ME, WOMEN, AND MATH: THE ROLE OF PERSONAL AND COLLECTIVE THREATS IN THE EXPERIENCE OF STEREOTYPE THREAT

DISSERTATION

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By

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ABSTRACT

Stereotype threat is a psychological predicament that arises when a person fears that an individual underperformance will support the veracity of a negative social group characterization. Research suggests that stereotype threat has important implications for the personal self as well as the collective self, although no study has systematically investigated the role of self-representation as antecedents to stereotype threat. The purpose of the current project was to meet that objective by teasing apart stereotype threat into these components. Study 1 investigated individual differences in chronic collective and personal threats in a situation where explicit performance expectations were removed. Women low in both a chronic personal threat and a chronic collective threat performed better on a difficult math test than women high in both of these chronic threats experienced together or separately. However, chronic collective threat and chronic personal threat were not effectively isolated. To address this limitation, Study 2 replicated Study 1, using an experimental methodology. Study 2 demonstrated that the collective threat and personal threat components of stereotype could indeed be isolated. Women who experienced a collective threat performed better than women who experienced a personal threat with or without a collective threat and women who experienced no threat. Moreover, there was a tendency for women who experienced both threats to perform worse than women who experienced a personal threat and women not threatened suggesting that stereotype threat may be the consequence of the simultaneous experience of a personal threat and a collective threat, that is, a *dual threat*. Study 3 attempted to provide converging evidence of the dual threat conceptualization of stereotype threat. Women were presented with a task intended to buffer against a personal threat to alleviate

the consequences of stereotype threat, and thus replicate Study 2 by showing that collective threat enhances performance. There were no differences among women who received personal threat buffering instructions and those who did not, although, ancillary measures suggest that the intended phenomenology was not achieved. The implications of these findings to the theoretical underpinnings of stereotype threat are discussed.

Dedicated to all the individuals who have supported

me in this endeavor … Thank-you.

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INTRODUCTION

"I find [math] intriguing. It's very beautiful. I love working on it, I really do…It's just fascinating to me."

-- Female Math Doctoral Student (cited in Herzig, 2004)

"There were six of us in the high school physics classes, and I was the only girl. The teacher walked in the first day and said, 'So guys, what do you think about it here?' And they called me 'it' for the rest of the year."

-- Female Math Undergraduate Student (cited in Seymour & Hewitt, 1996)

Women who enjoy the domain of mathematics enter a field where their abilities are called into question largely because of a culturally entrenched stereotype that men have superior natural mathematical abilities than women (Eccles, Jacobs, & Harold, 1990; Swim, 1994; Williams & Ceci, 2007). For instance, Maccoby and Jacklin (1974) documented within Western thought a belief that boys naturally excel in mathematics. Even individuals whom one might predict to be immune to the influence of the stereotype are not. Research assessing teacher's perceptions of gender mathematical differences revealed a belief that boys possess natural math abilities that is absent in girls (Ernest, 1979). Similarly, parents report believing that math is easier for their sons than for their daughters (see also Brown & Josephs, 1999; Yee & Eccles,

1988). Even a recent past president of Harvard University suggested that women were not capable of performing at the highest levels of math and related fields, citing an inherent inability as a cause.

Scores on standardized tests are congruent with the stereotype. Performance data consistently demonstrate a gender differential in favor of males on mathematical problem-solving tests. For instance, women underperform men on the quantitative sections of the Scholastic Aptitude Test (SAT) and Graduate Record Exam (GRE) between one-third and two-thirds of a standard deviation (as cited in Lesko & Corpus, 2006; Williams & Ceci, 2007). Analogous findings have been obtained among junior high students. Benbow & Stanley (1980, 1983) reported that prior to the age of 13 the boy to girl ratio was 13:1 for those who obtained a score of at least 700 on the quantitative section of the SAT.

In spite of the negative cultural characterizations of women's math abilities, some women still choose to pursue careers within mathematics and related fields. Women who care about their performance within the domain of mathematics have to manage their individual expectancy for success within a context of collective expectancy for failure. Suggested by the opening quotations, as individuals these "identified" women find math "beautiful, fascinating, & intriguing," but as members of the social group of "women" they are haunted by disparaging expectations due solely to their social group membership. The ability to negotiate simultaneously a conceptualization of the self that includes individual positive ability characteristics as well as collective negative characteristics, both within the same domain, would be challenging. Researchers have found that women in this situation may experience a psychological threat arising from the fear that an individual underperformance will underscore a negative social group characterization. This experience is termed *stereotype threat*.

Most of stereotype threat research has focused on cataloguing the groups in which stereotype threat effects will emerge (Marx, Stapel, & Miller, 2005). However, emerging research

demonstrates that stereotype threat is associated with the motivation to protect one's individual self image as well as the motivation to protect one's collective group image. As background, self-identity can be conceptualized into two broad representations: the individual self and the collective self (Brewer & Gardner, 1996; Trafimos, Triandis, Triandis, & Goto, 1991). The individual self is salient when a person conceptualizes the self in terms of unique characteristics. The collective self is salient when an individual conceptualizes the self in terms of similarities to in-group members, as well as perhaps emphasizing differences to out-group members (Deaux, 1996; Turner, Hogg, Oaks, Reicher, & Wetherell, 1987). Conceptually, certain threats can be perceived as an attack on the personal self or collective self.

The issue at hand is to investigate the role of a collective self and personal threat in the experience of stereotype threat. Empirical evidence demonstrating that stereotype threat can be produced when experiencing a personal threat and a collective threat either separately or simultaneously would serve to illuminate the antecedents of this phenomenon. The purpose of the current set of studies is to meet that objective.

The Experience of Stereotype Threat

Considering that gender math performance differences are well-documented, the question arises as to why these performance differences exist. Many researchers interpret the performance data as an indication of male natural mathematical abilities (Benbow & Stanley, 1980, 1983). This interpretation supports the assumption that the stereotype reflects "a kernel of truth" and thus, the stereotype is in essence a cultural consequence of the performance differences. However, this explanation is incomplete when taking into account that performance differences only emerge on standardized tests but is absent, and even favors women, when examining other indicators of math ability such as course grades (Kimball, 1989).

A provocative area of research examining stereotype threat makes a different argument —that the stereotype is actually an antecedent, not a cultural consequence, of gender math performance differences. According to this position a situational predicament arises when one faces the possibility of confirming a stereotype when trying to disconfirm its veracity or simply fears being viewed through the lens of a stereotype (see also Pronin, Steele, & Ross, 2002; Steele, 1997; Steele & Aronson, 1995). In other words, a psychological threat that arises when a person fears that an individual failure will support a group stereotype can explain gender differences on standardized tests of mathematics.

Stereotype threat can hinder performance when experienced during the completion of a stereotype relevant task. In an early demonstration of the influence of stereotype threat on performance, researchers examined the effect of being aware of the negative stereotype surrounding women's mathematical ability (Spencer, Steele, and Quinn, 1999). Women who excelled in mathematics performed worse on a math test compared to men when the stereotype was relevant, but performed comparably to men when the math stereotype was described as not relevant. Similar debilitating influences of stereotype threat on performance have been obtained from African American students (Steele & Aronson, 1995) as well as members of low socioeconomic class within the domain of academics (Croizet & Claire, 1998), and the elderly on memory tasks (Levy, 1996). Taken together, these results suggest that any individual who is a member of a group in which a negative ability stereotype is relevant becomes vulnerable to the fear of confirming that negative characterization (Steele, Spencer, & Aronson, 2002).

Researchers characterize stereotype threat as a subtle threat that is present "in the air" (Steele, 1997). The ubiquitous nature of stereotype threat explains why surprisingly simple methods can cue the relevance of a negative stereotype. A completely unobtrusive approach to making the stereotype relevant is instructing participants to indicate whether they are members of the group associated with the negative stereotype (Rucks & Arkin, 2006; Steele & Aronson,

1995). Another situation that can cue the relevance of a stereotype is the number of individuals with a shared identity within a given context. Specifically, a stereotype threat experience can be created when individuals complete a stereotype relevant task in the presence of out-group members as the sole member of one's in-group (Inzlicht & Ben-Zeev, 2000). The relevance of a stereotype can also be signaled through the evaluative criteria. A stereotype threat experience can be created by manipulating whether an individual's performance will be an indication of one's own abilities alone or additionally as an indication of one's group's abilities (Schmader, 2002). The decision to use a particular technique to induce the stereotype threat rests on the specific aims of the investigation.

Proposed Mechanisms of Stereotype Threat

Although much is known about the consequences of stereotype threat, less is understood about its underlying mechanism, however, a number of explanations have been offered. These explanations reflect three common themes: 1) internalization of stigmatization; 2) behavioral priming effects; and 3) person-situation predicament.

The internalization of stigmatization position posits that a stigmatized identity is necessary to produce stereotype threat effects (see Aronson, Lustina, Good, Keough, Steele, & Brown, 1999). Previous research suggests that the ease with which stereotype threat effects are produced is affected by a history of stigmatization (Pinel, 1999; Brown & Pinel, 2003), yet, it is not necessary. For example, White males, who have not been historically stigmatized, can also experience stereotype threat under certain conditions (Ford, Ferguson, Brooks, & Hagadone, 2004; Leyens, Désert, Croizet, & Darcis, 2000; Stone, Lynch, Sjomeling, & Darley, 1998). For example, research has demonstrated that performance on a math test is worse for White males who are reminded of the Asian math superiority stereotype than for White males who are not reminded of the stereotype (Aronson et al., 1999; Rucks & Arkin, 2006).

The behavioral priming perspective argues that purely "cold" cognitive mechanisms are responsible for stereotype threat. According to this position, activation of the stereotype leads to stereotypic behaviors through the *ideomotor pathway* (see Dijksterhuis & Bargh, 2001; Wheeler & Petty, 2001). In support of this hypothesis, non-African American participants who wrote a story about an ostensible African American student performed worse on a subsequent task then those who wrote a story about an ostensible White student (Wheeler, Jarvis, & Petty, 2001).

Although the behavioral priming position offers a potentially parsimonious explanation, it fails to account for all the relevant data known about stereotype threat (Marx & Stapel, 2006). For instance, there is evidence that "hot" mechanisms are also involved. Specifically, research suggests that arousal plays a role in the experience of stereotype threat. Blascovich and colleagues (2001) found that African American participants under stereotype threat experienced greater increases in mean arterial blood pressure and performed worse on difficult problems than nonthreatened African American and White participants. Similarly, Croizet et al. (2004) found that workload, as measured through heart rate variability, partially mediated the relationship between stereotype threat and performance. Thus, arousal measured at the objective level appears to be associated with the stereotype threat experience.

Research examining the subjective experience of arousal is consistent with these physiological findings. In an investigation of the role of arousal in stereotype threat, female participants were randomized to either a stereotype relevant or nonrelevant condition. In addition, half of the participants were provided an attribution for any possible arousal while the other half were not. The behavioral priming perspective would predict that performance on the math test should not differ as a function of attribution instructions, however, nonthreatened participants or threatened participants provided an external source of arousal performed better than threatened participants not provided an external source of arousal performed (Rucks, Smith, & Arkin, 2007). Additional research provides similar support for the subjective experience of arousal in stereotype

threat (Bosson, Haymovitz, & Pinel, 2004; O'Brien & Crandall, 2003). Taken together, these findings suggest that it is unlikely that the behavior priming explanation can fully account for stereotype threat effects.

The person-situation predicament argues that situational factors cue the relevance of the stereotype to be used as part of the evaluation. According to this position, an activating threat (Aronson et al., 1999) leads to a cognitive appraisal of the threat (Schmader & Johns, 2003) causing an increase in arousal (Ben-Zeev, Fein, & Inzlicht, 2005; Rucks et al., 2007) and ultimately to lower performance on a stereotype relevant evaluative task. Most of the research examining stereotype threat and its effects investigate different aspects of this causal chain (Ben-Zeev et al., 2005). Less attention, however, has been devoted to the antecedents that put this causal chain into action. Specifically, what is the exact nature of the threat that produces the unique pattern of results associated with stereotype threat? Researchers tend to believe that situational factors cue the relevance of the stereotype to be used as part of the evaluation (Murphy, Steele, & Gross, 2007). As a consequence, the motivation to protect one's group image along with the motivation to protect one's self-image emerges either separately or simultaneously (Leyens, Désert, Croizet, & Darcis, 2000).

Levels of Self-Representation in the Experience of Stereotype Threat

Stereotype threat has important implications for the collective self as well as the personal self. For instance, Claude Steele and colleagues (2002) write:

> When a negative stereotype about a group that one is part of becomes personally relevant, usually as an interpretation of one's behavior or an experience one is having, stereotype threat is the resulting sense that one can then be judged or treated in terms of the stereotype or that one might do something that would inadvertently confirm it (p. 389).

Indeed, emerging research is consistent with this conceptualization. A growing body of research has begun to isolate the collective identity component of stereotype threat (Gresky, Ten Eyck, Lord, & McIntyre, 2005; Shih, Pittinsky, & Ambady, 1999; Smith & Hopkins, 2004). Marx, Stapel, & Muller (2005) demonstrated that stereotyped threatened women activate a collective self-construal orientation. For instance, participants under stereotype threat and no threat conditions were asked to use their "gut response" to translate a paragraph written in a bogus language, and they then completed a task called "an inclusion of others in the self" with the purpose to assess participants' salient level of self-representation (Tropp & Wright, 2001). Stereotype threatened women translated the paragraph with more group-based pronouns and had more overlap with the targeted social group than nonthreatened women.

Empirical evidence supporting the individual nature of stereotype threat is more subtle. Examining the instructions used to create a stereotype threat can be illuminating. Schmader (2002) told participants in both the stereotype threat and no threat conditions that the experimenter was interested in "each individual's performance on the test and that he would be comparing participants' individual scores to those of other students." Stereotype threatened participants received the additional information that the experimenter would compare women's scores to men's scores and that "each individual's score [would be used] as an indicator of women's or men's math ability in general."

