifiable information was not collected or shared, the questionnaires were completed online, thus, information such as their IP addresses may have been tracked. However, the settings in my Microsoft Forms account were adjusted to restrict the collection of such data.

To minimize conflicts of interest, no incentives or coercion were used. Students were assured that their participation was both voluntary and anonymous and would not impact their grades or relationship with the institution in any way. An additional concern was the participants' access to the questionnaire. Differences in technological abilities and access to minimum technology requirements (e.g., computers, email addresses, internet, etc.) often preclude certain individuals from online surveys and questionnaires (Mclnroy, 2016). However, because the target population was online students, it was

reasonable to assume that the respondents would possess both the skills and access to the technology needed to complete the questionnaire.

To ensure that my research fully aligned with the ethical expectations of the APA, approval from the Walden University Institutional Review Board (IRB) was sought. An approved application complete with IRB approval numbers was obtained (approval #08-30-22-0120950).

Chapter Summary

In this chapter, I described the research design and methodology for the proposed study. It was determined that a quantitative, correlational approach was appropriate, more specifically, a cross-sectional survey design was used. The variables, including the independent variable (stereotype threat), dependent variable (academic performance), moderators (self-affirmation and context), and covariates (age, gender, and race) were identified, and the rationale for the design was discussed. The target population, reason for a convenience voluntary sampling strategy, participant selection and recruitment procedures, and sample size were discussed, as well. Additionally, details regarding the data collection and analysis procedures and the three instruments that were used to measure the constructs were provided. The chapter concluded with the data analysis plan, possible threats to validity (e.g., external, internal, and construct validity), and ethical considerations were addressed. In Chapter 4, I discuss the results obtained after data collection and analysis were completed.

Chapter 4: Results

Introduction

The purpose of this quantitative correlational study was to examine the moderating impact of spontaneous self-affirmation and context on the relationship between stereotype threat and online academic performance. The independent variable in the study was stereotype threat. The dependent variable was academic performance. The moderating variables were spontaneous self-affirmation and context. Microsoft Forms was used to create an online questionnaire that was used to collect the data and assess the variables. The online questionnaire began with an informed consent section followed by a demographics section, which contained questions about the respondent's gender; age; race and ethnicity; classification and major; cumulative grade point average (CGPA), and course format (e.g., synchronous, asynchronous, etc.). The questionnaire also contained two instruments designed to measure spontaneous self-affirmation and stereotype threat.

Two quantitative research questions were used to guide the study. The first research question was based on literature that suggests that self-affirmation interventions can decrease the negative effects of stereotype threat on academic performance in minority students (e.g., Borman et al., 2021; Brady et al., 2016). The second research question was based on the belief that context or environment can exacerbate stereotype threat vulnerability (Dennehy et al., 2018; Wu et al., 2020). Moderation analysis, by way of hierarchical multiple regression, was used to address both research questions and to test the corresponding hypotheses. The research questions and hypotheses were as follows:

RQ_1: Quantitative: To what extent is the relationship between stereotype threat, as measured by ethnic stigma consciousness, and the academic performance, as measured by cumulative grade point average of online minority students, moderated by spontaneous self-affirmation when controlling for age?

H_0: Spontaneous self-affirmation does not moderate the relationship between stereotype threat vulnerability and online academic performance.

H_1: Spontaneous self-affirmation moderates the relationship between stereotype threat vulnerability and online academic performance.

RQ_2: Quantitative: To what extent is the relationship between stereotype threat, as measured by ethnic stigma consciousness, and academic success, as measured by cumulative grade point average in online courses, moderated by differences in synchronous and asynchronous contextual cues when controlling for age?

H_0: The relationship between stereotype threat vulnerability and online academic performance is not moderated by the contextual cues present in synchronous and asynchronous online courses.

H_1: The relationship between stereotype threat vulnerability and online academic performance is moderated by the contextual cues present in synchronous and asynchronous online courses.

This chapter provides details about the data collection process, including the time frame, recruitment, and response rates. Discrepancies in the data collection plan from Chapter 3 are discussed. Further, the baseline descriptive, representativeness of the sample, and the sample's demographic characteristics are described. Additionally, I

provide a justification for the inclusion of the covariates.

The results of the study are also presented in this chapter. Descriptive statistics and an evaluation of the statistical assumptions are described. The findings from the statistical analysis, including the probability values, confidence intervals, effect size, correlation coefficient, and regression coefficient are provided. Tables and figures are used to present the results. Chapter 4 ends with a summary of the answers to the research questions and an introduction to Chapter 5.

Data Collection

Data collection for the study adhered to the protocol approved by the Walden University IRB. However, four partner sites were included in the study instead of three as initially proposed. Also, a filter question was added to the questionnaire to prevent unqualified respondents from participating in the study. Additionally, to obtain the desired sample size, the research invitation was also posted on three online platforms: Social Psychology Network, Psychological Research on the Net, and Facebook.

Recruiting from the Partner Sites

The recruitment phase of the study began in August 2022 after conditional approval was granted by Walden University's Institutional Review Board (approval #08-30-22-0120950). To identify potential research sites, I conducted a Google search for colleges and universities that offered both synchronous and asynchronous online courses. Nineteen institutions were selected based on their demographics. Because stereotype threat has been found to occur in environments where racial minorities are also the numeric minority (Casad & Bryant, 2016), it was necessary to include institutions where

minority students are not the majority. Therefore, I selected prospective research sites where Caucasian students were the majority. Consequently, due to low response rates and challenges with obtaining the necessary permission from some of the research sites, an additional partner site where Caucasians were the minority was later added. Recruitment requests for site approval were emailed to the review boards at the 19 institutions. Three institutions responded and agreed to participate in the study, while six others declined the request. Three institutions initially agreed to participate and then later reversed their decision, while seven more failed to respond to the recruitment request.

