Social rejection as a mediating variable in the link between stereotype threat and math performance.

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SOCIAL REJECTION AS A MEDIATING VARIABLE IN THE LINK BETWEEN
STEREOTYPE THREAT AND MATH PERFORMANCE

A Thesis Presented
by
DARREN J. A. YOPYK

Submitted to the Graduate School of the
University of Massachusetts Amherst in partial fulfillment
of the requirements for the degree of
MASTER OF SCIENCE
February 2005
Social and Personality Psychology
SOCIAL REJECTION AS A MEDIATING VARIABLE IN THE LINK BETWEEN
STEREOTYPE THREAT AND MATH PERFORMANCE

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ACKNOWLEDGMENTS

I first want to thank my advisor, Ronnie Janoff-Bulman for her guidance and support throughout this process. This project would not have been possible without her. I'd also like to express my sincere thanks to Catherine Sanderson whose help, guidance and support were invaluable throughout this project. Without her, I'm afraid this project would not have even gotten off the ground – never mind been completed. I'd also like to thank the third and final member of my committee, Robert Feldman for his continued support throughout this process. Although a Yankee fan, his insight, and helpfulness have gone a long way in making this project a success.

A special thanks goes out to all of those whose support and friendship helped me to stay focused on this project even when times were difficult. You all know who you are, and of course, I thank you all.
ABSTRACT
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STEREOTYPE THREAT AND MATH PERFORMANCE
FEBRUARY 2005
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This research examined the impact of stereotype threat on academic performance in students at a highly-selective liberal arts college, as well as whether athlete status, various dimensions of self-esteem, and rejection-sensitivity moderate this effect. It also examined two potential mediating variables to the stereotype-threat – math performance link, namely mood and perceived social rejection. Ninety-one students (46 athletes and 45 non-athletes) were recruited to participate in a study on personality and problem-solving. Participants were randomly assigned to read one of two reading comprehension passages (priming athlete status or a control), and then complete a brief math test. Results indicated that athletes who received the athlete status prime performed significantly worse on a math test than those who received the control prime. Moreover, the negative effects of athlete status prime were moderated by both general self-esteem, with athletes low in SE showing the most debilitating effects, and academic SE, with student-athletes high in academic SE showing the most debilitating effects. Although neither positive nor negative mood was associated with the threat manipulation, perceived social rejection from faculty partially mediated the link between stereotype
threat and academic performance. The discussion focuses on the theoretical and applied implications of these findings.
CONTENTS

ACKNOWLEDGMENTS .................................................................................................... iii
ABSTRACT ................................................................................................................. iv
LIST OF TABLES ........................................................................................................ viii
LIST OF FIGURES ...................................................................................................... ix

CHAPTER

1. INTRODUCTION .................................................................................................... 1
   The nature of stereotype threat .............................................................................. 1
   Moderators of the stereotype threat effect ......................................................... 2
   Mediators of the effects of stereotype threat ...................................................... 6
   A new potential mediator: Social rejection ......................................................... 10
   The present study ................................................................................................. 12

2. METHODS ............................................................................................................. 14
   Participants ........................................................................................................... 14
   Procedure ............................................................................................................. 14
   Experimental manipulation .............................................................................. 16
   Measures ............................................................................................................. 18
      Rejection-sensitivity questionnaire ................................................................. 18
      Self-rating scale .............................................................................................. 18
      Social rejection scale ...................................................................................... 19
      Positive and negative affect scale (PANAS) .................................................. 20
      Math test ........................................................................................................... 20
      Background information ................................................................................. 20

3. RESULTS .............................................................................................................. 22
   Preliminary analyses ........................................................................................... 22
   Hypotheses 1 and 2: Does priming athlete academic underperformance lead student-athletes to underperform and does athlete status moderate this effect? .............................................. 23
   Hypothesis 3: Does mood mediate the threat-performance link ....................... 24
Hypothesis 4: Does self-esteem moderate the effects of priming athlete academic underperformance? 
General self-esteem
Academic self-esteem
Athletic self-esteem
Social self-esteem

Hypothesis 5: Does rejection-sensitivity moderate the effects of priming athlete academic underperformance?

Hypothesis 6: Does social rejection mediate the threat-performance link?

4. DISCUSSION
Limitations and future directions

APPENDICES
A. PARTICIPANTS’ INSTRUCTIONS: PART I
B. REJECTION-SENSITIVITY SCALE
C. SELF-ESTEEM SCALE
D. EXPERIMENTAL MANIPULATION
E. SOCIAL REJECTION SCALE
F. PANAS
G. PARTICIPANTS’ INSTRUCTIONS: PART II
H. MATH TEST
I. DEMOGRAPHICS

REFERENCES
<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Means (and standard deviations) by athlete status and prime condition</td>
<td>37</td>
</tr>
</tbody>
</table>
## LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Number of right answers as a function of the interaction of prime condition and athlete status</td>
<td>38</td>
</tr>
<tr>
<td>2.</td>
<td>Percent accuracy as a function of the interaction of prime condition and athlete status</td>
<td>39</td>
</tr>
<tr>
<td>3.</td>
<td>Percent accuracy as a function of the interaction of prime condition, athlete status and general self-esteem</td>
<td>40</td>
</tr>
<tr>
<td>4.</td>
<td>Number of right answers as a function of the interaction of prime condition, athlete status and academic self-esteem</td>
<td>41</td>
</tr>
<tr>
<td>5.</td>
<td>Percent accuracy as a function of the interaction of prime condition, athlete status and academic self-esteem</td>
<td>42</td>
</tr>
</tbody>
</table>
CHAPTER 1
INTRODUCTION

The nature of stereotype threat

As a result of a phenomenon known as stereotype threat, individuals can underperform on a variety of tasks in which their group suffers negative stereotypes by simply making that group identity salient (Steele, 1997). The existence of these negative stereotypes means that individuals may fear that their behavior will help to confirm the stereotypes about their group in the eyes of others (and perhaps in their own eyes). This fear may in turn cause individuals to underperform. Steele and Aronson (1995) argue that this phenomenon is experienced as a self-evaluative threat. Members of a group where negative stereotypes are present may fear that they can be reduced to the specific stereotype. In other words, they may feel that others (or even themselves) may use this stereotype to characterize themselves, and thus the mere presence of this threat can actually hamper performance on tasks related to the stereotypes.

In order to be hampered by the effects of stereotype threat, the individual must identify with the specific domain (Steele, 1997). If the threat is experienced in the context of a domain performance, the emotional reaction itself can cause direct interference with the performance. For example, Steele and Aronson (1995) asked Black and White Stanford undergraduates to complete a GRE-like verbal test. Half of the participants were led to believe that the test was diagnostic of their verbal ability (e.g., were told that the study was concerned with “personal factors that are involved in performance on problems requiring reading and verbal skills” [Steele & Aronson, 1995, p. 799]) whereas the other half believed it was nondiagnostic of ability (e.g., were told
that the study was concerned with “psychological factors involved in solving verbal problems” [Steele & Aronson, 1995, p. 799]). Results indicated that Blacks underperformed compared to Whites (controlling for SAT scores) on verbal tests when the test was described as diagnostic of ability but not when it was deemed non-diagnostic. In other words, when Black participants perceived that a negative performance would strengthen the stereotype that Blacks have trouble with verbal assignments, their performance was lower compared to the performance of Whites. This difference was not present when the stereotype threat was removed (i.e., the test was said to be non-diagnostic of ability). These results are particularly remarkable considering that Stanford undergraduates have all had considerable experience and success with this type of task.

This phenomenon of stereotype threat has since been demonstrated for people in a variety of different types of stigmatized groups, including high school girls and college women taking math tests described as having shown gender differences in the past (Keller & Dauenheimer, 2003; Spencer, Steele, & Quinn, 1999), White males who take a math test following a comparison of their math ability to that of Asian males (Aronson, Lustina, Good, Keough, Steele, & Brown, 1999), Latino men and women taking a math test described as diagnostic of their ability (Gonzales, Blanton, & Williams, 2002), and children from low socioeconomic backgrounds who take intellectual tests described as diagnostic of their overall intellectual ability (Croizet & Claire, 1998).