The current understanding of the involvement of the personal self and collective self in the experience of stereotype threat is limited. There are, however, two plausible predictions describing this interplay: the single threat conceptualization and the dual threat conceptualization. The *single threat conceptualization* predicts that stereotype threat can be produced when a stereotype-based threat is targeted at either the personal or collective level of self-representation. According to this conceptualization, the experience of one threat is sufficient to interfere with performance. Further, the experience of a threat that is targeted at both levels of self-

representation would lower performance to a greater extent because of the increase in arousal. The *dual threat conceptualization,* on the other hand, predicts that stereotype threat will only occur when a stereotype based threat is targeted at both levels of self-representation. According to this conceptualization, simultaneously targeting both the personal and collective level of self-representation is necessary to interfere with performance. The dual threat conceptualization predicts that the experience of a single threat would either increase performance or have no affect on performance. Disentangling the single or dual threat nature of stereotype threat would advance the understanding of responses to threatening situations.

Individual Difference Moderators

Not all members of a targeted group are expected to experience stereotype threat to the same degree. Certain individual difference variables can serve as antecedents, which researchers have begun to document. For instance, consistent with stereotype threat theory, studies demonstrate that "domain identification" is an important moderator. Identification is the extent to which a person cares about or is invested in an entity (Steele et al., 2002; Steele, 1997). Individuals highly identified with the relevant stereotyped domain are chronically concerned about the self-relevance of their performance and thus, are more susceptible to stereotype threat effects than those lower in identification (Steele, 1997). Aronson et al. (1999) found that White males high in math identification performed worse on a math test compared to White males lower in math identification under conditions of threat.

Two additional moderators that have received less research attention, but nonetheless affect the phenomenology of stereotype threat, are stigma consciousness and self-doubt. Stigma consciousness is the extent to which individuals expect to be stereotyped (Pinel, 1999). Using the stigma consciousness scale to identify women high and low in this expectation, researchers have demonstrated that performance decrements on a math test were greater for those high in stigma

consciousness than those low in stigma consciousness under conditions expected to create stereotype threat (Brown & Pinel, 2003). Conceptually, stigma consciousness represents one facet of one's chronic vulnerability to a collective threat.

Self-doubt is the other moderator that has important theoretical implications in the experience of stereotype threat. Self-doubt has been defined as the extent to which an individual is uncertain about one's abilities (Oleson, Poehlmann, Yost, Lynch, & Arkin, 2000). Previous research suggests that individuals high in self-doubt are more vulnerable than those low in self-doubt to situational cues indicating a threat targeted at the self (Hermann, Leonardelli, & Arkin, 2002). Although the role of self-doubt in the experience of stereotype threat has not been examined to date, it is reasonable to hypothesize that the self-doubt construct represents chronic vulnerability to a personal threat.

Examining this particular constellation of individual difference moderators can provide insight into the deconstruction of the personal and collective threat components of stereotype threat. Further investigation of the interplay among these variables could potentially illuminate the antecedents of stereotype threat.

Overview of Research

There is a gap in our current understanding of the role of personal threat and collective components of stereotype threat. Although researchers are attempting to address this gap, their efforts are limited. Most of stereotype threat research has instead focused on cataloguing the groups in which stereotype threat effects will emerge (Marx, Stapel, & Miller, 2005). As a result, stereotype threat has largely been an atheoretical concept. Therefore, little is understood about the antecedents of stereotype threat. An examination of the literature is problematic as well, because often the personal and collective threats are confounded within studies of stereotype threat (Shapiro & Neuberg, 2007).

Three studies, therefore, attempted to tease apart the personal and collective threat components of stereotype threat with the objective of advancing the theoretical understanding of this phenomenon. In an initial attempt to investigate the role of the target of a psychological threat, Study 1 examines individual difference variables that conceptually represent the experience of personal threat and a collective threat either separately or simultaneously. Study 2 is an experimental replication of Study 1. In Study 2, women received different descriptions of an impending math test intended to create a threat targeted to their personal self, their gender collective group, both types of threats together, or neither threats. If stereotype threat is a single threat, then performance differences would be expected when one or the other threat is chronically or experimentally experienced. If stereotype threat requires a dual threat, then performance differences would be expected only when both threats are experienced together. If the data are consistent with the dual threat hypothesis it will be interesting to determine if a single threat, taken by itself, increases or has no effect on performance. Study 3 is intended to extend the evidence for the threat conceptualization of stereotype threat. Following on the results of Study 2, if one assumes that stereotype threat is the result of the simultaneous experience of a personal and collective threat, it follows that stereotype threat effects should be eliminated by lessening the experience of a personal threat. Thus, in Study 3 women experienced both types of threats either with or without a buffer to the personal threat. It is expected that performance on a math test should improve when a personal self threat buffer is provided than when it is not provided.

CHAPTER 2

Study 1

Overview

The purpose of the current study was to investigate the effects of chronic collective threat and chronic personal threat, experienced separately or simultaneously, on a difficult math test. Recall that a collective threat is the fear that a negative stereotype is true of one's group while a personal threat is the fear that a negative stereotype is true of one's self. A novel approach to tease apart stereotype threat into these components is by examining individuals' trait differences in personal and collective threat levels. For instance, individuals who are vulnerable to situational factors that cue a personal threat could be categorized as high in chronic personal threat, while those not sensitive to situational factors that cue a personal threat could be categorized as low in chronic personal threat. The same reasoning would hold for individual differences in chronic collective threat.

The differences in chronic collective and personal threat should theoretically emerge in an ambiguous situation where performance expectations based on one's collective or personal characteristics are not explicitly stated, but rather are implied. Individuals high in chronic personal threat while low in chronic collective threat should perceive the situation as more personally threatening. Similarly, individuals high in chronic collective threat while low in chronic personal threat should perceive the situation as more collectively threatening. Consistent with this logic, those who are high in both threats would be vulnerable to perceiving the situation as both personally and collectively threatening. Those low in both threats would be expected to

perceive the situation as neither personally nor collectively threatening. Conceptually, the individuals low in both threats would represent the no threat condition used as a comparison group in previous stereotype threat research. The question then becomes, whether individuals high in a single chronic threat or high in both chronic threats would also produce stereotype threat effects.

The present study tested this hypothesis by classifying women as either high or low in chronic collective threat as reflected in scores on the stigma consciousness scale (see Appendix A) and high or low in chronic personal threat as reflected by scores on the self-doubt scale (see Appendix B). All participants read otherwise ambiguous instructions about an impending math test. Capitalizing on the gender math stereotype which claims that women are worse at math than men, it was predicted that women high in chronic collective threat and chronic personal threat would perceive the instructions as more collectively or personally threatening, respectively. The findings from the current study should ideally illuminate whether level of self-representation is an antecedent of stereotype threat.

Several ancillary measures were included to gain insight into participants' phenomenology. Perceived performance pressure and performance concerns were used to examine participants' experience of threat. Although, perceived performance pressure and performance concerns are believed to drive the stereotype threat experience, there is little support for this assertion (Smith, 2004). These measures are included to investigate whether the novel methodological approach utilized in the present study will replicate previous null findings.

Self-representation measures were included to explore participants' salient level of self-representation. Specifically, it was predicted that women high in chronic collective threat compared to women low in chronic collective threat would show a collective level of self-representation. Chronic personal threat is not expected to moderate collective level of self-representation. Similarly, women high in chronic personal threat compared to women low in

chronic personal threat were expected to show a personal level of self-representation. Chronic collective threat is not expected to moderate a personal level of self-representation.

Method

Participants and Design

Two hundred thirty-five female undergraduate students from Ohio State University participated for course credit. Participants were divided into three groups determined by their responses to the math subscale of the domain identification scale (see Appendix C). The 16-item domain identification scale is composed of two subscales that measure both self-perception of past performance as well as the importance of the Mathematical domain (9 items) and the English domain (7 items) to one's self-concept. Participants rated the items (e.g., "Mathematics is one of my best subjects"; "I have always done well in Math") on a scale ranging from 1 (strongly disagree) to 5 (strongly agree). Math Domain Identification is conceptualized as a one factor construct (Smith & White, 2001; Smith, Morgan, & White, 2005). Participants whose scores ranged in the bottom third were classified as the "low math identified" group (M = 2.25, SD = .43), those who scores ranged in the middle third were classified as the "moderately math identified" group (M = 3.27, SD = .25), and those who scores ranged in the upper third were classified as the "highly math identified" group (M = 4.18, SD = .33). Based on previous stereotype threat research, only participants who were classified as highly math identified were included in the data analysis. This yielded a sample of eight-two participants.

The study employed a Chronic Collective Threat x Chronic Personal Threat design. Chronic Collective and Personal Threats were measured using the Stigma Consciousness Scale (Pinel, 1999) and Self-Doubt Scale (Oleson, Poehlmann, Yost, Lynch, & Arkin, 2000). Performance on a moderately difficult math test was the dependent variable.

Measures

Stigma consciousness scale. The stigma consciousness scale includes 10-items that measure individual differences in the "extent to which [individuals] expect to be stereotyped by others (p. 114; Pinel, 1999)." Participants responded to items such as "Stereotypes about women have not affected me personally" or "I almost never think about the fact that I am female when I interact with men" on a scale ranging from 1 (strongly disagree) to 7 (strongly agree). In the present study the Stigma Consciousness Scale was used to measure chronic collective threat.

Previous research suggests that the stigma consciousness scale should accurately reflect the construct of chronic collective threat. The stigma consciousness scale is positively correlated with the gender identification scale (Luhtanen & Crocker, 1992) such that woman high in stigma consciousness compared to women low in stigma consciousness have greater identification with the gender group of women. Additionally, the stigma consciousness scale is negatively correlated with the modern-sexism scale (Swim, Aikin, Hall, & Hunter, 1995), such that women high in stigma consciousness compared to women low in stigma consciousness endorse the notion that sexism is prevalent in society. Moreover, in an experimental investigation, women high in stigma consciousness relative to women low in stigma consciousness performed worse on a math test when blatantly reminded of the gender math stereotype (Brown & Pinel, 2003). Taken together, these findings support the contention that the stigma consciousness scale can reflect the construct of chronic collective threat.

Self-doubt scale. The self-doubt scale is an 8-item subscale of the subjective overachievement scale. The self-doubt scale measures the extent to which an individual is uncertain about one's important abilities (Oleson, Poehlmann, Yost, Lynch, & Arkin, 2000). Participants rated items (e.g., "More often than not I feel unsure of my abilities"; "I sometimes find myself wondering if I have the ability to succeed at important activities") on a scale ranging from 1 (strongly disagree)

to 6 (strongly agree). In the present study, the self-doubt scale was used to measure chronic personal threat.

Previous research suggests that the self-doubt scale should accurately reflect the construct of chronic personal threat. The self-doubt scale is positively correlated with the private self-consciousness scale such that individuals high in self-doubt compared to individuals low in self-doubt are more concerned about their own competence. Moreover, previous research indicates that self-doubt moderates vulnerability to situational cues that have an implication to one's personal self (Hermann et al., 2002). Therefore, the self-doubt scale reflects the construct of chronic personal threat.

Dependent Measures

Math test. The dependent measure was score on a math test. Participants were given 10 minutes to complete 15-math problems. The math test contained problems taken from practice books on the Graduate Records Examination of moderate difficulty that have been used in previous stereotype threat studies (O'Brien & Crandall, 2003; Rucks et al., 2007; Smith & White, 2002; see Appendix D).

Ancillary Measures

Perceived performance pressure. Three items assessed participants' perceived performance pressure: self-reported anxiety, perception of threat, and ability to cope. Self-reported anxiety was assessed by presenting the participants the following question: "To what extent did you feel anxious during the test?" To assess the participants' perception of the threat they were asked: "How threatening did you find the math test to be?" Ability to cope was assessed by the item: "How able were you to cope?" The corresponding scales were labeled 1

(not at all) and 7 (extremely). These items have been used in previous research (Rucks et al., 2007; Tomaka, Blascovich, Kibler, & Ernst, 1997).

Performance concerns. Performance concerns were assessed using both the evaluation apprehension and self-efficacy scales used in previous stereotype threat research (Cohen & Garcia, 2005; Spencer et al., 1999). The evaluation apprehension scale contains 5-items (e.g., "People will think I have less ability if I do not do well on this test"; "If I do poorly on this test, people will look down on me") and the self-efficacy scale contains 4-items (e.g., "I am uncertain I have the mathematical knowledge to do well on this test"; "I doubt I have the mathematical ability to do well on the test"; see Appendix E). Both scales were labeled 1 (not at all true) and 7 (extremely true).

Salience of self-representation. Three measures were included to classify gender identification. The first measure was a10-item identification with a gender group scale that measured "the perception of sharing experiences of a focal group and sharing characteristics of the group's members" (Mael & Tetrick, 1992, p. 813; see Appendix F). Participants responded to items such as "When someone criticizes women, it feels like a personal insult"; "When I talk about my gender group, I usually say 'we' rather than 'they' " on a scale ranging from 1 (strongly agree) to 7 (strongly disagree). Similarly, the Inclusion of the Group in the Self measure (Tropp & Wright, 2001) asked participants to determine which of seven Venn diagrams best "represents your own level of identification with your gender group" (see Appendix G). Finally, a translation task required participants to translate a passage that was allegedly written in the "Wezwe" language. They were asked to use their feelings to determine the English translation of 15 underlined pronouns in a passage. Previous research suggests that Dutch individuals who experienced stereotype threat had a collective self-construal rather than a personal self-construal (Marx, Stapel, & Muller, 2005). The present translation task is an English version of the original Dutch Task used by Marx et al. (2005; see Appendix H).

Past math performance. In order to address the possibility that math ability is correlated with self-doubt, participants were asked to state their performance on the quantitative section of commonly administered college entrance examinations (e.g., SAT or ACT). Performance on these exams was used as a proxy for math ability. The majority of respondents provided ACT quantitative scores (range 0 – 18). Therefore, SAT quantitative scores were converted into ACT scores using a conversion table made available by the Educational Testing Service (Dorans, Lyu, Pommerich, & Houston, 1997).

Procedure

Participants were greeted by a research assistant either individually or in a group of 2 – 5 individuals and escorted to a large testing room. While ostensibly waiting for the research assistant to locate a bogus participant, individuals completed the Math Identification Scale, Self-Doubt Scale, and Stigma Consciousness Scale. Upon returning to the lab, the research assistant stated that the bogus participant was a "no show" and began the session. The research assistant informed participants that they were allegedly participating in the "National Education Project." Participants were further told that "we are interested in understanding individual math differences as well as understanding gender differences." Following these instructions, participants were led to a cubicle where the remainder of the study instructions and measures were presented on computer using MediaLab (Jarvis, 2004). All participants received the same study description. Specifically, they were told that the impending math test is diagnostics of their math abilities (also see Appendix I). Participants then had 10 minutes to complete 15-math problems of moderate difficulty. Following the completion of the math test, participants completed measures of perceived performance pressure, performance concerns, gender awareness, gender identification, salience of self-representation, and past math performance. At the conclusion of the study, participants were thanked, debriefed, and dismissed.

