

Stereotype Threat and Sport: Can Athletic Performance be Threatened?

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Stereotype threat occurs when knowledge of a negative stereotype about a social group leads to less-than-optimal performance by members of that group. Although the stereotype threat phenomenon has been extensively studied in academic and cognitively-based tasks, it has received little attention in sport. This article reviews the existent literature on stereotype threat and discusses its implications for sports performance. The causal mechanisms of stereotype threat in sport are examined, followed by a discussion of why the cognitive processes thought to govern negative stereotype-induced performance decrements in academic and cognitively based tasks (e.g., GRE or SAT tests) may not unequivocally extend to sport skills. Finally, factors that should moderate the impact of stereotype threat in sport are outlined. Because stereotype threat has important consequences for athletics (e.g., impairing athletic performance, maintaining the underrepresentation of minority athletes in certain sports), it is a phenomenon that deserves greater attention in sport and exercise psychology research.

Key Words: choking under pressure, motor skill, expertise, stereotype threat

Various subdisciplines of psychology such as sport and exercise psychology, social psychology, and cognitive psychology have long held the common goal of identifying the psychological variables that allow performers to function at their best. Indeed, research on the psychological constructs of motivation (Dweck, 2000; Kim, Williams, & Gill, 2003), self-efficacy (Bandura, 1997; Moritz, Feltz, Fahrbach, & Mack, 2000), self-regulation (Higgins, 1997; Ryan & Deci, 2000), and attention (Beilock & Carr, 2001; Beilock, Carr, MacMahon, & Starkes, 2002) has been conducted across diverse skill domains, from sports skills to cognitive tasks, in an attempt to elucidate common psychological principles that promote optimal performance. Such cross-domain work is extremely important for research in sport psychology because it not only advances our understanding of the psychology of sport but it also recognizes the important contributions of sport psychology research to the general field of psychology.

There is still much cross-domain work to be done, however, and it is in this spirit that we wrote the current paper. The stereotype threat phenomenon has re-

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ceived considerable interest in the social and cognitive psychology literatures recently, yet despite its implications for sport it has not been extensively applied to motor skills. This paper reviews the phenomenon of stereotype threat and explores how it can account for less-than-optimal performance in sports.

Stereotype Threat: Academics to Athletics

Although research in sport psychology and sociology has considered the role of cultural stereotypes in athletics (M.A. Hall, 1996; R.E. Hall, 2002; Harrison, 2001), there has not been extensive work examining how an athlete's knowledge of a particular cultural stereotype might affect his or her own performance. Social psychologists have begun to address this question and have provided provocative evidence that such knowledge undercuts performance across a variety of skill domains. Steele and Aronson (1995) proposed that merely introducing a negative stereotype about a social group in a particular task domain could reduce the quality of performance exhibited by members of that group. They hypothesized that the less-than-optimal performance of African Americans and other minority groups in academic situations was not entirely due to a lack of preparation and skills, but rather could be attributed to negative stereotypes that predicted poor academic performance by members of these groups. Steele and Aronson coined the term stereotype threat to describe this phenomenon and conducted a series of empirical studies to examine it.

In one of the first studies on stereotype threat, Steele and Aronson (1995) had high-achieving African American and Caucasian students at Stanford University complete a portion of the graduate record exam (GRE). Prior to doing so, some students were told that the test was diagnostic of intellectual ability whereas others were told that the test was a laboratory problem-solving task not diagnostic of intellectual ability. Results demonstrated that after controlling for SAT scores (to equate past academic performance), there was no difference in GRE performance between White and Black students for whom the test was *not* framed as diagnostic of intellectual ability (for further discussion, see Sackett, Hardison, & Cullen, 2004). Of those students who were told that the test *was* diagnostic of intellectual ability, however, African Americans performed significantly worse than Caucasians. Steele and Aronson argued that informing students about the diagnosticity of the test activated the negative cultural stereotype that "Blacks are not as intelligent as Whites," which contributed to the less-than-optimal performance of African Americans on a test assumed to gauge intelligence.

