

## The Dumb Jock: How Negative Stereotype Threats Impact Student-Athletes' Standards of Academic Competence and Their Math Performance

By Jed A. Diekfuss

College student-athletes are susceptible to a unique stereotype threat known as the “dumb jock” stereotype, according to which student-athletes are supposedly less engaged in academics and less competent academically. Previous research has shown that people do harbor the “dumb jock” stereotype, which negatively affects student-athletes’ perceived academic self-regard and academic performance. In the present research, I test whether a shifting in standards of academic competence may be the mechanism underlying the negative effect of stereotype threat on student-athletes’ perceived academic self-regard and academic performance. A standard of academic competence is defined as the criterion people set on an academic task in order for them to call themselves academically competent. Stereotype threat was manipulated and participants’ standards of academic competency, perceived academic self-regard, and academic performance were measured. It was predicted that student-athletes who take a math test that they perceive as being diagnostic of typical academic performance would perform worse academically and have lower perceived academic self-regard than student-athletes who perceive the test as non-diagnostic of typical academic performance and non-athlete students who perceive the test as diagnostic of academic performance. Also, it was predicted that student-athletes who perceive the test as diagnostic of typical academic performance would shift their standards of academic competence downwards (i.e., require less evidence of competence for themselves) to reduce the likelihood of confirming the “dumb jock” stereotype, which would lead to poorer academic performance and to lower perceived academic self-regard. However, contrary to the predictions, the participants in the test diagnostic/student-athlete condition had significantly higher math test accuracy scores than the test diagnostic/non-athlete student condition. These results suggest that the “dumb jock” stereotype threat may be less threatening than previous research has suggested. Possible explanations for the enhanced performance and perceived academic self-regard are discussed. One potential explanation is stereotype reactance - the motivated tendency to behave in a manner inconsistent with an imposed stereotype about the group to which the person belongs. This interpretation is described in detail and new avenues of research on the “dumb jock” stereotype threat are discussed.

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Impact Student-Athletes' Standards of Academic Competence

by

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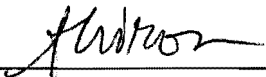
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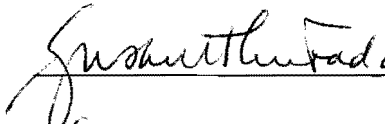
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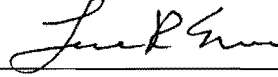
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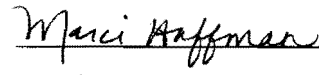
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This thesis is dedicated to my parents, Jeff and Diane, my brother, Jake, and my wife-to-be, Teri. I thank them for their endless love, support, and encouragement.

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## TABLE OF CONTENTS

	Page
LIST OF TABLES .....	vi
LIST OF FIGURES .....	vii
INTRODUCTION .....	3
Stereotype Threat .....	3
Shifting Standards .....	10
PREDICTIONS .....	17
ANOVA Predictions .....	17
Mediation Predictions .....	18
METHOD .....	19
Recruitment of Participants .....	19
Recruitment Method A .....	19
Recruitment Method B .....	19
Recruitment Method C .....	20
Procedure .....	21
Location of Experiment .....	21
Stereotype Threat Manipulation .....	22
Standards of Academic Competence .....	24
Academic Performance and Academic Self-Regard .....	24
Manipulation Checks .....	26
RESULTS .....	28
Descriptive Statistics .....	28
Data Screening .....	28
Reliability Analyses .....	28
Outliers .....	28
Normality and variable transformation .....	29
Covariates .....	29
Manipulation Checks .....	30
Information Paragraphs .....	30
Condition .....	30
Primary Analysis .....	31
DISCUSSION .....	36
Study Limitations and Future Directions .....	39

## TABLE OF CONTENTS (Continued)

	Page
APPENDIXES .....	42
Appendix A1: Consent Form (Recruitment Method A) .....	43
Appendix A2: Consent Form (Recruitment Methods B and C) .....	45
Appendix B: Manipulation of Stereotype Threat .....	48
Appendix C: Standard of Academic Competency Questionnaire .....	52
Appendix D: Academic Performance .....	55
Appendix E: Academic Self-Regard .....	60
Appendix F: Demographic Questionnaire .....	63
Appendix G: Study Debriefing .....	67
Appendix H: Participant Recruitment Script .....	70
REFERENCES .....	72

## LIST OF TABLES

	Page
Table 1. Mean Standard of Academic Competence by Condition .....	34
Table 2. Mean Perceived Academic Self-Regard by Condition .....	34
Table 3. Mean Math Test Accuracy Score by Condition .....	35
Table 4. Mean Math Test Problems Correct by Condition .....	35

## LIST OF FIGURES

	Page
Figure 1. Proposed Mediating Pathway .....	16



## INTRODUCTION

College students who are members of athletic programs are referred to as student-athletes. These student-athletes are exposed to a college lifestyle that is unlike those of non-athlete students. Student-athletes have to find time to practice, participate in their athletic competitions, and deal with scrutiny from coaches, media, family, and friends. They also have to find time to study, attend class, and complete assignments. With this in mind, it is understandable that student-athletes have dual identities (e.g., an athlete identity and student identity). Yopyk and Prentice (2005) found that a student-athlete's identity can switch from student to athlete rather quickly. This dual identity may leave student-athletes more susceptible to stereotype threats compared to non-athlete students. Indeed, college students-athletes are often stereotyped to be less academically engaged and competent, regardless of race, or gender (Engstrom & Sedlacek, 1991; Yopyk & Prentice, 2005). This stereotype is commonly referred to as the "dumb jock" stereotype (Coakley, 1990; Sailes, 1993).

The origin of the "dumb jock" stereotype is believed to have originated as early as 500 B.C.; Greek athletes spent all their time preparing for athletic competitions, but ignored intellectual development (Coakley, 1990). The "dumb jock" stereotype continued to stay prevalent throughout history and was depicted in popular movies (e.g. *Revenge of the Nerds*), television shows, and situation comedies. Early in the 1990s, Sailes (1993) stated that the media was challenging the scholarship of student-athletes and tainting the academic credibility of college student-athletes. Sailes acknowledged

media reports that student-athletes were not meeting the minimum grade point averages and standardized test scores that were set by the National Collegiate Athletics Association (NCAA) to determine athletic eligibility. Furthermore, college student-athletes were failing their courses and graduating at lower rates than non-athlete students, perpetuating the “dumb jock” stereotype. However, despite these beliefs perpetuated by the media, there was a lack of empirical evidence that people in general (regardless of their athletic status) believed in the “dumb jock” stereotype (Sailes, 1993).

Sailes (1993) administered a questionnaire to a sample of undergraduate students who varied in race and gender. The questionnaire asked the participants to rate their agreement or disagreement on a 5-point Likert scale about statements related to the “dumb jock” stereotype. For example, one statement was, “Generally, athletes are not as smart as the average student.” Sailes found that Caucasian American students (compared to African American students) believed college student-athletes were not as intelligent as the typical college student, and college student-athletes took easier courses to maintain their athletic eligibility. In addition, males felt stronger than females that college student-athletes took easier courses. This indicates that, some college students may believe media and cultural depictions of student-athletes as intellectually inferior to non-athlete students (Sailes, 1993). Despite the fact that Sailes’ study had methodological flaws (e.g., the use of leading statements in the questionnaire), his work suggests that people may hold the “dumb jock” stereotype.

Before examining further research on the prevalence of the “dumb jock” stereotype in the general population and how it may be affecting student-athletes, it is

important to fully understand the importance of stereotype threat in other contexts. This is discussed in the next section.

### **Stereotype Threat**

Stereotype threat is defined as the anxiety people experience when they risk confirming a negative stereotype of their group (Steele, 1997). When people are reminded of a stereotype, they often perform in a manner similar to the stereotype (Spencer, Steel, & Quinn, 1999; Steele & Aronson, 1995; Stone, Perry, & Darley, 1997). Often the stereotype type threat results in people underperforming in relation their abilities (Steele & Aronson, 1995).

Early literature on stereotype threat focused on the stereotypes that affected minority group members. One such stereotype is the stereotype that African Americans have lower intelligence than Caucasians. Steele and Aronson (1995) explored the effect of being aware of this stereotype on African Americans' performance by having African American and Caucasian American students take tests from the verbal portion of the GRE. In the *stereotype threat condition*, the participants were told that the test was diagnostic of intellectual ability. In the *non-stereotype threat condition*, they were told the test was just a laboratory problem-solving task that was non-diagnostic of ability. Steele and Aronson controlled for SAT scores and found that African Americans performed significantly worse than Caucasian Americans when they were told that the test was diagnostic of intellectual ability. When they were told it was not a tool of diagnostic ability, African Americans and Caucasian Americans scored equally well.

Steel and Aronson explained that by informing participants that the test was an accurate tool in determining people's intellectual ability, the situation activated the negative cultural stereotype in the African American participants.

Steele and Aronson (1995) also conducted another experiment to test the effects of the stereotype that African Americans are not as intelligent as Caucasian Americans. They primed participants by having half of them state their race in a demographics portion of a questionnaire given at the beginning of the study (*stereotype threat condition*). The other half of the participants did not answer any questions regarding their race (*control*). After the demographics portion, participants took a difficult math test. The results showed that African Americans performed significantly worse than the Caucasian Americans in the stereotype threat condition. In the control condition, African Americans did as well as the Caucasian Americans (Steel & Aronson, 1995). This experiment showed how easy it is to trigger a stereotype in a group member. Indeed, indicating one's race on a demographic questionnaire is enough to activate stereotype threat, which subsequently depressed performance in minority group members.

