

Running head: STEREOTYPES AND AUDIENCE-PRESSURE IN ATHLETIC
PERFORMANCE

The Effects of Stereotypes and Audience-Pressure on Athletic Performance:

Threat, Lift, and Choking Under Pressure

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Abstract

The present study examines how positive ingroup and positive outgroup stereotypes interact with audience-induced pressure to affect athletic performance. In sport the effects of negative stereotypes and pressure are well researched, but the effects of positive stereotypes and the interactions between stereotypes and pressure are less researched. Specifically, it remains an open question as to whether positive ingroup stereotypes will enhance or impair performance, particularly in high-pressure situations. In the current study, White males shot an initial baseline set of free throws. They then watched a video either purporting a positive basketball stereotype about White basketball players, a video purporting a positive basketball stereotype about Black basketball players, or a neutral sports video. Following the video, participants shot a second set of free throws, during which half the participants were overtly videotaped for an Internet audience in order to induce an audience-pressure. We predicted positive ingroup stereotypes would cause stereotype lift in low-pressure situations, but cause choking in high-pressure situations. We predicted that positive outgroup stereotypes would hurt performance, and that these effects would be amplified by audience-pressure. Results supported these hypotheses, although audience-pressure did not significantly intensify decrements in participants primed with the positive outgroup stereotype. Discussion examines the potential limits of choking and threat, the contrasting effects of lift and choking inspired by positive ingroup stereotypes, and directions for future research.

Keywords: stereotype threat, stereotype lift, race, choking, audience pressure, athletic performance

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The introduction will discuss the previously researched effects of stereotypes on performance, highlight the existence and effects of stereotypes and audience-pressure in sport, and establish the novel variables to be investigated in the present study. Using this research, the introduction will conclude with hypotheses for the present study.

Background on the Effects of Stereotype on Performance

The effects of stereotypes on performance are varied and contextually dependent. One well-researched phenomenon is *stereotype threat*; according to the theory, people often suffer performance decrements when presented with a negative task-related stereotype about their ingroup (Steele & Aronson, 1995). For instance, women underperformed on math tests when confronted with the stereotype that they were inferior at math prior to the test (Spencer, Steele, & Quinn, 1999). In these cognitive tasks, the negative stereotype depletes the performer's working memory, thus impairing a valuable resource for cognitive tasks (Schmader & Johns, 2003). Stereotype threat also affects athletic performance; in a study by Stone, Lynch, Sjomeling, and Darley (1999), both White and Black participants underperformed in mini-golf when the task was framed in a manner highlighting a negative task-related stereotype about the performer's ingroup. In sports, stereotype threat can deplete working memory and, especially with more skilled athletes, interfere with automatized motor-skills (Beilock & McConnell, 2004).

Positive stereotypes can have varying effects on the targets and non-targets of the stereotype. Positive stereotypes about one's own group can aid performance through a phenomenon called *stereotype lift*. In a study by Shih, Ambady, Richeson, Fujita, and

Gray (2002), Asian Americans showed performance increments in math after subtly being primed with the positive stereotype that Asian Americans excel in math. On the other hand, in a study by Cheryan and Bodenhausen (2000), Asian American women demonstrated *choking under pressure* after being primed with positive ingroup stereotypes; participants underperformed in math when their ethnicity and the corresponding heightened expectations were made salient in a high-pressure condition. These same positive stereotypes, when socially comparative in nature, can even induce stereotype threat in an outgroup (i.e. a different-race target of a stereotype prime); White males suffered performance decrements when primed with the comparative stereotype that Asian males achieve the highest scores on math tests (Aronson, Lustina, Good, Keough, Steele, & Brown, 1999). Overall, priming participants with positive stereotypes can inspire stereotype lift or choking in same-race targets, depending on the context, and can also inspire stereotype threat in different-race targets of the stereotype.

A caveat here is that individuals that are proficient and invested in the performed task are generally most affected by the stereotypes. In cognitive tasks, a negative stereotype more severely preoccupies the mind of a more invested performer, and thus further depletes working memory and hurts performance (Steele, 1997). For instance, in one study, women with high levels of gender identification suffered from stereotype threat; women with low levels of gender identification showed no performance decrements (Schmader, 2002). In athletics, a negative stereotype causes overthinking of automatized skills in more invested/more skilled performers and consequently impairs these performers more than others (Beilock & Carr, 2001; Stone, 2002). In a study by Stone and colleagues (1999), the athletes whose self-worth was tied to athletic

performance were more vulnerable to stereotype threat in a mini-golf task than athletes whose self-worth was not tied to athletic performance.

Stereotypes and Audience-Pressure in Sport

Sports have a historical connection with racial stereotypes, they permeate elementary schools and billion-dollar businesses alike, and they are inherently performance-based (Baade, 1996; Goldstein, 1989; Jeziorski, 1994; Shropshire, 1996). Given that stereotype threat can contribute to performance gaps between groups, examining the potential effects of stereotypes in sports is important in order to help reduce these gaps, prevent the harmful effects of stereotyping, and reduce the prevalence.