I completed IRB approval forms for the four colleges and universities that agreed to participate. After receiving approval and letters of cooperation from those partner sites, I contacted the Walden University IRB for final approval to begin the study. Once the study was granted final approval, I emailed the deans of the institutions requesting their assistance with sending the research invitation to the students. One of the deans agreed to include the invitation in the school's weekly newsletter email to their students, and the second opted to share the invitation on their student engagement platform. The third institution agreed to post flyers on the physical campus. For that institution, I created a flyer that contained the same information as the email invitation, except for an added scannable QR code. Scanning the QR code with a cellphone allowed participants to be forwarded directly to the questionnaire. The last institution chose to randomly select and provide me with 500 student email addresses. I emailed the research invitation to the students on March 13, 2023, using my Walden University email account.

The partner sites consisted of three, four-year colleges and universities, and one two-year community college. Degree programs ranged from technical and professional to academic. Two of the institutions are in the Midwestern United States, while the other two are in the Northeastern United States. All four of the sites are predominately female. Three of the schools are predominantly Caucasian, with Caucasian students comprising at least 55% of the student body. The fourth institution is predominately Hispanic (nearly 50%).

Additional Data Collection Efforts

Participants began responding to the questionnaire on December 2, 2022. After three months, only 18 questionnaires had been completed. Thus, due to low response rates from the participants at the research sites, other data collection efforts were needed. As Plous (2000) indicates, internet websites are not only convenient, but they permit a large and diverse audience to be reached with general ease. Also, researchers have control over where their study invitations are advertised, allowing them to target audiences of their choice (Whitaker et al., 2017). Therefore, after receiving approval from the Walden University IRB, I completed online requests on March 18, 2023, to have my questionnaire link posted on the Social Psychology Network and Psychological Research on the Net websites. The site administrators of both websites approved the requests and posted a direct link to the questionnaire on March 20, 2023.

Social Psychology Network

Social Psychology Network (socialpsychology.org) is an academic website created in 1996 by Wesleyan University professor, Scott Plous, a former graduate advisee

of American psychologist, Philip Zimbardo, who is known for his 1971 Stanford Prison Experiment (Zimbardo, 2022). The Social Psychology Network website offers links to a variety of educational resources ranging from psychology textbooks to professional journals. The website contains links to more than 100 online psychology-related research studies and receives nearly 3,000 views daily. To increase visibility, the links are also publicized on the website's social media pages. The present study was listed under the "Beliefs and Attitudes" section of the website.

Psychological Research on the Net

Psychological Research on the Net (psych.hanover.edu/research/exponnet.html) is also an academic website. It was created by John Krantz, a professor at Hanover College. Like the Social Psychology Network, it contains links to various psychology-related online experiments. The experiments are listed by topic. The current study was listed under the "Social Psychology" heading on the website.

Facebook

In addition to the Social Psychology Network and Psychological Research on the Net websites, I posted the research invitation on facebook.com on April 3, 2023, using my personal account; there were 45 participants at the time. Facebook is a social media platform that allows its users to network and socialize with other users around the world. It has been used in qualitative and quantitative studies ranging from health research to radical ideations (Sikkens et al., 2016; Whitaker et al., 2017). According to Rife et al. (2016), Facebook provides a large and heterogenous pool of prospective research participants and allows for generalizable results. Sikkens et al. (2016) and Whitaker et al.

(2017) suggest that Facebook is an inexpensive and quick way to recruit participants that are otherwise hard to reach, such as individuals in different locations and regions. In this study, using Facebook to recruit participants eliminated the limitation of only recruiting from specific colleges and universities. This allowed any student enrolled in online classes no matter their institution to participate in the study, possibly making the data more generalizable to the current population of online students.

After being advertised on Facebook for a little more than a month, the questionnaire was closed on May 8, 2023. There were 313 respondents at that time. The questionnaire remained open to participants at all four research sites while simultaneously being posted on the Social Psychology Network, Psychological Research on the Net, and Facebook. Therefore, it is not possible to determine how many participants were recruited from the partner sites or the websites.

Cleaning and Recoding the Data

Three hundred and thirteen respondents completed the questionnaire; however, after the data were cleaned, 299 completed questionnaires remained. Because the target sample was at least 160 participants, the remaining sample size was sufficient. The data were cleaned to remove questionnaires completed by participants who were not enrolled in online courses. Those questionnaires were identified by a filter question that only allowed participants enrolled in online classes to continue with the questionnaire. Ten questionnaires were removed based on the response to the filter question. Additionally, questionnaires with nonsensical responses to the CGPA item were also removed; four

questionnaires were removed due to incorrect CGPA responses. Removing these 14 questionnaires helped prevent invalid and missing cases when the data were analyzed.

To prepare the data to be imported into SPSS Version 28 for analysis, the demographic variables (except age and CGPA) and questionnaire responses were transformed and recoded into numerical values. Most of the demographic variables were qualitative, string variables with no quantitative value. The questionnaire responses, which were downloaded from Microsoft Forms as qualitative data, were also recoded. The recoding process helped make it possible to obtain the baseline statistics. Coding does not alter a nominal variable but enhances it and makes it useable during data analysis (Gniazdowski & Grabowski, 2015).

Baseline Descriptive and Demographic Characteristics of the Sample

Participants were asked demographic questions related to their gender, race, age, classification (e.g., freshman, sophomore, junior, senior, etc.), number of years in their degree program, major, course format (e.g., synchronous, asynchronous, or both), and cumulative GPA. Baseline descriptive statistics, such as mean and standard deviation, were reviewed to understand the characteristics of the sample, which consisted of 299 adults ranging in age from 18 to 69. The average age was 37.6 years old. Females (n = 233) and males (n = 62) were not equally represented in the sample, and only .7% of the sample identified as non-binary (n = 2) with the remaining .7% preferring not to disclose their gender (n = 2). Most of the respondents were either Caucasian (n = 132) or African American (n = 126) graduate or postgraduate students enrolled in asynchronous courses, with the majority having been in their degree programs for 1-3 years. Although there

were 41 participants of either Hispanic, American Indian, or Asian descent, they were excluded from the hypothesis test for the first research question because there are so few in each group. Also, I was unable to interpret the differences in their mean scores on the measures. Therefore, the hypothesis testing was confined to participants who self-identified as African American or Caucasian. Further, it should also be noted that 30% of the total sample self-reported a CGPA of 4.0, which may have impacted the regression analyses. This observation is discussed later in the chapter.