Another stereotype that has been studied is that women perform worse on difficult math tests than do men but score equally well when the math tests are somewhat easier. Spencer, Steele, and Quinn (1999) researched this phenomenon by studying men and women with a very strong math background. They primed all the participants by informing them that they were taking a math test. Some participants took an easy math test and some took a difficult math test. Spencer et al. (1999) were able to replicate the stereotype threat effect in women; even though men and women were equally skilled in

math, women underperformed in comparison to men on the difficult test, but did just as well on the easy test.

In a different study, Spencer et al. (1999) also used only a difficult test, but manipulated stereotype threat by explaining to men and women preparing to take a test that gender differences supposedly occurred in the past on the test (stereotype threat condition), or that both genders supposedly scored equally well on the test in the past (control condition). Again, they were able to replicate the stereotype threat effects found in previous studies: when the participants were explicitly told that the test yielded gender differences, women greatly underperformed in relation to men; however, when the test was presented as not yielding gender differences, women performed at the same high level as equally qualified men. This occurred even though the same difficult test was used in both conditions.

After seeing how easy a stereotype threat can be activated in an individual, it is no surprise that stereotypes exist in other contexts. In the context of athletics, many different stereotype threats exist and these threats can significantly affect both how others perceive an athlete and how an athlete actually performs. Stone, Perry and Darley (1997) focused on the stereotypes that African Americans are more naturally athletic compared to Caucasian Americans and that Caucasian Americans are believed to be intellectually superior to African Americans. Stone et al. (1997) argued that the stereotype held by the general public is that when Caucasian Americans do well in sports it is because they make up for their lack of athletic ability by compensating with hard work and learning the sport better; however, when African Americans perform better in sports it is due to

their natural gifted athletic ability. Stone et al. studied this racial belief about athletes by having participants listen to a collegiate basketball game. Before they listened to the game, they were shown one of four pictures: an athletic looking Caucasian male, an unathletic looking Caucasian male, an athletic looking African American or an unathletic African American. In all conditions they were told that the person in the photograph was the collegiate basketball player Mark Flick. All participants were told to listen to the audio recording of the collegiate basketball game and to pay special attention to how Mark Flick performed.

After the participants listened to the audio recording they answered questionnaires intended to measure how the participants perceived Mark Flick's athletic ability and sports intelligence. When the participants thought Mark Flick was African American, he was perceived as having more natural physical and basketball ability. When Mark Flick was perceived as Caucasian American, he was perceived as having more basketball intelligence. This finding confirmed that participants endorsed the stereotype that African Americans have more natural physical skills and that Caucasians have more sports intelligence. These stereotype studies exemplify the influence a stereotype threat may have on a particular social group.

For the present study, the social group consists of student-athletes and the "dumb jock" stereotype will be examined. Sailes' study cited earlier provided support, albeit weak, that the "dumb jock" stereotype is prevalent. However, Engstrom and Sedlacek (1991) found conclusive results demonstrating the presence of the "dumb jock" stereotype. The authors surveyed a random sample of 293 freshmen entering an eastern

university division 1-A athletic program. The authors had participants complete a survey that assessed the participants' attitudes and beliefs about non-athlete students and student-athletes. There was one control version of the survey in which the target individuals to be evaluated in the survey were referred to as students and another version of the survey in which they were referred to as student-athletes. For example, in one condition a statement would read, "A *student* gets an A in a class," and in another condition a statement would read, "A *student-athlete* gets an A in a class."

Engstrom and Sedlacek found that the participants in the student-athlete condition reported feeling more suspicious, worried, and displeased when a student-athlete receives an A versus a student. The authors concluded that these findings suggest that students simply do not believe student-athletes have the academic capabilities to obtain an A (Engstrom & Sedlacek, 1991). Engstrom and Sedlacek also found that participants were more worried or displeased when they were assigned a student-athlete as a lab partner versus a student, and were not as concerned when a student-athlete left school.

People may not explicitly state that they are dissatisfied working with a student-athlete on an academic task, but it is likely that the student-athlete will feel uncomfortable knowing that the stereotype exists. Engstrom and Sedlacek's results suggest that there is a negative cultural stereotype towards student-athletes and the "dumb jock" stereotype threat is prevalent.

Indeed, this research indicates that people harbor negative stereotypes about student-athletes. These beliefs put student-athletes at risk to confirm or to behave in a

manner consistent with the stereotype. As mentioned above, student-athletes are believed to be less intelligent, take easier classes, and lack the ability to perform well academically (Engstrom & Sedlacek, 1991; Sailes, 1993). However, this work does not answer the question of whether the “dumb jock” stereotype actually affects student-athletes’ performance or how they perceive their own academic abilities.

Yopyk and Prentice’s (2005) work does this. They reasoned that student-athletes would perform worse academically and have lower perceived academic self-regard when they are exposed to the “dumb jock” stereotype threat compared to no stereotype threat. Academic self-regard refers to how people feel about their academic potential and their ability to perform well in the classroom. Academic performance refers to performance outcomes that can be reliably measured (e.g. number of correct responses on a math test). Yopyk and Prentice primed male student-athletes to think of themselves as a student or athlete, and then had participants complete a challenging math test and a self-reflection survey. The authors primed student-athletes in the *student condition* to think of themselves as a student by having them write about their last success as a student. Student-athletes in the *athlete condition* were primed to think of themselves as a student-athlete by having them write about their last success as an athlete. As hypothesized, when student-athletes were primed with their athlete identity, they performed worse on the math test and had a significantly lower self-regard than student-athletes primed with their student identity.

In another study, Yopyk and Prentice (2005) found more direct evidence for a causal link between task performance and identity salience. The authors had student-



athletes complete a self-rating inventory or a math test, and then assessed the salience of their athlete and student identities by using a word fragment completion task. Yopyk and Prentice found that when the student-athletes completed the self-rating inventory and took the social role of an athlete, they reported more words related to athletics. However, when the student-athlete completed the math test and took the social role of a student, they reported more words related to academics. This experiment shows how student-athletes can quickly change between social identities and take a different social role depending on the situation. If a student-athlete's social identity as an athlete is made salient, it leads student-athletes to perceive themselves as having lower academic self-regard, which in turn leads them to perform worse academically.

Harrison et al. (2009) noted some limitations and alternative explanations for Yopyk and Prentices' (2005) experiment. Harrison et al. stated that athlete-priming method used by Yopyk and Prentice was too open-ended. Yopyk and Prentice had participants "think about how they felt before and after competition" or to recall "some of the problems they faced during competition." This style of priming may have allowed the participants in the athlete priming condition to cognitively recall feelings and problem solving strategies that were not associated with athletics, indicating that this identity prime manipulation may not have been sufficient. The present research addressed this limitation by using a diagnostic stereotype threat manipulation. In addition, prior work had not looked closely at potential mechanisms by which stereotype threat leads to depressed academic self-regard and performance. The research addressed this by exploring one possible underlying mechanism: the shifting of standards of ability by

student-athletes. Specifically, it was hypothesized that student-athletes would shift their academic performance standards upward or downward depending on the social identity that they undertake.

### **Shifting Standards**

Biernat, Manis, & Nelson (1991) predicted that people use their prior stereotypical beliefs when making evaluative judgments of others. Specifically, that people shift their subjective judgment standards of others when they evaluate members of stereotyped social groups. In addition, the authors predicted that judgment standards would not shift as often when an objective measure is used compared to a subjective measure. To test these hypotheses, Biernat et al. had participants view photographs of men and women and judge the height of the person in the photo (Experiment 1). The authors manipulated whether the participants judged height on a subjective scale (e.g., very tall) or on an objective scale (e.g. 5'11"). Biernat et al. found that participants judged men and women to be of equal height when a subjective scale was used; however, when an objective scale was used men were judged as significantly taller.

Biernat et al (2010) conducted two follow-up experiments in which participants judged subjectively and objectively other stereotypical characteristics of men and women (e.g. financial success, weight) and found similar results that supported their hypotheses. They concluded that objective judgments reveal stereotype effects, whereas subjective judgments do not. The authors argued that people *do use stereotypical beliefs* when evaluating others, but this is only evident when judgments are made on an objective

scale. Biernat et al. provided the earliest evidence that people shift their evaluative standards of others based on previously held stereotypes. As a result, the researchers began examining people's shifting evaluative standards in other domains (e.g. race, relationships, etc.), in an attempt to understand which stereotypes produced the greatest shifts in evaluative standards.

For instance, Miron, Branscombe, and Biernat (2010) studied how the shifting standards phenomenon affected peoples' judgments of their groups' unjust treatment of other groups depending on the group identification of the participant. Miron et al. hypothesized that people quantitatively shift their standards when evaluating injustices committed by their ingroup. Specifically, if a person identifies with a specific group, they would be motivated to protect that group's image, which would result in less collective guilt for the individual. Collective guilt is defined as the guilt experienced from transgressions committed by a person's ingroup, regardless of who specifically was responsible (Branscombe & Doosje, 2004).