Stereotypes in American basketball surrounding White and Black basketball players are prevalent—this may result from (and may contribute to) real world gaps in performance between White and Black basketball players (Sailes, 1998). Black Americans continue to thrive in basketball across the country at many levels—the world’s premier professional men’s basketball league, the National Basketball Association (hereafter referred to as the NBA), has a player population that is over 80% Black (Sailes, 1998). At the same time, the top four free throw shooters in the NBA’s history, and six of the top ten, are White (Basketball-reference, 2011). Because of these discrepancies, Blacks are stereotyped to be better overall basketball players while Whites are stereotyped to be better shooters. Some of these stereotypes, and their consequences, have been demonstrated in experimental research.

In a study by Stone, Perry, and Darley (1997), participants listened to the broadcast of a men’s college basketball game. Participants rated a player from the recording in variety of categories. Although all participants heard the same audio

recording and assessed the same player, half of the participants were told that the target player was White while the other half were told that the target player was Black.

Participants that were told the target player was White evaluated him as having more “basketball intelligence” and a stronger work ethic as compared to participants that were told that the target player was Black; in contrast, participants that were told that the target player was Black evaluated the target player as more athletic, more individually productive, and more contributive to the team as compared to participants that were told the target player was White. Stone and colleagues demonstrate the presence and some effects of stereotypes surrounding Whites and Blacks in basketball—White basketball players, regardless of their true actions, are viewed as less athletic, more intelligent, harder working, and less successful when compared to Black basketball players.

With these stereotypes empirically demonstrated, Stone and colleagues tested the effects of these stereotypes on athletic performance (1999). Both White and Black participants performed a mini-golf activity. Prior to the task, participants were told either that the task was a diagnostic of “sports intelligence,” a diagnostic of “natural athletic ability,” or nothing (for the various control conditions). Whites who were told that the task was a diagnostic of natural athletic ability performed worse relative to Whites in other conditions; likewise, Blacks underperformed relative to Blacks in other conditions when they were told the task was a diagnostic of sports intelligence. Interestingly, the study showed no effects of stereotype lift—Whites told that the task was a test of sports intelligence and Blacks told that the task was a test of natural athleticism did not perform better relative to participants in the control conditions. Stone’s mini-golf study clearly demonstrates the negative effects of stereotype threat in sports and calls into question

whether positive ingroup stereotypes affect athletic performance (either through choking or through stereotype lift).

While positive in-group stereotypes did not affect performance in Stone's mini-golf task, Chalabaev, Stone, Sarrazin, and Coizet (2008) showed how negative outgroup stereotypes can inspire stereotype lift through downward social comparison and improved self-confidence. In their study, both men and women performed a balancing task. Before the task, they were primed with a negative task-related stereotype about men or women—either that men are historically poor at the balancing task or that women are historically poor at the balancing task. Interestingly, they found no evidence of stereotype threat; men and women confronted with the negative stereotype about their sex (ingroup) did not underperform relative to men and women in the control conditions. Meanwhile, men and women confronted with the negative stereotype about the opposite sex (outgroup) showed signs of stereotype lift as well as increased self-confidence and investment in the task. This study, therefore, questions the existence of stereotype threat in athletics and provides evidence for stereotype lift. This lift occurred through the priming of negative outgroup stereotypes, subsequent downward social comparison, and increased confidence and investment that this comparison inspired.

Neither Chalabaev nor Stone's studies manipulated the presence of an audience or the pressure to perform; this stands in contrast to the nature of sports, which often have a pressure to perform and the pressure to do so in front of others. The present study chose to introduce these variables (in the form of videotaping participants for an educational video for a large Internet audience) to improve ecological validity. Audience presence, being videotaped, and the importance of task success all been shown to induce self-

awareness, pressure, and subsequent choking in athletic tasks (Baumeister & Showers, 1986; Lewis & Linder, 1997; Wang, 2002). For instance, in a study by Otten (2009) in which participants shot two sets of fifteen free throws, videotaping half of the participants during their second set and telling them that the video would be shown to a UCLA psychology class successfully inspired pressure in participants. In Wang's research, videotaping participants and providing monetary rewards for made free throws increased self-reported pressure and caused significant choking in participants. The present study investigates how the pressure to perform (via videotaping participants for a large audience) can interact with the effects of primed stereotypes.

Taking everything together, positive stereotypes can influence performance in many different ways. The primary variables that mediate the effects of positive stereotypes on performance are (a) The ingroup/outgroup status of the performer relative to the stereotype (b) The socially comparative nature of the stereotype (c) The investment and level of expertise of the performer (d) The perceived pressure to perform and meet expectations, especially via audience-pressure. The present study examines how and when these variables interact with positive stereotypes to affect performance.

The Present Study

We operationalized motor-skill performance in sport by measuring participants' made free throws. Free throws are a good measure of athletic coordination in which a variety of people can participate in a controlled manner (as opposed to measuring downhill-skiing or live competitions) and an athletic skill that will not cause fatigue or discomfort in participants. Free throws have been used in previous studies as measures of athletic performance (Otten, 2009; Wang, 2002). In addition, free throws are an essential

part of basketball, a sport with established stereotypes for both Whites and Blacks (Sailes, 1998; Stone, 1997). On the whole, free throws are an example of a measurable and stereotyped athletic ability that many people can perform without experiencing fatigue.

Hypotheses

We expected targets of the same-race stereotype to benefit from stereotype lift and improve in the low-pressure condition. In the high-pressure condition, we expected targets of the same-race stereotype to choke under the pressure to live up to heightened expectations for a large Internet audience and suffer performance decrements. We expected targets of the different-race stereotype to show performance decrements, and for these effects to be intensified in high-pressure situations. The presented different-race stereotype was socially comparative in favor of an outgroup, and thus a threat, and the pressure to perform for an Internet audience should have intensified this threat and caused further decrements.