Why are these findings important? First, Steele and Aronson's results suggest that one's awareness of a negative stereotype about one's social group hurts performance. Even more astounding was that this demonstration of stereotype threat was seen in individuals who were highly skilled and placed a great deal of importance on the domain related to the stereotype (i.e., high achieving undergraduates at Stanford). One might expect that such individuals would be highly motivated to disconfirm the negative stereotype rather than reveal it. Surprisingly, however, stereotype threat seems most likely to occur for individuals who are highly skilled and highly invested in performing well (see Aronson, Lustina, Good, et al., 1999). If one considers this idea in the context of sport, expert athletes should be especially susceptible to the detrimental consequences of a negative performance stereotype (Baker & Horton, 2003). These individuals are not only skilled in their

domain but they are also highly invested, putting in thousands of hours of practice into their sport (Ericsson, Krampe, & Tesch-Roemer, 1993).

If stereotype threat is applicable to sport, how widely might stereotype-induced performance decrements be revealed? Stereotype threat was first examined in the context of minority groups. However, recent research has shown that groups who are not normally considered minority in status can also fall prey to stereotype-induced performance decrements. For example, Aronson et al. (1999) had highly math-proficient Caucasian men perform the math portion of the GRE test. Prior to the test, participants either received information that the study was designed to learn more about the findings that "in math, it seems to be the case that Asians outperform Whites" (p. 34, Aronson et al., 1999), or they received no explicit information about Asian/Caucasian ability differences.

Results demonstrated that Caucasian men given the negative stereotype, that Asians outperform Whites, performed significantly worse than those who did not receive this information. In addition to replicating Steele and Aronson's (1995) work, these findings reveal that one need not be a member of a traditionally stigmatized group to fall prey to stereotype threat effects. Rather, all that is necessary for such unwanted performance outcomes to occur is to be presented with a situation in which a negative stereotype about how one should perform exists (Kray, Galinsky, & Thompson, 2002). Turning back to sport, this would suggest that White men playing basketball who are aware of the stereotype "White men can't jump" may fall prey to stereotype threat in the same way that African Americans who are aware of the stereotype that "Blacks are not as athletically intelligent as Whites" may fail in sports (e.g., golf) traditionally thought to embody athletic intelligence (Stone, Lynch, Sjomeling, & Darley, 1999).

Is stereotype threat a viable phenomenon in sport skills? To address this question, one first has to establish that there are commonly held stereotypes in athletics that could impact performance. For participants or spectators of sports, this may not seem to be such a daunting task. As in the academic arena, many stereotypes come readily to mind when thinking about sport performance (e.g., "White men can't jump"; "women are not fast, strong, or athletic"). In an attempt to systematically explore such sport stereotypes, Stone, Perry, and Darley (1997) had individuals listen to a recording of a men's Division I college basketball game and evaluate a player in terms of his athletic ability, individual performance, and contribution to his team. All participants listened to the same broadcast of the basketball game and all evaluated the same player. The only factor that varied across participants was whether individuals were told that the player they were listening to was White or Black.

When participants thought the player was Black, they rated him as being more athletic and as making more of a contribution to the game through individual and team play compared to when they thought he was White. In contrast, when participants thought the player was White, they perceived him as having more basketball intelligence (i.e., "court smarts") and putting in more effort on the court than when they thought he was Black. Thus, individuals interpreted the player's performance in light of the stereotypes they held about Black and White athletes.

These findings not only reveal the existence of racial stereotypes in athletics but they also demonstrate that stereotypes can influence perceptions of players' abilities and talents. If stereotype threat operates in sport in much the same way as it operates in academic tasks, then making negative stereotypes about African

American and Caucasian athletes salient should have a negative impact on the athletic performance of members of the stereotyped groups.