For example, if person (XY) identifies him or herself with race "Z," and was asked, "How many acts of violent crime per year do race Z's need to commit for you to consider race Z malicious?" XY may indicate that race Z needs to commit *300,000* acts of violent crime per year to consider race Z malicious. In contrast, if XY was asked the same question, but for a race he or she does not identify with (race L), he or she may indicate that race L needs to commit *200,000* acts of violent crime per year to consider race L malicious. XY would be setting a higher confirmatory evidentiary standard (Biernat & Fuegen, 1991); XY needs more evidence (more violent acts per year) to

consider his or her own race malicious. In the previous example, if XY was told that race Z *actually commits 250,000 acts* of violent crime per year, it would not be enough evidence for XY to consider race Z as malicious, but enough to consider race L malicious.

Miron et al. (2010; study 1) empirically tested their hypotheses by having participants indicate the amount of evidence (also referred to as a confirmatory standard of injustice) needed regarding the American slavery policy to conclude that the past United States was a racist nation. Miron et al. hypothesized that participants who highly identified themselves as American would need *more evidence* to conclude the past United States was a racist nation than would participants who did not highly identify themselves as American. The authors believed that if the high identifiers shift the injustice standards upwards, they would more easily arrive at the conclusion that their group's behavior was not that severe (judgment of harm), and this would result in less collective guilt experienced compared to the low identifiers. Additionally, Miron et al. hypothesized that the standards set by participants would mediate the effect of group identification on participants' judgment of harm, and participants' judgment of harm would mediate the effect of confirmatory standards on collective guilt.

Miron et al (2010; study 1) first had participants complete a judgment of harm questionnaire that measured the subjective amount of harm Americans needed to commit against African Americans to view Americans as unjust. For example, participants answered a question, "How much was lost by Africans in wages during slavery?" They responded on a 7-point scale ranging from "almost none" to "almost all." Next,

participants completed an objective standard of injustice questionnaire. This questionnaire objectively measured the standards participants set to consider the United States a racist nation. For example, “What percentage of Americans would have had to be involved in causing harm to Africans for you to consider the past United States a racist nation?” Participants could select a percentage interval (on a scale ranging from 0-10% to 90-100%) for each question. Then, participants completed a questionnaire that asked for participants’ agreement or disagreement with statements pertaining to collective guilt experienced from the United States’ past actions. They finished the study by completing a questionnaire that measured participants’ group identification as an American.

The authors’ results supported their hypotheses. Participants who highly identified themselves as American set higher evidentiary standards of injustice (i.e., asked for more evidence of past United States slavery acts/injustices), which resulted in a less severe assessment of the past United States and less collective guilt experienced compared to those who were more weakly identified as American. The standards set by participants mediated the effect of group identification on participants’ judgment of harm, and participants’ judgment of harm mediated the effect of confirmatory standards on collective guilt.

Miron et al. (2010; Study 2) conducted a follow-up study that experimentally manipulated group identification (in Study 1 participants only *indicated* their group identification). Group identification was manipulated by having participants write about times (or situations) when they identified themselves as an American (e.g., they felt similar to Americans; high identification), or about times when they did not identify

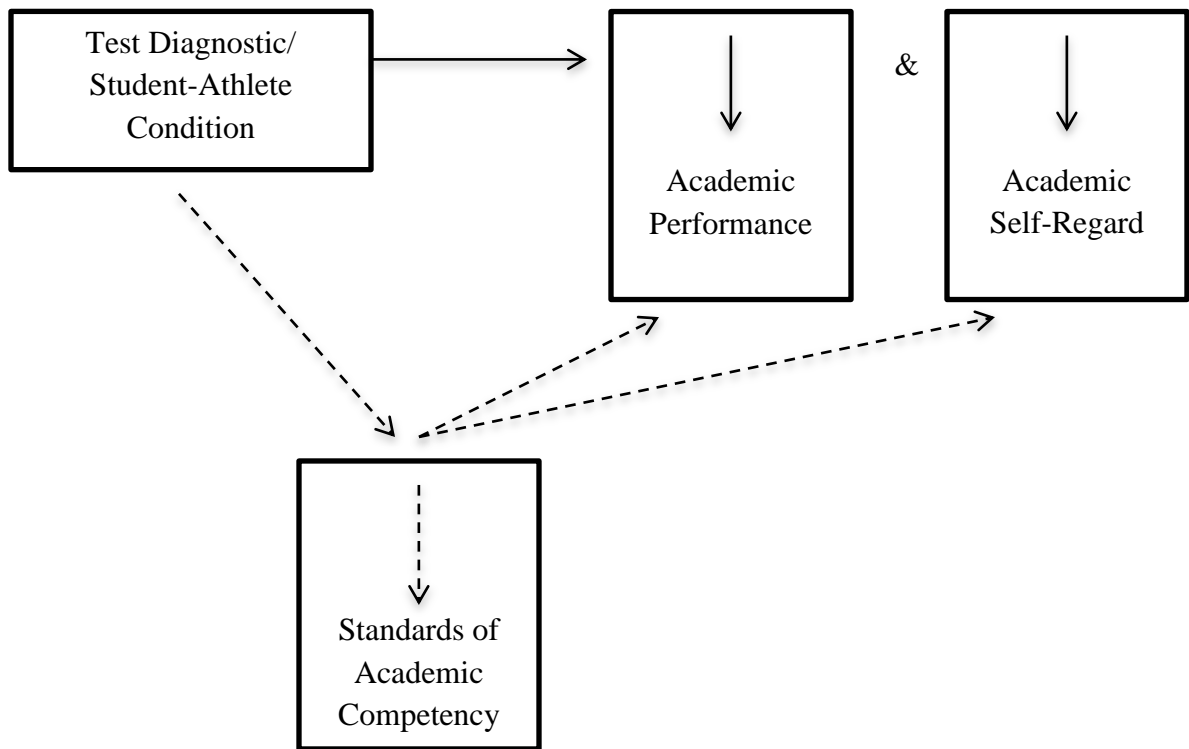
themselves as an American (e.g., they felt dissimilar to Americans; low identification). The authors' results from this experiment provided evidence that were consistent with Study 1. Participants in the high identification condition set higher standards of injustice to conclude the United States was a racist nation resulting in lower perceived severity of harm and lower collective guilt. Furthermore, the results again indicated that the standards set by participants mediated the effect of group identification on participants' judgment of harm, and participants' judgment of harm mediated the effect of confirmatory standards on collective guilt.

Miron et al.'s (2010; studies 1 and 2) experiments provided evidence that people shift their evidentiary standards depending on individuals' motivation to protect their group. By shifting evidentiary standards, people can protect themselves from the collective guilt instigated from being associated with the in-group's transgressions. With this in mind, the present research examined whether *student-athletes shift their evidentiary standards* in academic settings. Does the "dumb jock" stereotype cause student-athletes to shift their academic standards in order to protect their group's self-image from potentially confirming the dumb jock stereotype? In the research, a *standard of academic competence* was created in attempt to answer this question.

A standard of academic competence was defined as the criterion (e.g., percentage score on an upcoming math test) people set for themselves on an academic task in order to call themselves academically competent. For example, would people feel academically competent if they scored a 70% on a math test when they had set a criterion of 80% beforehand? Or, would a person feel academically competent if they score a 70% on a

math test when they set a criterion of 60% beforehand? The latter was believed to evoke greater feelings of academic competency.

It was predicted that student-athletes who completed a math test that they perceived as being diagnostic of typical academic performance would perform worse academically and report lower perceived academic self-regard than student-athletes who perceived the test as being non-diagnostic of typical academic performance and compared to non-athlete students who perceived the test as being diagnostic of typical academic performance. Additionally, it was predicted that student-athletes would shift their standards of academic competence downwards (i.e., require less evidence of competence for themselves) resulting in poorer academic performance and lowered perceived academic self-regard (See Figure 1). The specific predictions are presented in the following section.



*Figure 1:* The connected line represents the pathway suggested by Yopyk and Prentice (2005). As in that study, in the current experiment student-athletes who complete a math test that they perceive as being diagnostic of typical academic performance are expected to perform worse academically and to have lower perceived academic self-regard than student-athletes who perceive the test as non-diagnostic of typical academic performance and compared to non-athlete students that perceive the test as being diagnostic of typical academic performance. The dotted lines in red represent the proposed mediating pathway. Student-athletes who perceive the test as diagnostic of typical academic performance are expected to set lower standards of academic competency, which would be mediating the effects of the “dumb jock” stereotype on academic performance and academic self-regard.



## Predictions

### ANOVA Predictions

Three 1 X 3 analysis of variances (ANOVAs) were conducted. The ANOVAS used the following polynomial contrast codes (1 -1 0) and (0 -1 1) used the pooled error variance to contrast the test diagnostic/student-athlete, test non-diagnostic/non-athlete student, test diagnostic/non-athlete student conditions. Three predictions were tested:

*Prediction 1:* Participants in the test diagnostic/student-athlete condition would score significantly lower on the standards of academic competence questionnaire than the test non-diagnostic/student-athlete and the test diagnostic/non-athlete student conditions, with no difference expected between the latter two conditions.

*Prediction 2:* Participants in the test diagnostic/student-athlete condition would score significantly lower on the academic self-regard scale than the test non-diagnostic/student-athlete and the test diagnostic/non-athlete student conditions, with no difference expected between the latter conditions.

*Prediction 3:* Participants in the test diagnostic/student-athlete condition would score significantly lower on the math test than the test non-diagnostic/student-athlete and the test diagnostic/non-athlete student conditions, with no difference expected between the latter two conditions.

**Mediation Predictions**

*Prediction 4:* The standards of academic competency set by participants would mediate the effects of stereotype threat on academic self-regard.