The question regarding the participants' majors was open-ended, allowing for a wide range of responses. Therefore, to simplify the analysis, related majors were grouped together using the degree programs listed in the course catalogs for the four research sites. The result was eight primary areas of study, including one for participants who were undecided about their major. A breakdown of the areas of study, as well as the baseline descriptive statistics for the demographic characteristics is provided in Tables 1 and 2.

Table 1

Baseline Demographic Characteristics of the Sample

Variable	*n*	%
Gender		
Female	233	77.9
Male	62	20.7
Non-binary	2	.7
Prefer not to answer	2	.7
Race		
African American	126	42.1
Caucasian	132	44.1
Mexican American	7	2.3
Other Hispanic	22	7.4
American Indian	4	1.3
Asian	8	2.7
Classification		
Freshman	16	5.4
Sophomore	27	9.0
Junior	18	6.0
Senior	20	6.7
Graduate	112	37.5
Postgraduate	106	35.5
Years in Program		
One year	86	28.8
Two years	75	25.1
Three years	86	28.8
Four years	26	8.7
More than four years	26	8.7
Course Format		
Synchronous	53	17.7
Asynchronous	181	60.5
Both	65	21.7
Area of Study		
STEM	13	4.3
Business, Management, Leadership, and Marketing	31	10.4
Social and Behavioral Sciences	105	35.1
Human and Social Services	26	8.7
Humanities	14	4.7
Education	57	19.1
Health Sciences and Public Health	35	11.7
Nursing	16	5.4
Undeclared	2	0.7

Note. $N = 299$ (n = number of participants for each condition).

Table 2

Descriptive Statistics for Age and Self-Reported CGPA

Variable	Mean	*SD*	Min	Max
Age	37.6	11.4	18	69
Self-reported CGPA	3.7	.4	2	4

Reliability of the Measures and Computing the Scores

Following the demographic questions, the participants completed two measures, the ethnic stigma subscale from the Social Identities and Attitudes Scale (SIAS), which was designed to measure stereotype vulnerability, and the Spontaneous Self-Affirmation Measure (SSAM), which assesses an individual's tendency to spontaneously self-affirm in difficult or negative situations. The reliability of the measures has already been established in previous studies. However, Cronbach's alpha was calculated for both measures. Cronbach's alpha is a measure of internal consistency among scale items (Ghazali, 2016). The ethnic stigma subscale consists of 5 items and had a Cronbach's alpha of $\alpha = .91$, while the SSAM consists of 13 items with a Cronbach's alpha of $\alpha = .97$. These values along with other descriptive statistics for the two measures are displayed in Table 3.

Both scales were measured on a 7-point ordinal Likert scale ranging from either "Strongly Disagree" to "Strongly Agree" or "Disagree Completely" to "Agree Completely." As mentioned previously, the participants' questionnaire responses were recoded from qualitative data to quantitative values so that the total scores on the measures could be computed. The methods for computing participants' scores on the two measures are described in the following sections.

Ethnic Stigma Consciousness

The 30-item SIAS contains six separate subscales measured along a 7-point Likert scale. However, only the most relevant of the subscales, the 5-item ethnic stigma consciousness (ESC) subscale, was included in the questionnaire. To obtain their scores, each participant's responses to the subscale items were totaled. The lowest possible score on the subscale was 5 and the highest possible score was 35. The mean score on the subscale was 17.6. The descriptive statistics for the ESC subscale are presented in Table 4.

Spontaneous Self-Affirmation

The 13-item SSAM contains three subscales (Strengths, Values, and Social Relations), all of which were used in the questionnaire. The strengths and values subscales contain four items, while the social relations subscale contains 5 items; the subscales are rated on a 7-point Likert scale. The participants' SSAM scores were obtained by computing the average for each individual subscale and then computing the average of those scores to obtain a total composite score, which corresponds with the formula recommend by Harris et al. (2019). The formula allows for the subscales to be weighted equally. The lowest possible score on the measure is 1 with the highest being 7. The mean score on the SSAM was 4.7. The descriptive statistics for the SSAM are presented in Table 5.

Racial Differences on Ethnic Stigma and Self-Affirmation

To observe the variance among the racial groups, I conducted a oneway ANOVA. The oneway ANOVA includes an *F*-test which is used to determine whether there is a

difference in the group mean (Chen et al., 2018). The results of the *F*-Test are considered significant if $p \leq .05$ when $\alpha = .05$. Therefore, the test for the difference between means among the ESC subscale was significant with $F(5, 293) = 12.70$, $p < .001$ as shown in Table 4. Further, there was also significant variability among the SSAM scores by race ($F(5, 293) = 4.20$, $p = .001$) as shown in Table 5.

Table 3

Descriptive Statistics for Measures of Stereotype Threat and Spontaneous Self-Affirmation

Measure	Mean	*SD*	Number Of Items	α
Stereotype Threat				
Ethnic Stigma Consciousness	17.57	8.57	5	.91
Spontaneous Self-Affirmation	4.68	1.63	13	.97

Table 4

Total Ethnic Stigma Consciousness Scores by Race

Race	*N*	Mean	*SD*
African American	126	21.3	8.2
Caucasian	132	13.7	6.9
Mexican American	7	15.6	9.3
Other Hispanic	22	18.8	9.3
American Indian	4	23.3	12.3
Asian	8	17.0	9.1
Total	299	17.6	8.6

Note. There was significant variability among the scores by race ($F(5, 293) = 12.70$, $p < .001$).

Table 5

Average Spontaneous Self-Affirmation Scores by Race

Race	*N*	Mean	*SD*
African American	126	5.1	1.6
Caucasian	132	4.2	1.5
Mexican American	7	4.7	2.1
Other Hispanic	22	4.8	1.9
American Indian	4	5.2	1.4
Asian	8	4.3	1.6
Total	299	4.7	1.6

Note. There was significant variability among the scores by race *(F*(5, 293) = 4.20, *p* = .001).