Results

Data Analysis Strategy

Multiple regression analyses were conducted according to the following three recommended procedures. First, all continuous variables were mean-centered to reduce issues of multicollinearity that may arise when interaction terms are computed (Aiken & West, 1991). Second, the dependent variables were regressed onto Chronic Collective Threat, Chronic Personal Threat, and their interaction term using hierarchical regression. Significant main effects and interactions were interpreted in the first step of the hierarchical regression equation for which they appeared (Cohen & Cohen, 1983). Finally, significant interactions were decomposed by analyzing the simple slopes; that is, analyzing the interaction one standard deviation above and below the mean (Aiken & West, 1991).

It should also be noted that, even though previous math experience was correlated with math score, $r(81) = .578$, $p < .05$, it was not correlated with either of the two primary variables. Moreover, the primary variables were divided into a high chronic threat group and a low chronic threat group using a median split, thus, yielding four orthogonal groups (high chronic collective threat/low chronic personal threat, low chronic collective threat/high chronic personal threat, high chronic collective threat/high personal threat, and low chronic collective threat/low personal collective threat) as more stringent test of the correlation between the primary variables and previous math experience. Examining the relationship within each group between the primary variables and previous math experience again did not yield a significant correlation.

Dependent Measure

Number of items correctly answered on the math test was the sole dependent measure. There was no main effect of Chronic Collective Threat and a marginally significant main effect of Chronic Personal Threat, $\beta = -.496$, $t(81) = -1.689$, $p = .09$, on the number of items answered correctly. This effect was qualified by a significant Chronic Collective Threat x Chronic Personal Threat interaction, $\beta = .815$, $t(81) = 2.472$, $p < .02$, $R^2\triangle = .124$ (also see Figure 2.1). Analysis of the simple slopes revealed that participants low in chronic personal threat and low in chronic collective threat answered more items correctly than participants low in chronic personal threat and high in chronic collective threat, $\beta = -.935$, $t(81) = -1.982$, $p = .05$. Participants high in chronic personal threat did not differ in the number of items correctly answered as a function of Chronic Collective Threat, $\beta = .515$, $t(81) = 1.140$, $p =$ ns.

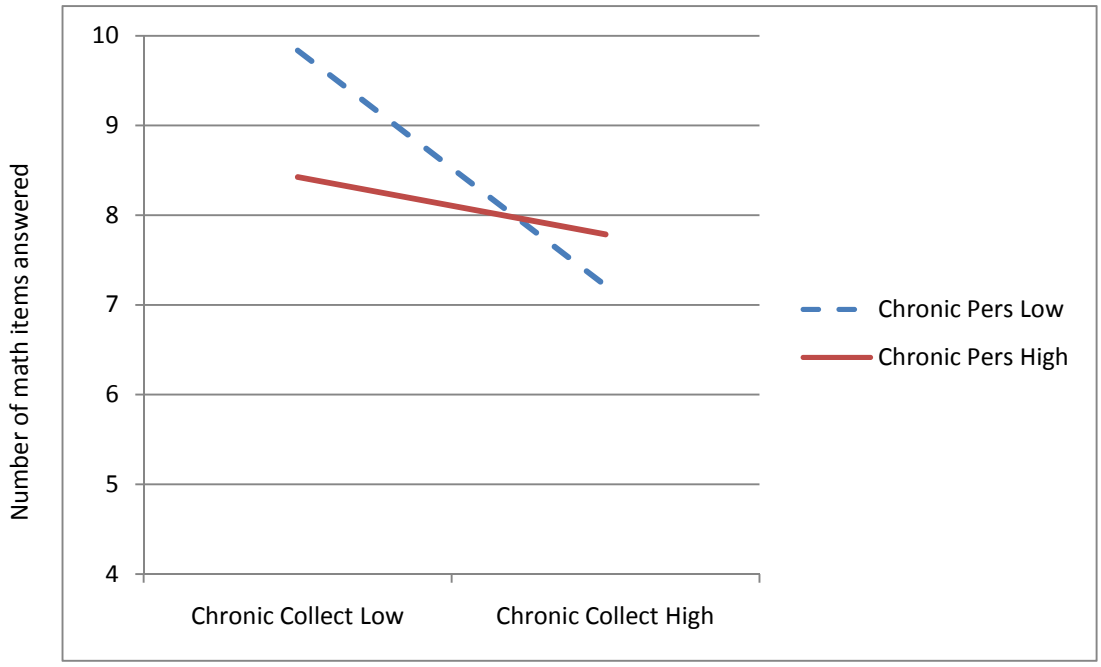

Figure 2.1: Scores on the Math Test by Chronic Collective Threat and Chronic Personal Threat.

Ancillary Measures

Perceived performance pressure. Overall, the measures used to assess participants' perceived performance pressure yielded comparable patterns of results. There was a significant main effect of both Chronic Collective Threat, $\beta = .536$, $t(81) = 2.481$, $p = .01$ and Chronic Personal Threat, $\beta = .477$, $t(81) = 2.587$, $p = .01$, on self-reported anxiety. There was also a significant main effect of Chronic Collective Threat, $\beta = .509$, $t(81) = 2.452$, $p = .02$, and Chronic Personal Threat, $\beta = .370$, $t(81) = 2.083$, $p < .04$, on the perception of the threat. Taken together, participants low in chronic collective threat or chronic personal threat reported less anxiety and perceived the test as less threatening than participants high in these chronic threats.

There was no main effect of Chronic Collective Threat and only a marginally significant main effect of chronic personal threat, $\beta = -.271$, $t(81) = -1.704$, $p = .09$, on ability to cope. Consistent with the previous measures, participants low in chronic personal threat reported greater ability to cope than participants high in chronic personal threat. These findings replicated previous stereotype threat research that has failed to produce a pattern on perceived performance pressure that paralleled performance outcomes.

Performance concerns. The pattern of findings for evaluation apprehension and self-efficacy differed. There was no main effect of collective threat and a significant effect of chronic personal threat on evaluation apprehension, $\beta = .330$, $t(81) = 3.105$, $p = .00$, qualified by a marginally significant Chronic Personal Threat x Chronic Collective Threat interaction, $\beta = .272$, $t(81) = 1.809$, $p = .07$, $R^2\triangle = .04$ (see Figure 2.2). Analysis of the simple slopes revealed that individuals high in chronic personal threat compared to those low in chronic personal threat reported more evaluation apprehension when Chronic Collective Threat was high, $\beta = .272.$, $t(81) = 1.809$, $p = .08$. However, when Chronic Collective Threat was low, evaluation apprehension reported did not differ across levels of Chronic Personal Threat, $\beta = .090$, $t(81) = -.565$, $p = .57$.

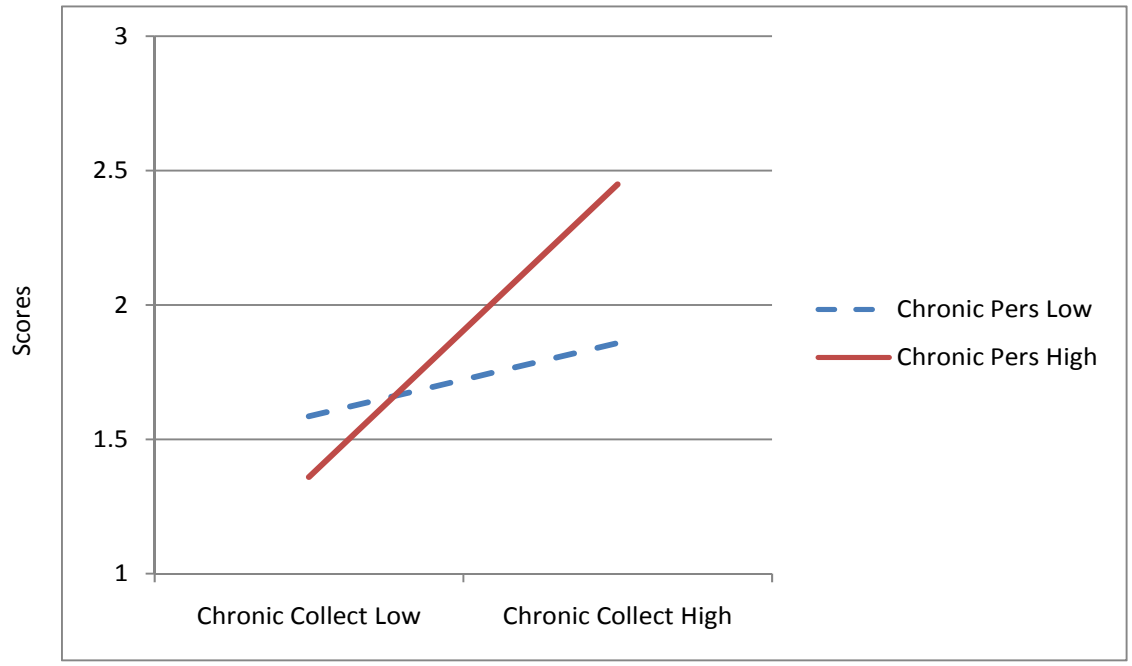

Figure 2.2: Evaluation apprehension by Chronic Collective Threat and Chronic Personal Threat

The measure of self-efficacy revealed a significant main effect of Chronic Personal Threat, $\beta = -.349$, $t(81) = -3.380$, $p < .00$, on self-efficacy. But unlike the evaluation apprehension, the interaction was not significant.

Taken together, these findings replicate previous stereotype threat research that has failed to consistently establish empirical support that perceived performance pressure and performance concern mediate the relationship between stereotype threat and performance.

Salience of self-representation. Although both the Identification with Gender Group and Inclusion of the Group in the Self were intended to assess overlapping constructs, they yielded different patterns of results. The Identification with Gender Group could arguably be considered a blatant assessment of gender identification, while the Inclusion of the Group in the Self could be

considered a subtle assessment of gender identification. For the former measure, there was only a significant main effect of Chronic Collective Threat on Identification, $\beta = .262$, $t(81) = 2.495$, $p < .02$, but no significant main effect of Chronic Personal Threat and no significant interaction.

For the measure Inclusion of Others in the Self, there were no main effects of either Chronic Collective Threat or Chronic Personal Threat, but a marginally significant interaction did emerge, $\beta = .466$, $t(81) = 2.596$, $p < .02$, $R^2\triangle = .08$ (see Figure 2.3). Analysis of simple slopes revealed that participants low in chronic personal threat tended to report greater inclusion of the social group of women in the self than participants high in chronic personal threat when Chronic Collective Threat was low, $\beta = -.479$, $t(81) = -1.866$, $p = .06$. Women low in chronic personal threat did not differ from women high in chronic personal threat when Chronic Collective Threat was high, $\beta = .350$, $t(81) = 1.42$, $p =$ ns.

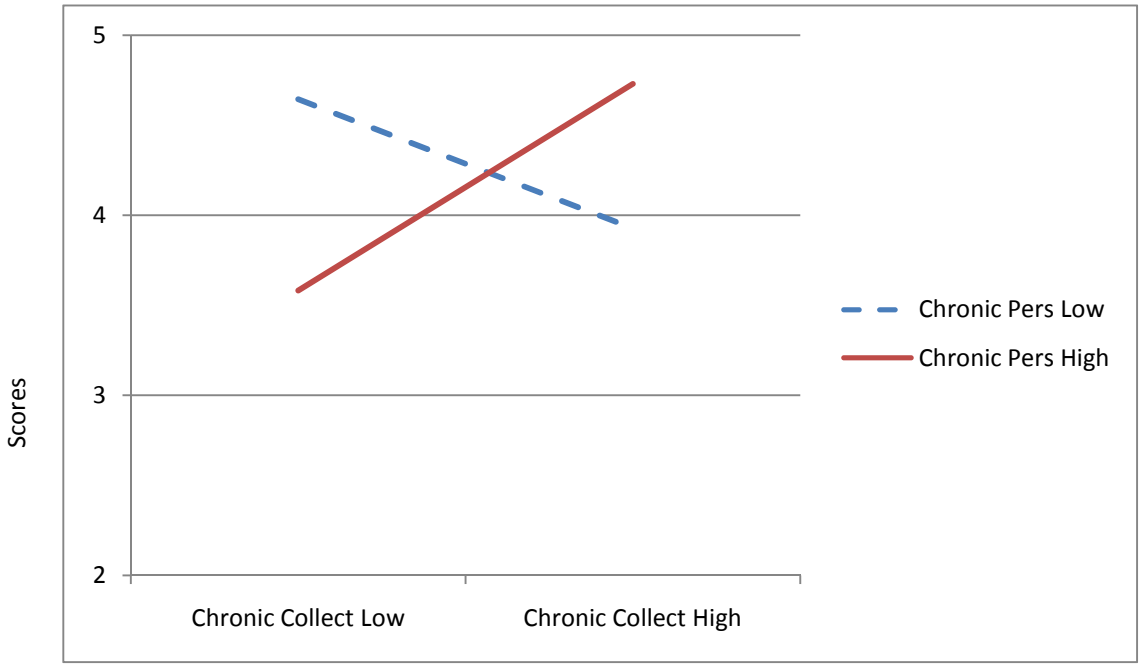

Figure 2.3: Inclusion of Others in the Self by Chronic Collective Threat and Chronic Personal Threat.

For the translation task measure only a significant main effect of Chronic Personal Threat on the number of collective-based pronouns emerged, surprisingly, women high in chronic personal threat reported more collective-based pronouns than women low in personal threat, $\beta = .599$, $t(81) = 2.155$, $p < .05$. There was a no difference among women's level of chronic collective threat in the number of personal-based pronouns or the number of collective-based pronouns. These findings suggest that chronic collective did not moderate salience of collective self-representation.