Method

Participants

Participants (N = 81) were White males between 18 and 30 years old who were undergraduate and graduate students from Tufts University. Participants were compensated with partial course credit or five US dollars.

Materials

For their free throws, participants shot on a regulation basketball hoop (10 foot tall rim in a hardwood gym) from the standard free-throw distance (19 feet from the baseline) with a regulation men's indoor basketball. Participants watched videos using

QuickTime player at full-screen on a 15-inch Macintosh MacBook Pro computer screen. Participants sat comfortably in a chair at a table in the gym approximately three feet from a chest-level computer screen to watch the videos. The experimenter started the video for the participant and left the participant alone for the duration of the video in an otherwise empty and quiet gym. Participants were videotaped using a video recorder supported by a tripod located underneath the basketball hoop on which participants were shooting.

Participants watched one of three different videos depending on the stereotype condition to which they were randomly assigned. Each of the videos lasted approximately 30 seconds.

The video for the same-race condition contained six short clips of White NBA basketball players making free throws. At the end of the video, text appeared on an otherwise blank screen in 16-point font for three seconds that stated: “White players shoot the highest free throw percentage in the NBA, making 85%.” The video for the different-race condition contained six clips of Black NBA basketball players making free throws. At the conclusion of this video, text appeared on an otherwise blank screen in 16-point font for three seconds that stated, “Black players shoot the highest free throw percentage in the NBA, making 85%.” In the videos for both of these conditions, the race of the basketball players was visually clear and salient. In addition, the videos in both conditions were matched for camera quality, camera angle, video length, era of the shown basketball players, and video format. The video format refers to the fact that the video in each condition was made up of six consecutive clips, without time in between clips.

The video in the third stereotype condition—the neutral condition—contained six clips of MLS (Major League Soccer, the top men’s professional soccer league in the

United States) soccer players scoring penalty kicks. At the conclusion of the video, text appeared on an otherwise blank screen in 16-point font for three seconds that stated, “Midfielders have the highest penalty kick success rate in the MLS, making 85%.” The neutral-condition video was matched with the videos in the other conditions for video length, video format, and camera quality. Penalty kicks were used because, like free throws, they are standardized individually performed events outside of the flow of normal game play. That being said, the neutral-condition video had more distanced camera angles that deemphasized race and employed a different sport with no task-relevant stereotypes (i.e. the video would not activate stereotypes relevant to free throws).

All of the clips for all of the videos were downloaded from YouTube and edited using iMovie HD 6.0.4. All clips of free throws and penalty kicks shown in the videos were edited to start immediately prior to the attempt and to end immediately following its success (all free throws and penalty kicks were successful on behalf of the shooter).

After they finished shooting all free throws, participants then filled out a 7-item questionnaire (see Appendix) about their previous basketball experience. A sample question is, “How would you rate yourself as a basketball player?”

Design

The present study manipulated three independent variables: Time (time 1 and time 2), Prime (same-race, different-race, or control), and Pressure (low-pressure/not videotaped or high-pressure/videotaped). Our dependent variable was the number of made free throws in each set of fifteen. It is important to note that participants were pseudorandomly assigned to their condition (i.e., same-race prime, different-race prime, or control-prime with or without being videotaped) only after they completed their first

set of free throws to ensure the experimenter remained blind to the participants' condition during these baseline free throws.

Procedure

Upon arrival to the study location, participants were told that the purpose of the study was to examine how watching specific sports videos affects athletic performance, specifically free throw abilities. After completing a consent form (see Appendix), participants were given a practice session in which they shot 10 free throws. The first 5 free throws of the practice session were untimed. For the remaining 5 practice free throws, however, participants were told to take no more than 10 seconds to shoot after receiving the ball in preparation for each free throw (i.e. after a participant shot, the experimenter rebounded the ball and handed it to the participant, at which point the participant had 10 seconds to shoot again). The 10-second time limit was selected because it is the NBA's free throw time limit. The experimenter monitored each free throw with a stop watch.

Following the practice session and a one-minute break, participants shot 15 free throws to establish a baseline ability (with the 10-second time limit for each of the 15 throws). The experimenter noted how many free throws each participant successfully made of the 15 and then pseudorandomly assigned the participant's condition (i.e., same-race prime, different-race prime, or control-prime with or without being videotaped).

Following the conclusion of the baseline free throws, participants were seated in a comfortable chair at a table along the middle of the gym's sideline. Participants were told that they would then watch a 30-second sports video. They were reminded that the purpose of the study was to determine how certain sports videos affect athletic

performance. The experimenter started the video for the participant and proceeded to walk away from the participant's line of vision toward a chair thirty feet away near the gym's baseline. Participants watched one of three different videos. In the same-race condition, participants watched a video of White NBA players making free throws; in the different-race condition, participants watched a video of Black NBA players making free throws; in the neutral condition, participants watched a video of MLS soccer players making penalty kicks.

After watching the videos, participants were then told they would complete another series of 15 free throws. Regardless of which video they had seen, half the participants were then asked if they could be videotaped while they shot the remaining free throws. They were told that the videos would go on YouTube as part of an educational tool designed to help others with sports performance. Participants in the videotaped conditions were asked to sign a consent form agreeing to be videotaped (see Appendix). Participants were videotaped using a video recorder supported by a tripod located underneath the basketball hoop on which participants were shooting. This video recorder and tripod were kept out of sight prior to videotaping the participant.