Inclusion of Age as a Covariate

Age, race, and gender were examined to determine if there was a statistically significant relationship between each of those variables and the dependent variable (academic performance as measured by CGPA). Three analyses were conducted to assess the relationships. Oneway ANOVAs were run to assess the relationships between race and academic performance and gender and academic performance; oneway ANOVAs were used because gender and race are categorical variables and academic performance is a continuous variable. However, a correlational analysis was run to assess the relationship between age and academic performance, as both variables are continuous. Of the three variables, only age was found to have a statistically significant relationship with academic performance. Therefore, age was included in the regression analyses as a covariate to control for its effects on the model, specifically on the amount of variance found. Bivariate correlations were run to assess the relationship between CGPA, average

SSAM score, total ESC score, and age. Table 6 shows the Pearson correlation coefficient values for the variables. There was a statistically significant, moderate positive correlation between age and CGPA ($r(295) = .33$, $p < .001$). There was also a statistically significant, small positive correlation between average SSAM score and total ESC score ($r(295) = .28$, $p < .001$).

Table 6

Pearson Correlation Amongst Variables in the Regression Models

	Average SSAM Score	Total ESC Score	Age	CGPA
Average SSAM Score		.28**	.04	.05
Total ESC Score			-.10	-.06
Age				.33**

Note: $N = 299$; SSAM = Spontaneous Self-Affirmation Measure; ESC = Ethnic Stigma Consciousness; **Correlation is significant at the 0.01 level (2-tailed).

Results

Research Question 1 Analysis

RQ_1: Quantitative: To what extent is the relationship between stereotype threat, as measured by ethnic stigma consciousness, and the academic performance, as measured by cumulative grade point average (CGPA) of online minority students, moderated by spontaneous self-affirmation when controlling for age?

H_0: Spontaneous self-affirmation does not moderate the relationship between stereotype threat vulnerability and online academic performance.

H_1: Spontaneous self-affirmation moderates the relationship between stereotype threat vulnerability and online academic performance.

In RQ_1, the independent variable was stereotype threat as measured by ethnic stigma consciousness (ESC), the dependent variable was online academic performance as measured by CGPA, and the moderator was spontaneous self-affirmation (measured by the scores on the SSAM). Age was included as a covariate. Hierarchical multiple regression was used to investigate the moderating effects of spontaneous self-affirmation on the relationship between stereotype threat and online academic performance of when controlling for the effects of the participants' ages. In the analysis, only the African American respondents were included (these participants represented minorities in this research question). As mentioned previously, I was unable to interpret the differences in the mean scores of the remaining minority participants on the measures.

Before conducting the analysis, an interaction term between average SSAM score and total ESC score (ethnic_stigma X self_affirmation) was created. Linearity, normality, and homoscedasticity were observed visually using a histogram and scatterplots as shown in Figures A1-A3 in Appendix E. The scatterplots show a slight deviation among the residuals, indicating that the residuals are not normally distributed, as well as heteroscedasticity. Further, the Durbin-Watson statistic was 1.905, which suggests independence of the residuals. There was no undue influence or evidence of multicollinearity as values for Cook's distance were all less than 1 and VIF values were between 1 and 10.

Three models were created in the hierarchical multiple regression. In the first step, I entered CGPA as the dependent variable and total ESC score and average SSAM score as the independent variables. In the second and third steps, I entered the covariate (age)

and the interaction term as the independent variables respectively. This method allowed me to observe the amount of variance attributed to the covariate and the interaction term. The variables collectively predicted online academic performance as measured by CGPA ($F(4, 121) = 3.37$, $p = .012$, $R^2 = .100$). However, age ($t = 3.58$, $p < .001$) was the only statistically significant individual predictor in the regression model (see Table 7). The addition of age in step two of the regression resulted in a statistically significant increase in R^2 of .094 ($F(1, 122) = 12.648$, $p < .001$, $R^2 = .098$, adjusted $R^2 = .076$). The addition of the interaction term accounted for a statistically insignificant proportion of the variance with an increase in R^2 of .002 ($F(1, 121) = .270$, $p = .605$). Therefore, no moderating effect was found, and the null hypothesis was not rejected.

Table 7

Moderated Regression Results for Ethnic Stigma and Self-Affirmation Interaction

Variable	*B*	95% CI for *B*	*SE*	β	*t*	*p*
Model						.012
Constant	2.893	[2.203, 3.584]	.349		8.30	<.001
Stereotype Threat (Ethnic Stigma)	.011	[-.015, .038]	.013	.244	.85	.399
Self-Affirmation	.044	[-.065, .153]	.055	.185	.81	.422
Interaction	-.001	[-.006, .003]	.002	-.190	-.52	.605
Age	.012	[.005, .018]	.003	.322	3.58	<.001

Note. *B* = unstandardized regression coefficient; CI = confidence interval; *SE* = coefficients standard error; β = standardized coefficients beta.

Research Question 2 Analysis

RQ_2 Quantitative: To what extent is the relationship between stereotype threat, as measured by ethnic stigma consciousness, and academic success, as measured by cumulative grade point average in online courses, moderated by differences in synchronous and asynchronous contextual cues when controlling for age?

H_0: The relationship between stereotype threat vulnerability and online academic performance is not moderated by the contextual cues present in synchronous and asynchronous online courses.

H_1: The relationship between stereotype threat vulnerability and online academic performance is moderated by the contextual cues present in synchronous and asynchronous online courses.

In RQ_2, the independent variable was stereotype threat as measured by ethnic stigma consciousness, the dependent variable was online academic performance as measured by CGPA, and the moderator was course format. As with RQ_1, age was included as a covariate. Hierarchical multiple regression was used to examine the moderating effects of course format on the relationship between stereotype threat and online academic performance when controlling for age. In the regression, course format, was categorized as either synchronous or asynchronous and both; combining the "asynchronous" and "both" categories, which were similar in mean CGPA, into one category transformed the course format variable from trichotomous to dichotomous. Further, both African American and Caucasian participants were included in the analysis.