Effectiveness of Isolating the Primary Variables

Table 2.1 shows the correlations among the primary variables. Chronic collective threat correlated significantly with chronic personal threat, $r = .385$, $p < .05$ (also see Figure 2.4). This finding suggests that using the stigma consciousness and self-doubt scales to tease apart chronic collective threat and chronic personal threat, respectively, is not ideal.

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. MathID	4.17	.33	___													
2. ChCollTh	3.96	.80	.031	___												
3. ChPersTh	2.84	.95	-.165	.385**	___											
4. MathScore	7.80	2.48	.032	-.135	-.233*	___										
5. Anxiety	3.87	1.63	.042	.347**	.413**	-.228*	___									
6. Threat	3.39	1.50	-.073	.325**	.367**	-.264*	.619**	___								
7. Coping	4.57	1.26	.148	-.037	-.233*	.413**	-.294**	-.460**	___							
8. Eval App	2.09	.83	-.081	.259*	.409**	-.399**	.388**	.399**	-.338**	___						
9. Self-Efficacy	4.82	.88	.196	-.199	-.401**	.404**	-.411**	-.487**	.566**	-.581**	___					
10. IDGG	4.10	.73	.078	.259*	.046	.090	.027	-.061	.184	.035	.031	___				
11. Incl Self	4.30	1.33	-.028	-.001	.062	.249*	.050	.100	.054	.050	-.052	.439**	___			
12. Sali – Pers	6.46	2.22	-.061	-.067	-.133	.259*	-.007	-.040	.064	.081	.006	-.077	-.040	___		
13. Sali – Coll	7.25	2.15	-.012	.000	.231*	.046	.072	.037	.109	.021	-.016	.054	.125	-.559**	___	
14. Previ Math	27.12	1.84	.247	-.138	-.138	.578**	-.040	-.258*	.194	-.288	.311**	.029	-.062	.142	.149	__

Table 2.1: Descriptive statistics and correlations among study variables included in Study 1 * $p \leq .1$, ** $p \leq .05$, *** $p < .01$.

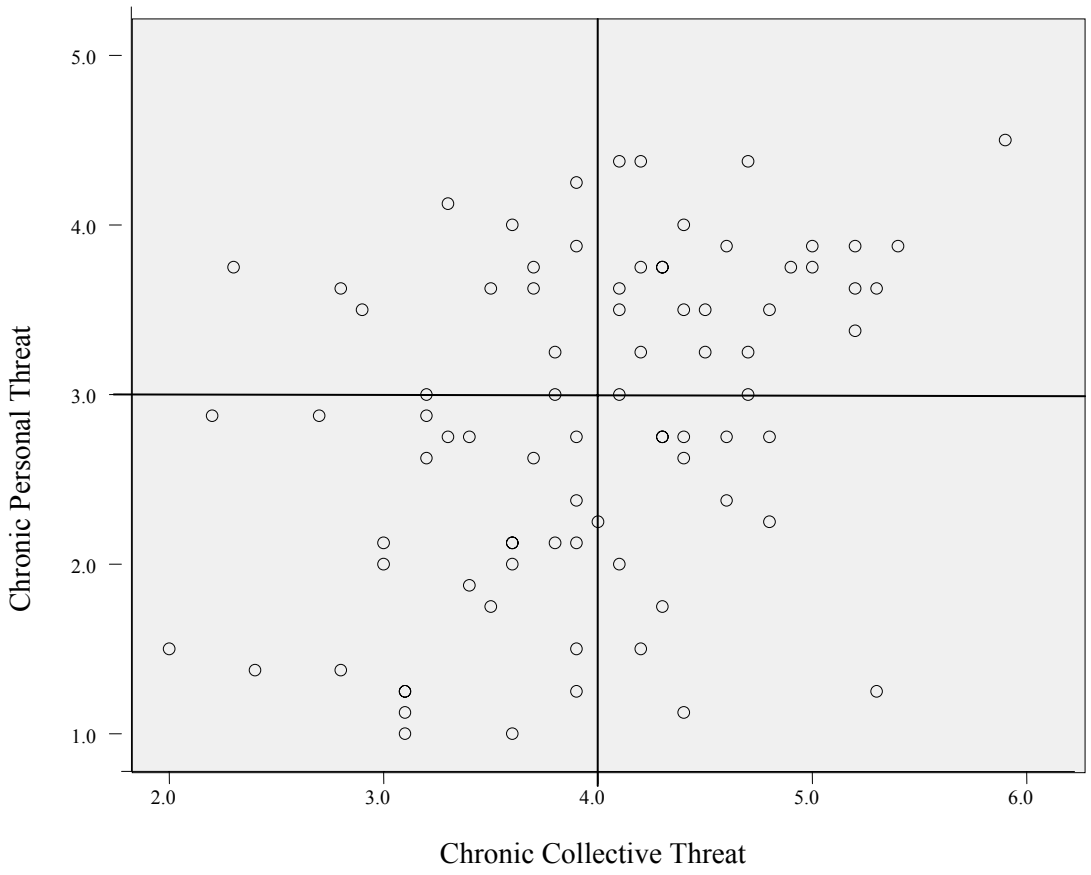

Figure 2.4: Participants' level of chronic collective threat and chronic personal threat.

Discussion

The purpose of the present study was to provide an initial investigation of the role of self-representation in the experience of stereotype threat. Specifically, the present study attempted to tease apart stereotype threat into its components by examining individual differences in the experience of collective threat and personal threat. Women low in both chronic collective threat and chronic personal threat performed better on a math test than women high in these threats experienced together or separately. These data are consistent with previous stereotype threat

research in that women highly identified with the math domain experiencing stereotype threat perform worse on a math task compared to women who are not threatened. Exploratory analyses were also included to investigate participants' phenomenology. Previous research has failed to establish phenomenological evidence supporting a particular mechanism of stereotype threat. The current study is no exception. The patterns of means were inconsistent with the notion that perceived performance pressure and performance concerns measures mediated the relation between stereotype threat and math performance.

Although the current study provides a novel conceptual replication of stereotype threat effects, the central objective of isolating chronic collective threat and chronic personal threat did not appear to be met. A positive correlation emerged between chronic personal threat and chronic collective threat, suggesting that the measures used to reflect these threats were assessing overlapping constructs. Moreover, supplemental analyses suggest that the targeted level of self-representation was not salient. For instance, it was expected that chronic collective threat would moderate the salience of the collective self. However, the findings revealed that chronic personal threat, not chronic collective threat, moderated salience of the collective self. Taken together, it is doubtful that these threats were effectively isolated. To address this limitation, an experimental replication should be conducted, thus, the purpose of Study 2.

CHAPTER 3

Study 2

Overview

The main goal of Study 2 was to address the limitation of Study 1. Specifically, Study 1 did not effectively tease apart stereotype threat into its components. As a consequence, Study 1 was unable to address the question as to whether a target to the personal self or collective self, separately or together, would give rise to a stereotype threat experience. Therefore, Study 2 using an experimental approach, personal threat and collective threat were induced to create an orthogonal design. Similar to Study 1, the math gender stereotype that purports that men are better at math than women was used to manipulate the description of an impending task in order to target a level of self-representation. That is, women participants either experienced a personal threat, collective threat, both threats, or no threat. By manipulating only the presence or absence of personal threat and collective threat, Study 2 will be able to address the causal relationship between threat targeted level of self-representation and performance. Ideally, the findings from the current study should illuminate the role of self-representation in stereotype threat.

Similar to Study 1, several ancillary measures were included to gain insight into participants' phenomenology. Consistent with previous research, Study 1 failed to provide support for the role of perceived performance pressure and performance concerns in the experience of stereotype threat. In the present study, these measures are included to investigate whether the isolation of personal threat and collective threat in the present study will replicate previous null findings.

Self-representation measures were included to explore participants' salient level of self-representation. Specifically, it was predicted that women who had experienced a collective threat compared to women who had not experienced a collective threat would show a collective level of self-representation. Similarly, women who had experienced a personal threat compared to women who had not experienced a personal threat were expected to show a personal level of self-representation.

Method

Participants & Design

One hundred ninety-five female undergraduate students from the Ohio State University were recruited to participate for either monetary compensation or course credit. The study employed a 2 x 2 between factorial design where the type of threat (personal threat or collective threat) and presence of threat (present or absent) were the factors.

Similar to Study 1, participants were categorized into three different groups based on their responses to the math subscale of the domain identification scale. Participants whose scores ranged in the bottom third were classified as the "low math identified" group ($M = 2.20$, $SD = .41$), scores ranged in the middle third were classified as the "moderately math identified" group ($M = 3.17$, $SD = .22$), and those who scores were in the upper third were classified as the "highly math identified" group ($M = 4.22$, $SD = .37$). Again, only participants who were classified as highly math identified were included in the data analysis. This yielded a sample of sixty-nine participants.

Materials and Procedure

The materials, instructions, and procedures were the same as that used in Study 1, except for three modifications. First, all study instructions and materials were presented on computer using MediaLab (Jarvis, 2004).

Second, the presence of personal and collective threats was experimentally manipulated. That is, participants were randomly assigned to one of four conditions that differed in the description of a math test in order to create a personal threat, a collective threat, both threats, or no threat. In the Personal Threat condition participants were told "we are interested in understanding individual math differences." In the Collective Threat condition participants were told "we are interested in understanding men and women's mathematical ability differences." In the Both Threats condition participants were given a combination of the previous two conditions' instructions. Participants were told "we are interested in understanding individual mathematical differences as well as understanding gender mathematical ability differences." Finally, participants in the No Threat condition were told "we are interested in understanding how students perform on this newly developed math test." In an effort to hold motivation constant across all conditions, participants were told that they would receive their scores at the end of the testing situation. However, to avoid activating a personal threat in the Collective Threat and No Threat conditions, participants were additionally instructed "please note, however, that you and only you will see your personal score." Further, they were told that we are only interested in "how men and women overall perform differently on the math test" or "how students overall perform on the test" respectively. Then participants were given explicit instructions in order to manipulate the threat (see Appendices J and K for full instructions).

Finally, because math ability would be controlled through the random assignment, participants were not asked to provide their previous math experience which was used to measure math ability. The remaining procedures were identical to Study 1.

Results

Data Analysis Strategy

A similar data analytic approach to that used in Study 1 was also used in Study 2, with one modification. Because Personal Threat and Collective Threat were categorical variables, in the present study these variables were dummy coded ("0" = Absent; "1" = Present) instead of mean-centered.

Dependent Measure

Similar to Study 1, number of items correctly answered on the math test was the dependent measure (see Table 3.1). A similar pattern of main effects from Study 1 emerged in Study 2 (see Figure 3.1). There was no main effect of collective threat and a marginally significant main effect of personal threat, $\beta = -.948$, $t(68) = -1.861$, $p = .07$, on the number of items answered correctly. Women answered more items correctly when the personal threat was absence ($M = 9.02$, $SE = .36$) than when the personal threat was present ($M = 8.05$, $SE = .33$). However, this effect was qualified by a marginally significant Collective Threat x Personal Threat interaction, $\beta = -1.932$, $t(68) = -1.928$, $p = .058$, $R^2\triangle = .05$ (also see Figure 3.1). Simple contrasts revealed that the participants in the Collective Threat Condition ($M = 9.62$, $SD = 1.71$) answered more items correctly than women in the Personal Threat ($M = 8.07$, $SD = 2.15$), Both Threats ($M = 7.75$, $SD = 2.09$) and the Control ($M = 8.32$, $SD = 2.11$) conditions, $\beta = .858$, $t(81) = 2.809$, $p > .01$. Also women in the Both Threats condition tended to answer less items correctly than women in the Personal Threat and No Threat conditions, but this pattern failed to reach significance ($\beta =$

.267, $t(81) = 1.355$, $p = .18$). These findings suggest that when both a personal threat and collective threat is experienced together that there is a tendency for performance to worsen than when a personal threat or collective threat is experienced separately.

	Personal Threat	Collective Threat	Both Threats	No Threat
Math Score	8.35 (2.06)	9.62 (1.71)	7.75 (2.10)	8.42 (2.09)
Anxiety	4.06 (1.30)	3.92 (1.61)	4.50 (1.82)	4.32 (1.29)
Threat	3.41 (1.42)	3.23 (1.48)	3.50 (1.53)	3.74 (1.24)
Coping	5.00 (1.50)	5.31 (1.18)	5.00 (.97)	4.58 (1.26)
Eval App	2.17 (.83)	2.42 (.80)	2.37 (.80)	2.42 (1.00)
Self-Efficacy	4.28 (.55)	4.03 (1.05)	3.93 (.80)	4.06 (.68)
IDGG	3.82 (.82)	4.17 (1.05)	4.27 (.93)	3.96 (.76)
Incl of Self	4.24 (1.39)	4.23 (2.05)	4.20 (1.28)	4.42 (1.17)
Sali – Pers	6.64 (2.23)	5.92 (1.26)	6.00 (2.15)	6.47 (1.54)
Sali – Coll	7.53 (1.84)	7.23 (2.16)	8.05 (1.82)	7.53 (1.30)

Table 3.1: Means (and standard deviations) of math score, perceived performance pressure, and performance concern.

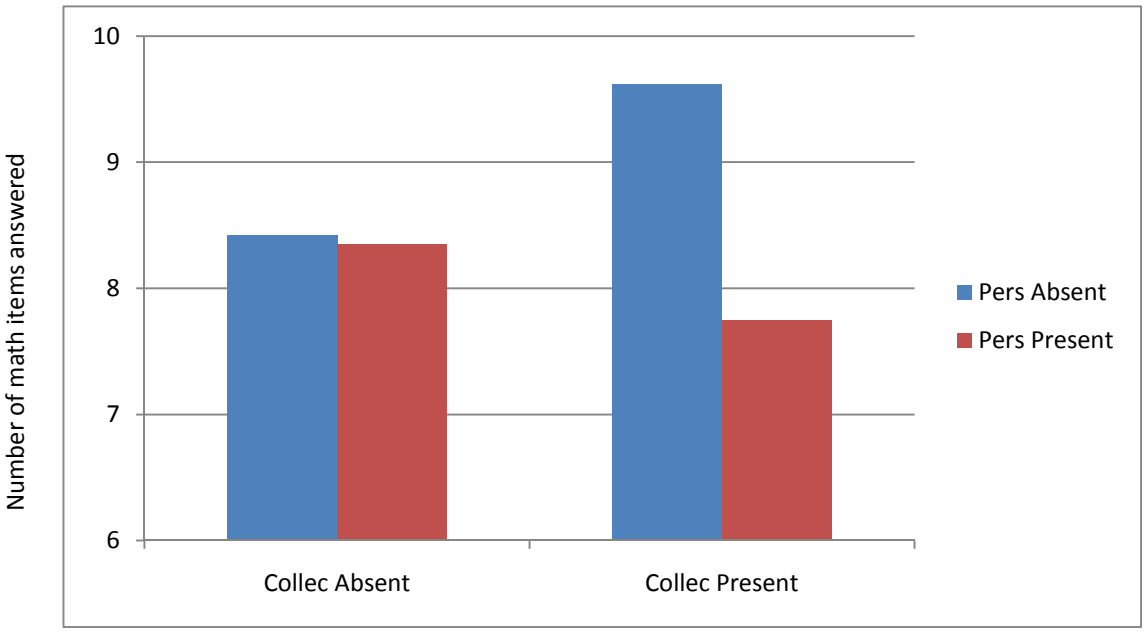

Figure 3.1: Scores on the Math Test by the presence and absence of collective threat and personal threat.