*Prediction 5:* The standards of academic competency set by participants would mediate the effects of stereotype threat on academic performance.

## Method

### Recruitment of Participants

Student-athletes and non-athlete students were recruited from the University of Wisconsin Oshkosh (UWO) to complete a laboratory experiment; participant recruitment took one of three forms (A, B, and C, to ensure an adequate number of participants):

**Recruitment method A.** This method was designed to recruit introductory psychology students at UWO who were required to complete psychology research for course credits. Participants registered for the experiment on UWO's *Sona-Systems* (an online system used for participant recruitment by the Psychology Department). To recruit student-athletes, participants were only able to select the present study if they selected "yes" to the following prescreening question (included in the UWO Psychology Department prescreening questionnaire to ensure participants were student-athletes): Are you a student-athlete? (Yes/No). The participants were instructed to select "yes" only if they were members of one (or more) UWO athletic program(s). They were instructed not to select "yes" if they only participate in intramural/recreational sports. It was important that potential participants understood the meaning of *student-athlete* (as defined by this experiment). Next, the participants selected a time and date on Sona-Systems to meet with the researcher. The participants who selected "no" for the prescreening question were used as the non-athlete student control group.

**Recruitment method B.** For the second recruitment method, the researcher contacted members of various UWO athletic members and teams. He communicated with

UWO individual team members (typically team captains) through e-mail or by introduction through third party acquaintances. The emails and introductions consisted of some brief information regarding the research and a request to speak to their respective athletic team after an organized practice (see Appendix H for the contents of the email and for the general information that was presented during an introduction). An *organized practice* refers to any time the members of an athletic team are typically together (e.g., team practice, meeting, weightlifting, lunch gathering, study session, etc.).

During an organized meeting, the researcher introduced himself, and indicated that he is working on his Master's thesis and was looking for voluntary participation. Next, the researcher informed the student-athletes about the procedure and explained to them it would not take more than 30 minutes of their time. The researcher emphasized that there was no pressure to participate and their coach(s) would never be informed of who did, or did not participate. The researcher also explained that the research was being conducted to expand on the literature regarding student-athletes, and that those who would like to participate could obtain the study's results later in the year. The researcher asked participants to write down their email address or phone number if they were interested in being contacted to set up a future time for the study.

**Recruitment method C.** For the third recruitment method, the researcher sat at a table in UWO's recreation and wellness center (RWC; UWO's primary fitness center) and asked *potential* student-athletes if they were willing to take part in a study. Whether a person is a potential student-athlete was determined by a subjective judgment made by the researcher. For example, if 2 women walked into the RWC wearing "UWO Women's

Basketball” t-shirts, it was reasonable to believe that they may be student-athletes. The researcher would then politely introduce himself and ask if either of them were members of one or more of UWO’s athletic programs. If one (or more) of the women said “yes,” the researcher would proceed to ask those women if they were willing to participate in a voluntary study on student-athletes. The experiment then took place immediately at the RWC if it was feasible for the participant, if not, the researcher obtained their email address or phone number to schedule a time to meet.

## **Procedure**

**Location of experiment.** Participants completed the experiment individually with the same male researcher; however, the location of the experiment varied for participants as a function of the recruitment method. For recruitment method A, the participants met the researcher at the time and place indicated during the online sign-up; the location was always one of the rooms in the UWO psychology laboratory. For recruitment method B, the participants met with the researcher after an organized practice, or at a mutually convenient time determined through email. The researcher attempted to conduct the experiment in a small quiet room, but this was not always feasible. For example, when meeting participants at the RWC, background sounds (e.g. weights dropping) could be heard; however, the background noise was not believed to confound the research (see discussion). One research goal was to keep the student-athletes thinking in terms of their athlete identity as opposed to their student identity, regardless of condition. For recruitment method C, the participants typically completed the experiment in the lounge

area of the RWC. As in the case of recruitment method B, background sounds of a typical fitness center may be heard. Additionally, a few participants requested to meet at one of UWO's common areas (e.g., the cafeteria, or library), and arrangements were made to accommodate.

**Stereotype Threat Manipulation.** Participants met with the experimenter in one of the varying locations. Before any information was provided, the researcher first instructed participants to read and sign an informed consent form (see Appendix A1 for participants recruited from method A, and see Appendix A2 for participants recruited by methods B and C). Then the student-athletes were randomly assigned to either a test diagnostic/student-athlete condition or a test non-diagnostic/student-athlete condition. The non-athlete students were assigned to a test diagnostic/non-athlete student condition. The researcher stayed blind to the student-athlete conditions. Participants in each condition were given a folder containing a page of information (Appendix B) specific to their condition. The participants in the test diagnostic/non-athlete student condition first read the following information:

In this study, **our goal is to measure academic performance and competency and to compare students from your major to students from other majors.** As part of this study you will be asked to complete a few standardized academic math questions. You will also be asked to provide some feedback about this test and to answer some questions about yourself.

Please read the following information carefully and then, with that information in mind, answer the questions on the next pages. When you are finished, please put

this questionnaire back in its envelope, and the researcher will inform you of the next set of instructions.

The participants in the student-athletes' conditions read a similar introductory paragraph:

In this study, **our goal is to measure academic performance and competency and to compare student-athletes to non-athlete students**. As part of this study, you will be asked to complete a few standardized academic math questions. You will also be asked to provide some feedback about this test and to answer some questions about yourself.

Please read the following information carefully and then, with that information in mind, answer the questions on the next pages. When you are finished, please put this questionnaire back in its envelope, and the researcher will inform you of the next set of instructions.

Next, participants read a paragraph that was specific to their condition. In the *test diagnostic/student-athlete condition*, student-athlete participants read information that the math test they were completing was recognized for being an accurate measure of academic competency and is indicative of typical academic performance. In the *test non-diagnostic/student-athlete condition*, student-athlete participants read information that the test is in early stages of development and is not indicative of academic performance, and that a goal from this study is to develop good test items rather than to diagnose academic competence. In the *test diagnostic/non-athlete student condition*, non-athlete student participants read information that the test is recognized for being an accurate measure of

academic competency and is indicative of typical academic performance. This condition was added to ensure that the diagnostic condition was effectively tapping into student-athletes' anxiety about confirming the "dumb jock" stereotype (non-athlete students should not feel anxious about confirming that stereotype).

**Standards of academic competence.** Attached to the participants' information sheet was a 5-item Standard of Academic Competency Questionnaire (see Appendix C). This questionnaire was a revised version of a scale used by Miron et al. (2010) to measure participants' standard of academic competence. For example, one question asked, "For you to consider yourself academically competent, what percentage of the math questions do you feel you need to answer correctly?" Participants could select a 10-point percentage interval ranging from 0% to 100% for each of the 9 items. Each item was scored from 1 – 11, added together, and divided by the number of questions (5) to produce a value that represented participants' standard of academic competence.

An objective measure was believed to better measure participants' standards than a subjective measure. This is because Biernat and Manis (1994) found that participants are more influenced by *previously* held stereotypes when making evaluations on a subjective scale compared to making the same evaluations on an objective scale. For the present study, it is important to show that *participant condition* is affecting participants' standards of academic competency.

**Academic Performance and Academic Self-Regard.** After participants completed the SAC, they were instructed to complete 10 questions from the math test, and then complete the academic self-regard scale. The order of these two measures was



different than the one used by Yopyk and Prentice (2005), who administered the academic self-regard scale before the math test. However, Yopyk and Prentice found that when athletes were primed of their athlete status, academic self-regard did not mediate the effects of identity salience on academic performance. This may suggest that academic self-regard was not a determinant of academic performance. However, another explanation may be that academic self-regard and academic performance were *simultaneously* lowered due to the saliency of their athlete identity. Assessing academic self-regard after the academic performance task, made it possible to statistically assess the causal link between these variables.

To measure academic performance, participants were given the math test. This test contained ten questions selected from the math portion of the Graduate Record Exam. The researcher told participants that they had 10 minutes to complete the test and that they could write in the margins or on the test as scratch paper (Appendix D). Questions attempted, questions correctly answered, and questions incorrectly answered were all used in computing a total academic performance score. The *academic performance score* was determined by dividing the number of problems answered correctly by the number of problems attempted for each participant (*accuracy*; scores could range between 0 and 100). For example, if a participant attempted 8 of the 10 math test questions, and answered 7 of the questions correctly, the participant was given an academic performance score (math test accuracy) of 87.5 (7/8).

Following the math test participants, participants were given the Academic-Self Regard Sub-scale (ASR; see Appendix E). This scale is identical to the scale used by

Yopyk and Prentice (2005). It is a subscale of a Self-Regard scale created by Fleming and Courtney (1984) that contains 30 items that measure 5 different areas of self-esteem: general self-regard, school abilities, physical appearance, and physical abilities. The 7 questions from the “school abilities” portion of questions are believed to closely represent a person’s perceived academic self-regard and were used for the ASR in this experiment. Participants were told to circle a number on a Likert-type scale ranging from 1 to 5, a larger score indicated higher perceived academic self-regard.

After the ASR was completed, participants were instructed to complete a demographics questionnaire. The demographics questionnaire included questions regarding participants’ age, grade level, ACT scores, etc. (see Appendix F). This questionnaire asked participants to indicate the level at which they identified themselves as a student or athlete on a 7-point Likert type scale that ranged from “not at all” to “very much” (with a higher score indicating higher identification). It also asked participants to rate how difficult the math test was on another 7-point Likert type scale (with a higher score indicating higher difficulty).