Like RQ_1, an interaction term was created between total ESC score and the moderator variable. The hierarchical multiple regression was conducted to predict online academic performance as measured by CGPA from four variables: total ESC score, class format, the interaction term (ethnic_stigma X class_type), and age. Linearity, normality, and homoscedasticity were observed visually using a histogram and scatterplots as shown in Figures B1-B3 in Appendix F. The scatterplots reveal some deviation among the

residuals, as well as heteroscedasticity. The Durbin-Watson statistic was 2.060, suggesting independence of the residuals. There was no undue influence or evidence of multicollinearity as values for Cook's distance were all less than 1 and VIF values were between 1 and 10.

The hierarchical multiple regression resulted in three models. In the first step, I entered CGPA as the dependent variable, and total ESC score and course format served as the independent variables. In the second step, I entered age as the independent variable, and in the third step, the interaction term served as the independent variable. As mentioned in RQ_1, creating three models made it possible to observe the amount of variance attributed to age and the interaction term separately.

Collectively, the variables statistically significantly predicted online academic performance as measured by CGPA ($F(4, 253) = 8.12$, $p < .001$, $R^2 = .114$). But again, age ($t = 5.05$, $p < .001$) was the only statistically significant individual predictor in the regression model as shown in Table 8. The addition of age in step two of the regression resulted in a statistically significant increase in R^2 of .089 ($F(1, 254) = 25.430$, $p < .001$, $R^2 = .113$, adjusted $R^2 = .103$). The addition of the interaction term accounted for a statistically insignificant proportion of the variance with an increase in R^2 of .001 ($F(1, 253) = .200$, $p = .655$). Thus, no moderating effect was found in the analysis, and the null hypothesis was not rejected.

Table 8

Moderated Regression Results for Ethnic Stigma and Class Format Interaction

Variable	*B*	95% CI for *B*	*SE*	β	*t*	*p*
Model						<.001
Constant	2.994	[2.454, 3.534]	.274		10.92	<.001
Stereotype Threat (Ethnic Stigma)	.007	[-.016, .029]	.012	.147	.57	.571
Class Format	.166	[-.114, .445]	.142	.162	1.17	.244
Interaction	-.003	[-.015, .010]	.006	-.119	-.45	.655
Age	.010	[.006, .014]	.002	.305	5.05	<.001

Note. *B* = unstandardized regression coefficient; CI = confidence interval; *SE* = coefficients standard error; β = standardized coefficients beta.

Chapter Summary

In Chapter 4, I discussed the data collection and data analysis procedures for the current study. The results of the regression analyses indicated that neither self-affirmation nor course format moderate the relationship between stereotype threat and online academic performance. Self-affirmation, course format, and stereotype threat were not significant individual predictors of online academic performance, but age was. In Chapter 5, I summarize and interpret the key findings of the study. I also discuss the limitations of the study and recommendations for future research.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this quantitative study was to extend the findings of previous studies on the relationship between self-affirmation, stereotype threat, and academic performance to the online college classroom while also examining the moderating effects of class format (synchronous or asynchronous). Two hundred and ninety-nine respondents participated anonymously in the study. They completed an online questionnaire comprised of items from the Social Identities Attitude Scale (SIAS; Picho & Brown, 2011), the Spontaneous Self-Affirmation Measure (SSAM; Harris et al., 2019), and the College Student Experience Questionnaire (CSEQ; Pace & Kuh, 1998). Hierarchical multiple regression was used to analyze the data.

There is a relatively large body of literature that examines stereotype threat and self-affirmation in in-person elementary and secondary school. Although there are also studies that examine these concepts in relation to postsecondary school and in online contexts, this is the first study that examined the relationship between stereotype threat, self-affirmation, and academic performance in terms of the type of online class a student is enrolled in. Additionally, unlike previous studies, the current research was not limited to science, technology, engineering, and math (STEM) disciplines.

The results of the first analysis suggest that self-affirmation does not moderate the relationship between stereotype threat and online academic performance. The results of the second analysis also indicate that course format does not moderate the relationship. This chapter includes an analysis and interpretation of the findings, a discussion of the

limitations of the research and recommendations for future research, as well as a discussion of how the research will impact positive social change.

Interpretation of Findings

Stereotype threat theory suggests that when minority students are in environments that remind them of their minority status and the negative stereotypes associated with that status, they will perform academically in ways that confirm those stereotypes (Steele & Aronson, 1995); this phenomenon has been observed in both face-to-face and online learning environments (Borman et al., 2017; Kumi-Yeboah & Smith, 2016; Merillat et al., 2018; Wladis et al., 2015). Further, in previous studies, self-affirmation interventions, including spontaneous self-affirmation, had a moderating impact on the relationship between stereotype threat and academic performance, with increased self-affirmation resulting in improved academic performance (Borman et al., 2021; Brady et al., 2016). However, despite previous findings, spontaneous self-affirmation was not found to moderate the relationship between stereotype threat and academic performance in the current study. Age, which functioned as a covariable, was found to predict academic performance.

It should be noted that although spontaneous self-affirmation did not have a moderating relationship with stereotype threat and academic performance in this study, it is not an indication that the results refute or disconfirm the existence of such a relationship in online learning contexts. In academia, stereotype threat is most consistently associated with STEM-related disciplines and majors in which minorities are typically underrepresented (e.g., Casad et al., 2018; Fordham et al., 2020). Also, in a

more general sense, stereotype threat is linked to difficult tasks or challenging situations, such as in sports or medical care (Chang et al., 2021; Phelan et al., 2019). In terms of education, STEM courses are among the most difficult college courses, as seen in their high attrition rates (O'Keefe et al., 2022). Only 4% of the sample in the current study were STEM majors, which may have impacted not only the moderating effects but also the degree of stereotype threat vulnerability. Further, the distribution of CGPAs suggests that the participants' courses may not have been demanding enough to generate a sufficient stereotype threat effect.