At the conclusion of the final set of free throws, participants completed a short questionnaire about their personal basketball experience (see Appendix). Previous research suggests that individuals who have high domain identification are most susceptible to the negative effects of stereotype threat (Spencer et al., 1999). We therefore examined participants' domain identification with athletic ability by administering a questionnaire (see Appendix) to all participants in which they were asked to rate how important their athletic ability is to them (1 = *very unimportant*, 7 = *important*). Before

debriefing the participants, the experimenter asked participants if they benefitted from seeing professionals shoot free throws, if they believed the YouTube cover story, and if they suspected the true purpose of the study. Although some participants suspected race as a topic of interest, no participants suspected the true purpose of the study. After completion of the questionnaire, participants were debriefed, compensated, and dismissed.

Results

Of the 81 participants in the study, six rated the importance of their athletic ability as a 3 or lower, and they were therefore excluded from the analyses. This left 76 participants: 15 in the same-race/low-pressure condition, 12 in the different-race/low-pressure condition, 12 in the control/low-pressure condition, 12 in the same-race/high-pressure condition, 12 in the different-race/high-pressure condition, and 13 in the control/high-pressure condition.

Free throw performance was assessed by comparing the number of free throws each participant made in the time 1 baseline condition to the time 2 post-manipulation condition. Table 1 shows the mean number of made free throws for each set in each condition. We conducted a 2 (Time: time 1 and time 2) x 3 (Prime: same-race, different-race, or control) x 2 (Pressure: low pressure or high-pressure) repeated measures ANOVA on these data, with time as a repeated measure. Results revealed a main effect for time ($F(1,70) = 8.30, p < .01$), a Time X Prime interaction ($F(2,70) = 3.50, p < .04$), a Time X Pressure interaction ($F(1,70) = 8.61, p < .01$), and a trend toward a three-way interaction ($F(2,70) = 3.01, p = .06$). There was no main effect of prime ($F(2,70) = 1.71, p = .19$) or pressure ($F(1,70) = .244, p = .623$).

A closer examination of the data demonstrated that the race primes had opposing effects on performance in the low-pressure condition, but a similar effect on performance in the high-pressure condition. Specifically, although performance significantly improved following the same race prime in low-pressure condition ($t(14) = 2.36, p < .04$), it significantly decreased following the different-race prime in low-pressure condition ($t(11) = 2.35, p < .04$). Conversely, in the high-pressure condition, participants' performance in both the same-race prime and the different-race prime conditions significantly declined over time ($t(11) = 2.38, p < .04$; $t(11) = 2.96, p < .02$, respectively). Importantly, performance did not change over time in the control condition in either the low pressure ($t < 1$) or in the high-pressure conditions ($t(12) = 1.03, p = .32$), suggesting two critical conclusions. First, neither fatigue nor practice effects were responsible for the changes we observed in performance over time in the two race-prime conditions. Second, being videotaped in the absence of a race-prime was not sufficient in and of itself to impair performance.

In order to better understand the effects of being videotaped in the same-race and different-race conditions, we calculated a performance difference score for each participant by subtracting their Round 1 score from their Round 2 score for each condition (see Figure 1). We then entered these difference scores into t-tests comparing the high and low pressure conditions of the same-race and different-race primes, respectively, to determine whether being videotaped impaired performance in both conditions. In the same-race prime condition, participants who were videotaped (high-pressure) after the manipulation performed significantly worse over time than those who were not videotaped (low-pressure; $t(26) = 2.64, p < .02$). In the different-race prime

condition, however, participants' performance declined to a similar extent regardless of whether they were videotaped (high-pressure) or not (low-pressure), $t < 1$.

Together, witnessing same-race primes improved performance, but only in the low-pressure condition. The same-race primes had an adverse effect on performance, leading to performance decrements, in the high-pressure condition. Conversely, the different-race prime impaired performance regardless of whether or not additional pressure (videotaping) was introduced. It is important to note that in both the high and low pressure conditions, control performance did not change over time, suggesting that any negative effects in the race-prime conditions are not due to participant fatigue or practice effects.

Discussion

The results of this study provide evidence for stereotype lift in the same-race/low-pressure condition, the tendency to choke under the pressure to live up to a positive stereotype in the same-race/high-pressure condition, and for stereotype threat in both the different-race/low-pressure and different-race/high-pressure conditions. In this discussion, each of these findings (along with other non-findings) will be examined in conjunction with the present study's limitations and with directions for future research.

Participants primed with the positive same-race stereotype showed significant improvements in the low-pressure condition, suggesting evidence for stereotype lift. While Chalabaev and colleagues (2008) showed that negative outgroup stereotypes have been shown to produce stereotype lift in athletic tasks through downward social comparison and improved self-confidence, our findings suggest that this lift-inspiring confidence can also come from a comparative positive ingroup stereotype. Furthermore,

when positive ingroup stereotypes have caused stereotype lift in domains different from sport, this has happened through subtle priming and not through the blatant priming that the present study employed (Shih et al., 2002). Our results suggest that in a low-pressure situation, a positive ingroup stereotype can inspire lift in an athletic task even if its presentation is blatant.