In one of the first studies exploring stereotype threat in sport, Stone et al. (1999) found support for this idea. They had African Americans and Caucasians perform a golf putting task that was framed as either a test of “sports intelligence” or a test of “natural athletic ability.” Results demonstrated that Black participants who were told that the putting task was a test of sports intelligence did worse than Blacks who were not given this information. In contrast, White participants who were told that the putting task was a test of natural athletic ability performed worse than Whites who did not receive this information. Thus, merely framing a sports activity as diagnostic of a negative racial stereotype (e.g., “African Americans are not athletically intelligent,” “Whites are not naturally athletic”) harms the performance of members of the negatively stereotyped group.

The negative consequences of stereotype threat in sport are not only limited to poor performance outcomes. Indeed, activating a negative performance stereotype can also impact how one approaches a skill. For example, Stone (2002) demonstrated that increasing the salience of a negative stereotype about White athletes prompted these athletes to engage in self-handicapping behaviors to obscure how well a particular performance reflected their true abilities. Specifically, when a golf task was framed as a measure of “natural athletic ability,” White athletes practiced the task less than their White counterparts who were not given this negative stereotype. By reducing practice (the self-handicap), it is unclear whether poor performance reflects one’s lack of ability or is a reflection of less-than-ideal circumstances for evaluating one’s ability (e.g., “With more practice, I certainly would have putt better”).

Thus, stereotype threat appears to be viable in sport. However, further work is needed to help us understand exactly when and how this phenomenon operates in athletic skills. Investigating *when* stereotype threat occurs will give researchers and practitioners insight into the types of environment that may hinder obtainable performance goals. Understanding *how* the activation of a negative performance stereotype leads to poor performance will shed light on whether the mechanisms by which stereotype threat exerts its impact are the same across both cognitive and motor skills or, conversely, vary as a function of the type of task being performed. If the latter is true, it seems especially important to explore stereotype threat specifically in the context of motor skill performance.

How Does Stereotype Threat Harm Performance?

Although the stereotype threat phenomenon has received a great deal of attention (see Wheeler & Petty, 2001), only recently have its underlying causal mechanisms been examined. Moreover, most of this work has been limited to cognitively-based tasks. In a series of studies designed to shed light on how stereotype threat operates in an academic math test, Schmader and Johns (2003) activated the stereotype that “women are poorer at math than men” in some female participants (stereotype threat condition) but did not mention gender differences in math to other female participants (control condition). They then measured women’s working memory capacity and their performance on a difficult math test.

Schmader and Johns found that women in the stereotype threat condition showed reduced working memory capacity and poorer performance on the math test relative to the control group. Furthermore, working memory capacity medi-

ated the link between stereotype threat and poorer math performance. Working memory is the ability to focus attention on a central task while at the same time inhibiting irrelevant, distracting information (Kane & Engle, 2000, 2002). Schmader and Johns concluded that stereotype threat interfered with math performance by reducing the working memory capacity (possibly via worries that the women held about confirming the negative stereotype) needed to perform the task successfully.

Do reductions in working memory govern stereotype-threat-induced failure in sport as well? This does not seem likely, especially for high-level athletes, the precise group of people that stereotype threat research to date suggests should be most susceptible to failure (Steele, 1997). It is interesting to note that high-level motor skills are thought to become proceduralized with practice. Thus they do not rely heavily on working memory for successful execution. In fact, such skills are performed best when they run largely outside of conscious control (Beilock & Carr, 2001; Fitts & Posner, 1967; Kimble & Perlmuter, 1970; Proctor & Dutta, 1995; Wulf & Prinz, 2001). So it seems doubtful that reductions in working memory capacity could account for failure in well-learned motor skills that do not rely extensively on these resources. According to this logic, either high-level athletes are not susceptible to stereotype threat or there are other mechanisms by which stereotype threat may harm well-learned motor skills.