**Manipulation checks.** The demographics questionnaire contained two manipulation checks to assess the effectiveness of the stereotype threat manipulation. For one, participants were asked to identify which information they had read about the math test. Participants could select one of the following, “The test has been recognized for being an accurate measure of academic competency and is indicative of typical academic performance” or “The test is in its early stages of development and is not indicative of

typical academic performance. The goal from this study is to develop better test items rather than diagnose academic competence.” As another manipulation check, the participants were asked to indicate whether or not they were a student-athlete (yes/no).

After participants completed the demographics questionnaire, they were debriefed by the researcher (see Appendix G) and thanked for their participation.

## Results

### Descriptive Statistics

Fifty-three participants completed the study ( $n = 19$  non-athlete students;  $n = 34$  student-athletes), but one non-athlete student participant was excluded from the analyses (see data screening section). The primary analysis was conducted using 52 participants, 18 non-athlete students (test diagnostic/non-athlete student condition) and 34 student-athletes. The student-athletes were equally divided into the two conditions (17 per condition; test diagnostic/student-athlete condition or a test non-diagnostic/student-athlete). Of the 52 participants, 23 (44%) were female and 29 were male (56%).

### Data Screening

**Reliability Analyses.** The 5 items on the SAC questionnaire ( $\alpha = .89$ ) were averaged to produce a standard of academic score (ranging from 1 to 10) for each participant, and the 7 items on the ASR questionnaire ( $\alpha = .70$ ) were averaged to produce an academic-self-regard score for each participant (ranging from 1 to 5). A greater standard of academic competence score indicated a higher academic competence standard, and a larger academic self-regard score indicated higher perceived academic self-regard.

**Outliers.** The dependent variables (standard of academic competence, attempted math problems, math test accuracy, and perceived academic self-regard) were screened to eliminate potential multivariate outliers. A linear regression was conducted on the

dependent variables, and participants who produced a Mahalanobis distance score greater than or equal to 16.27 ( $\chi^2 = 3$ ) was considered a potential outlier. One participant met this criteria ( $MD = 16.49$ ). Further examination of this participant revealed an academic self-regard score 3.84 standard deviations below the mean; this participant was eliminated from the data analyses.

**Normality and variable transformation.** The skewness, standard error of skewness, kurtosis, and standard error of kurtosis for the dependent variables were calculated. The skewness was divided by the standard error of skewness and the kurtosis was divided by the standard error of kurtosis to produce z-scores. Variables that had z-scores greater than 3.29 standard deviations from the mean were considered skewed and (or) kurtotic. However, only attempted math test problems produced a non-normal distribution, ( $z = -4.95$  for skewness and  $z = 1.84$  for kurtosis), but no transformation was deemed necessary because accuracy, the index used as a dependent variable, was normally distributed.

**Covariates.** Correlational analyses were conducted and it was determined that both participants' typical math course grade and ACT score were significantly correlated with math test accuracy ( $r = .45, p = .001$ , and  $r = .42, p = .002$  respectively) and academic self-regard ( $r = .32, p = .02$   $r = .47, p < .001$ , respectively). Also, participants' typical math course grade and ACT score were significantly correlated with each other ( $r = .31, p = .03$ ). Because of this, participants' typical math course grade and ACT score range were standardized and averaged into a single score for each participant (Prior Math Skills and General Knowledge; PMGK). An ANOVA was then conducted with PMGK as

the dependent variable and condition (test diagnostic/non-athlete student; test diagnostic/student-athlete; test non-diagnostic/student-athlete) as the independent variable. The results indicated that there were no significant differences for PMGK between the three conditions  $F(2, 49) = .62, p = .54$ . Given that all groups had on average the same GPA and ACT scores, no covariate was used in the analyses to control for potential differences on these two dimensions.

### **Manipulation Checks**

**Information paragraphs.** During the demographics portion of the study, participants indicated what information they read earlier in the study; this served as a manipulation check. Participants were asked to select if the information paragraph they read earlier was, “recognized for being an accurate measure of academic competency and is indicative of typical academic performance (test diagnostic)” or “in its early stages of development and is not indicative of typical academic performance (test non-diagnostic).” Of the total participants analyzed ( $n = 52$ ), 69% ( $n = 36$ ) correctly selected the information paragraph they were given previously; however, 31% ( $n = 16$ ) answered incorrectly. This was a limitation to the study and should be addressed in future research.<sup>1</sup>

**Condition.** In addition, the demographics portion of the questionnaire asked participants to indicate their student-athlete status. This served as a manipulation check for correct condition assignment. Of the total participants ( $n = 52$ ), 94% ( $n = 49$ ) indicated a student-athlete status that was consistent with their assigned condition and 6% ( $n = 3$ ) indicated a student-athlete status that was inconsistent with their assigned

condition; however, Yopyk and Prentice (2005) stated how quickly student-athletes shift between their student and athlete identities. Therefore, it is reasonable to believe that the participants who indicated a student-athlete status inconsistent with their assigned condition shifted identities during the study.

### **Primary Analyses**

For prediction 1, a one-way between subjects ANOVA was run with standard of academic competence as the dependent variable and condition (test diagnostic/non-athlete student; test diagnostic/student-athlete; test non-diagnostic/student-athlete) as the independent variable. Two targeted contrasts were used to compare the test diagnostic/student-athlete condition to the test diagnostic/non-athlete student and test non-diagnostic/student-athlete conditions (1 -1 0 and 0 1 -1, respectively). The results indicated that participants in the test diagnostic/student-athlete condition ( $M = 7.25$ ,  $SD = .74$ ) did not set significantly different standards of academic competence than the test diagnostic/non-athlete student condition ( $M = 7.09$ ,  $SD = 1.33$ ),  $t(49) = .43$ ,  $p = .67$ ,  $d = .14$ . Also, participants in the test diagnostic/student-athlete condition did not set significantly different standards of academic competence than the test non-diagnostic/student-athlete condition ( $M = 6.82$ ,  $SD = 1.07$ ),  $t(49) = .17$ ,  $p = .25$ ,  $d = .11$ . See Table 1 for group means and standard deviations.

For prediction 2, a one-way between subjects ANOVA was run with perceived academic self-regard as the dependent variable and condition (test diagnostic/non-athlete student; test diagnostic/student-athlete; test non-diagnostic/student-athlete) as the

independent variable. Two targeted contrasts were used to compare the test diagnostic/student-athlete condition to the test diagnostic/non-athlete student and test non-diagnostic/student-athlete conditions (1 -1 0 and 0 1 -1, respectively). The results indicated that participants in the test diagnostic/student-athlete condition ( $M = 3.36$ ,  $SD = .36$ ) did not perceive their academic self-regard significantly different than the test diagnostic/non-athlete student condition ( $M = 3.11$ ,  $SD = .39$ ),  $t(49) = 1.75$ ,  $p = .09$ ,  $d = .66$ . Also, participants in the test diagnostic/student-athlete condition did not perceive their academic self-regard significantly different than the test non-diagnostic/student-athlete condition ( $M = 3.13$ ,  $SD = .48$ ),  $t(49) = 1.61$ ,  $p = .11$ ,  $d = .54$ . See table 2 for means and standard deviations.

For prediction 3, a one-way between subjects ANOVA was run with math test accuracy as the dependent variable and condition (test diagnostic/non-athlete student; test diagnostic/student-athlete; test non-diagnostic/student-athlete) as the independent variable. Two targeted contrasts were used to compare the test diagnostic/student-athlete condition to the test diagnostic/non-athlete student and test non-diagnostic/student-athlete conditions (1 -1 0 and 0 1 -1, respectively). Contrary to the predictions, the results indicated that participants in the test diagnostic/student-athlete condition ( $M = 73.70$ ,  $SD = 22.45$ ) had significantly *higher* math test accuracy scores than the test diagnostic/non-athlete student condition ( $M = 52.05$ ,  $SD = 28.74$ ),  $t(49) = 2.56$ ,  $p = .01$ ,  $d = .84$ . However, participants in the test diagnostic/student-athlete condition did not have significantly different math test accuracy scores than the test non-diagnostic/student-



athlete condition ( $M = 63.67$ ,  $SD = 26.12$ ),  $t(49) = .90$ ,  $p = .37$ ,  $d = .41$ . See Table 3 for group means and standard deviations.

To supplement the significant result from prediction 3, a one way between-subjects ANOVA was run with number of math test problems answered correctly as the dependent variable and condition (test diagnostic/non-athlete student; test diagnostic/student-athlete; test non-diagnostic/student-athlete) as the independent variable.<sup>2</sup> Two targeted contrasts were used to compare the test diagnostic/student athlete condition to the test diagnostic/non-athlete student and test non-diagnostic/student athlete conditions (1 -1 0 and 0 1 -1, respectively). The results indicated that participants in the test diagnostic/student-athlete condition ( $M = 7.12$ ,  $SD = 2.39$ ) answered significantly *more* math test problems correctly than the test diagnostic/non-athlete student condition ( $M = 4.78$ ,  $SD = 2.58$ ),  $t(49) = 2.84$ ,  $p = .01$ . However, participants in the test diagnostic/student-athlete condition did not answer a significantly different amount of math test problems correctly than the test non-diagnostic/student-athlete condition ( $M = 6.35$ ,  $SD = 2.32$ ),  $t(49) = .92$ ,  $p = .37$ . See Table 4 for group means and standard deviations.