Moderators of the stereotype threat effect

Despite the considerable time that researchers have devoted to the phenomenon of stereotype threat, relatively little research has examined whether individual difference factors moderate the impact of this threat. The majority of work on such moderators has
focused on domain identification, and specifically whether individuals who highly identify with a given identity are particularly susceptible to experiencing detrimental effects when this identity is threatened in some way (Aronson et al., 1999; Leyens, Desert, Croizet, & Darcis, 2000; Schmader, 2002; Stone, Lynch, Sjomeling, & Darley, 1999). Because only those who care about performing well in a given domain will feel threatened by the possibility of performing poorly, and thereby confirming a negative stereotype about their group, people who do not identify strongly with a given domain should not experience the same debilitating effects of stereotype threat as those who show such identification. In line with this reasoning, several studies have shown that people who identify strongly with a given domain perform much more poorly when this domain is made salient than those who identify less strongly (Aronson et al., 1999; Leyens et al., 2000; Schmader, 2002). For example, men who highly identify with the math domain do worse under conditions of threat than do those who moderately identify (Aronson et al., 1999). These findings therefore suggest that even within a given group, different people will respond to messages designed to induce feelings of threat in different ways.

The debilitating effects of stereotype threat are stronger when individuals identify with the particular domain in which their group is known to be weak. For example, Schmader (2002) found that women showed poorer performance on a math test than men when their gender was made salient, but only when they saw gender as an important part of their identity. In contrast, men who saw gender as a relevant part of their identity performed even better in this condition. Similarly, Leyens and colleagues (2000) examined the role of identification with the affective domain on participants’
performance in either a threat condition (i.e., were told that men are not as apt as women to process affective information) or a no-threat condition (i.e., were told the study focused on understanding the cognitive factors involved in the processing of verbal information). As predicted, male participants in the threat condition made many more errors during this task than did participants in the other three conditions, and male participants who strongly identified with the task domain performed particularly poorly. On the other hand, for female participants, a stronger identification was associated with stronger performance.

The negative effects of stereotype threat on performance among those who heavily identify with a domain on which their group is known to be weak even extend beyond academic performance. For example, Stone and colleagues (1999) found that White males who were highly engaged in athletics performed worse on a golf task when they were told the test measured personal factors correlated with “natural athletic ability” (which prior research has shown is threatening to White males) than when the test measured psychological factors correlated with “general sports performance”. In contrast, those who were athletically disengaged performed relatively well on a golf task regardless of condition. Once again, this research demonstrates that identification with a given domain moderates the effects of stereotype threat.

Although most research on the moderators of the stereotype threat effect has focused on individuals’ identification with a given domain, some recent research by Josephs and colleagues (2003) has demonstrated that the effects of stereotype threat can be moderated by biological differences. Specifically, these researchers examined the role of baseline testosterone levels in male and female participants on their performance.
during a math test. In their first study, participants were assigned to either a threat or no-threat condition similar to previous studies on stereotype threat. Results indicated that only women with high baseline testosterone levels performed poorer on the math task in the stereotype threat condition than participants in the other condition. In a similar study (Josephs et al., 2003), for male participants who had the opportunity to confirm a positive stereotype about their math performance, performance was increased, but only for those males with high levels of baseline testosterone. These two studies indicate that biological differences such as levels of testosterone can also moderate the effects of stereotype threat.

More recently, research has examined self-esteem as a moderator of stereotype threat (Yopyk & Sanderson, 2004). Specifically, we examined the moderating role of athletic self-regard as well as general self-regard on the effects of stereotype threat on student-athletes’ performance on a math test. Student-athletes read either a passage claiming that student-athletes underperform academically at highly-selective institutions (threatening condition), or that legacies underperform (non-threatening). Results indicated that student-athletes with either a high athletic self-esteem and/or high general self-regard were not debilitated by being reminded of the negative student-athlete stereotype (i.e., they are dumb). On the other hand, student-athletes with low levels of either type of self-esteem performed more poorly on a math test when informed about the negative stereotype of student-athletes compared to those who read about the negative stereotype of legacy students. Relatedly, participants with high levels of general self-esteem were more persistent (i.e., attempted more math problems in the allocated 10 minute period) on the math task when they were reminded of the “dumb-jock” stereotype.
Conversely, participants with low levels of general self-esteem were more persistent when reading about the negative stereotypes of legacies compared to when they read about the negative stereotypes of student-athletes. This research demonstrates the moderating role of self-esteem on stereotype threat.

**Mediators of the effects of stereotype threat**

Despite numerous studies on stereotype threat, very little is known about the process by which stereotype threat causes poor performance. In other words, the precise factors that mediate the stereotype threat - performance link are still unclear. Researchers have, however, examined the role of several different variables including anxiety (Aronson et al., 1999; Spencer et al., 1999; Stone et al., 1999), arousal (Blasovich et al., 2001; O’Brien & Crandall, 2003), sadness (Keller & Dauenheimer, 2002), and working memory capacity (Schmader & Johns, 2003).

Some research provides tangential evidence for the mediating role of anxiety in the stereotype literature (Stone et al., 1999). For example, Stone and colleagues (1999) found that Black participants showed a relatively large increase in anxiety from pre- to post-test following a golf task described as a measure of sports intelligence (i.e., threatening for Black participants but not for White participants), whereas White participants showed little change. Conversely, White participants showed an increase in anxiety when the golf task was described as a measure of natural athletic ability (i.e., threatening for White participants but not for Black participants) whereas Black participants did not. To provide further evidence that anxiety plays a role in stereotype manipulation, they provided participants with an opportunity to attribute their arousal to the renovations of the lab room. In the absence of the misattribution cue, White
participants performed significantly worse on a golf task when it was framed as a measure of athletic ability compared to those in the attribution condition. In other words, when under a threatening condition, having the ability to attribute potential feelings of anxiety to an external cue, namely renovations in the laboratory, alleviated the negative effects of stereotype threat. However, anxiety and performance on the golf task were not significantly correlated, suggesting that anxiety is not truly a mediating variable.

Other research provides more direct, albeit weak, evidence for the role of anxiety in mediating the threat-performance link. Aronson and colleagues (1999) demonstrated that for individuals who identify highly with math, being in a threatening situation leads to increases in anxiety about how the experimenter will think about them compared to being in a non-threatening situation. Specifically, participants who highly identified with math and were under threat performed the worst on a math test and also reported higher levels of anxiety. However, anxiety only partially mediated the stereotype threat-performance link. Similarly, Spencer and colleagues (1999) found that describing a test as gender fair lowered women’s self-reported anxiety compared to providing no specific information about gender. However, once again these analyses only revealed weak evidence for partial mediation. Taken together these studies demonstrate that anxiety may indeed play a role in mediating the threat-performance link.

However, several studies have failed to find differences in anxiety between stereotype threat conditions. For example, in their pioneering work on stereotype threat, Steele and Aronson (1995) found no differences in self-reported anxiety between African American participants who were told the test was diagnostic of their ability and those told it was non-diagnostic, despite finding differences in test performance. Similarly,
although Schmader (2002) found that women who identify highly with math underperformed on a math test under a threatening condition (i.e., making gender identity relevant) compared to men and low-identified women, there were no differences in self-reported anxiety across conditions. Still other research using a Latino women population failed to find a difference in self-reported anxiety across stereotype threat conditions (Gonzalez, Blanton, & Williams, 2002). In these studies, the failure to discover differences in self-reports of anxiety sheds doubt about the role of anxiety in mediating the link between stereotype threat and poor performance.

Although the evidence for the mediating role of anxiety in stereotype threat is mixed, another potential mediator is arousal. For example, some research demonstrates that African Americans show increases in their blood pressure under conditions of stereotype threat (Blascovich et al., 2001). Specifically, African American participants showed higher blood pressure during a verbal task when they were told that the test was created to achieve a nationally representative sample compared to when they were told this was an unbiased test whereas White participants showed no differences in blood pressure across the conditions. Similarly, O’Brien and Crandall (2003) argue that stereotype threat studies reduce performance due to heightened arousal. In their study, they manipulated threat by either claiming the math tests are gender fair or gender biased. They then asked participants to take part in three different math tasks ranging in difficulty (easy, moderate, difficult). In line with previous research on arousal, women performed better on an easy test when they were in a threatening condition than when they were in a non-threatening condition. On the other hand, women did worse on a difficult test when under threat than when no under threat. Men’s performance did not differ across the
conditions. These two lines of research provide some evidence for the mediating role of arousal on the link between stereotype threat and performance.