Ancillary Measures

Across perceived performance pressure, performance concerns, and salience of self-representation yielded no main effects of Collective Threat, Personal Threat or a Collective Threat x Personal Threat interaction emerged. These null findings replicate previous research that has not consistently identified a mediator for stereotype threat effects.

Effectiveness of Threat Induction

Several significant correlations emerged among the study variables that support the effectiveness of the manipulation of the threat induction (see Table 3.2; also see Appendices L – O). Consistent with the collective threat induction, a large correlation emerged between the two measures collective group salience, Identification with Gender Group (IDGG) and Inclusion of Others Within the Self (Inc Self) measures, within the Collective Threat ($r = .720$, $p < .01$) and

Both Threats conditions ($r = .702$, $p < .01$), while no such significant correlation emerged within the Personal Threat condition ($r = .471$, $p < .05$). A weaker correlation emerged for women within the No Threat condition. Additionally, a positive correlation between Identification with a gender and perceived threat emerged only for women who experienced a collective threat induction. Moreover, consistent with the personal threat induction, the self-efficacy and evaluation apprehension measures were negatively correlated in the Personal Threat Condition ($r = -.708$, $p < .01$) with a weaker relationship emerging within the No Threat condition ($r = -.496$, $p < .05$). Taken together, these correlations suggest that the threat induction targeted the intended level of self-representation.

Variables	Personal Threat	Collective Threat	Both Threats	No Threat
Threat & Anxiety	.598**	.744***	.526**	.540**
Coping & Math Score	.243	-.266	.129	.429*
Coping & Threat	-.647***	-.472*	-.668***	-.572**
Eval App & Math Score	-.165	-.223	-.109	.123
Eval App & Coping	-.321	-.155	-.371	-.399*
Self-Efficacy & Math Score	.418	.373	.351	.451*
Self-Efficacy & Threat	-.394	.343	-.592***	-.389
Self-Efficacy & Coping	.374	-.141	.579***	.632***
Self-Efficacy & Eval App	-.708***	-.408	-.302	-.496**
IDGG & Anxiety	.336	.207	.507**	.253
IDGG & Threat	.221	.711***	.519**	.185
Inc Self & Threat	.264	.366	.400*	-.073
Inc Self & Anxiety	.338	-.045	.564***	.017
Inc Self & Eval App	.136	-.013	.130	-.341
Inc Self & Coping	-.179	-.411	-.380*	.240
Inc Self & IDGG	.265	.720***	.702***	.471**
Sali – Pers & MathScore	.531**	-.054	-.012	.124
Sali – Pers & Coping	.019	.130	.302	.521**
Sali – Pers & Self-Efficacy	-.050	-.024	.323	-.052
Sali – Coll & MathScore	-.514**	-.363	-.052	-.086
Sali – Coll & Anxiety	.012	.724***	.136	-.334
Sali – Coll & Threat	-.304	.502*	.348	-.390*

Variables	Personal Threat	Collective Threat	Both Threats	No Threat
Sali – Coll & Eval App	-.535**	-.020	.001	-.350
Sali – Coll & Self-Efficacy	.119	.184	-.401*	.362
Sali –Coll & Sali –Pers	-.878***	-.299	-.793***	-.655***

Table 3.2: Correlations among the perceived performance pressure, performance concerns, and salience of self-representation variables across conditions, * $p \leq .1$, ** $p \leq .05$, *** $p < .01$.

Discussion

Study 2 was designed as a conceptual replication of Study 1. By manipulating the presence and absence of a personal threat and collective threat, the present study successfully demonstrated that stereotype threat could be teased apart into its components. Women who received a threat targeted at the collective level of self-representation performed better than women who received a threat targeted at the personal level of self-representation with or without the addition of a collective threat as well as women who did not receive a threat. Additionally, there was a tendency for women to perform worse when a threat was targeted at both levels of self-representation than when a threat was targeted at the personal self or when women did not receive a threat. Of note, ancillary measures assessing participants phenomenology, replicated previous null findings. Specifically, there were no differences across conditions in reported levels of perceived performance pressure or performance concerns.

To my knowledge, the present study is the first demonstration of separating stereotype threat into personal threat and collective threat components. As a consequence, it serves to extend the current understanding of stereotype threat theory.

Collective Threat vs. Collective Challenge

Based on previous research, I predicted that a threat targeted at the collective level of self-representation would either impair or possibly not affect performance. Therefore, it was quite surprising when the experience of a collective threat actually yielded increases in performance outcomes. The question naturally arises as to why the experience of a "pure" collective threat ameliorated performance.

One plausible explanation is that arousal accounts for the observed increase in performance. The Yerkes-Dodson Model of Arousal (1908) describes an inverse-U relationship between arousal and performance such that small amounts of arousal "energizes" behavior yielding performance increases compared to a phenomenological state that is absent of arousal. If arousal continues to increase then arousal will interfere with behavior producing performance decrements. Overall, the pattern of data was consistent with these predictions. Performance was lowest when women were not threatened and when women experienced a simultaneous threat to both levels of self-representation both situations expected to produce no arousal or high levels of arousal, respectively. Moreover, performance was highest when women experienced a single threat targeted at the collective level of arousal, a situation expected to produce arousal at a low level. However, an important deviation arose. According to the model, performance increases would also be expected for women who experienced a threat targeted at the personal level of self-representation, similar the Collective Threat condition. However, performance increases were not observed suggesting that arousal is not responsible for the pattern of data.

An alternative explanation is that instead of appraising the task as a threat, participants appraised the task as a challenge. Prior work indicates that a stressor is interpreted as a threat when the demands of a task is appraised as exceeding one's abilities or resources to cope. On the other hand, a stressor is interpreted as a challenge when the demands of a task is appraised as not exceeding one's abilities or resources to cope (Tomaka, Blascovich, Kelsey, & Leitten, 1993;

Tomaka et al., 1997). In the present study, a high correlation between threat and coping emerged for women in the Both Threats condition ($r = -.608$, $p < .01$), while a weaker relationship emerged for women in the Collective Threat condition ($r = -.472$, $p < .10$). These correlations suggest that women who experienced simultaneous threats to both levels of self-representation reported a stronger relationship between interpreting the math test as a threat while also perceiving one's inability to cope with the math test than women who experienced a threat to the collective level of self-representation. This finding is consistent with the notion that participants in the Collective Threat condition interpreted the math test as a challenge as opposed to interpreting the math test as a threat.

Study 1 – Revisited

Study 2 demonstrated that stereotype threat could be teased apart into its collective threat and personal threat components, which Study 1 failed to demonstrate. These data suggest that the inability to isolate collective threat from personal threat in Study 1 was a feature of the methodological approach. Two likely explanations account for this shortcoming.

One explanation suggests that the problem of isolating stereotype threat into its components in Study 1 resides at the level of the scales. Recall that a correlation between the chronic threats emerged. Perhaps the scales used to assess chronic collective threat and chronic personal threat, the stigma consciousness scale and the self-doubt scale, respectively, measure overlapping constructs.

Another explanation argues that the collective self and personal self are merged together when one is high in a particular domain identification. A developing area of research demonstrates that under certain situations, one's personal identity becomes "fused" with one's collective identity. According to the Identity Fusion Model, when the personal self and collective self are closely aligned, then it is not possible to activate one identity without activating the other

identity (Seyle, 2007). The concept of identity fusion could have important implications to understanding stereotype threat effects. Perhaps, individuals high in domain identification are most vulnerable to stereotype threat because they naturally experience a dual identity. Consistent with this proposition, the correlation between chronic collective threat and chronic personal threat for women in the upper third of math identification was significant, while the correlation for women in the middle and bottom thirds of identification was not significant.

Although speculative, the findings from Studies 1 and 2 are suggestive of a dual threat conceptualization of stereotype threat. That is, that stereotype threat is the consequence of both a collective threat and a personal threat. In the present study, women who experienced both threats together tended to perform worse on a math test than women not threatened, however, these differences did not reach statistical significance. Replicating Study 2 to demonstrate that the experience of a collective threat will enhance performance will support the dual conceptualization of stereotype threat. Specifically, the dual threat conceptualization predicts that eliminating the experience of a personal threat in a situation expected to produce stereotype threat will attenuate performance decrements. The purpose of Study 3 was to test this proposition.

CHAPTER 4

Study 3

Overview

Study 3 extends the case for a dual identity conceptualization of stereotype threat. The dual identity conceptualization predicts that if either the personal self or collective self can be buffered then the stereotype threatening experience should be eliminated. Accordingly, Study 3 tests this assumption by attempting to attenuate stereotype threat effects by providing participants with a personal threat buffer.

Prior work provides initial evidence that buffering the self will attenuate stereotype threat effects. Research suggests that stereotype threat effects can be reduced by instructing individuals to affirm a value that is outside of the stereotype domain (Cohen, Garcia, Apfel, & Master, 2006). For instance, women experiencing a stereotype who were also provided an opportunity to write about a valued characteristic that is personally important performed similarly to women not experiencing stereotype threat (Martens, Johns, Greenberg, & Schimel, 2005). The underlying rationale for the effectiveness of the self-affirmation technique in alleviating stereotype threat effects is unclear. It is plausible that the self-affirmation technique provides an avenue for individuals to become more individuated, thus buffering against the experience of stereotype threat.

According to dual threat conceptualization, providing either a personal buffer or a collective self buffer would attenuate stereotype threat effects. In the present study, however, buffer against the experience of a personal threat was provided. The primary motive for buffering

the personal self against a threat was based on research indicating that a threat targeted at the individual self is perceived as more threatening than a threat targeted at the collective self (Gaertner, Sedikides, & Graetz, 1999). Therefore, a stronger case for the dual threat conceptualization would emerge by demonstrating that a buffer against the personal self rather than a collective self attenuated stereotype threat effects.

In Study 3, all participants were given a threat targeted at both the personal and collective level of self-presentation. Then, half of the participants were also given an opportunity to buffer against a personal threat by being primed with a success event within the stereotype relevant domain. It was predicted that performance decrements would emerge when women were not provided a buffer than when women were provided a buffer.

Again, ancillary measures were included to assess participants' phenomenological experience. Consistent with Study 2, it was predicted that differences across conditions would not emerge for responses on the perceived performance pressure as well as performance concerns measures. Based on the results from Study 2, a correlation between identification with a gender and inclusion of others in the self was expected for participants in the both threats condition, but not for participants in the both threats plus personal buffer condition. This finding would suggest that the intended phenomenological experience was induced.

Method

Participants and Design

Participants were recruited from Ohio State University. Ninety female undergraduate students participated in the study for course credit. Participants were categorized into three different groups based on their response to the math subscale of the Domain Identification Scale. Participants whose scores ranged in the bottom third were classified as "low math identified"

group (M = 2.13, SD = .56), scores ranged in the middle third were classified as the "moderately math identified" group (M = 3.14, SD = .24), and those who scores were in the upper third were classified as the "highly math identified" group (M = 4.23, SD = .42). This yielded a sample of thirty participants.

Materials and Procedure

The materials, instructions, and procedures used in Study 2 were employed in the present study except for a slight modification in the instructions (Appendix P). Participants were assigned to either a Both Threats or Both Threats plus Buffer condition. Participants received instructions intended to blatantly induce the simultaneous experience of both a personal threat and collective threat. These instructions were also used in the Both Threats condition of Study 2. Prior to completing the math test, participants were told that the researchers are interested in obtaining information about academic-related experiences. Specifically, participants in the Both Threats were instructed to write about "why creativity would be important to others." Participants in the Both Threats plus Buffer condition were instructed to write about "a situation when you performed well in a math related situation." All other procedures were identical to those used in Study 2.

Results

Data Analysis Strategy

A similar data analytic approach used in Study 2 was also used in the current study. In the present study, the categorical variables were dummy coded ("0" = Both Threats; "1" = Both Threats plus Personal Buffer).

Dependent Measure

Similar to the previous two studies, number of items correctly answered was the sole dependent measure. There was no main effect of condition. Women in the Both Threats condition (M = 7.89, SD = 2.51) answered the same number of math questions as the women in the Both Threats plus Personal Buffer condition (M = 7.87, SD = 2.59; see Table 4.1).

Variables	Both Threats	Both Threats plus Buffer
Math Score	7.89 (2.51)	7.87 (2.59)
Anxiety	4.28 (1.71)	4.33 (1.40)
Threat	3.67 (1.37)	3.93 (1.50)
Coping	5.11 (1.23)	5.07 (.70)
Eval App	2.23 (1.02)	2.01 (.73)
Self-Efficacy	2.07 (.65)	2.00 (.48)
IDGG	4.11 (1.02)	4.19 (.76)
Incl of Self	4.17 (.99)	4.47 (1.30)
Sali – Pers	5.17 (2.60)	5.47 (1.96)
Sali – Coll	8.06 (3.26)	8.33 (1.80)

Table 4.1: Means (and standard deviations) of math score, perceived performance pressure, and performance concern.

Ancillary Measures

Similar to Study 2, differences across conditions did not emerge on the ancillary measures. Specifically, perceived performance pressure, performance concerns, and salience of self-representation yielded no main effects of condition.