This study was the first to consider online course format (synchronous or asynchronous) as a possible moderator on the relationship between stereotype threat and academic performance. Consequently, the results did not indicate that course format moderates the relationship. Current research indicates that context plays a role in the presence of stereotype threat (Dennehy et al., 2018; Wu et al., 2020), which suggests that the context in which online learning occurs should influence how stereotype threat is experienced; however, this assertion was not confirmed in the present study.

Limitations of the Study

There are several limitations of the study, especially in relation to the generalizability of the results. The first limitation was the sample size. Only 299 participants were included in the current study; therefore, a much larger sample size may yield more generalizable results. Also, the sample contained significantly more graduate and postgraduate students than undergraduate students, as well as more participants

completing asynchronous courses than synchronous courses. These limitations may further impact the generalizability of the results.

There are also limitations in terms of validity and reliability. For instance, some of the assumptions of hierarchical multiple regression are violated. One of those assumptions is that the predictor and outcome variables should have a linear relationship. In this study, there is a non-linear relationship between the predictor (stereotype threat) and outcome (academic performance) variables. As mentioned previously, stereotype threat is often associated with STEM courses and majors. In the current research, only 13 of the 299 participants were completing STEM-related programs, which may have impacted the relationship between the predictor and outcome variables. Other assumptions were also violated, as there was heteroscedasticity and non-normal distribution of errors among the data. These assumption violations suggest that the findings of the study should be accepted with caution. Additionally, there may be other variables that influenced the results but were not accounted for in this study, which could introduce issues with external validity.

Other limitations relate to the data collection methods used for the study. Because the invitation to participate in the research was posted on websites that are not restricted to United States citizens, it is possible that some of the participants were completing online courses at foreign colleges and universities. Also, there was no protocol in place to prevent participants from completing the questionnaire multiple times. Additionally, CGPA was self-reported in this study. It is well known that self-report measures are only useful if the respondents are truthful. There were no steps taken to verify the participants'

CGPAs. Therefore, inaccurately reported CGPAs may have impacted both the reliability and validity of the data.

There were limitations regarding one of the instruments, as well. The Social Identities and Attitudes Scale (SIAS), used in the study to assess stereotype threat, is a highly reliable and valid measure. It is high in external reliability as well as content, discriminant, convergent, and construct validity. Although its creators deemed it appropriate for measuring stereotype threat in a wide range of domains, the scale was initially created to measure stereotype threat vulnerability specifically in mathematical domains (Picho & Brown, 2011; Smith & Cokley, 2016). Therefore, due to the original intent of the measure and the fact that only a small percentage of the sample in this study were completing math-related courses, the measure itself may have impacted the findings.

Furthermore, the SIAS consists of six subscales (gender identification, gender stigma consciousness, ethnic identification, ethnic stigma consciousness, math identification, and negative affect) but only the ethnic stigma consciousness subscale was used in this research. In most of the available literature, either the full SIAS, a modified version of the scale, or questions from one of the other SIAS subscales were used (e.g., Aguillon et al., 2020; Decker et al., 2022, Grimes, 2019). The ESC subscale has been used as the sole measure of stereotype threat in at least one other study. In their research, Salehi et al. (2021) used the ESC subscale to understand how stereotype threat (as measured by ethnic stigma consciousness) and test anxiety mediate academic performance in minority undergraduate biology students. The researchers did not find

ethnic stigma consciousness to negatively influence academic performance, and in most instances, it had a positive impact on performance despite the participants' race or ethnicity (Salehi et al., 2021). They also found that the mediating effects differed depending on the institutional environment. These results, as well as those from the current study, may suggest that the ESC subscale, although both reliable and valid, might not be appropriate for assessing stereotype threat when not used in tandem with one or more of the other SIAS subscales. Additionally, the ESC subscale has not been used regularly as a measure of stereotype threat across institutional contexts, especially in online educational environments with different contextual cues. Therefore, more extensive application of the subscale is warranted to further evaluate how it can be used to assess stereotype threat in various in-person and online pedagogical contexts.

An additional limitation of the study is that the nature of ethnic stigma consciousness was not addressed. Stigma consciousness can be trait or state, with state stigma consciousness being situational and trait being more stable and inherent to the individual (Blount-Nuss, 2011; Pinel, 2004). Certain situations can result in temporary fluctuations in the level of stigma consciousness; these fluctuations often lead to increased or decreased levels of state stigma consciousness (Blount-Nuss, 2011). Because the type of ethnic stigma consciousness being measured was not accounted for, it is undetermined whether this influenced the results of the study. Also, it has not been established whether the ESC subscale, which assesses ethnic stigma consciousness as a trait, measures both forms of the construct. This aspect of the instrument may have impacted the results as well.

Recommendations

The current study was designed to help shed light on the impact of stereotype threat on academic performance in online courses. It addressed a gap in existing literature and further indicates the need for additional research. Stereotype threat has been found to occur primarily in STEM classes. Therefore, future studies should focus more on science, technology, engineering, and math-related online classes. The studies should also include a larger sample size with equal numbers of synchronous and asynchronous students. Synchronous classes are more like face-to-face courses; thus, stereotype threat may be more evident in synchronous environments.

Future researchers should also consider altering the research design. For instance, using a repeated-measures design instead of a cross-sectional one would help a researcher observe the impact that self-affirmation can have on academic performance over time. Also, including additional subscales from the SIAS could provide a more complete assessment of the participants' experiences with stereotype threat; this study only included one of the six subscales: the ethnic stigma consciousness subscale. Additionally, academic performance could be assessed in other ways, such as through test scores or curriculum-based written assessments. A different data analysis method, one in which all the associated assumptions are met, would be beneficial in a future study as well. Using an appropriate data analysis method would help ensure accurate results.

Implications

This study helped enhance the existing literature on stereotype threat and self-affirmation by highlighting the impact of stereotype threat specifically on minority

students enrolled in online courses, and how self-affirmation can help improve their academic performance. Although the results of the study did not support previous findings that suggest self-affirmation moderates the relationship between stereotype threat and self-affirmation, this research can serve as a starting point for continued research into how stereotype threat impacts students in different types of online classes.