As a result of the findings from predictions 1, 2 and 3, the proposed mediation predictions (predictions 4 and 5) were not conducted. However, to better understand the results, an additional post hoc test was conducted. Specifically, a targeted contrast was used to compare the test diagnostic/non-athlete student condition with the test non-diagnostic/student-athlete condition (1 0 -1). The results indicated that there were no

significant differences between the two conditions for standards of academic competence, perceived academic self-regard, and math test accuracy scores, all  $t_s < 1.66$ , all  $p_s > .11$ .

Table 1

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*Mean Standard of Academic Competence by Condition.*

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Variable	<i>n</i>	M ( <i>SD</i> )
Test diagnostic/non-athlete student	18	7.09 (1.34)
Test diagnostic/student-athlete	17	7.25 (.74)
Test non-diagnostic/student-athlete	17	6.82 (1.07)

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*Note.* No significant differences between conditions at  $p = .05$ .

Table 2

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<i>Mean Perceived Academic Self-Regard by Condition</i>	<i>n</i>	M ( <i>SD</i> )
Test diagnostic/non-athlete student	18	3.12 (.39)
Test diagnostic/student-athlete	17	3.36 (.36)
Test non-diagnostic/student-athlete	17	3.13(.48)

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*Note.* ). No significant differences between conditions at  $p = .05$ . A participant could score between 0 (lowest perceived academic self-regard) and 5 (highest perceived academic self-regard).

Table 3

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*Mean Math Test Accuracy Score by Condition*

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Variable	<i>n</i>	M ( <i>SD</i> )
Test diagnostic/non-athlete student	18	52.06 (28.74) <sub>a</sub>
Test diagnostic/student-athlete	17	73.70 (22.45) <sub>b</sub>
Test non-diagnostic/student-athlete	17	65.95 (23.01) <sub>ab</sub>

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*Note.* Conditions with different subscripts were significantly different,  $p < .05$ . Accuracy scores were calculated by dividing the total problems answered correctly by the total problems attempted and then multiplying by 100. A participant could score between 0 (least accurate) and 100 (most accurate).

Table 4

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*Mean Math Test Problems Correct by Condition*

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Variable	<i>n</i>	M ( <i>SD</i> )
Test diagnostic/non-athlete student	18	4.78(2.58) <sub>a</sub>
Test diagnostic/student-athlete	17	7.12 (2.39) <sub>b</sub>
Test non-diagnostic/student-athlete	17	6.35 (2.32) <sub>ab</sub>

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*Note.* Conditions with different subscripts were significantly different,  $p < .05$ .

## Discussion

It was predicted that student-athletes who took a math test described as diagnostic of their academic abilities would be negatively affected by the “dumb jock” stereotype threat. Specifically, the “dumb jock” stereotype threat would cause a depression in their math test scores and perceived academic self-regard. A standard of academic competence was proposed as a possible mediating variable in the relationship between the “dumb jock” stereotype threat and poor performance. However, since there was no depression in scores for either the math test or perceived academic self-regard, a mediating variable was not relevant. Also, there were no differences on the proposed standard of academic competence variable among the test diagnostic/non-athlete student, test diagnostic/student-athlete, and test non-diagnostic/student-athlete condition.

Although the proposed mediating mechanism was not supported, nor were the five predictions, the study did produce an unpredicted, yet meaningful result: the elevated math test accuracy scores produced by the participants in the test diagnostic/student-athlete condition in comparison to the participants in the test diagnostic/non-athlete student condition. This was noteworthy because all participants in this study were believed to be equal in the capabilities needed to take a math test, such as general knowledge and math ability. The combined PMGK variable measured both general knowledge (participants’ ACT score) and math abilities (prior math grade) and showed no significant mean group differences among the test diagnostic/non-athlete student, test diagnostic/student-athlete and test non-diagnostic/student-athlete conditions.

Although the student-athletes in the diagnostic test condition did not perform significantly better than those in the non-diagnostic test condition, it is possible that the student-athletes who took the diagnostic test may have experienced stereotype reactance (Kray, Thompson, & Galinsky, 2001). Brehm (1966) noted that when individuals perceive a threat to their freedom (i.e., being categorized as a student-athlete that is not as smart and competent as a non-athlete student), they react against this forced social categorization with more force than they otherwise would by behaving in ways that disconfirm the stereotype attached to that social category (e.g., do better on a math test). Kray, Thompson, and, Galinsky, (2001) found supporting evidence for this phenomenon from a bargaining experiment in which men and women were required to negotiate. The authors told the female participants that men typically perform better because of their stereotypical masculine traits (e.g. assertiveness, aggressiveness). As a result, the women who were conveyed this information reacted against the stereotype by setting significantly higher and more aggressive goals during the bargaining experiment.

Alternatively, a second possible explanation is that the information paragraph used to manipulate stereotype threat caused the student-athletes to perform in a competitive manner compared to the non-athlete students. This explanation is plausible in light of a lack of a significant difference in math performance between the two athletes condition. All student-athletes were told their scores were being compared to other non-athlete students; whereas, the non-athlete students were told their scores were being compared to students from varying academic majors. The presentation of this group comparison information may have activated the “competitor” schema in the student-

athletes and may have instigated a competition motivation, resulting in improved performance compared to the nonstudent athletes. Student-athletes regularly participate in competitive athletic activities and are believed to be more competitive than the non-athletes students, which supports the possibility that they would portray the study as a competition.

In addition, the varying recruitment methods (B and C) used to obtain some of the student-athlete participation may have further contributed to the student-athletes' desire to perform better. Specifically, 15 of the 34 student-athlete (0 non-athlete students) participants voluntarily agreed to participate in the research after direct contact with the researcher. It is possible that the participants who agreed to participate in the research were susceptible to demand characteristics that were presented by the researcher; however, the researcher stayed blind to the student-athlete conditions as an attempt to prevent this from occurring. To test this possibility, the primary analyses of the study were rerun excluding the 15 participants recruited with methods B and C. The results indicated similar condition mean scores as in the original findings. This suggests that the athletes' enhanced performance is not due to demand characteristics but to some other psychological process.

Lastly, there is a possibility that the student-athletes had higher math test accuracy scores not because they engaged in stereotype reactance, but that the non-athlete students were experiencing a stereotype threat unrelated to the "dumb jock" threat. Unfortunately, no baseline or comparison condition was run for the non-athlete students (non-diagnostic test condition) in this study, but the fact that they performed worse than the student-

athletes who took the non-diagnostic test ( $p = .10$ ) points to another conclusion supporting the competitiveness explanation. Future research should attempt to replicate the current findings and get a better grasp of the changes in performance of student-athletes and non-athlete students, by including a test non-diagnostic condition for the non-athlete students.

### **Study Limitations and Future Directions**

For pragmatic reasons, the researcher accepted men and women participants for the research. Specifically, the study consisted of 55.8% ( $n = 29$ ) male participants and 44.2% ( $n = 23$ ) female participants. However, analyses conducted within each gender suggest very similar effects for men and women, consistent with the overall pattern of results reported. This is consistent with research by Engstrom and Sedlacek, (1991) who found evidence for the “dumb jock” stereotype threat irrespective of student-athlete gender.

In addition, when developing a standard of academic competence measure, it would be beneficial to offer more answer options to the participants. The current study allowed participants to choose from a 10 point percentage interval range (ranging from 0-100%) when completing the SAC. The average standard of academic competence set for all the participants was 7.05 (70.5%) with a standard deviation of 1.08. This suggests that participants tended to select answers on the SAC that fell between 60 and 80%. If these percentages were thought of in terms of academic letter grades, the participants would have ranged anywhere from an, “F” or “D” to a “B” or “C.” Presumably, no student-

athlete or non-athlete student would set an academic competence standard much lower than a 60% (an already failing percentage). In fact, in the current study no participant had a standard of academic competence below 3.6 (36.00%). Future questionnaires like the SAC should use a more ambiguous scale with meaning not linked to GPA or objective scales.

Another limitation of the study was that the student-athlete participants were members of a NCAA Division 3 athletic program. Currently, there are three divisions in collegiate sports (Divisions 1, 2, and 3). Division 1 programs consist of the most athletically talented student-athletes who are often awarded scholarships to cover the cost of education. Division 1 student-athletes may be viewed as someone who is only attending a university because of their athletic (opposed to academic) abilities. It is unknown if student-athletes from other divisions would engage in stereotype reactance, and this is one potential direction for future research. In general, future work should attempt to partial out possible motives for enhanced performance (stereotype reactance versus competitive motivation) for all student-athletes in academic contexts.

In conclusion, the influence of the “dumb jock” stereotype threat on student-athletes’ academic performance and perceived academic self-regard is still unknown. However, future work can address some of the current study’s limitations and examine whether student-athletes may engage in stereotype reactance when made aware of the “dumb jock” stereotype or whether instigating a competitive motivation may be a strategy to enhance performance in these students.



## Footnotes

<sup>1</sup>Analyses excluding the participants who incorrectly answered the manipulation check rendered the same results as analyses with their inclusion. As a result, these participants were used in all analyses.

<sup>2</sup>Yopyk and Prentice (2005) used math test accuracy as their primary dependent variable to determine academic performance. However, math test accuracy may make the interpretations of participants' academic performance ambiguous. Hence, an additional ANOVA was conducted, which used number of math test problems correct as the dependent variable.