This lift inspired by the blatantly presented, positive ingroup stereotype could be related to the stereotype-consistent behavior that the blatant priming of a social category (e.g. race) can potentially cause. College students blatantly primed with “college professor” performed better on trivia questions than students in a control condition (Dijksterhuis and van Knippenberg, 1998). The threat-less activation of a stereotype associated with intellectual ability may have activated stereotype-consistent behavior. Relating this to the present study, the priming of a positive stereotype in the same-race/low-pressure condition may have caused stereotype-consistent behavior, and thus a lift in free-throw performance.

Research by Chalabaev and colleagues offer other potential ways that stereotype lift can operate; they showed that negative outgroup stereotypes can increase self-confidence and investment (and in turn improve performance). The different nature of the present study’s positive ingroup stereotypes could have triggered different (or similar) mechanisms through which stereotype lift acted. The present study did not measure pre-test confidence and investment (the variables affected by lift in Chalabaev’s research); their measurement would be necessary in order to assess their potential role in stereotype lift. In addition, this study did not attempt to capture the potential processes behind the trend toward stereotype-consistent behavior that Dijksterhuis and van Knippenberg

(1998) were able to demonstrate. Future research should continue to focus on the specific mechanisms by which positive ingroup stereotypes, and stereotype lift in general, facilitate athletic performance.

While participants experienced stereotype lift in the same-race/low-pressure condition, participants that witnessed the positive same-race stereotype in the high-pressure condition suffered significant performance decrements. This finding suggests that the pressure to live up to a stereotype for an audience can cause choking in athletic tasks. Prior to the present study, the ability for a positive stereotype to inspire choking had been shown in cognitive tasks, but not yet in athletic tasks (Cheryan & Bodenhausen, 2000). The pressure to conform to the stereotype and live up to positive expectations for the public eye may have caused an over-attention and subsequent failure of form (Beilock & McConnell, 2004). The pressure of being videotaped in and of itself does not explain these participants' decrements, as videotaped participants in the control condition did not suffer performance decrements. However, previous studies show that videotaped participants that are also under a pressure to perform can choke because of a heightened self-awareness and a subsequent over-attention to form (Baumeister & Showers, 1986; Wang, 2002). In the present study the pressure of being videotaped and the positive same-race stereotype may have interacted to produce in the participant a heightened ingroup salience that caused extra pressure to live up to expectations for the public eye. These weighty expectations were enough to cause heightened self-awareness, over-attention to form, and subsequent choking and underperformance.

Although participants in the same-race/high-pressure condition suffered performance decrements, it is impossible to know the exact reason behind this failure.

Participants did not indicate group identification, self-confidence, perceived pressure to succeed, or level of attention to form—four factors known to moderate the effects of stereotypes on performance (Beilock & McConnell, 2004; Shih et al, 2002). Future research should investigate the specific roots behind and mechanisms driving the underperformance of those primed with positive ingroup stereotypes in high-pressure situations. One idea might be to introduce a distracting task that consumes cognitive resources—if participants are failing because of an over-attention to form, then the distracter-task would consume cognitive resources and remove attention away from the task at hand, thus causing performance to improve. However, if participants are failing because the ingroup stereotype and pressure are interacting to consume necessary cognitive resources, then the distracter-task would not help performance, and might introduce enough cognitive load to further hurt performance.

As predicted, participants who saw the positive different-race stereotypes suffered performance decrements in both low-pressure and high-pressure conditions, suggesting evidence for stereotype threat. This is consistent with previous research that suggests positive outgroup stereotypes can induce threat and that stereotype threat can occur in sports (Aronson, 1999; Stone et al., 1999). That being said, we did not attempt to measure the mechanisms by which stereotype threat operated. As mentioned in the discussion of the decrements that participants suffered in the same-race/high-pressure conditions, we did not measure participants' group identification, self-confidence, perceived pressure to succeed, or level of attention to form—four factors known to moderate the effects of stereotypes on performance (Beilock & McConnell, 2004; Shih et al, 2002). Measuring these factors in future research would help identify the possible mechanisms behind the

failure that stereotype threat inspires in athletic tasks.

Although the present study provides evidence for stereotype threat in sport, stereotype threat and audience-pressure did not interact to cause more severe decrements, contrary to our predictions. There are several possible reasons for this non-interaction. It is possible that the videotaping, which on its own did not impair performance in the present study (videotaped participants in the control condition did not suffer performance decrements), did not inspire sufficient audience-pressure to interact with the threat to in turn to cause significantly worse decrements. Moreover, if the interaction were to have occurred on some level (i.e. even if the pressure manipulation in and of itself were to have hurt performance), there may be a limit to how much over-attention (the frequent result of both high-pressure and stereotype threat) can hurt performance; these overlapping negative effects may have plateaued in participants. This potential plateau has not been discussed in previous research and deserves future consideration.

As discussed in the analysis of both the same-race/high-pressure and different-race/high pressure conditions, our pressure manipulation—the apparent videotaping of participants for a large Internet audience—did not cause choking in participants in and of itself; there were no differences between time 1 and time 2 free throw scores in the control/high-pressure condition. Individual differences in how participants respond to pressure may account for the lack of difference between groups (Otten, 2009). While participants in the control/low-pressure condition showed no difference in free throw scores between time 1 and time 2 (as would be expected with the lack audience-pressure and the lack of stereotype-priming), participants in the control/high-pressure condition may not have showed performance differences between time 1 and time 2 due to some

participants excelling and others choking under the audience-pressure; these divergent responses could have clouded the difference score and masked any effects of the pressure-manipulation.