Still other research suggests that feelings of sadness mediate the link between stereotype manipulation and performance on a math test (Keller & Dauenheimer, 2003). Keller and Dauenheimer (2003) told half of their sixth grade participants that the math test they were about to take has shown gender differences in the past (stereotype threat), whereas the other half were told the test has not shown this difference (no threat). The results of their study not only demonstrated that girls performed worse on the math test under stereotype threat, whereas boys showed no difference, but also that feelings of sadness mediated this effect. Specifically, girls in the threatening condition felt sadder than girls in the non-threatening condition. Furthermore, as feelings of sadness increased, performance on the math test decreased. When feelings of sadness where controlled for, the link between stereotype threat and test performance no longer reached significance. This line of research suggests that feelings of sadness are a potential mechanism that leads participants to underperform under threatening conditions.

Although most of the research on the potential mediators of stereotype threat has concentrated on the role of affective processes, one recent study examined the role of cognitive processes. Specifically, Schmader and Johns (2003) examined the role of stereotype threat manipulations on one’s working memory capacity. In a series of studies, they found that when under threat, both women (study I) and Latinos (study II) remembered fewer words under a threatening condition than participants in a non-threatening condition. More importantly, they found that working memory capacity acted as a mediating variable between stereotype threat and performance on a math test.
This research shows that one of the processes by which stereotype threat manipulations work is through a cognitive overload.

**A new potential mediator: Social rejection**

The present research aims to extend prior research by examining the role of another potential mediating variable, namely social rejection. It is possible that upon being reminded about negative stereotypes about one’s group, feelings of rejection increase, which in turn lead to poorer performance on the task at hand. For example, a female undergraduate in engineering who is reminded of the negative stereotypes associated with women in math may feel ostracized by her peers. This feeling of rejection could in turn lead her to underperform on a math test.

One piece of evidence in support of the role of rejection in mediating the link between stereotype threat and poor performance is the research demonstrating sadness is a mediating variable in this link. As previously discussed, Keller and Durkheimer (2002) demonstrated that middle school girls felt sadder when they take a test described to them as demonstrating gender differences than when the test was described as gender-fair. This feeling of sadness, in turn, accounts for the link between stereotype threat manipulation and performance on the math test. It seems plausible that these feelings of sadness may in fact be the result of feeling rejected by their peers.

Further evidence of the potential mediating role of social rejection is found in a recent study that explored the moderating role of trait self-esteem on the effects of social rejection on performance and persistence (Sommer & Baumeister, 2002). In a series of studies, Sommer and Baumeister demonstrated that in the face of social rejection, individuals with high self-esteem (HSE) will persist longer than those with low self-
esteem (LSE). Specifically, after being primed with words of rejection, participants with high-self esteem worked longer on impossible anagrams before giving up than did participants with low self-esteem. A similar pattern of results was found on performance on difficult (but solvable) anagrams, such that rejection had a debilitating effect on performance only for individuals with low self-esteem. In other words, LSE participants solved fewer anagrams following rejection than did HSE participants. Interestingly, however, in an acceptance condition, low self-esteem individuals actually outperformed individuals with high self-esteem.

These findings can be used to help explain the results found by Yopyk and Sanderson (2004). As previously discussed, student-athletes with high self-esteem were not affected by reading a passage reminding them about the “dumb-jock” stereotype. Specifically, HSE participants performed as well on a math test whether they read about the academic underperformance of student-athletes or legacies. Relatedly, HSE participants persisted longer (i.e., tried to solve more problems) when under threat compared to a non-threatening condition. On the other hand, LSE student-athletes showed the debilitating effects of the threatening passage. As work by Sommers and Baumeister (2002) suggests, however, when reading about legacies’ underperformance, LSE participants actually show a lift in their performance (i.e., performed better relative to the other conditions). Similarly, LSE participants showed an increase in persistence under the low threat condition, and a decrease when in the threatening condition. In other words, the findings of this research parallel the findings associated with rejection by Sommers and Baumeister (2003), suggesting that social rejection in fact mediates the link between stereotype threat and poor performance.
The present study

This study extends prior work on stereotype threat in several ways. First, I examined the impact of reading these two passages (i.e., on either student-athletes or legacies propensity to underperform academically) on math performance in non-student-athletes as well as student-athletes to rule out an alternative explanation. Perhaps, for example, reading about student-athletes in general, regardless of personal-relevance, accounts for the results found in our previous study (Yopyk & Sanderson, 2004). However, I predicted that unlike student-athletes', non-student-athletes' math performance will not differ across the two stereotype conditions because neither are personally relevant.

Second, this study measured participants’ mood following reading the passages in order to eliminate an alternative explanation for my expected findings. Specifically, it is possible that reading a self-relevant passage (i.e., about stereotypes of student-athletes) simply creates a negative mood which then leads to poor performance on the math test. However, I predicted that student-athletes would show no differences in emotional responses to the two different passages (i.e., student-athlete versus legacy).

This research also examined two potential moderators of the stereotype threat effect. First, I expected to replicate findings of previous research (Yopyk & Sanderson, 2004) by demonstrating the moderating role of self-esteem on stereotype threat. Specifically, as previously demonstrated, I predicted that HSE student-athletes would not demonstrate the debilitating effects of stereotype whereas LSE student-athletes would. I also hoped to extend upon my prior research by demonstrating a new moderating variable, namely rejection-sensitivity. I predicted that student-athletes who are low on
rejection-sensitivity would not show the debilitating effects of stereotype threat on math performance, whereas those student-athletes who are high in rejection-sensitivity would.

Finally, this research project extends prior work by directly measuring an individuals’ perceived social rejection following reading a passage describing negative stereotypes about their in-group (specifically student-athletes). If social rejection is a mediating variable in the link between reading about a negative stereotype and performance on a math test, individuals who read about the negative stereotypes of student-athletes would feel less accepted than would student-athletes who read about legacies underperforming academically. Furthermore, this decrease in perceived social acceptance should explain the expected negative effects of reading this passage on math performance.
CHAPTER 2

METHODS

Participants

Ninety-one male Amherst College students served as participants for this study (M age = 19.78; SD = 1.29). Of the 91 participants, 50.5% (N = 46) were student-athletes and 49.5% (N = 45) were non-student-athletes. The majority of the athletes were football players (54.3%), hockey players (10.9%) or baseball players (6.5%), although some other sports were represented (e.g., swimming, tennis, track and field, lacrosse). Prior research suggests High Profile sports (i.e., football, baseball, hockey, and basketball) are the ones most associated with academic underperformance (Bowen & Levin, 2003; Shulman & Bowen, 2001). Furthermore, this study only included male athletes because previous research suggests that female athletes do not suffer the debilitating effects of stereotype threat that male athletes do (Yopyk & Sanderson, 2004). Seven participants were excluded from the analyses because they were legacies and in the legacy condition (N = 4), they completed the study in the incorrect order (N = 1), they fell asleep during the experiment (N = 1), or they were intoxicated during the session (N = 1).

Procedure

Participants were recruited in one of two ways. First, rosters from all varsity sports at Amherst College were gathered, and all athletes who were currently enrolled in the introduction to psychology course were contacted. These students were contacted by email, and were told that I had received their name from the course instructor, and
wanted to know if they needed an additional study to complete the research requirement. Because this method did not supply a sufficient number of athletes, I contacted other athletes based on the roster lists and simply asked if they would like to participate in a psychology study and received $5. Non-athlete participants were all recruited from the psychology subject pool. During recruitment, students were told that this research examined the impact of personality variables on problem solving strategies. Athletics was never mentioned during the recruitment.