## APPENDIX A1

### Consent Form (Recruitment Method A)

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Jed Diekfuss is completing a study at the University of Wisconsin Oshkosh under the supervision of psychology professor, Dr. Anca Miron. The Department of Psychology at the University of Wisconsin Oshkosh supports the practice of protection for human participants in research. The following information is provided so you may decide whether you wish to participate in the present study. You should be aware that even if you agree to participate, you are free to withdraw at any time without penalty and that you shall receive your experimental credit regardless.

We are interested in assessing the effectiveness of a test that measures academic competency and performance, and how this test can be used as a tool to compare people who belong to different groups and have various academic majors. Therefore, you will be asked to read some information on this topic and complete a few standardized math questions. You will also be asked to provide some feedback about this test and complete two short questionnaires about yourself. All of your responses will be anonymous. Your name or student ID number will never be associated with your responses, nor will your name ever be associated with the research project in any way. Although participation will not directly benefit you, we believe that the information will be useful in understanding some aspects of human behavior. Completion of this study should not take more than one half hour of your time.

We do not anticipate that the study will present any risk of physical injury or harm to your health associated with this study, other than some discomfort that you might feel answering some of the questions.

We do solicit your participation but it is strictly voluntary. If you want to withdraw from the study at any time, you may do so without penalty. You will receive your research participation credit even if you decline to volunteer. The information collected from you up to that point would be destroyed if you so desire.

Once the study is completed, we would be glad to give the results to you. Do not hesitate to ask any questions about the study before, during, or after the research is complete. If you would like additional information concerning this study before or after it is complete, please feel free to contact Jed Diekfuss or Dr. Miron by phone, mail, or email:

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If you have any complaints about your treatment as a participant in this study, please call or write:

Chair, Institutional Review Board  
For Protection of Human Participants  
c/o Grants Office  
University of Wisconsin Oshkosh  
Oshkosh, WI 54901  
920-424-1415

**Consent Statement:** I have received an explanation of the study and agree to participate. I understand that my participation in this study is strictly voluntary.

---

PRINTED NAME

SIGNATURE

DATE

This research project has been approved by the University of Wisconsin Oshkosh IRB for Protection of Human Participants for a 1-year period, valid until \_\_\_\_\_.

## APPENDIX A2

### Consent Form (Recruitment Methods B and C)

Jed Diekfuss is completing a study at the University of Wisconsin Oshkosh under the supervision of psychology professor, Dr. Anca Miron. The Department of Psychology at the University of Wisconsin Oshkosh supports the practice of protection for human participants in research. The following information is provided so you may decide whether you wish to participate in the present study. You should be aware that even if you agree to participate, you are free to withdraw at any time.

We are interested in assessing the effectiveness of a test that measures academic competency and performance, and how this test can be used as a tool to compare people who belong to different groups and have various academic majors. Therefore, you will be asked to read some information on this topic and complete a few standardized academic math questions. You will also be asked to complete two short questionnaires about yourself. All of your responses will be anonymous. Your name or student ID number will never be associated with your responses, nor will your name ever be associated with the research project in any way. Although participation will not directly benefit you, we believe that the information will be useful in understanding some aspects of human behavior. Completion of this study should not take more than one half hour of your time. We do not anticipate that the study will present any risk of physical injury or harm to your health associated with this study, other than some discomfort that you might feel answering some of the questions.

We do solicit your participation but it is strictly voluntary. If you want to withdraw from the study at any time, just inform the researcher. Any information collected from you up to that point would be destroyed if you so desire.

Once the study is completed, we would be glad to give the results to you. Do not hesitate to ask any questions about the study before, during, or after the research is complete. If you would like additional information concerning this study before or after it is complete, please feel free to contact Jed Diekfuss or Dr. Miron by phone, mail, or email:

Jed A. Diekfuss  
Department of Psychology  
University of Wisconsin Oshkosh  
Oshkosh, WI 54901  
diekfj68@uwosh.edu  
262-364-6319

Dr. Anca Miron  
Department of Psychology  
University of Wisconsin Oshkosh  
Oshkosh, WI 54901  
mirona@uwosh.edu  
920-424-2328

If you have any complaints about your treatment as a participant in this study, please call or write:

Chair, Institutional Review Board  
For Protection of Human Participants  
c/o Grants Office  
University of Wisconsin Oshkosh  
Oshkosh, WI 54901  
920-424-1415

**Consent Statement:** I have received an explanation of the study and agree to participate. I understand that my participation in this study is strictly voluntary.

---

PRINTED NAME

SIGNATURE

DATE

This research project has been approved by the University of Wisconsin Oshkosh IRB for Protection of Human Participants for a 1-year period, valid until \_\_\_\_\_.

## APPENDIX B

### Manipulation of Stereotype Threat



In this study, **our goal is to measure academic performance and competency and to compare students from your major to students from other majors.** As part of this study you will be asked to complete a few standardized academic math questions. You will also be asked to provide some feedback about this test and to answer some questions about yourself.

Please read the following information carefully and then, with that information in mind, answer the questions on the next pages. When you are finished, please put this questionnaire back in its envelope, and the researcher will inform you of the next set of instructions.

**This following math test you will be completing is used as a tool to compare academic competency and performance for people who are members of different groups and have various majors. This test is recognized for being an accurate measure of academic competency and is indicative of typical academic performance.**

In this study, **our goal is to measure academic performance and competency and to compare student-athletes to non-athlete students.** As part of this study, you will be asked to complete a few standardized academic math questions. You will also be asked to provide some feedback about this test and to answer some questions about yourself.

Please read the following information carefully and then, with that information in mind, answer the questions on the next pages. When you are finished, please put this questionnaire back in its envelope, and the researcher will inform you of the next set of instructions.

**This following math test you will be completing is used as a tool to compare academic competency and performance for people who are members of different groups and have various majors. This test is recognized for being an accurate measure of academic competency and is indicative of typical academic performance.**

In this study, **our goal is to measure academic performance and competency and to compare student-athletes to non-athlete-students.** As part of this study, you will be asked to complete a few standardized academic math questions. You will also be asked to provide some feedback about this test and to answer some questions about yourself.

Please read the following information carefully and then, with that information in mind, answer the questions on the next pages. When you are finished, please put this questionnaire back in its envelope, and the researcher will inform you of the next set of instructions.

**This following math test you will be completing will be used as a tool to compare academic competency and performance for people who are members of different groups and have various majors. However, this test is in its early stages of development and is not indicative of typical academic performance. The goal from this study is to develop better test items rather than diagnose academic competence.**

## APPENDIX C

### Standard of Academic Competency Questionnaire

For this part of the study we are interested in how you perceive your own academic competency and what you feel is necessary to consider yourself academically competent.

**Following this part of the study you will complete the math test described previously.** For each item below, please check the one option that best describes your opinion.

1. For you to consider yourself **academically competent**, what percentage of the **math questions** do you feel you need to answer correctly?  
☐ 0%-10%  
☐ 11%-20%  
☐ 21%-30%  
☐ 31%-40%  
☐ 41%-60%  
☐ 61%-70%  
☐ 71%-80%  
☐ 81%-90%  
☐ 91%-100%
  
2. For you to consider yourself **academically competent**, what percentage of the math questions measuring **analytical thinking** do you feel you need to answer correctly?  
☐ 0%-10%  
☐ 11%-20%  
☐ 21%-30%  
☐ 31%-40%  
☐ 41%-60%  
☐ 61%-70%  
☐ 71%-80%  
☐ 81%-90%  
☐ 91%-100%
  
3. For you to consider yourself **academically competent**, what percentage of the math questions measuring **practical thinking** do you feel you need to answer correctly?  
☐ 0%-10%  
☐ 11%-20%  
☐ 21%-30%  
☐ 31%-40%  
☐ 41%-60%  
☐ 61%-70%  
☐ 71%-80%  
☐ 81%-90%  
☐ 91%-100%

4. For you to consider yourself **academically competent**, what percentage of the **very difficult** math question do you feel you need to answer correctly?
- ☐ 0%-10%
  - ☐ 11%-20%
  - ☐ 21%-30%
  - ☐ 31%-40%
  - ☐ 41%-60%
  - ☐ 61%-70%
  - ☐ 71%-80%
  - ☐ 81%-90%
  - ☐ 91%-100%
5. For you to consider yourself **academically competent in overall math ability**, what percentage of the math questions do you feel you need to answer correctly?
- ☐ 0%-10%
  - ☐ 11%-20%
  - ☐ 21%-30%
  - ☐ 31%-40%
  - ☐ 41%-60%
  - ☐ 61%-70%
  - ☐ 71%-80%
  - ☐ 81%-90%
  - ☐ 91%-100%

## APPENDIX D

### Academic Performance

Now you will be completing 10 questions from the math test described earlier; you will have 10 minutes to complete this. You may use the margins or blank space as scratch paper; however, no calculator will be provided.