Effectiveness of Threat Induction

Supplemental analyses examined the correlations among the study variables by condition (see Table 4.2; also see Appendices Q and R) to gather support for the effectiveness of the threat induction. The positive correlation between inclusion of others in the self and identification with a gender group emerged for the Both Threats and Both Threats plus buffer conditions, this suggests that the intended phenomenological threat experience was not induced.

Variables	Both Threats	Both Threats plus Buffer
Threat & Anxiety	.318	.252
Coping & Math Score	.042	.162
Coping & Threat	-.395	-.678**
Eval App & Math Score	-.410*	.136
Eval App & Coping	.118	-.306
Self-Efficacy & Math Score	-.541**	-.277
Self-Efficacy & Threat	.408*	.422
Self-Efficacy & Coping	-.142	-.170
Self-Efficacy & Eval App	.523**	.521**
IDGG & Anxiety	-.385	.366
IDGG & Threat	-.229	-.001
Inc Self & Threat	-.204	.054
Inc Self & Anxiety	-.131	-.052
Inc Self & Eval App	-.535**	.038
Inc Self & Coping	-.501**	.275
Inc Self & IDGG	.556**	.545**
Sali – Pers & MathScore	-.060	-.071
Sali – Pers & Coping	.436*	.079
Sali – Pers & Self-Efficacy	.428	-.503*
Sali – Coll & MathScore	.559**	.102
Sali – Coll & Anxiety	.198	-.047
Sali – Coll & Threat	-.140	-.125

Variables	Both Threats	Both Threats plus Buffer
Sali – Coll & Eval App	-.568**	.169
Sali – Coll & Self-Efficacy	-.456*	.332
Sali –Coll & Sali –Plur	-.272	-.615**

Table 4.2: Summary of significant correlations among perceived performance pressure, performance concerns, and salience of self-representation at *$p \leq .1$, ** $p \leq .05$, *** $p \leq .01$

Discussion

The purpose of Study 3 was to replicate Study 2 by demonstrating that the experience of a collective threat would enhance performance by buffering the personal self against the experience of a threat in a situation intended to create stereotype threat. Women who were provided a buffer against the experience of a personal threat performed the same on a math test as women who were not provided a buffer. Moreover, consistent with Study 2, measures of perceived performance pressure and performance concerns did not differ across conditions.

The lack of performance differences across conditions could be attributed to either the conceptualization of stereotype threat tested or the particular buffering technique used. The present study assumes that stereotype threat is the consequence of both a collective threat and a personal threat. As such, removing the experience of a personal threat should enhance performance. Perhaps the dual conceptualization does not accurately reflect stereotype threat. This conclusion is unlikely considering the previous findings reported in the current paper.

A more likely cause of the null findings on the performance data obtained in the present is that the particular buffering technique did not effectively remove the phenomenological experience of a personal threat. Indeed, internal analyses suggest when personal threat is removed that performance decrements are eliminated. Research suggests that the perceptual ease or

difficulty of retrieving content from memory is informative. That is, the ease to which an individual brings to mind an instance of a requested characteristic, affects the likelihood that the individual will attribute that characteristic to the self (Schwartz et al., 1991). In the present study, women whose subjective recall of a successful math example was easy would attribute high math abilities to the self, and thus, eliminate the personal threat. In converse, women whose subjective recall of a successful math example was difficult would attribute low math abilities to the self, and therefore, not eliminate the personal threat. Following this reasoning, individuals who provided a poor example of a math success likely experienced subjective ease in recalling the example from memory; while those who provided a quality example of a math success likely experienced subjective difficulty in recalling the example from memory. To test this hypothesis, the math examples were coded and ranked by its quality. Conducting a median split, women who provided a low quality example performed better ($M = 8.23$; $SD = 2.29$) than women who provided a higher quality exampled performed ($M = 7.50$; $SD = 3.14$). This exploratory analysis suggests that if the personal threat can effectively be removed then performance will be ameliorated. Admittedly, additional research needs to further explore this topic, but these internal analyses are encouraging that stereotype threat is accurately conceptualized as a dual threat.

CHAPTER 5

General Discussion

Stereotype threat research has largely focused on identifying the groups *who* are vulnerable to stereotype threat, rather than exploring *why* the vulnerability exists. The purpose of the present research was to elucidate the role of self-representation in stereotype threat with the goal of illuminating its antecedents. Study 1 showed that women who were chronically low in both personal threat and collective threat performed better on a math test than women who were chronically high in both of these threats experienced together or separately. These findings are consistent with previous stereotype threat research in that nonthreatened participants outperformed threatened participants on a stereotype relevant task. However, a major limitation of Study 1 was the inability to separate chronic collective threat from chronic personal threat. To address this limitation, Study 2 experimentally replicated Study 1. Unexpectedly, women who experienced a collective threat performed better than women who experienced a personal threat with or without a collective threat as well as women not threatened. Moreover, there was a tendency for women who simultaneously experienced both threats to perform worse than women who solely experienced a personal threat and a control group. Study 3 continued to investigate the role of personal and collective threat by attempting to remove the personal threat in order to ameliorate performance for women experiencing stereotype threat. Differences did not emerge among women who were provided a personal threat buffer or not. However, the buffering technique did not appear to produce the intended phenomenology. Internal analyses suggest that when personal threat was effectively eliminated that performance outcomes were improved.

Implications to Stereotype Threat Theory

Although preliminary, the present research provides an extension of prior work. Specifically, the findings contribute to stereotype threat theory in three ways. First, the findings support the argument that the performance decrements observed among stereotype threatened individuals are due, in part, to their adoption of strategies that interfere with performance. Second, the data from the present research challenges the view that stereotype threat is the consequence of a threat targeted only at the collective level of self-representation. Instead, these findings suggest that stereotype threat may be the result of a *dual threat*. That is, stereotype threat is the consequence of a threat targeted at both the collective and personal levels of self-representation. Finally, the dual threat conceptualization serves to provide a parsimonious theoretical framework for organizing the established moderators of stereotype threat. Each of these contributions is discussed in greater detail.

Performance Strategies

An intriguing finding revealed in the data was an increase in performance for women who experienced a threat targeted solely at the collective self. As discussed earlier, a likely explanation of this finding is that women perceived the math test as a challenge rather than a threat. This interpretation lends support for the Stereotyped Task Engagement Process (STEP; Smith, 2004). The STEP model is based on the premise that individuals will adopt either a *performance approach goal* or *performance avoidance goal* (see Elliot & Church, 1997) when confronted with a task. Performance approach goals arise when one is attempting to achieve success on a task and are associated with positive performance outcomes. In contrast, performance avoidance goals arise when one is attempting to avoid a poor result on a task and are associated with negative performance outcomes. The STEP model predicts that performance

decrements among stereotype threatened individuals are due to the adoption of performance avoidance goals. Stereotype threatened individuals are motivated to choose a performance avoidance goal because they desire to disprove the applicability of a negative stereotype. Ironically, adopting this type of goal leads to the obtainment of what individuals are trying to avoid – lowered performance. It is plausible that women experiencing a sole collective threat adopted a performance approach goal in lieu of the expected performance avoidance goal. Previous work has demonstrated a similar finding. In an investigation of the moderating effects of gender identification, researchers found that women high in gender identification tended to adopt a performance avoidance strategy compared to women low in gender identification (Rucks, 2006). Further exploration of the performance strategies chosen by stereotype threatened individuals will highlight the phenomenological experience of stereotype threat.

Stereotype Threat as a Dual Threat

A notable contribution of the present study is the advancement towards an accurate conceptualization of stereotype threat. As discussed earlier, stereotype threat can be conceptualized as either a *single threat* or a *dual threat*. The single threat conceptualization predicts that the experience of one threat targeted at either level of self-representation is sufficient to produce stereotype threat. On the other hand, the dual threat conceptualization predicts that only simultaneously targeting both the personal and collective level of self-representation is sufficient to produce stereotype threat. In the first systematic investigation of these conceptualizations, the present study suggests that the single threat conceptualization does not fully account for stereotype threat effects. Perhaps, then, stereotype threat is an example of a dual threat.

A dual threat would be expected to be particularly difficult to defend against. This difficulty can be understood by examining the utility of a dual representation framework when

experiencing a psychological threat (Linville, 1985). A threat in one aspect of the self can be buffered by shifting one's self-identification away from the targeted self-representation (Gaertner, et al., 1999). That is, identifying the self in terms of the collective group can buffer against an individual threat. Similarly, identifying oneself as an individual can buffer against a collective threat. Considering that threats to the self are generally dichotomized as a personal threat or a collective threat, the dual threat conceptualization would present a novel perspective in understanding how people respond to threatening situations.

In arguing that stereotype threat is a dual threat, it is important to address a definitional limitation of this conceptualization. Definitions of collective threat other than the one previously delineated are also accepted. For instance, one definition proposes that a collective threat is the fear that arises when a member of one's in-group may reinforce the veracity of a stereotype (Cohen & Garcia, 2005). The concept of a dual threat as proposed in the present work does not necessarily extend to these alternative definitions. Ideally, future stereotype threat research will address the applicability of the varying definitions of collective threat to the dual threat conceptualization.

Future research should seek to obtain additional evidence of the dual threat conceptualization by focusing on two objectives. The first objective is to provide direct empirical support that the simultaneous experience of a collective threat and personal threat yields performance decrements. Study 2 showed that performance among participants who experienced both a threat targeted at both levels of self-representation tended to be lower than participants were not threatened or who experienced a personal threat, but this difference did not reach statistical significance. Additional studies ought to be designed with sufficient power to detect these group differences.

Another objective is to determine if the findings from the present study are applicable to additional groups who are also susceptible to stereotype threat. For instance, previous work

indicates that African American students (Steele & Aronson, 1995) as well as members of low socioeconomic class (Croizet & Claire, 1998) can experience stereotype threat. Demonstrating that a stereotype threat is a consequence of both a collective threat and a personal threat among these additional groups would provide converging evidence of the dual threat conceptualization.

Dual Threat Conceptualization as an Organizing Framework

The view that stereotype threat is a dual threat would serve to organize stereotype threat and its effects around a theoretical framework. For instance, studies show that individuals who are highly identified with a domain are vulnerable to stereotype threat. Perhaps individuals who are high in identification experience a fusion between the collective self and the personal self such that a threat directed at either level of self-representation is experienced as a threat directed at both levels (Seyle, 2007). Study 1 is consistent with this argument. Study 1 replicated previous stereotype threat effects in that nonthreatened participants outperformed threatened participants on a stereotype relevant task. Additionally, the study also revealed an overlap between the collective self and the personal self for women high in math identification but this correlation did not emerge for women low in math identification. Future research should investigate whether other established moderators, like gender identification (Schmader, 2001), similarly reflect an overlapping relationship between the collective self and personal self.

The dual threat conceptualization also provides a theoretical framework for explaining the effectiveness of techniques that attenuate stereotype threat effects. For instance, the present study attempted to capitalize on the dual threat conceptualization to enhance performance by removing the experience of a personal threat. However, performance outcomes did not improve among women who were provided a buffering technique compared to women not provided with a buffering technique. This lack of effectiveness highlights a methodological limitation that future research should overcome. For instance, a buffering technique should direct participants along a

phenomenological path that intentionally leads to the alleviation of the experience of a personal threat. One methodological approach to achieve this outcome is to manipulate the meaning of the perceptual ease or difficulty of recalling a math success example. Recall that perceptual ease or difficulty of retrieving content from memory is informative. By manipulating the meaning of recollection, the presence or absence of personal threat can be induced (see Schwartz et al., 1991). Additional techniques used to attenuate stereotype threat can be understood by evaluating them through the lens of the dual threat conceptualization.

Implications to the Mechanism of Stereotype Threat

Researchers propose that arousal drives the experience of stereotype threat, although direct empirical evidence has been difficult to obtain when using self-report measures (Bosson et al., 2004). The current study supports these previous findings. Across all three studies, the pattern of means was inconsistent with the assertion that perceived performance pressure and performance concern measures, used as a proxy for arousal, mediated the relation between stereotype threat and performance concerns. There are several reasons why subjective measures of arousal fail to produce meditational support.

A divergence between "self-reported" arousal and the experience of actual arousal is rooted in the difference between the objective and the subjective experience of arousal. An aroused state will trigger a cognitive search for an initiating stimulus (Cotton, 1981). Individuals can attach differing labels to an arousal experience (Olson, 1988). The particular label that an individual will attach to an arousal experience is dependent on one's currently available cognitions (Olson, 1988). For instance, an aroused state can also be labeled as "threatening" or "challenging". The results from the present study provide additional evidence of this distinction.

Another reason that differences across conditions may not have emerged is that participants may not be aware of being physiologically aroused. Individuals have limited insight

into their own intrapsychic states (Nisbett & Wilson, 1977; Zillmann, 1983). Bosson et al. (2004) used a novel paradigm to examine the effect of salience of the pedophile stereotype on gay men's interactions with children. In this study, half of the gay men participants were asked to note and identify their sexual orientation prior to interacting with children within a daycare environment, while the other half did not. After the interaction, participants were asked to report their level of anxiety. Similar to the findings obtained in the present study, there were no differences across conditions. However, independent judges' rating of the participants' interactions with the children revealed that stereotype threatened participants were judged to be more anxious compared to nonthreatened participants. Additional research should be directed towards unobstructive methods to examine the role of arousal in stereotype threat.

Future Directions

In addition to implementing the lines related to the theoretical aspects of stereotype threat as previously outlined, research efforts should also be devoted towards investigating the ecological ramifications of the current findings. For instance, research should examine the nature of instructions that will attenuate stereotype threat for women completing a high stakes exam. Indentifying the techniques that will help to reduce the "real-word" implications of stereotype threat is important to researchers as well as other individuals interested in understanding the consequences of stereotype threat on performance.

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APPENDIX A

SELF-DOUBT SCALE

INSTRUCTIONS: Listed below are statements that concern how you feel about yourself. Read each statement carefully, and then decide how much you agree or disagree with it. Use the following scale:

1	2	3	4	5	6	7
Strongly disagree	disagree	disagree somewhat	neutral	agree somewhat	agree	strongly agree

1. When engaged in an important task, most of my thoughts turn to bad things that might happen (e.g., failing) than to good.

2. For me, avoiding failure has a greater emotional impact (e.g., sense of relief) than the emotional impact of achieving success (e.g., joy, pride).