Students who agreed to participate scheduled a time to come into the lab to complete the experiment. Experimental sessions were run in groups of 1-5 students, in which all participants were assigned individual rooms. At the start of the experimental session, the experimenter explained to participants that they were taking part in a study on personality characteristics and problem-solving strategies. They were told that the study consists of two parts, namely a questionnaire assessing various personality measures, and then a brief problem-solving task. Participants received a packet that included the rejection-sensitivity scale (Downey & Feldman, 1996), the self-esteem scale (Fleming & Courtney, 1984), one of the two manipulation conditions (i.e., athlete versus legacy control), the Social Rejection Scale as well as the Positive and Negative Affect Scale (PANAS). The Social Rejection Scale and the PANAS were completed after reading the experimental manipulation, and their order was counterbalanced. There were no effects of order on negative mood (t(81) = -0.65, p = .52), positive mood (t(81) = -0.21, p = .84), rejection form others (t(81) = 1.17, p = .25), or rejection from faculty (t(81) = -0.84, p = .41).
Next, participants were given the second part of the experiment. Participants completed a twenty-question math test consisting of mathematical problems similar to those found on a standardized test such as the Scholastic Aptitude Test or Graduate Record Exam. They were given ten minutes to complete the exam. Participants were instructed to concentrate on finding the right answers and that few people were actually able to finish the test in the allotted time.

At the completion of the ten-minute period, participants were stopped and asked to answer a variety of demographic questions. Participants received $5 or credit towards fulfillment of their psychology coursework for their participation.

**Experimental manipulation**

The experimental manipulation was designed to create threat in one condition, but not in the other. Specifically, participants were asked to read a passage about the propensity of a particular group of students (i.e., athletes or legacies) to underperform academically in colleges and universities. This passage, which summarizes some of the main findings of *The Game of Life* (a book examining athlete underperformance at selective schools), was presented as a reading comprehension passage to disguise its purpose. After reading the passage, participants answered a series of questions about its comprehensibility and clarity (e.g., “This passage was very clearly written,” “This passage was the appropriate length”). Participants were then randomly assigned to one of two conditions: the threat condition (i.e., about student-athletes) or the control condition (i.e., about legacies). Participants in the threat condition read the following excerpt entitled “The Role of Athletics on College Campuses: Athletes Underperform in the Classroom”: 
A major finding in The Game of Life is the pervasive and persistent tendency of athletes at liberal arts colleges and universities to underperform academically: that is, to do even less well in the classroom than one would expect them to do on the basis of their entering academic credentials. Stated another way, athletes, male and female, were found, as a group, to earn even lower grades than could be predicted by their SAT scores and high school grades, after also controlling for race, socio-economic status, field of study, and institutional selectivity (measured by mean institutional SAT score).

Why does academic underperformance matter? Some may feel that the actual grades earned are all that counts, that a B- is a B-, whether the student could or could not have been expected to do better. But when some students underperform, and especially when they are blunt about their own (different) priorities, they can affect the campus ethos and even the academic performance of at least some of their fellow students. More generally, we regard consistent underperformance as a serious problem for reasons that have to do with educational values and what may be thought of as an obligation to take reasonably full advantage of scarce educational opportunities that others would clearly have prized. To be sure, there will always be, by definition, students who underperform relative to the norm for their class (just as there will always be a bottom third of the class); and of course some athletes, in company with other students, overperform
academically. But it is grounds for concern when a particular subgroup exhibits, overall, consistent and statistically significant underperformance. Students in the control condition read the identical excerpt, except the term student-athletes (and “athletes”) was replaced by legacies (e.g., the title of the piece was “The Role of Legacies on College Campuses: Legacies Underperform in the Classroom”).

Measures

Rejection-sensitivity questionnaire

Participants completed portions of the Rejection Sensitivity Questionnaire (RSQ; Downey & Feldman, 1996; see Appendix B). The RSQ consists of eight hypothetical situations in which rejection by a significant other is possible (α = .86; e.g., “You ask a friend to do you a big favor; After class, you tell your professor that you have been having some trouble with a section of the course and ask if he/she can give you some extra help”). For each situation participants were first asked to indicate their concern or anxiety about the outcome on a 6-point scale (1 = very unconcerned to 6 = very concerned). The participants were also asked to indicate the likelihood that the other person would respond in an accepting fashion on a 6-point scale (1 = very unlikely to 6 = very likely). Rejection sensitivity scores were then be calculated by summing the RS scores and dividing by the number of scenarios.

Self-rating scale

Participants completed four subscales of the Self-Rating Scale (Fleming & Courtney, 1984), a measure of several domains of self-esteem (see Appendix C). The four subscales included in the present research were general self-esteem (α = .87; five items, e.g., “How often do you feel inferior to most of the people you know?”).
ever think of yourself as a worthless individual?"}), academic self-esteem ($\alpha = .85$; seven items, e.g., “How often do you imagine that you have less scholastic ability than your classmates?”, “In turning in a major assignment such as a term paper, how often do you feel you did an excellent job on it?”), athletic self-esteem ($\alpha = .87$; five items, e.g., “Have you ever thought of yourself as physically uncoordinated?”, “Have you ever felt inferior to most other people in athletic ability?”), and social self-esteem ($\alpha = .76$; five items, e.g., “How often do you worry about whether other people will like you?”, “How often do you worry about how well you get along with others?”). Participants rated each of these items on a 1 (never) to 5 (always) scale, which were reverse-scored so that higher scores represented higher levels of self-esteem. This measure was completed prior to the priming manipulation.

Social rejection scale

Participants completed a 16-item social rejection scale that I created which assessed their perceptions of acceptance/rejection from both peers and faculty members on the Amherst College campus (see Appendix E). They indicated the degree to which they agree or disagree with the sixteen-items on this scale on a 7-point scale (1 = strongly disagree to 7 = strongly agree). A factor analysis with a varimax rotation revealed a two factor solution provided the best fit: rejection from faculty ($\alpha = .86$; four items, e.g., “Faculty members believe I do not belong at Amherst College”, “Faculty members think I make a valuable contribution to Amherst College”), and rejection from other Amherst college students ($\alpha = .89$; nine items, e.g., “Other students do not think I belong at Amherst College”, “Other students believe that I am an important part of the Amherst College community”). Three items were dropped because their factor loadings were less
than .50 (e.g., “I make a significant contribution at Amherst College”, “I am afraid other people notice my shortcomings”, and “I am afraid that others do not approve of me”). High scores on these scales signify high levels of perceived social rejection.

Positive and negative affect scale (PANAS)

Participants completed the 20-word PANAS scale as an assessment of positive and negative affect (Watson, Clark, & Tellegen, 1988; see Appendix F). Participants indicated “to what extent [they] feel this way right now, that is, at the present moment” on a 5-point scale (1 = not at all to 5 = extremely). Individual scores for both positive ($\alpha = .85$; 10 items, e.g., interested, alert, attentive) and negative mood ($\alpha = .81$; 10 items, e.g., distressed, ashamed, jittery) were created. High scores represent higher levels of mood.

Math test

Participants completed a twenty-question math test consisting of mathematical problems similar to those found on a standardized test such as the Scholastic Aptitude Test or Graduate Record Exam (see Appendix H). They were given ten minutes to complete the exam. Pilot testing showed that was the right amount of time to give participants to work on this particular math test. Participants were instructed to concentrate on finding the right answers and that few people were actually able to finish the test in the allotted time.

Background information

Participants were asked questions about their class, age, ethnicity, overall GPA, SAT scores (both verbal and math), if anyone in their immediate family attended Amherst College, and if they were a recruited athlete and for what sport they were
recruited (see Appendix I). This measure was completed after the priming manipulation and the math test.
CHAPTER 3

RESULTS

In this section, I first report preliminary analyses, and then I report ANCOVAs that examine the role of athlete status and condition of math performance. Next, I sought to eliminate a potential alternative explanation to stereotype threats by examining the role of mood in this manipulation. Next, a series of regressions are reported to examine if various subscales of self-esteem, as well as rejection-sensitivity moderate these effect. Finally, a series of regressions were run to examine if perceived feelings of social rejection mediate the stereotype threat-performance link. All analyses were conducted using two separate dependent variables, namely the number of right answers provided and accuracy on the math test. All analyses control for participants’ Math SAT scores. Table 1 provides the means and standard deviations of all variables.