These proposed individual differences in response to audience-pressure in the absence of other pressures (e.g. stereotypes, performance-contingent rewards and punishments) exist in the literature. Otten (2009) showed that individual differences in the measured “reinvestment” (and subsequent self-focus) and measured “perceived control” in participants caused divergent effects in free throw performance—an increase in the former caused choking while an increase in latter caused clutch performance (i.e., improved performance). We did not measure those variables and cannot assess their role in the lack of observed effects from the pressure manipulation in the present study. Although Wang’s research (2002) used videotaping to manipulate pressure and cause choking in free throw shooters, videotaping was used in conjunction with an audience and financial incentives as additional sources of pressure. Perhaps the present study could have introduced an additional type of pressure in its pressure-manipulation, like Wang, to inspire the predicted choking. In all, the present study’s pressure-manipulation may not have caused group differences in performance due to confounding individual differences in response to pressure or because of insufficient forms of applied pressure.

The present research expands the available information regarding how different stereotypes and levels of pressure can interact to affect performance; hopefully, this information can be used to prevent choking and to reduce the inequality and prevalence of stereotypes in sport. Both stereotype threat and stereotype lift can perpetuate, and potentially exacerbate, real-world gaps in performance. In addition, the present research

demonstrates the negative effects of heightened expectations (via positive stereotypes) in high-pressure situations on athletic performance. Hopefully, coaches and counselors can utilize the knowledge of the effects of stereotypes on performance to intervene with athletes and eventually prevent the harmful effects of stereotyping, reduce the prevalence of stereotyping, and narrow gaps in athletic performance between groups. By being alerted to this information, coaches and counselors can reduce their own blatant and subtle biases in their interactions with players that may perpetuate stereotypes and group differences. In addition, they could use the present study's results as evidence of the power of the situation over an uninformed mind; coaches and counselors could remind players that with the knowledge and awareness of the effects of stereotypes and pressure, players can now understand some performance decrements to be due to context and thus dismiss fictitious stereotypes and detrimental pressure in effort to perform to their fullest potential.

Future directions of research can expand the focus of the present study. For instance, future research can examine different types of stereotypes: positive and negative, blatant and subtle, existent and non-existent. In addition, future research can test hypotheses on participants of more varied backgrounds—the current study only employed White males. How might Black or female participants respond to stereotypes and pressure in basketball? Lastly, future studies can examine the effects of stereotypes and pressure on different activities. The present study looked at an athletic skill that is less cognitive and more procedural (i.e. free throws), however future research can examine skills that are unrelated to sports or skills that vary to the degree that they employ cognitive resources.

In summary, the present study confirms previous findings showing that stereotype lift can occur in athletics, although in the present study this only occurred in low-pressure contexts (Chalabaev, 2008). In high-pressure contexts, the priming of a positive ingroup stereotype had an inverse effect, causing choking and performance decrements. Despite the present study's use of a positive ingroup (rather than negative outgroup) and blatant (rather than subtle) stereotype prime, participants still experienced stereotype lift in the low-pressure situations. The present study also confirms previous findings of stereotype threat in sports (Stone et al., 1999). Positive outgroup stereotypes inspired stereotype threat in both low and high-pressure conditions, causing inferior free throw performance.

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Appendix

Questionnaire

1. Approximately how many hours per month do you spend playing basketball over the past 3 years? Please circle one.

a) Less than 1 hour/month b) 1-5 hours c) 6-10 hours d) 10-20 hours e) More than 20 hours

2. How many years did you play for your high school team (both Varsity and Junior Varsity)?

a) 0 years of high school basketball b) 1 year c) 2 years d) 3 years e) 4 or more years

3. How would you rate yourself as a basketball player? Please circle one.

1.....2.....3.....4.....5.....6.....7
 Very Poor Average Very Good

4. How would you rate yourself as an athlete in general? Please circle one.

1.....2.....3.....4.....5.....6.....7
 Very Poor Average Very Good

5. How important is your athletic ability to you? Please circle one.

1.....2.....3.....4.....5.....6.....7
 Very Unimportant Neutral Very Important

6. Please indicate how much you agree with the following statement: There is a stereotype in society that Whites excel in shooting within the world of basketball. Please circle one.

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

7. Please indicate how much you agree with the following statement: There is a stereotype in society that Blacks excel in shooting within the world of basketball. Please circle one.

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

Instructions

After consent: “The study you are participating in today examines how watching videos affects performance. Specifically, we are interested in how certain sports videos affect sports performance. We’re looking at various types of sports performance, but the study you’ll be participating in today is looking specifically at free throws. We’re going to start by giving you a short warm-up. After the warm-up, you will shoot 15 free throws and I’ll track how many you make. For all of your free throws today, I will retrieve the ball and give it back to you. For your practice set of free throws, you may shoot the first 5 free throws at your own pace; for each of the last 5 free throws you will within 10 seconds after receiving the ball. This is the same time-limit that NBA players have.” I then hand the ball to the participant and say, “Okay, now we will begin the practice session.”

After practice: “Now that you have finished your practice session, you will take a 60-second break. After the break, you will shoot your baseline set of 15 free throws. ”

Before baseline: “To establish your baseline ability, you will shoot a set of 15 free throws. As with the practice session, I will retrieve all the balls for you and give them back to you. Remember that each free throw must be shot within 10 seconds of receiving the ball.”