The current investigation has the potential to positively affect social change at various levels. For instance, at the individual level, minority students may benefit from more interventions targeted at helping to increase their retention in online courses and programs. Previous research suggests that interpersonal factors, such as stereotype threat, can negatively impact minorities' academic achievement (Isik et al., 2018). Therefore, before effective interventions can be created and implemented, a better understanding of how phenomena like stereotype threat impact minority academic success is needed. While the results of this study did not confirm previous findings related to the moderating effects of self-affirmation interventions, they signify a need for further exploration of both the individual impacts of stereotype threat and efficient remedies for its effects.

At the organizational level, this study could encourage college and university administrators to reevaluate their retention efforts and more effectively lower the attrition rates of their minority students. Existing research suggests that understanding students' experiences can aid in the retention process (Dennehy et al., 2018). Thus, once administrators and educators have identified at-risk students, they can exert more effort to understanding those students, their personal experiences, and other factors that may be impacting their academic performance. From this understanding, effective interventions

can be put into place. As other studies have shown, employing self-affirmation interventions, including teaching students spontaneous self-affirmation techniques, can help enhance their educational experiences and improve their academic performance (Borman, 2017; Brady et al., 2016).

Achievement gaps in education are persistent issues in our society, and stereotype threat plays a pivotal role in their occurrence (Padilla et al., 2022). Therefore, at the societal level, this study could prove useful as it contributes to the conversation about how to ensure the academic success of minority students. While this study focuses on the academic performance of racial minorities seeking postsecondary education, achievement gaps can also impact groups that vary in gender, social status, language proficiency, intellectual disability, etc. (Alfarhan & Dauletova, 2019; DeVries & Tkatchov, 2017; Soland & Sandilos, 2021; Zhang et al., 2020); these groups have also been found to be impacted by stereotype threat. Further, academic achievement gaps span across all levels of education. Thus, helping to ensure that online college students have equal educational opportunities can aid in closing the gap. Closing the achievement gap is important because it not only means educational equality, but higher wages, a stronger economy, more qualified adults to work in and serve their communities, and higher quality lives for more citizens (Lynch & Oakford, 2014; Song, 2015).

Conclusion

Existing studies indicate that stereotype threat negatively impacts students' academic performance in both traditional and online STEM-related classes (e.g., Casad et al., 2017; Chang et al., 2019; Steele & Aronson, 1995). Other studies suggest that the

relationship between stereotype threat and academic performance is moderated by self-affirmation interventions, including spontaneous self-affirmation (e.g., Borman, 2017; Goyer et al., 2017). The purpose of this quantitative, cross-sectional study was to investigate how self-affirmation and context moderate the relationship between stereotype threat and academic performance in online courses. This study was unique because it assessed the effects of stereotype threat and self-affirmation on academic performance in both synchronous and asynchronous online courses across STEM and non-STEM disciplines. However, the findings did not support those of earlier studies. Neither self-affirmation nor context (course format) had moderating effects on the relationship between stereotype threat and academic performance.

Although the results of the current study failed to corroborate existing literature, they do provide a starting point for continued research into the occurrence of stereotype threat and use of self-affirmation in various educational settings. The racial achievement gap continues to persist; therefore, understanding and mitigating the instigating factors for this educational disparity is imperative for student equality. Future researchers should examine this study and build upon its strengths, weaknesses, and limitations. Also, colleges and universities can use this study as a basis for a deeper conversation about the experiences of their minority students. This conversation can evolve into effective measures that help ensure both equal educational opportunities and academic success, which in turn, can benefit students on an individual and societal level.

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Appendix A: Histogram and Scatterplots for Research Question 1