Preliminary analyses

I first conducted a series of t-tests to examine differences in this sample as a function of athlete status and prime condition. These analyses revealed no athlete status differences in Positive (t(81) = -1.45, p = 1.51) and Negative Moods (t(81) = 1, p = .52), or perceived rejection from others (t(81) < 1). There were athlete status differences in GPA (t(81) = 2.07, p < .04) and Math and Verbal SAT scores (t(81) = 3.87, p < .0001; t(81) = 4.20, p < .0001, respectively), with athletes having lower scores on all three measures of academic aptitude. There were similar athlete status differences in athletic self-esteem (t(81) = 5.77, p < .0001), general self-esteem (t(81) = 2.76, p < .004), and a marginally significant difference in social self-esteem (t(81) = -1.91, p < .06), with
athletes reporting higher levels of each than non-athletes. There was also a marginally significant difference in academic self-esteem ($t(81) = 1.77, p < .08$), with non-athletes reporting higher academic self-esteem than athletes. Finally, there were no differences as a function of condition in any of the aforementioned measures.

**Hypotheses 1 and 2:** Does priming athlete academic underperformance lead student-athletes to underperform, and does athlete status moderate this effect?

To examine the effects of priming athlete academic underperformance versus legacy academic underperformance on math performance, 2 (condition: athlete versus legacy prime) X 2 (athlete status: athlete versus non-athlete) analyses of covariance (ANCOVA), predicting the number of right answers and percent accuracy controlling for Math SAT scores, were run.

First, an ANCOVA was conducted predicting total number of right answers. This analysis revealed a significant condition X athlete status interaction ($F(1,78) = 4.56, p < .04, \eta^2 = .05$). Simple effects comparisons revealed that prime condition had no significant effect on non-athletes, but a substantial effect on athletes, with those in the athlete prime condition providing significantly fewer right answers than those in the legacy condition (see Figure 1).

Next, an ANCOVA was run to examine the effects of athlete status and condition on accuracy rate. The analysis predicting percent accuracy revealed significant effects of athlete status ($F(1,78) = 9.89, p < .002, \eta^2 = .11$), and condition ($F(1,78) = 5.31, p < .03, \eta^2 = .06$), which were qualified by a significant condition X athlete status interaction ($F(1,78) = 5.17, p < .03, \eta^2 = .06$). Simple effects comparisons revealed that condition had no effect on non-athletes, but a substantial effect on athletes, with those in the athlete
prime condition showing significantly less accuracy than those in the legacy condition (see Figure 2).

**Hypothesis 3: Does mood mediate the threat-performance link?**

In order to examine whether mood mediates the effect of stereotype threat on test performance, a series of regression equations using participants in the athlete condition were conducted. Separate analyses were run for both negative and positive moods. Following Baron and Kenny (1986), mediation would be shown if the stereotype threat manipulation (i.e., condition) affects mood (first regression), mood affects math performance (second regression), and condition affects math performance (third regression). Furthermore, the effect of condition on performance must be reduced when mood is entered into the regression equation, with perfect mediation occurring when condition (the independent variable) has no effect on math performance (the dependent variable) when controlling for mood (the mediator).

Based on this approach, there was no support for negative mood mediating the threat-performance link. Specifically, the condition did not significantly predict negative mood ($\beta = 0.14, p = .42$), or positive mood ($\beta = 0.14, p = .44$). Therefore, these results suggest that reading these two passages does not lead participants do feel differently. As a result, mood cannot explain student-athletes’ underperformance in the athlete condition.

**Hypothesis 4: Does self-esteem moderate the effects of priming athlete academic underperformance?**

To examine whether self-esteem moderates the effects of priming athlete academic underperformance, a series of hierarchical linear regression analyses were conducted for each of the four self-esteem subscales, namely general self-esteem, academic, athletic, and social self-esteem. For all analyses, athlete status (dummy-
coded), condition (dummy-coded), self-esteem subscale, and Math SAT scores were entered into Block 1, the condition X athlete status, condition X self-esteem, and athlete status X self-esteem interactions were entered into Block 2, and the three way condition X athlete status X self-esteem interaction was entered into Block 3. For all of these analyses, I was only interested in the three-way interactions because self-esteem should moderate the effects of stereotype threat for athletes and not non-athletes (i.e., non-athletes do not feel threatened by either passage). As a result, only the three-way interactions will be mentioned. Once again, analyses were conducted predicting the number of right answers provided as well as the accuracy rate on the math task.

General self-esteem

First, analyses were run using the general self-esteem subscale. An analysis was conducted predicting total number of right answers. The analysis predicting number of right answers revealed a non-significant three-way interaction ($\beta = -2.04, p < .13$).

Next, a regression was conducted predicting overall accuracy on the math task. This analysis revealed a marginally significant three-way interaction of condition X athlete status X general self-regard ($\beta = -2.75, p < .07$). Moreover, the inclusion of this interaction made a marginally significantly contribution to the power of the equation ($\Delta R^2 = .03, F_{\text{change}}(1,74) = 3.41, p < .07$). As shown in Figure 3, this interaction revealed that athletes with low self-esteem were debilitated by reading about student-athletes’ propensity to underperform on academic tasks, whereas athletes with high self-esteem did not show this debilitating effect. Non-student-athletes performed equally well on the math task effect regardless of the passage they read or their level of self-esteem.
Academic self-esteem

Next, similar regressions were run using the academic subscale of self-esteem. First, an analysis was conducted predicting total number of right answers. The analysis predicting number of right answers revealed a significant three-way interaction ($\beta = 1.64$, $p < .05$). Moreover, the inclusion of this interaction made a significant contribution to the power of the equation ($\Delta R^2 = .02$, $F_{\text{change}}(1,74) = 4.05$, $p < .05$). As shown in Figure 4, this interaction revealed that only HSE athletes showed the debilitating effects of reading the athlete passage whereas, LSE athletes, and all non-athletes did not.

Next, a similar multiple regression was conducted predicting the overall accuracy on the math task. This analysis revealed a marginally significant three-way interaction of condition X athlete status X academic self-esteem ($\beta = 1.51$, $p < .10$). Moreover, the inclusion of this interaction made a marginally significantly contribution to the power of the equation ($\Delta R^2 = .02$, $F_{\text{change}}(1,74) = 2.87$, $p < .01$). As shown in Figure 5, this interaction revealed a similar pattern to the analysis performed on the number of right answers provided. Specifically, HSE athletes showed the debilitating effects of reading the athlete passage, whereas LSE athletes and all non-athletes did not.

Athletic self-esteem

Next, regressions were run using the athletic self-esteem subscale. An analysis was conducted predicting total number of right answers provided. The analysis predicting number of right answers revealed a non-significant three-way interaction ($\beta = -1.54$, $p = .15$). A similar multiple regression was conducted predicting the overall accuracy on the math task. This analysis failed to reveal a significant three-way interaction ($\beta = -1.77$, $p = .15$).
Social self-esteem

Next, regressions were run using the social subscale of self-esteem. An analysis was conducted predicting total number of right answers provided. The analysis predicting number of right answers revealed a non-significant three-way interaction ($\beta = 0.24, p = .78$). A similar multiple regression was conducted predicting the overall accuracy on the math task. This analysis failed to reveal a significant three-way interaction ($\beta = 0.77, p = .43$).

**Hypothesis 5: Does rejection-sensitivity moderate the effects of priming athlete academic underperformance?**

To examine whether rejection-sensitivity moderates the effects of priming athlete academic underperformance, a series of hierarchical linear regression analyses were conducted. For all analyses, athlete status (dummy-coded), condition (dummy-coded), rejection-sensitivity, and Math SAT scores were entered into Block 1, the condition X athlete status, the condition X rejection-sensitivity, and the athlete status X rejection-sensitivity interactions were entered into Block 2, and the three way condition X athlete status X rejection-sensitivity interaction was entered into Block 3. Once again, analyses were conducted predicting the number of right answers as well as the accuracy rate on the math task.

First, an analysis was conducted predicting total number of right answers provided. The analysis predicting number of right answers revealed a non-significant three-way interaction ($\beta = -0.83, p = .79$). Next, a regression analysis was conducted predicting the overall accuracy on the math task. This analysis failed to reveal a significant three-way interaction ($\beta = -0.53, p = .13$).
Hypothesis 6: Does social rejection mediate the threat-performance link?