After baseline: “Now that we have established your baseline ability, you will watch a 30-second sports video. Again, we are interested in how certain sports videos affects sports performance. After the video, you will shoot your final set of free throws.”

After baseline/before final set (no videotape): “Now you will shoot your final set of 15 free throws. As with the earlier sets, I will retrieve all the balls for you and give them back to you. Remember that each free throw must be shot within 10 seconds of receiving the ball.”

After baseline (videotape): “In addition to being interested in how certain videos affect performance, we are developing an educational tool to help others with sports performance and would like to pilot it on YouTube. To assist in this project, we were wondering whether we could videotape you shooting free throws.” I then give the participant the video consent form. After it is filled out, I say, “Now you will shoot your final set of 15 free throws. As with the earlier sets, I will retrieve all the balls for you and give them back to you. Remember that each free throw must be shot within 10 seconds of receiving the ball. During this set of free throws, I’m going to video tape your performance.”

After final set: “To complete the experiment, you will fill out this short questionnaire. Afterward, please notify me so you can be debriefed and compensated.”

Debriefing: “Thank you for your participation today. Before you leave, I’d like to ask you a few questions: What suspicions, if any, did you have during the experiment? Were the cover stories about the purpose of the experiment, the video-watching, and the videotaping (if applicable) believable? Did watching professionals shoot free throws aid

your second round of free throws? Thanks again for your participation. Feel free to read this debriefing sheet now and ask if you have any questions.”

Informed Consent

STUDY TITLE: Examining the effects of load on procedural motor-skills

PRINCIPAL INVESTIGATOR: Izzy Gainsburg

PURPOSE AND DURATION: This study examines how our procedural motor-skills are affected by different college experiences. You are being asked to participate because you are a healthy adult. We expect that this session will take no more than 30 minutes of your time.

PROCEDURES: In this study, you will perform a task involving procedural motor skills (e.g. shooting free throws, dancing). You will also be asked to complete a short survey.

COSTS, RISKS, AND DISCOMFORT: There are no costs to you associated with this experiment. There is minimal risk involved in the experiment. Primarily, the tests you will be performing today are challenging and you may experience some fatigue upon completion of these tasks. You will be given breaks throughout the testing session to minimize fatigue. However, the probability and magnitude of harm or discomfort anticipated in this research are not greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests.

BENEFITS: There are no direct benefits to you besides the fun of the activity in which you will participate. However, we expect that the results of this study will add to the body of knowledge in perception, performance psychology, and procedural memory.

CONFIDENTIALITY: The results of this study may be published in a scholarly book or journal, presented at professional conferences or used for teaching purposes. However, your name and other identifiers will not be used in any publication or teaching materials.

COMPENSATION: If you were recruited through SONA you will receive half of a SONA credit. If you were recruited by other means, you will be compensated with your choice of either a Gatorade or a banana upon completion of this task.

REQUEST FOR MORE INFORMATION: You may ask more questions about the study at any time. Please e-mail the principal investigator Izzy Gainsburg at izzy.gainsburg@tufts.edu or telephone (202) 577-3767 with any questions or concerns about the study. You may also contact Anne Krendl (e-mail: anne.krendl@tufts.edu, telephone: (617) 627-3694) with questions or concerns. In addition, you may contact the Office of the Institutional Review Board at (617) 627-3417.

WITHDRAWAL OF PARTICIPATION: Should you decide at any time during the study that you no longer wish to participate, you may withdraw your consent and

discontinue your participation without prejudice.

SIGNATURE: I confirm that the purpose of the research, the study procedures, the possible risks and discomforts as well as benefits have been explained to me. All my questions have been answered. I have read this consent form. My signature below indicates my willingness to participate in this study.

Signature

Date

Printed Name

Experimenter Signature

Video Consent

Use of Video: With your permission, we would like to potentially use video recorded segments of your performance for the purposes listed below.

Confidentiality: These recordings will only be identifiable through code numbers and will never be associated with your name. Additionally, these recordings will be destroyed after they have been used for the purposes described above.

Participation and Withdrawal: You may decide that you do not want your video to be used. In this case, the video will be immediately erased with no penalty to you. Your present or future interactions with the Interpersonal Perception and Communication Lab or Tufts University will not be affected.

Signature: I confirm the future use of my video has been explained to me. All of my questions have been answered and I have read this consent form. I grant permission for my photograph to be used for the following terms:

Please sign after each individually described purpose in order to indicate your consent to the following terms:

- a. **Consent for my video recorded interaction to be coded and analyzed by experimenters associated with the current research.**

_____ (Signature)
 _____ (Date)

- b. **Consent for my video to be shown to future research participants so that their responses may be utilized to examine the nonverbal behavior of my interaction.**

_____ (Signature)
 _____ (Date)

- c. **Consent for my video to be shown to an academic audience solely in the context of this study or related research.**

_____ (Signature)
 _____ (Date)

- d. **Consent for my video to be posted in an online forum for educational and teaching uses only.**

_____ (Signature)
_____ (Date)

Debriefing

The study you just completed examines how being reminded of stereotypes affects performance on athletic tasks. On this task, you were asked to shoot free throws. Halfway through the task, you watched a video about a positive same-race stereotype, a positive different-race stereotype, or a neutral video. Then, we wanted to see whether the level of pressure you faced (you were either videotaped or you were not) interacted with the stereotype with which you were confronted. Previous research suggests that stereotypes can lead to pressure that inhibits procedural motor-skills (Beilock & McConnell, 2004). We are interested in identifying in what types of stereotypes (positive vs. negative, in-group vs. out-group) inhibit performance and in which contexts (high-pressure vs. low-pressure) they do so.