Figure A-1

Academic Performance as Measured by CGPA Histogram

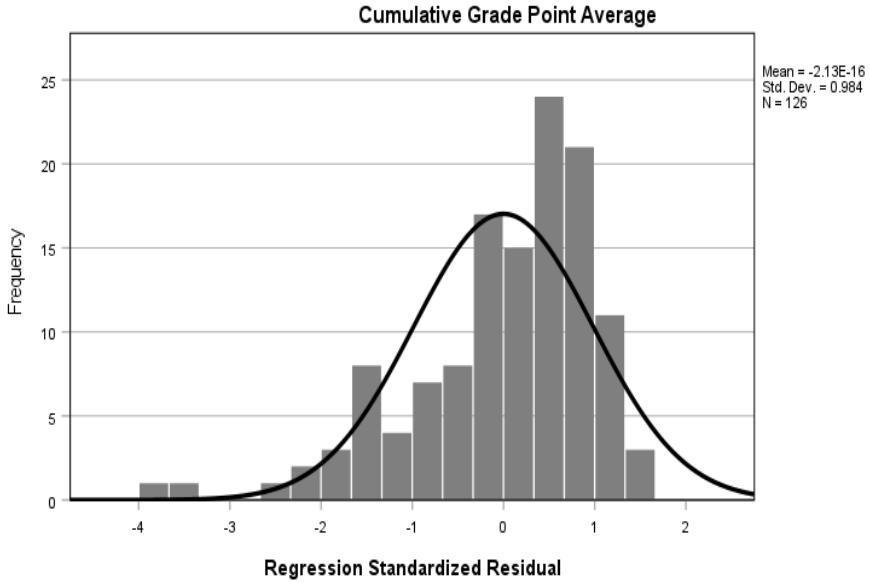


Figure A-2

Normal P-P Plot of Regression Standardized Residual

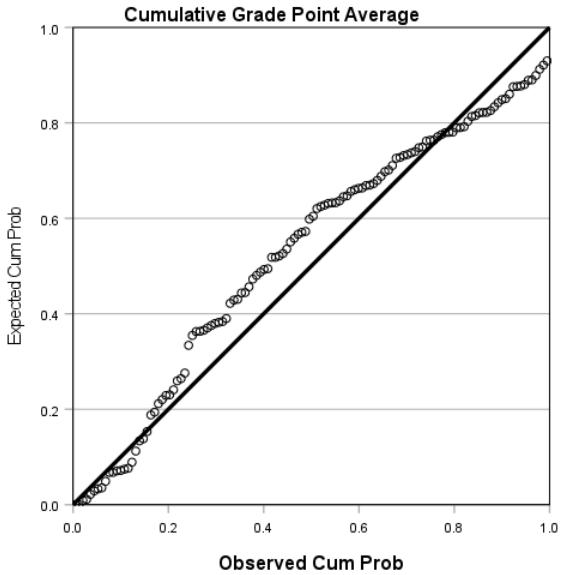
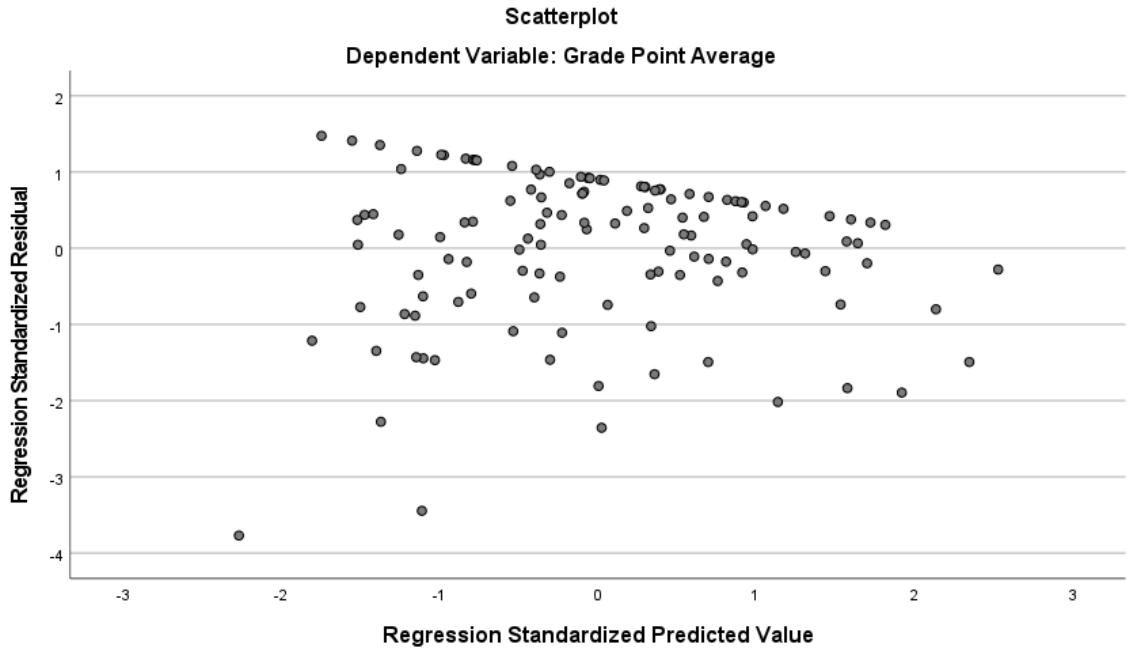


Figure A-3

Regression: Standard Residual vs Standard Predicted Value



Appendix B: Histogram and Scatterplots for Research Question 2

Figure B-1

Academic Performance as Measured by CGPA Histogram

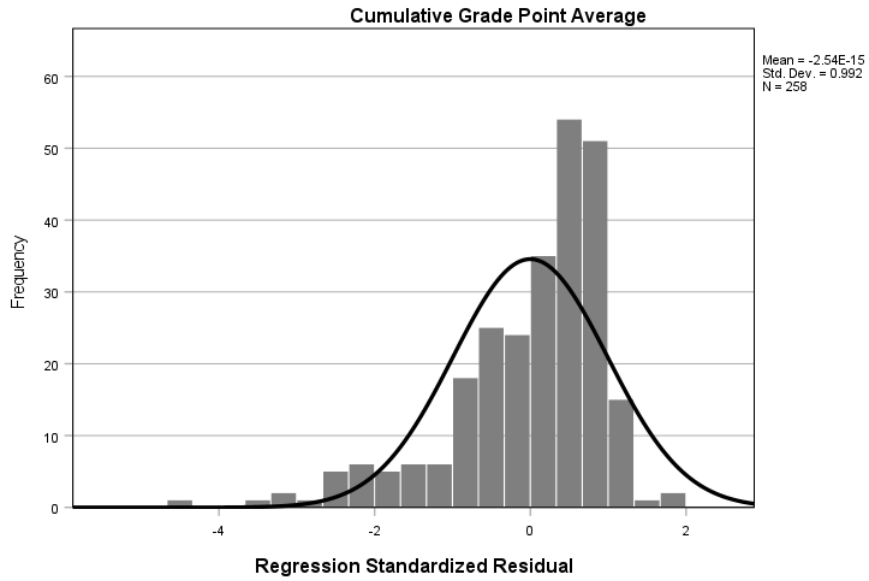


Figure B-2

Normal P-P Plot of Regression Standardized Residual

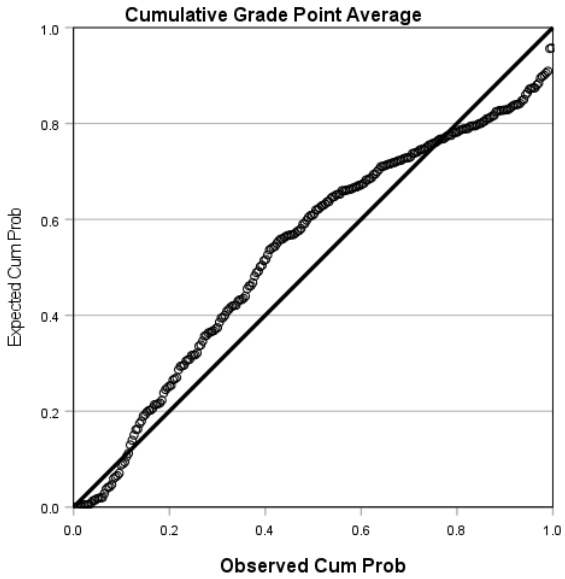


Figure B-3

Regression: Standard Residual vs Standard Predicted Value