In order to examine whether feelings of social rejection mediate the effect of stereotype threat on test performance, I again followed the procedure suggested by Baron and Kenny (1986). This analysis was restricted to those participants in the athlete prime condition because, as the results mentioned above indicate, athletes performed significantly worse than non-athletes in this particular condition. First, I made sure that athlete status was related to math performance. Regressions revealed a significant effect of athlete status on both number of right answers ($\beta = -0.52, p < .0001$) and accuracy ($\beta = -0.64, p < .0001$). Next, I analyzed the effect of athlete status on each of the two social rejection scales. I found no evidence of a relationship between athlete status and rejection from others ($\beta = 0.08, p = .65$). However, athlete status did have a significant effect on perceived rejection from faculty members ($\beta = 0.32, p = .03$), indicating that athletes felt more rejected from faculty members in the athlete condition than did non-athletes.

Next, I analyzed whether rejection from faculty members had a significant effect on test performance, namely the number of right answers and accuracy. These analyses revealed that rejection from faculty had a significant effect on the number of right answers ($\beta = -0.48, p < .001$), and accuracy ($\beta = -0.36, p < .02$) suggesting that people who felt more rejected performed poorer on the math task.

Next, I examined whether adding rejection from faculty to the equation reduced the significant relationship between athlete status and the number of right answers provided. Athlete status still had a significant effect on number of right answers after rejection was entered into the equation ($\beta = -0.40, p = .003$ compared to $\beta = -0.52, p <$
.0001 without rejection) and on accuracy ($\beta = -0.57$, $p < .0001$ compared to $\beta = -0.64$, $p < .0001$ without rejection). Therefore, additional tests were conducted to determine whether the drops in beta weights were significant using the formula described by Sobel (1982) (see Baron & Kenny, 1986). This analysis revealed that the beta weight for athlete status was reduced when rejection from faculty members was added to the equation for number of right answers ($Z = -1.87$, $p = .06$) and accuracy ($Z = -1.66$, $p < .10$) suggesting that perceived rejection from faculty members is one of the processes by which stereotype threat affects math performance. In other words, reading about the "dumb-jock" stereotype leads student-athletes to feel more rejected from faculty members which in turn leads to underperformance on the math task.
CHAPTER 4
DISCUSSION

The present research examined the negative consequences of reminding student-athletes about the negative stereotypes of athletes' intelligence and replicated and extended prior work in several ways. First, these findings demonstrate that athletes who read a passage describing athletes' underperformance show lower performance on the math test than those who read a similar but non-self-relevant passage (i.e., about legacies' academic underperformance). This work extends prior research (Yopyk & Sanderson, 2004) by demonstrating that participants for whom the passage is non-self-relevant (i.e., non-student-athlete participants) do not show similar debilitating effects of reading about negative athlete stereotypes. Moreover, this is one of only a few studies to examine the impact of stereotype threat on a group identity that is not fixed (e.g., race or gender), but rather is more flexible and fluid. The present research therefore expands on previous work in that it focuses on achieved, rather than ascribed, characteristics such as race and gender.

Next, this study demonstrates that the underperformance of threatened student-athletes is not simply a by-product of poor mood. By directly measuring participants' mood following the stereotype threat manipulation, an alternative explanation to these findings was ruled out. Specifically, neither negative nor positive mood followed reading a threatening passage. This research therefore suggests that mood cannot be used to explain stereotype threat findings.

This research also makes a theoretical contribution above and beyond that of prior research by showing that general self-esteem moderates the impact of threat on academic
performance. Specifically, among student-athlete participants in the athlete threat condition, those who were high in general self-esteem had more items right than those who were low in general self-esteem. In other words, student athletes with high general self-esteem were not negatively impacted by the reminder of the “dumb-jock” stereotype whereas those low in self-esteem were. These findings suggest that having high self-esteem may buffer the negative effects of being reminded of the negative intellectual stereotype about student-athletes (i.e., “perhaps athletes are dumb, but I am happy with myself”). In line with this view, some recent research by McIntyre and colleagues found that women who read a threatening passage (i.e., women are not as good at math as men) but are also told that women are better participants in research studies than men perform better at a math test than those who do not hear about a positive aspect of women and thereby have the negative information counteracted (McIntyre et al., 2003). In contrast, for participants in the legacy condition, self-esteem was not associated with math performance.

This research also makes a theoretical contribution by demonstrating that academic self-esteem moderates the impact of stereotype threat on performance. Specifically, only student-athletes with high academic self-esteem performed significantly worse when reading about athletes’ propensity to underperform academically. Student-athletes with low academic self-esteem, in contrast, performed equally well on the math test across both experimental manipulations. Although this finding was unexpected, it may indicate that participants with high academic self-esteem actually identify more strongly with scholastic work than those with low self-esteem. Therefore, in line with prior work on stereotype threat (i.e., Schmader, 2002), individuals
who identify with the task at hand (i.e., math test) are the ones who suffer under threatening conditions. Again, this research demonstrates that only those student-athletes with high academic self-esteem performed worse on the math task under a threatening condition than a non-threatening condition.

Finally, this research found that social rejection partially mediated the stereotype threat – performance link. Previous work in the stereotype threat literature has provided very weak support for mediating processes (see Keller et al., 2003). Reading a negative passage that is self-relevant (i.e., student-athletes reading about the “dumb-jock” stereotype) leads student-athletes to feel more rejected by faculty members of their school. In turn, this perception, at least in part, causes these participants to underperform on the math task at hand. This research in part suggests that social rejection may be an area worth exploring more in the future.

Limitations and Future Directions

Despite the overall contribution of this research, I should acknowledge several limitations of this study. First, because all of our participants were from one highly-selective liberal arts college, these findings may or may not apply to athletes at other schools. The use of athletic ability in admissions decisions is one that has received considerable attention at highly selective schools, including the school used in the present research, and hence the negative effects of stereotype threat may be especially salient, and potentially stigmatizing, in such an environment (Bowen & Levin, 2003). Prior research also suggests that the quality of school one attends may be inversely proportionate to an individual’s self-concept (Marsh, 1993; Marsh & Parker, 1984), meaning that students at lower-quality schools have higher self-concepts than students of
similar abilities at higher-quality schools. Moreover, because negative effects from stereotype threat are thought to occur only if individuals consider a given identity to be important to their self-concept (Steele, 1997), athletes who are admitted to less selective schools due almost entirely to their athletic abilities may not experience threat as a result of being reminded about athlete's underperformance. An athlete from a top-rated Division I program, for example, may intend to pursue a professional career in football, and hence see academic excellence as largely irrelevant to his identity. In sum, student-athletes who attend selective schools may suffer from negative effects even more than those who attend less-selective institutions.

On the other hand, student-athletes at less selective schools may in fact suffer more dramatic effects than the participants in this research. Because participants at highly selective schools (such as the one in this study) are admitted in part because of their intelligence, they probably think of themselves as more intelligent than do student-athletes at other institutions. As a result, student-athletes at less-selective schools may suffer more anxiety when taking tests, and therefore may underperform to a greater extent than our participants. Future research is clearly needed to examine whether the findings in the present research would replicate at less selective institutions.

Another limitation of this study is whether these findings truly explain, or even partially explain, student-athlete academic underperformance. Although it is likely that participants in this study suffer debilitating consequences (i.e., poor performance on a math test) only for a few minutes after the manipulation, because such results were found using only a low-impact manipulation, one could assume that the effects would be much greater out of the laboratory. Student-athletes at highly selective schools often report
feeling that their athlete status leads both their professors and peers to make negative assumptions about their academic capabilities. The issue of “lowering standards” to admit athletes is one that, at least on the campus studied, is constantly in the campus newspaper and is often discussed during formal and informal campus events. Student-athletes, in turn, are often advised by coaches and peers to not advertise their athlete status, such as by wearing team clothing or discussing their athletic events. I therefore believe it is quite likely that student-athletes at highly selective schools experience the equivalent of a stereotype threat condition rather frequently in their daily lives, which in turn could partially explain their academic underperformance.