Please circle your answer for the following questions (either A, B, C, D, or E):

1. Quantity A:  $(-6)^4$

Quantity B:  $(-6)^5$

- A. Quantity A is greater
  - B. Quantity A equals Quantity B
  - C. Quantity B is greater
  - D. Relationship Indeterminate
2. What fraction is smallest?
- A.  $11/20$
  - B.  $5/6$
  - C.  $3/8$
  - D.  $2/7$
  - E.  $1/3$

3. Add:  $(2 - 3x + 5x^3) + (7 + 4x - x^5)$ .

- A.  $9 - 7x + 4x^3$
- B.  $9 + x + 4x^3$
- C.  $9 + x + 5x^3$
- D.  $9 + x + 5x^3 - x^5$
- E.  $14 - 12x^2 - 5x^8$



4. Which of the following is closest to  $\sqrt{85}$ ?

- A. 7
- B. 8
- C. 9
- D. 10
- E. 11

5. Solve for  $x$ , if  $1/(x+1) = 2/(x-1)$

- A. -3
- B. -1
- C. 0
- D. 1
- E.  $\frac{1}{2}$

6. **Quantity A:** Time to travel 95 miles at 50 miles per hour

**Quantity B:** Time to travel 125 miles at 60 miles per hour

- A. Quantity A is greater
- B. Quantity A equals Quantity B
- C. Quantity B is greater
- D. Relationship Indeterminate

7. Mary's salary was \$60,000. Her new salary is 150% of her old salary. What is her new salary?
- A. \$60,000
  - B. \$75,000
  - C. \$80,000
  - D. \$90,000
  - E. \$150,000
8. If  $2x + 35 = 9x$ , then  $5x = \underline{\hspace{1cm}}$ .
- A. 5
  - B. 7
  - C. 10
  - D. 25
  - E. 35
9. In 2000 Paul was twice as old as his brother Biko. In 2008 Paul was only four years older than his brother. In what year was Biko born?
- A. 1990
  - B. 1992
  - C. 1996
  - D. 1998
  - E. 2000

10. The sum of four consecutive integers is 46. What is the sum of the previous four consecutive integers?

- A. 24
- B. 28
- C. 30
- D. 40
- E. 42

APPENDIX E  
Academic Self-Regard

**Please circle the response that best describes how you feel:**

1. When you have to read an essay and understand it for a class assignment, how worried or concerned do you feel about it?

1                      2                      3                      4                      5

No worry or concern                      Moderate worry or concern                      Strong worry or concern

2. When you have to write an argument to convince your teacher who may disagree with your ideas, how concerned or worried do you feel about it?

1                      2                      3                      4                      5

No worry or concern                      Some worry or concern                      Strong worry or concern

3. How often are you able to clearly express your ideas when you try to put them into writing as an assignment?

1                      2                      3                      4                      5

Never                      Some of the time                      All of the time

4. How often do you have trouble understanding things you read for class assignments?

1                      2                      3                      4                      5

Never                      Some of the time                      All of the time

5. How often do you imagine that you have more academic ability than your classmates?

1                      2                      3                      4                      5

Never                      Some of the time                      All of the time

6. In turning in a major assignment such as a term paper; how often do you feel you did an excellent job on it?

1	2	3	4	5
Never		Some of the time		All of the time

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

1	2	3	4	5
Never		Some of the time		All of the time

## APPENDIX F

### Demographic Questionnaire

**Before completing this study, please answer a few demographic questions:**

1. What is your gender (Circle one)?                      Male    Female
  
2. Are you a student-athlete (Circle one)?            Yes    No
  
3. What is your major (Please write)? \_\_\_\_\_
  
4. To what extent do you identify yourself as a student-athlete (Circle one number)?  
*Not at all    1        2        3        4        5        6        7        Very much*
  
5. To what extent do you identify yourself as a student in general?  
*Not at all    1        2        3        4        5        6        7        Very much*
  
6. At the beginning of the study you read about some information the math test you would be completing. You read that...(Check one)  
               \_\_\_\_\_ The test has been recognized as an accurate measure of academic competency and is indicative of typical academic performance.  
               \_\_\_\_\_ The test is in its early stages of development and is not indicative of typical academic performance. The goal from this study is to develop better test items rather than diagnose academic competence.
  
7. How easy or difficult was the math test for you?  
*Very easy    1        2        3        4        5        6        7        Very difficult*
  
8. How anxious did you feel while completing the math test?  
*Not anxious at all    1        2        3        4        5        6        7        Very anxious*
  
9. How anxious did you feel that you may perform poorly on the math test?  
*Not anxious at all    1        2        3        4        5        6        7        Very anxious*



10. What percentage of the math questions do you think you answered correctly?

- ☐ 0%-10%
- ☐ 11%-20%
- ☐ 21%-30%
- ☐ 31%-40%
- ☐ 41%-60%
- ☐ 61%-70%
- ☐ 71%-80%
- ☐ 81%-90%
- ☐ 91%-100%

11. What is the typical grade you receive in college math courses (e.g., A, B, C, D, F)

\_\_\_\_\_

12. What did you score on the ACT (please check the range that closest resembles your score; the ACT ranges from 0 – 36, with a 36 being a perfect score)?

- ☐ Very Low (0-10)
- ☐ Low (11-15)
- ☐ Average (16-20)
- ☐ Above Average (21-25)
- ☐ High (26-30)
- ☐ Very High (31-36)

13. What is your class level (check one)?

Freshman\_\_\_\_\_

Sophomore\_\_\_\_\_

Junior\_\_\_\_\_

Senior\_\_\_\_\_

Other\_\_\_\_\_

14. What is your cumulative GPA (write GPA here, or put 0 if you are a first semester freshman)? \_\_\_\_\_

15. What is your ethnicity/race (check one)?

☐ White/Caucasian    ☐ Hispanic/Latino    ☐ African American  
☐ Asian    ☐ Native American    ☐ Other

## APPENDIX G

### Study Debriefing

Now that the study is complete, I would like to provide you with some information about the purposes of this research. During this study, I asked you to read some information about how student-athletes performed academically in comparison to students. I then asked you to answer some questionnaires and complete some math questions

At the beginning of the study you were asked to read some information about the math test you would be taking.

Condition of Participant: ST NST IST

Did you believe that information: YES NO

IF NO, Why not?

First, let me tell you a few things about this study. I was interested in whether the information that I provided you about people's typical performance on the math test affected the standard you set for yourself on the math test, your actual performance on the math test, and your perceived academic abilities. Let me explain further, two thirds of the participants in this study were student-athletes and one third of the participants were non-athlete students. One half of the student-athletes were induced to think that the math test was indicative of a typical student-athletes academic performance and competency (test diagnostic/student-athlete condition) and one half of the student-athletes were induced to think that the math test was not indicative of a typical student-athletes academic performance and competency (test non-diagnostic student-athlete condition) other participants (the non-athlete students) were induced to believe that the math test was indicative of a typical student's academic performance and competency (test diagnostic/non-athlete students). The participants who read that the math test was indicative of academic performance and competency would be exposed to a stereotype threat. I expect that compared to the other two conditions, participants in the test diagnostic/student-athlete condition will set lower standards for what they feel is necessary to consider themselves academically competent. This is a result of the anxiety provoked by potentially behaving in a way consistent with the stereotype. In other words, it was predicted that the student-athlete participants who read that the test could measure academic performance and competency, would be satisfied with a lower score on the math test than if they had read the test was not able to measure academic performance and competency.

Which condition were you assigned to?

Stereotype Threat   Test Diagnostic/Student-Athlete   Test Non-Diagnostic/Student-Athlete  
Test Diagnostic/Non-Athlete Student

You should know that exposing an individual to a stereotype threat can significantly impact a person. A stereotype can alter how a person perceives their abilities, which can significantly affect their performance. This research is trying to better understand the stereotype that student-athletes are supposedly less competent and perform worse academically than non-athlete students. When the student-athletes perceived the test as diagnostic of academic performance and competency, these stereotype threats became relevant and may have lowered their perceived academic self-regard, academic performance, and academic competency

standards; however, when the student-athletes perceived the test as non-diagnostic of academic performance and competency they were expected to score similarity to the non-athlete students.

I apologize for not telling everything about this study right from the beginning. In order to gain insight into the effects of the student-athlete stereotype on performance and self-perceived abilities, it would have been difficult to do so if I told you which aspects of the information I were varying ahead of time. For this reason, I ask that you please not tell other students who might be participating in our research this semester what the specific hypotheses are and the nature of the information I varied in this study. OK?

(Wait for an answer).

Do you have any questions about this study or any feedback for me on how to make this study better?

If you would like additional information concerning this study, please feel free to contact Jed Diekfuss by email ([diekfj68@uwosh.edu](mailto:diekfj68@uwosh.edu)), or by phone (262) 364-6319 or Dr. Anca Miron, [mirona@uwosh.edu](mailto:mirona@uwosh.edu). Thank you for your participation.

## APPENDIX H

### Participant Recruitment Script

Hi \_\_\_\_\_ (UWO team captain),

My name is Jed Diekfuss. I am a graduate student at the University of Wisconsin Oshkosh conducting my Master's thesis on students who belong to various groups (e.g. student-athletes). I obtained your email address from the University directory, and I would like to ask for your assistance. If you are willing, I would like to set up a time I could speak to the members of your team to request their voluntary participation in my research. Their participation would require about 30 minutes of their time (on a separate date) and consist of answering a few questionnaires and completing a short math test. The research would be conducted individually and during a time and date that is most convenient to those who volunteer. For those who participate, their answers will remain anonymous. No one besides the researcher will know who participated (including your coaches). This is a request that is completely voluntary, but would help gain more insight and knowledge about student-athletes.

This research was approved by the University of Wisconsin Oshkosh Institutional Review Board and is being supervised by Dr. Anca Miron (a psychology professor).

Could you please contact me if you are able to fulfill this request? I would like to schedule a date and time to introduce myself to your team members.

Thank you,

Jed A. Diekfuss

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