3. More often than not I feel unsure of my abilities.

4. I sometimes find myself wondering if I have the ability to succeed at important activities.

5. I often wish that I felt more certain of my strengths and weaknesses.

6. As I begin an important activity, I usually feel confident in my ability.[R]

7. Sometimes I feel that I don't know why I have succeeded at something.

8. As I begin an important activity, I usually feel confident in the likely outcome.[R]

APPENDIX B

STIGMA CONSCIOUSNESS SCALE

INSTRUCTIONS: Using the scale that follows, indicate the number that best describes you for each of the statements.

1	2	3	4	5	6	7
strongly disagree	disagree	disagree somewhat	neutral	agree somewhat	Agree	strongly agree

1. Stereotypes about women have not affected me personally.[R]
2. I never worry that my behaviors will be viewed as stereotypically female.[R]
3. When interacting with men, I feel like they interpret all my behaviors in terms of the fact that I am a woman.
4. Most men do not judge women on the basis of their gender.[R]
5. My being female does not influence how men act with me.[R]
6. I almost never think about the fact that I am female when I interact with men.[R]
7. My being female does not influence how people act with me.[R]
8. Most men have a lot more sexist thoughts than they actually express.
9. I often think that men are unfairly accused of being sexist.[R]
10. Most men have a problem viewing women as equals.[R]

APPENDIX C

DOMAIN IDENTIFICATION SCALE

INSTRUCTIONS: Using the following scale, please indicate the number that best describes how much you agree with each of the statements below.

1	2	3	4	5
strongly disagree	Moderately disagree	neither disagree or agree	moderately agree	strongly agree

1. _____ I learn things quickly in English classes.[E]

2. _____ Mathematics is one of my best subjects.[M]

3. _____ English is one of my best subjects.[E]

4. _____ I get good grades in English.[E]

5. _____ I have always done well in Math.[M]

6. _____ I'm hopeless in English classes.[E, R]

7. _____ I get good grades in Math.[M]

8. _____ I do badly on tests of Mathematics.[M, R]

INSTRUCTIONS: Please indicate the number that describes you for each of the statements below using the following scale.

1	2	3	4	5
not at all		somewhat		very much

9. _____ How much do you enjoy Math-related subjects?[M]

10. _____ How much do you enjoy English-related subjects?[E]

11. _____ How likely would you be to take a job in a math related field?[M]

12. _____ How much is Math to the sense of who you are?[M]

13. _____ How important is it to you to be good at Math?[M]

14. _____ How important is it to you to be good at English?[E]

15. _____ Compared to other students, how good are you at math?[M]

    1. Very poor
    2. Poor
    3. About the same
    4. Better than average
    5. Excellent

16. _____ Compared to other students, how good are you at English?[E]

    1. Very poor
    2. Poor
    3. About the same
    4. Better than average
    5. Excellent

APPENDIX D

MATH TEST

INSTRUCTIONS: For each of the following questions, select the best of the answer choices given.

1. If 1/7 of a certain number is 4, then ¼ of the number is:

a. 7/16
b. 2
c. 16/7
d. 7
e. 28

2. Which of the following is equal to ¼ of 0.01 percent?

a. 0.000025
b. 0.00025
c. 0.0025
d. 0.025
e. 0.25

3. At College C there are from 2 to 4 philosophy classes each semester, and each of these classes has from 20 to 30 students enrolled. If one semester 10 percent of the students enrolled in philosophy failed, what is the greatest possible number who failed?

a. 12
b. 10
c. 8
d. 6
e. 3

4. The lengths of the sides of triangle T are X +1, 2X, and 3X. The sum of the degree measures of the three interior angles of T is

a. 6X
b. 60X
c. 90
d. 180
e. not determinable

5. Today is Jack's 12^{th} birthday and his father's 40^{th} birthday. How many years from today will Jack's father be twice as old as Jack is at that time?

a. 12
b. 14
c. 16
d. 18
e. 20

6. If $a + b = 10$, then $(a + b/2) + (b + a/2) =$

a. 5
b. 10
c. 15
d. 20
e. 25

7. If the sum of the first n positive integers is equal to $(n(n+1))/2$, then the sum of the first 25 positive integers is

a. 51
b. 52
c. 313
d. 325
e. 326

8. Of a set of 36 pencils, 1/3 are blue. If exactly 8 of the blue pencils do not have erasers, then how many of the blue pencils have erasers?

a. 4
b. 8
c. 12
d. 20
e. 28

9. If $3(x-30) = 2(x-30)$, what is the value of x?

a. 1
b. 2
c. 10
d. 15
e. 30

10. To reproduce an old photograph, a photographer charges x dollars to make a negative, 3x/5 dollars for each of the first 10 prints, and x/5 dollars for each print in excess of 10 prints. If $45 is the total charge to make a negative and 20 prints from an old photograph, what is the value of x?

a. 3
b. 3.5
c. 4
d. 4.5
e. 5

11. If the average (arithmetic mean) of 5 consecutive integers is 12, what is the sum of the least and greatest of the 5 integers?

a. 24
b. 14
c. 12
d. 11
e. 10

12. A certain cake recipe states that the cake should be baked in a pan 8 inches in diameter. If Marsha wants to use the recipe to make a cake of the same depth but 12 inches in diameter, by what factor should she multiply the recipe ingredients?

a. $2\ ^1/_2$
b. $2\ ^1/_4$
c. $1\ ^1/_2$
d. $1\ ^4/_9$
e. $1\ ^1/_3$

13. If $0 < st < 1$, then which of the following can be true?

a. $s < -1$ and $t > 0$
b. $s < -1$ and $t < -1$
c. $s > -1$ and $t < -1$
d. $s > 1$ and $t < -1$
e. $s > 1$ and $t > 1$

14. Which of the following numbers disproves the statement "A number that is divisible by 3 and 6 is also divisible by 9"?

a. 18
b. 30
c. 36
d. 54
e. 90

15. Which of the following numbers is between 1/5 and 1/4?

a. 0.14
b. 0.15
c. 0.19
d. 0.21
e. 0.26

APPENDIX E

PERFORMANCE CONCERNS

INSTRUCTIONS: Using the following scale, indicate the number that indicates what is true for you at this moment:

1	2	3	4	5
Not at all	A little bit	Somewhat	Very much	Extremely

1. People will think I have less ability if I do not do well on this test.[EA]
2. I am uncertain I have the mathematical knowledge to do well on this test.[SE, R]
3. People will look down on me if I do not do well on this test.[EA]
4. I am concerned about whether I have enough mathematical ability to do well on the test.[SE, R]
5. If I don't do well on this test, others may question my ability.[EA]
6. I am very good at math.[SE]
7. I doubt I have the mathematical ability to do well on the test.[SE, R]
8. If I do poorly on this test, people will look down on me.[EA]
9. I can handle the test.[SE]
10. I feel self-confident.[EA, R]

APPENDIX F

IDENTIFICATION WITH A GENDER GROUP

INSTRUCTIONS: Please consider your gender group membership. Respond to the following statements on the basis of how you feel about this group and your membership in it.

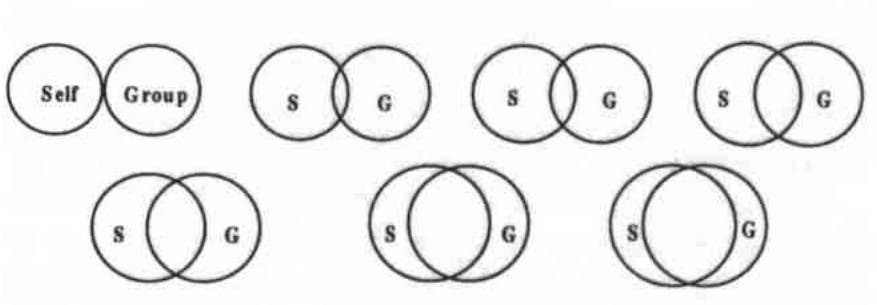
1	2	3	4	5	6	7
strongly disagree	disagree	disagree somewhat	neutral	agree somewhat	Agree	strongly agree

1. When someone criticizes my gender group, it feels like a personal insult.
2. I'm very interested in what others think about my gender group.
3. When I talk about my gender group, I usually say "we" rather than "they."
4. The successes of members of my gender group are my successes.
5. When someone praises my gender group, it feels like a personal compliment.
6. I act like a member of my gender group to a great extent.
7. If a story in the media criticized a member of my gender group, I would feel embarrassed.
8. I don't act like the typical member of my gender group.[R]
9. I have a number of qualities typical of members of my gender group.
10. The limitations associated with my gender group apply to me also.

APPENDIX G

INCLUSION OF THE INGROUP IN THE SELF

INSTRUCTIONS: Please select the diagram that best represents your identification with your gender group.



APPENDIX H

TRANSLATION TASK

INSTRUCTIONS: We are interested in language research and the relationship between languages. We have been investigating the way people translate relatively unknown foreign languages based "on their gut feelings." The text on the next page has been written in the "Wezwe" language, a language which is spoken by only a small population in New Guinea. In the text we have underlined several words. These words have been numbered (i.e.,1 – 15). They are pronouns in the Wezwe language.

In the text on the next page as you read try to let your feelings tell you what is the English translation of the underlined word. You should choose from the pronouns listed below. Please note: You don't have to use all of the pronouns. [Turn to the next page for the Wezwe text.]

WEZWE TEXT

After each underlined word in the passage below is a number. On the line provided you can indicate which pronoun in the text goes with each number. Try to work **AS QUICKLY AS POSSIBLE.** Use your gut feeling and do not think too long. You can choose from the following words:

I, We, My, Us, Ours, Mine

PLEASE NOTE YOU DON'T HAVE TO USE ALL OF THEM.

Todo de poi dele ban (1) numa te cloi san dem toi sel neldomo dan ko (2) cas im todo de oidemo dan. Beme de lo ban (3) seldemo ko jano cas. Te dem (4) de perdoiba ko (5) berbanoi. Te demi (6) sel cas doimo pan iri toi poban hili numoi son ban (7) perdoiba. Todo bois de bani (8) demai. Joi num jenoio bano (9) no jala membarjar koi (10) cas lano. Te sel demo pojan membaj er bano (11) don todo perdoiban. Oi, de deme hilie semoi bani (12) te dola inaidemo. De dolo hili (13) neldemoi membajar son! Soi tui. Ban (14) canto deme jan biri biri, deloi poba hin to koi (15) noi eme.

1)_____

2)_____

3)_____

4)_____

5)_____

6)_____

7)_____

8)_____

9)_____

10)_____

11)_____

12)_____

13)_____

14)_____

15)_____

APPENDIX I

STUDY 1 – INSTRUCTIONS

Welcome to the National Education Project! The purpose of the current study is to conduct additional research on a recently developed math test. Therefore, you will be taking a section of this newly developed math test. Please note that the math test you are about to complete is challenging because it is diagnostic of your mathematical ability. In other words, the impending math test will serve as an indication of your ability to solve complex quantitative problems. At the conclusion of the study you will receive your score on the math test.

APPENDIX J

STUDY 2 – INSTRUCTIONS

Individual Threat Condition

Welcome to the National Education Project! You will be taking a section of a newly developed math test. The purpose of the present study is to gain a better understanding of the factors involved in solving mathematical problems. Specifically, we are interested in understanding individual mathematical differences. The test you are about to take is challenging because the test is designed to measure individual mathematical ability differentials. Additionally, the impending math test has been shown to be completely free of gender bias. We will compare your score to other students as an indicator of your mathematical ability in an effort to demonstrate and understand these individual mathematical ability differences. At the conclusion of the study you will receive your score on the test.

Collective Threat Condition

Welcome to the National Education Project! You will be taking a section of a newly developed math test. The purpose of the present study is to gain a better understanding of the factors involved in solving mathematical problems. Specifically, we are interested in understanding gender mathematical ability differences. The test you are about to take is challenging because the test is designed to measure gender mathematical ability differentials. Additionally, the impending math test has been shown to produce gender differences. We will compare women's scores on average to men's scores on average as an indicator of women's and men's mathematical abilities in an effort to demonstrate and understand these gender mathematical ability differences. At the conclusion of the study you will receive your score on the test. Please note, however, that you and only you will see your personal score; we are only interested in how men and women overall perform differently on the test.

Both Threats Condition

Welcome to the National Education Project! You will be taking a section of a newly developed math test. The purpose of the present study is to gain a better understanding of the factors involved in solving mathematical problems. Specifically, we are interested in understanding individual mathematical differences as well as understanding gender mathematical ability differences. The test you are about to take is challenging because the test is designed to measure individual mathematical ability differentials as well as gender math ability differentials. Additionally, the impending math test has been shown to produce gender differences. We will compare your score to other students as an indicator of your mathematical ability in an effort to demonstrate and understand these individual mathematical ability differences. Also, we will compare women's scores on average to men's scores on average as an indicator of women's and men's mathematical abilities an effort to demonstrate and understand these gender mathematical ability differences. At the conclusion of the study you will receive your score on the test.

No Threat Conditions

Welcome to the National Education Project! You will be taking a section of a newly developed math test. The purpose of the present study is to gain a better understanding of the factors involved in solving mathematical problems. Specifically, we are interested in understanding how students perform on this newly developed math test. The test you are about to take is challenging because the test is designed to be challenging. Additionally, the impending math test has been shown to be completely free of gender bias. At the conclusion of the study you will receive your score on the test. Please note, however, that you and only you will see your personal score; we are only interested in how students overall perform on the test.

APPENDIX K

STUDY 2 – INSTRUCTIONS (ANNOTATED)

Using the "Both Threats Condition" as the exemplar, the instructions for the four conditions are presented in *italics*. Phrases that are deleted from the exemplar condition are represented with a ~~strikethrough~~. Phrases that are added to the exemplar condition are presented with an underline.