Although this study suggests one potential mediating variable of the threat—performance link, clearly perceived social rejection is not the only such mediator. In fact, the mediation analysis revealed only partial mediation, and the threat—performance link was still quite strong even after controlling for this variable. Future research clearly needs to further examine the mechanisms by which the stereotype threat process works. Prior research suggests some potentially fruitful avenues such as physiological arousal (Blascovich, Spencer, Quinn, & Steele, 2001; O’Brien & Crandall, 2003) lower expectations (Steele & Aronson, 1995, Stone et al., 1999), and cognitive load (Schmader, 2003). However, these findings have been mixed at best. This study demonstrates that social rejection is one possible process. Future research is needed to further examine this potential mediator among others. Perhaps, for example, when reading about relevant negative stereotypes, student-athletes not only feel rejected, but their feelings of self-worth also diminish, which in turn leads to their underperformance.
Finally, future research is clearly needed to examine how to ameliorate the negative effects of stereotype threat. Although researchers are only beginning to examine this important issue, some recent research suggests at least two potential solutions to the problems caused by stereotype threat. First, a study by Aronson and colleagues (2002) indicated that participants who are made to believe that intelligence is malleable (i.e., people were capable of learning and mastering new things at any time in their lives) report greater enjoyment of the educational process as well as academic engagement, and obtain higher grades than their counterparts in two control groups. Second, making salient a stereotyped group’s success in another domain can lead to the reduction of the debilitating effects of stereotype threat. Specifically, research by McIntyre and colleagues (2003) found that women under conditions of stereotype threat performed significantly better on a math test when they either first read that women make better participants in psychology experiments than do men, or they read about four individual women who had succeeded in architecture, law, medicine, and invention. Moreover, my findings provide some support for this intervention by showing that student-athletes who are high general self-esteem are able to buffer themselves from experiencing the negative effects of receiving threatening information about their intelligence. It seems plausible that reshaping participants’ feelings of perceived rejection from others could help improve their academic performances. This could be achieved by describing how student-athletes make their campus’ environment better (i.e., increase alumni giving, rally the campus to cheer for a common good, etc.) In others words, because this research suggests that feelings of rejection partially mediate the stereotype threat – performance
link, working with student-athletes to minimize their feelings of perceived rejection, and
make them feel more welcomed on campus, may in turn lead to better performance.
Table 1

Means (and standard deviations) by athlete status and prime condition

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<td>LC</td>
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Note. AC = athlete-prime condition; LC = legacy-prime condition. All means and standard deviations are adjusted for Math SAT scores
Figure 1: Number of right answers as a function of the interaction of prime condition and athlete status
Figure 2: Percent accuracy as a function of the interaction of prime condition and athlete status.
Figure 3: Percent accuracy as a function of the interaction of prime condition, athlete status and general self-esteem
Figure 4: Number of right answers as a function of the interaction of prime condition, athlete status and academic self-esteem

![Graph showing the interaction of prime condition, athlete status, and academic self-esteem on right answers provided. The graph plots right answers provided on the y-axis against athlete condition (HSE, athlete, LSE, athlete, HSE, non-athlete, LSE, non-athlete) and legacy condition (HSE, athlete, LSE, athlete, HSE, non-athlete, LSE, non-athlete).]
Figure 5: Percent accuracy as a function of the interaction of prime condition, athlete status and academic self-esteem.
APPENDIX A

PARTICIPANTS' INSTRUCTIONS: PART I

This study examines the link between personality variables and problem solving strategies. Please answer all of the questions as honestly as you can. The study is completely anonymous and confidential. Please provide a code number to help us place both sections of the study together. We suggest using the last four digits of your Social Security number, but you may use another number if you wish.

Thank you for your participation.
REJECTION-SENSITIVITY SCALE

Each of the items below describes things college students sometimes ask of other people. Please imagine that you are in each situation. You will be asked to answer the following questions:

1) How concerned or anxious would you be about how the other person would respond?
2) How do you think the other person would be likely to respond?

1. You ask your parents for extra money to cover living expenses.
   How concerned or anxious would you be over whether or not your parents would help you out?
   very unconcerned  very concerned
   1 2 3 4 5 6
   I would expect that my parents would not mind helping me out.
   very unlikely  very likely
   1 2 3 4 5 6

2. After class, you tell your professor that you have been having some trouble with a section of the course and ask if he/she can give you some extra help.
   How concerned or anxious would you be over whether or not your professor would want to help you out?
   very unconcerned  very concerned
   1 2 3 4 5 6
   I would expect that my professor would want to help me out.
   very unlikely  very likely
   1 2 3 4 5 6

3. You approach a close friend to talk after doing or saying something that seriously upset him/her.
   How concerned or anxious would you be over whether or not your friend would want to talk with you?
   very unconcerned  very concerned
   1 2 3 4 5 6
   I would expect that he/she would want to talk with me to try to work things out.
   very unlikely  very likely
   1 2 3 4 5 6

4. After graduation you can't find a job and you ask your parents if you can live at home for a while.
   How concerned or anxious would you be over whether or not your parents would want you to come home?
   very unconcerned  very concerned
   1 2 3 4 5 6
I would expect that I would be welcome at home
very unlikely very likely
1 2 3 4 5 6

5. You ask your friend to go on vacation with you over Spring Break.
How concerned or anxious would you be over whether or not your friend would want to go with you?
very unconcerned very concerned
1 2 3 4 5 6
I would expect that he/she would want to go with me.
very unlikely very likely
1 2 3 4 5 6

6. You ask a friend if you can borrow something of his/hers.
How concerned or anxious would you be over whether or not your friend would want to loan it to you?
very unconcerned very concerned
1 2 3 4 5 6
I would expect that he/she would willingly loan me it.
very unlikely very likely
1 2 3 4 5 6

7. You ask your parents to come to an occasion important to you.
How concerned or anxious would you be over whether or not your parents would want to come?
very unconcerned very concerned
1 2 3 4 5 6
I would expect that they would want to come.
very unlikely very likely
1 2 3 4 5 6

8. You ask a friend to do you a big favor.
How concerned or anxious would you be over whether or not your friend would want to help you out?
very unconcerned very concerned
1 2 3 4 5 6
I would expect that he/she would willingly agree to help me out.
very unlikely very likely
1 2 3 4 5 6
SELF-ESTEEM SCALE

Answer the following questions using the following scale:

1 2 3 4 5

Never Once in a while Sometimes Usually Always

1) How often do you have trouble expressing your ideas when you try to put them into writing as an assignment?

2) Do you ever feel so discouraged with yourself that you wonder whether you are a worthwhile person?

3) How often do you imagine that you have less scholastic ability than your classmates?

4) How often do you worry about how well you get along with others?

5) Compared with classmates, how often do you feel you must study more than they do to get the same grades?

6) How often do you feel inferior to most of the people you know?

7) How often do you have the feeling that there is nothing you can do well?

8) Have you ever thought of yourself as physically uncoordinated?

9) How often are you troubled with shyness?

10) Have you ever been concerned or worried when (or if) you have to write an argument to convince your teacher who may disagree with your ideas?

11) Have you ever thought that you lacked the ability to be a good dancer or do well at recreational activities involving coordination?

12) When trying to do well at a sport and you know other people are watching, how often do you feel rattled or flustered do you get?

13) When you have to read an essay and understand it for a class assignment, how often do you worry or get concerned about it?

14) Do you ever think that you are a worthless individual?

15) When involved in sports requiring physical coordination, are you often concerned that you will not do well?

Answer the following questions using the following scale:

1 2 3 4 5

Never Once in a while Sometimes Usually Always

16) How often do you dislike yourself?

17) How often do you have trouble understand things you read for class assignments?

18) In turning in a major assignment such as a term paper, how often do you feel you did an excellent job on it?

19) How often do you worry about criticisms that might be made of your work by your teacher?

20) Do you ever feel afraid or anxious about whether other people will regard you as a success or failure in school?

21) Do you often feel uncomfortable meeting new people?
22) How often do you worry about whether other people will like you?
23) Have you ever felt inferior to most other people in athletic ability?
APPENDIX D

EXPERIMENTAL MANIPULATION

Verbal Reading Passage:

Please read the following passage and answer the questions provided at the end.

The Role of Athletics on College Campuses: Athletes Underperform in the Classroom

A major finding in *The Game of Life*, is the pervasive and persistent tendency of athletes at liberal arts colleges and universities to *underperform academically*: *that is, to do even less well in the classroom than one would expect them to do on the basis of their entering academic credentials*. Stated another way, athletes, male and female, were found, as a group, to earn even lower grades than could be predicted by their SAT scores and high school grades, after also controlling for race, socio-economic status, field of study, and institutional selectivity (measured by mean institutional SAT score).