You may ask more questions about the study at any time. Please e-mail the principal investigator Izzy Gainsburg at izzy.gainsburg@tufts.edu or telephone (202) 577-3767 with any questions or concerns about the study. You may also contact Anne Krendl (e-mail: anne.krendl@tufts.edu, telephone: (617) 627-3694) with questions or concerns. In addition, you may contact the Office of the Institutional Review Board at (617) 627-3417. As this study is ongoing through the term, we ask that you please do not discuss the study with your cohort.

Thank you for your participation in this study.

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Table 1

Free Throw Score Means and Standard Deviations by Condition in the format of (M, SD)

Condition	Time 1	Time 2
Same-Race, Low-Pressure	6.80 (2.83)	8.00 (2.10)
Different-Race, Low-Pressure	8.17 (3.60)	7.17 (2.82)
Control, Low-Pressure	5.83 (2.79)	5.67 (2.27)
Same-Race, High-Pressure	8.92 (3.68)	7.50 (4.23)
Different-Race, High-Pressure	7.75 (3.96)	6.00 (3.77)
Control, High-Pressure	7.00 (2.97)	6.54 (2.57)

Note. The means are the number of made free throws out of fifteen possible free throw attempts. Time 1 denotes baseline free throw performance for all participant groups. Time 2 shows the results of the post-manipulation performance.

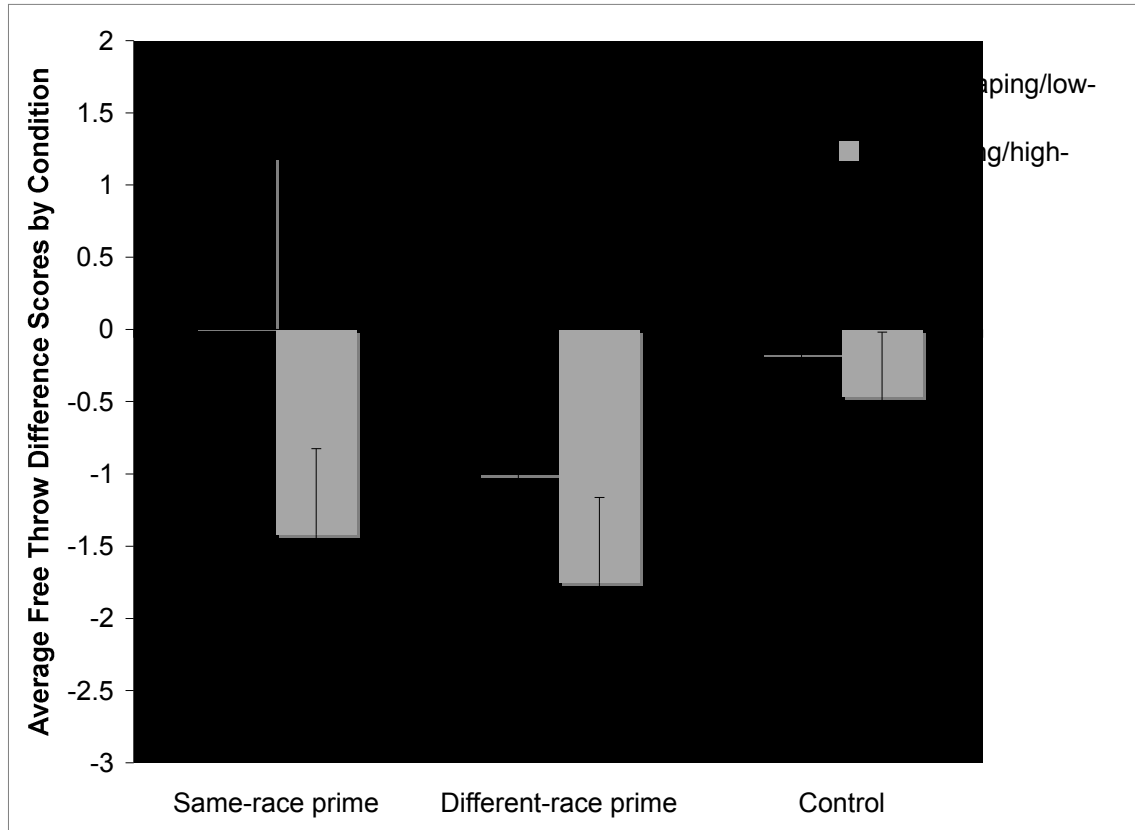


Figure 1. The mean free throw difference scores are displayed for each condition. By subtracting each participant's time 1 score from his time 2 score, we found each participant's difference score. We then averaged each participant's difference score by condition. This figure compares the low and high-pressure conditions for each video-prime (same-race, different-race, and control). Same-race stereotypes caused performance increments in the low-pressure condition, but caused performance decrements in the high-pressure condition. The different-race prime caused performance decrements, and these decrements were not significantly affected by the pressure manipulation. Finally, the pressure manipulation in and of itself did not significantly affect performance. The standard error bars in each column represent the standard errors for each condition.