Individual Threat Condition

Welcome to the National Education Project! You will be taking a section of a newly developed math test. The purpose of the present study is to gain a better understanding of the factors involved in solving mathematical problems. Specifically, we are interested in understanding individual mathematical differences ~~as well as understanding gender mathematical ability differences~~*. The test you are about to take is challenging because the test is designed to measure individual mathematical ability differentials* ~~as well as gender mathematical ability differentials~~*. Additionally, the impending math test has been shown* ~~to produce gender differences~~ *to be completely free of gender bias. We will compare your score to other students as an indicator of your mathematical ability in an effort to demonstrate and understand these individual mathematical ability differences.* ~~Also, we will compare women's scores on average to men's scores on average as an indicator of women's and men's mathematical ability an effort to demonstrate and understand these gender mathematical ability differences~~*. At the conclusion of the study you will receive your score on the test.*

Collective Threat Condition

Welcome to the National Education Project! You will be taking a section of a newly developed math test. The purpose of the present study is to gain a better understanding of the factors involved in solving mathematical problems. Specifically, we are interested in understanding ~~individual math differences as well as understanding~~ *gender mathematical ability differences. The test you are about to take is challenging because the test is designed to measure* ~~individual math ability differentials as well as~~ *gender mathematical ability differentials. Additionally, the impending math test has been shown to produce gender differences.* ~~We will compare your score to other students as an indicator of your math ability in an effort to demonstrate and understand these individual mathematical ability differences. Also,~~ *We will compare women's scores on average to men's scores on average as an indicator of women's and men's mathematical abilities in an effort to demonstrate and understand these gender mathematical ability differences. At the conclusion of the study you will receive your score on the test. Please note, however, that you and only you will see your personal score; we are only interested in how men and women overall perform differently on the test.*

Both Threats Condition

Welcome to the National Education Project! You will be taking a section of a newly developed math test. The purpose of the present study is to gain a better understanding of the factors involved in solving mathematical problems. Specifically, we are interested in understanding individual mathematical differences as well as understanding gender mathematical ability differences. The test you are about to take is challenging because the test is designed to measure individual mathematical ability differentials as well as gender mathematical ability differentials. Additionally, the impending math test has been shown to produce gender differences. We will compare your score to other students as an indicator of your mathematical ability in an effort to demonstrate and understand these individual mathematical ability differences. Also, we will compare women's scores on average to men's scores on average as an indicator of women's and men's mathematical abilities an effort to demonstrate and understand these gender mathematical ability differences. At the conclusion of the study you will receive your score on the test.

No Threat Condition

Welcome to the National Education Project! You will be taking a section of a newly developed math test. The purpose of the present study is to gain a better understanding of the factors involved in solving mathematical problems. Specifically, we are interested in understanding ~~individual mathematical differences as well as understanding gender mathematical ability differences~~ *how students perform on this newly developed math test. The test you are about to take is challenging because the test is designed* ~~measure individual mathematical ability differentials as well as gender mathematical ability differentials~~ *to be challenging. Additionally, the impending math test has been shown* ~~to produce gender differences~~ *to be completely free of gender bias.* ~~*We* will compare your score to other students as an indicator of your mathematical ability in an effort to demonstrate and understand these individual mathematical ability differences. Also, we will compare women's scores on average to men's scores on average as an indicator of women's and men's math ability an effort to demonstrate and understand these gender mathematical ability differences~~*. At the conclusion of the study you will receive your score on the test. Please note, however, that you and only you will see your personal score; we are only interested in how students overall perform on the test.*

APPENDIX L

STUDY 2 – DESCRIPTIVES STATISTICS AND CORRELATIONS AMONG VARIABLES FOR PARTICIPANTS IN THE PERSONAL THREAT CONDITION

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. MathID	4.31	.36	___												
2. ChCollTh	3.75	.80	-.060	___											
3. ChPersTh	2.72	.92	.029	.721***	___										
4. MathScore	8.35	2.06	.170	.127	.251	___									
5. Anxiety	4.06	1.30	.501*	-.108	-.455*	-.032	___								
6. Threat	3.41	1.42	.559*	-.151	-.261	-.053	.598**	___							
7. Coping	5.00	1.50	-.456	.241	.169	.243	-.289	-.647***	___						
8. Eval App	2.17	.83	.442	.333	.228	-.165	.119	.383	-.321	___					
9. Self-Efficacy	4.28	.55	-.371	.098	.244	.418	-.435	-.394	.374	-.708***	___				
10. IDGG	3.82	.82	-.104	.546*	.196	-.165	.336	.221	.101	.341	-.347	___			
11. Incl Self	4.24	1.39	.122	-.011	-.263	.143	.338	.264	-.179	.136	-.169	.265	___		
12. Sali – Pers	6.64	2.23	.371	.374	.495**	.531**	.008	.167	.019	.405	-.050	.026	-.192	___	
13. Sali – Coll	7.53	1.84	-.360	-.338	-.337	-.514**	.012	-.304	-.023	-.535*	.119	-.125	.070	-.878***	__

* $p \leq .1$, ** $p \leq .05$, *** $p < .01$

APPENDIX M

STUDY 2 – DESCRIPTIVES STATISTICS AND CORRELATIONS AMONG VARIABLES FOR PARTICIPANTS IN THE COLLECTIVE THREAT CONDITION

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. MathID	4.24	.34	___												
2. ChCollTh	4.19	.64	-.039	___											
3. ChPersTh	3.33	.91-]	-.715***	.091	___										
4. MathScore	9.62	1.71	.250	-.059	-.013	___									
5. Anxiety	3.92	1.61	-.419	.317	.240	.140	___								
6. Threat	3.23	1.48	-.392	.387	.380	.170	.744***	___							
7. Coping	5.31	1.18	.192	.007	.054	-.266	-.426	-.472*	___						
8. Eval App	2.42	.80	-.427	-.055	.262	-.223	.225	.125	-.155	___					
9. Self-Efficacy	4.03	1.05	.229	.268	-.494	.373	.303	.343	-.141	-.408	___				
10. IDGG	4.17	1.05	.061	.196	-.025	.047	.207	.711***	-.173	-.145	.396	___			
11. Incl Self	4.23	2.05	.258	-.312	-.312	.123	-.045	.366	-.411	-.013	.255	.720***	___		
12. Sali – Pers	5.92	1.26	.348	.006	.006	-.054	-.417	-.079	.130	-.285	-.024	.210	.072	___	
13. Sali – Coll	7.23	2.16	-.231	.397	.397	-.363	.724***	.502*	-.225	-.020	.184	-.044	-.107	-.299	___

* $p \leq .1$, ** $p \leq .05$, *** $p < .01$

APPENDIX N

STUDY 2 – DESCRIPTIVES STATISTICS AND CORRELATIONS AMONG VARIABLES FOR PARTICIPANTS IN THE BOTH THREATS CONDITION

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. MathID	4.09	.42	___												
2. ChCollTh	3.78	.82	.289	___											
3. ChPersTh	2.89	1.07	-.082	.271	___										
4. MathScore	7.75	2.10	.385*	-.110	.253	___									
5. Anxiety	4.50	1.82	.008	.436*	.170	-.117	___								
6. Threat	3.50	1.53	-.063	.292	-.229	-.057	.526**	___							
7. Coping	5.00	.97	.143	-.408*	.120	.129	-.594***	-.668***	___						
8. Eval App	2.37	.80	.113	.340	.474*	-.109	-.128	.351	-.371	___					
9. Self-Efficacy	3.93	.80	.474**	-.109	-.128	.351	-.371*	-.592***	.579***	-.302	___				
10. IDGG	4.27	.93	.116	.497**	-.037	-.018	.507**	.519**	-.511**	.349	-.245	___			
11. Incl Self	4.20	1.28	-.100	.239	-.180	-.020	.564***	.400*	-.380*	.130	-.057	.702***	___		
12. Sali – Pers	6.00	2.15	.110	-.188	.256	-.012	.013	-.270	.302	-.006	.323	-.060	-.019	___	
13. Sali – Coll	8.05	1.82	-.251	.071	-.068	-.052	.136	.348	-.149	.001	-.401*	-.188	-.140	-.793***	__

* $p \leq .1$, ** $p \leq .05$, *** $p < .01$

APPENDIX O

STUDY 2 – DESCRIPTIVES STATISTICS AND CORRELATIONS AMONG VARIABLES FOR PARTICIPANTS IN THE NO THREAT CONDITION

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. MathID	4.26	.43	___												
2. ChCollTh	3.95	.76	.211	___											
3. ChPersTh	2.96	.74	.559**	.219	___										
4. MathScore	8.42	2.09	.295	-.099	2.72	___									
5. Anxiety	4.32	1.29	.286	.232	.108	.154	___								
6. Threat	3.74	1.24	.021	.006	.056	-.019	.540**	___							
7. Coping	4.58	1.26	.033	.031	-.153	.429*	-.220	-.572**	___						
8. Eval App	2.42	1.00	.314	.212	.399*	.123	.184	.175	-.399*	___					
9. Self-Efficacy	4.06	.68	.410	-.069	.286	.451*	-.138	-.389	.632***	-.496**	___				
10. IDGG	3.96	.76	.328	.464*	-.092	-.113	.253	.185	-.084	-.164	.030	___			
11. Incl Self	4.42	1.17	.050	.387	-.173	-.167	.017	-.073	.240	-.341	.175	.471**	___		
12. Sali – Pers	6.47	1.54	.248	-.255	.103	.124	.311	.272	.521*	-.007	-.052	.127	-.086	___	
13. Sali – Coll	7.53	1.30	-.205	.117	-.193	-.086	-.334	-.390*	.479*	-.350	.362	.107	-.044	-.655***	___

* $p \leq .1$, ** $p \leq .05$, *** $p < .01$

APPENDIX P

STUDY 3 – INSTRUCTIONS

Both Threats Condition

Welcome to the National Education Project! You will be taking a section of a newly developed math test. The purpose of the present study is to gain a better understanding of the factors involved in solving mathematical problems. Specifically, we are interested in understanding individual mathematical differences as well as understanding gender mathematical ability differences. You were selected for this experiment because of your strong background in mathematics. The test you are about to take is challenging because the test is designed to measure individual mathematical ability differentials as well as gender mathematical ability differentials. Additionally, the impending math test has been shown to produce gender differences. We will compare your score to other students as an indicator of your mathematical ability in an effort to demonstrate and understand these individual mathematical ability differences. Also, we will compare women's scores on average to men's scores on average as an indicator of women's and men's mathematical abilities an effort to demonstrate and understand these gender mathematical ability differences. At the conclusion of the study you will receive your score on the test.

The researchers are also interested in obtaining information about an academic-related experience. **Please write about why creativity would be important to others**.

Both Threats plus Buffer Condition

Welcome to the National Education Project! You will be taking a section of a newly developed math test. The purpose of the present study is to gain a better understanding of the factors involved in solving mathematical problems. Specifically, we are interested in understanding individual mathematical differences as well as understanding gender mathematical ability differences. You were selected for this experiment because of your strong background in mathematics. The test you are about to take is challenging because the test is designed to measure individual mathematical ability differentials as well as gender mathematical ability differentials. Additionally, the impending math test has been shown to produce gender differences. We will compare your score to other students as an indicator of your mathematical ability in an effort to demonstrate and understand these individual mathematical ability differences. Also, we will compare women's scores on average to men's scores on average as an indicator of women's and men's mathematical abilities an effort to demonstrate and understand these gender mathematical ability differences. At the conclusion of the study you will receive your score on the test.

The researchers are also interested in obtaining information about an academic-related experience. **Please write about when you performed well in a math related situation**.

APPENDIX Q

STUDY 3 – DESCRIPTIVES STATISTICS AND CORRELATIONS AMONG VARIABLES FOR PARTICIPANTS IN THE BOTH THREATS CONDITION

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. MathID	4.35	.39	___												
2. ChCollTh	3.67	.88	.015	___											
3. ChPersTh	2.97	.94	-.160	.237	___										
4. MathScore	7.89	2.51	.354	-.155	-.158	___									
5. Anxiety	4.28	1.71	.048	.668***	.084	.267	___								
6. Threat	3.67	1.37	-.288	.101	.322	-.148	.318	___							
7. Coping	5.11	1.23	-.223	-.043	.010	.042	.124	-.395	___						
8. Eval App	2.23	1.02	-.319	.617***	.529**	-.410*	.398	.377	.118	___					
9. Self-Efficacy	2.07	.65	-.381	.526**	.296	-.541**	-.049	.408*	-.142	.523**	___				
10. IDGG	4.11	1.02	.497**	-.066	.151	.161	-.385	-.229	-.335	-.245	-.240	___			
11. Incl Self	4.17	.99	.463**	.005	-.400*	.245	-.204	-.131	-.501**	-.535**	-.312	.556**	___		
12. Sali – Pers	5.17	2.60	-.184	.179	.269	-.060	.374	.198	.436*	.428	-.035	.048	-.311	___	
13. Sali – Coll	8.06	3.26	.301	-.196	-.031	.559**	.198	-.140	-.119	-.568**	-.456*	.071	.345	-.272	___

* $p \leq .1$, ** $p \leq .05$, *** $p < .01$

APPENDIX R

STUDY 3 – DESCRIPTIVES STATISTICS AND CORRELATIONS AMONG VARIABLES FOR PARTICIPANTS IN THE BOTH THREATS PLUS BUFFER CONDITION

	M	SD	1	2	3	4	5	6	7	8	9	11	12	13	14
1. MathID	4.02	.40	___												
2. ChCollTh	3.86	.72	.383	___											
3. ChPersTh	2.89	.99	-.116	.050	___										
4. MathScore	7.87	2.59	-.028	.149	.252	___									
5. Anxiety	4.33	1.40	-.071	.304	.628**	-.007	___								
6. Threat	3.93	1.50	.003	-.069	.025	-.318	.252	___							
7. Coping	5.07	.70	.135	-.331	.062	.162	-.242	-.678***	___						
8. Eval App	2.01	.73	.554**	.372	.164	.136	.302	.419	-.306	___					
9. Self-Efficacy	2.00	.48	.331	-.211	-.087	-.277	-.257	.422	-.170	.521**	___				
10. IDGG	4.19	.76	.017	.168	.108	-.229	.366	-.001	.042	.130	-.176	___			
11. Incl Self	4.47	1.30	.009	-.252	-.034	-.404	-.052	.054	.275	.038	-.046	.545**	___		
12. Sali – Pers	5.47	1.96	-.065	.518**	-.161	-.071	.096	-.185	.079	-.362	-.503*	.095	-.175	___	
13. Sali – Coll	8.33	1.80	-.121	-.340	.077	.102	-.047	-.125	-.132	.169	.332	-.111	-.193	-.615**	___

* $p \leq .1$, ** $p \leq .05$, *** $p < .01$