Why does academic underperformance matter? Some may feel that the actual grades earned are all that counts, that a B- is a B-, whether the student could or could not have been expected to do better. But when some students underperform, and especially when they are blunt about their own (different) priorities, they can affect the campus ethos and even the academic performance of at least some of their fellow students. More generally, we regard consistent underperformance as a serious problem for reasons that have to do with educational values and what may be thought of as an obligation to take reasonably full advantage of scarce educational opportunities that others would clearly have prized. To be sure, there will always be, by definition, students who underperform relative to the norm for their class (just as there will always be a bottom third of the class); and of course some athletes, in company with other students, overperform academically. But it is grounds for concern when a particular subgroup exhibits, overall, consistent and statistically significant underperformance.

In order to help us select appropriate passages for future GRE tests, please answer the following questions using this scale:

1. This passage was very clearly written.
2. This passage was comprehensible.
3. This passage is the appropriate length.

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<td></td>
<td>strongly disagree</td>
<td>somewhat disagree</td>
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<td>somewhat agree</td>
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1. ________
2. ________
3. ________
SOCIAL REJECTION SCALE

Use the scale below to rate the following series of statements.

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

1. People respect me for who I am. ________________________________
2. I make a significant contribution to Amherst College. ____________
3. Amherst College is a warm, welcoming environment. ____________
4. I am afraid of other people noticing my shortcomings. ___________
5. I feel rejected by other students at Amherst College. ____________
6. I feel like I belong at Amherst College. __________________________
7. Faculty members believe I do not belong at Amherst College. ______
8. Other students on this campus make me feel welcome. ____________
9. Faculty members believe that I am an important part of the Amherst
   College community. __________________________
10. The faculty on this campus make me feel welcome. _______________
11. Other students do not think I belong at Amherst College. __________
12. Other students believe that I am an important part of the Amherst
    College community. __________________________
13. I am an accepted member of the Amherst College community. ______
14. I am afraid that others do not approve of me. ________________
15. Other students think I make a valuable contribution to Amherst
    College. __________________________
16. Faculty members think I make a valuable contribution to Amherst
    College. __________________________
APPENDIX F

PANAS

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer next to that word. Indicate to what extent **YOU FEEL THIS WAY RIGHT NOW, THAT IS, AT THE PRESENT MOMENT**. Use the following scale to record your answers.

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or not at all

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<td>inspired</td>
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<td>strong</td>
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<td></td>
<td>guilty</td>
<td></td>
<td>determined</td>
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<td></td>
<td>scared</td>
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<td>attentive</td>
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<td></td>
<td>hostile</td>
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<td>jittery</td>
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<tr>
<td></td>
<td>enthusiastic</td>
<td></td>
<td>active</td>
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<tr>
<td></td>
<td>proud</td>
<td></td>
<td>afraid</td>
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PARTICIPANTS’ INSTRUCTIONS: PART II

Be sure to read the instructions carefully.
You will have 10 minutes to complete this section.
You may begin now. Good luck.
MATH TEST

1. The average of two numbers is XY. If one number equals X, the other number equals
   (A) Y
   (B) 2Y
   (C) XY – X
   (D) 2XY – X
   (E) XY – 2X

2. Given that a and b are real numbers, let f(a,b) = ab and let g(a) = a^2 + 2. Then
   \( f[g(3)] = \)
   (A) 3a^2 + 2
   (B) 3a^2 + 6
   (C) 27
   (D) 29
   (E) 33

3. The afternoon classes in a school begin at 1:00 PM and end at 3:52 PM. There
   are four afternoon periods with 4 minutes allowed between periods for passing to
   classes. The number of minutes in each class period is
   (A) 39
   (B) 40
   (C) 43
   (D) 45
   (E) 59

4. If \( x^2 + 2x - 8 = 0 \), then \( x \) is either –4 or
   (A) -2
   (B) -1
   (C) 0
   (D) 2
   (E) 8

5. If four cows produce 4 cans of milk in 4 days, how many days does it take eight
   cows to produce 8 cans of milk?
   (A) 1
   (B) 2
   (C) 4
   (D) 8
   (E) 16
6. One-half of a number is 17 more than one-third of that number. What is the number?
   (A) 52
   (B) 84
   (C) 102
   (D) 112
   (E) 204

7. In a certain shop, notebooks normally sell for 59 cents each are on sale at 2 for 99 cents. How much can be save by buying 10 of these notebooks at the sale price?
   (A) $0.85
   (B) $0.95
   (C) $1.10
   (D) $1.15
   (E) $2.00

8. In triangle ABC, angle B = angle C. D is any point on BC. Which of the following statements is true?
   (A) AB > BC
   (B) AB < BC
   (C) BD = DC
   (D) AC > AD
   (E) AC < AD

9. If \( x + y = 6 \) and \( 3x - y = 4 \), then \( x - y = \)
   (A) -1
   (B) 0
   (C) 2
   (D) 4
   (E) 6

10. A triangular plot with sides of 28 feet, 35 feet, and 56 feet is to be surrounded by a fence built on posts set 7 feet apart. After posts are placed at each corner, how many additional posts will be needed?
    (A) 14
    (B) 15
    (C) 16
    (D) 17
    (E) 18

11. In July the price of a stock increased by 10 percent. In August, it declined by 20 percent. If in September the price increased 10 percent, by what percentage of the original July price has the stock changed in price from the start of July to the end of September?
    (A) 0 percent
    (B) 3.2 percent
    (C) 4.4 percent
    (D) 20 percent
    (E) 40 percent
12. Which of the following is 850 percent greater than $8 \times 10^3$?
   (A) $8.5 \times 10^3$
   (B) $6.4 \times 10^4$
   (C) $6.8 \times 10^4$
   (D) $7.6 \times 10^4$
   (E) $1.6 \times 10^5$

13. A vending machine dispenses gumballs in a regularly repeating cycle of ten different colors. If a quarter buys 3 gumballs, what is the minimum amount of money that must be spent before three gumballs of the same color are dispensed?
   (A) $1.00$
   (B) $1.75$
   (C) $2.00$
   (D) $2.25$
   (E) $2.50$

14. If a dealer had sold a stereo for $600, he would have made a 20% profit. Instead, the dealer sold it for a 40% loss. At what price was the stereo sold?
   (A) $300$
   (B) $315$
   (C) $372$
   (D) $400$
   (E) $440$

15. A butcher buys 240 kilograms of beef for $380. If 20 percent of the beef is unusable, at approximately what average price per kilogram must he sell the rest of the beef in order to make a profit of 25 percent?
   (A) $2.30$
   (B) $2.40$
   (C) $2.45$
   (D) $2.47$
   (E) $2.55$

16. If $x$ and $y$ are both prime and greater than 2, then which of the following CANNOT be a divisor of $xy$?
   (A) 2
   (B) 3
   (C) 11
   (D) 15
   (E) 17

17. The average of four numbers is 20. If one of the numbers is removed, the average of the remaining numbers is 15. What number was removed?
   (A) 10
   (B) 15
   (C) 30
   (D) 35
   (E) 45
18. The ratio of two numbers is 10 and their difference is 18. What is the value of the smaller number?
   (A) 2
   (B) 5
   (C) 10
   (D) 21
   (E) 27

19. If $3y + 5 = 7x$, then $21y - 49x =$
   (A) -40
   (B) -35
   (C) -10
   (D) 0
   (E) 15

20. Seven years ago, Scott was 3 times as old as Kathy was at that time. If Scott is now 5 years older than Kathy, how old is Scott?
   (A) 12 1/2
   (B) 13
   (C) 13 1/2
   (D) 14
   (E) 14 1/2

**STOP**
DO NOT CONTINUE UNTIL TOLD
## DEMOGRAPHICS

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<td>Did anyone in your immediate family attend Amherst College?</td>
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<td>If so, who:</td>
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<td>what year:</td>
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### Amherst Activities

Please list the clubs and organizations that you have joined, or plan to join, at Amherst. Please include sports teams, social organizations, acting or media groups, ethnic organizations, volunteer groups, peer awareness groups, political groups, newspaper staffs, etc. Please rate your level of involvement, the number of hours per week you are involved, and whether or not you have a leadership position (i.e., captain, president, editor, etc.).

<table>
<thead>
<tr>
<th>name of activity/org.</th>
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Were you recruited to play a sport at Amherst College? | Yes | No
REFERENCES