To uncover other mechanisms by which high-level motor skills may fail, we looked to another body of work that explores unwanted skill failure in sport: "choking under pressure." Within this literature it has been suggested that well-learned motor skills fail under pressure because such environments prompt individuals to increase the amount of attention they devote to controlling step-by-step performance in order to ensure a positive outcome (Baumeister, 1984; Beilock & Carr, 2001; Lewis & Linder, 1997). Unfortunately, this increased attention can backfire and disrupt what should have been fluent, proceduralized execution. If this idea, often termed the "explicit monitoring hypothesis," can be extended to stereotype threat, it would suggest a very different route by which stereotype threat can impair performance in sport. That is, although stereotype threat may harm working-memory-demanding cognitive tasks by consuming the working memory resources needed for skill execution (Schmader & Johns, 2003), it may hurt high-level motor skills by prompting too much attention to execution rather than too little.

Past research has shown that stereotype threat effects in sport are moderated by how important performance is to athletes' sense of self-worth, that is, greater stereotype threat effects are observed for those who perceive sports as more important (Stone, 2002; Stone et al., 1999). Thus it may be that high-level athletes, who place a great deal of importance on sport success, are especially likely to increase the attention they devote to execution in order to ensure a positive outcome in response to stereotype threat. Therefore, athletes with the highest skill level who have the most invested in their performance may be the most susceptible to failure. Although this would be similar to stereotype threat findings in academic tasks (Steele, 1997), the mechanisms by which this failure occurs in academic and athletic domains may differ.

In an attempt to test the mechanisms underlying stereotype threat in well-learned motor skills, Beilock, Jellison, McConnell, and Carr (2003) examined stereotype threat in high-level golfers. Golf was chosen because it is known to fall prey to stereotype threat effects (Stone, 2002; Stone et al., 1999) and is a complex motor skill that has been shown to become proceduralized with extended practice

(Beilock & Carr, 2001; Beilock, Wierenga, & Carr, 2002). The viability of two explanations for stereotype threat in motor skills was explored: (a) Stereotype threat-induced reductions in working memory harms performance, similar to how cognitively-based tasks fail under stereotype threat (Schmader & Johns, 2003); or (b) stereotype-induced explicit monitoring prompts too much attention to performance, similar to how high-level motor skills fail in high pressure situations (Beilock & Carr, 2001; Lewis & Linder, 1997).

If stereotype threat only operates by inducing worries that reduce the working memory capacity and attention available for performance, then high-level golf putting should not be hurt. However, if stereotype threat prompts attention to execution in a manner in which experts are not accustomed, this attention may disrupt proceduralized performance processes that normally run outside of conscious control. Support for these predictions comes from recent work in both golf putting (Beilock, Bertenthal, McCoy, & Carr, 2004; Perkins-Ceccato, Passmore, & Lee, 2003) and baseball batting (Gray, 2004), demonstrating that well-learned motor skills are harmed by too much attention to execution rather than too little.

For example, Gray (2004) found that when highly skilled Division I college baseball players were asked to perform a hitting task while at the same time listen for a randomly presented tone in order to judge whether the tone was "high" or "low" in frequency, this external dual-task had little effect on the baseball players' temporal swing error. Because it is thought that experienced batters do not explicitly attend step-by-step to execution, attentional capacity was available to devote to the secondary task demands without significantly disrupting primary skill execution. But when the same batters were required (in a skill-focused condition) to attend to a specific component of swing execution in a manner to which they are not accustomed, their performance suffered. In this skill-focused condition, the batters heard a randomly presented tone and had to indicate whether their bat was moving downward or upward at the instant the tone was presented. Kinematic swing analyses revealed that the observed performance failure was at least partially due to the fact that skill-focused attention in experts interfered with the sequencing and timing of the different motor responses involved in swinging.

The pattern of results reported above was not merely due to different attentional demands in the external dual-task and skill-focused conditions (i.e., the skill-focused condition just required more attentional resources). Evidence for this comes from the fact that novice baseball players in Gray's (2004) work showed the opposite pattern of results to that of the experts reported above. That is, the novices were harmed by the external dual-task but not the skill-focused condition. Unlike experts, novice performance is thought to require explicit attentional control (Beilock & Carr, 2001; Fitts & Posner, 1967; Proctor & Dutta, 1995). As a result, novices are hurt when attention is taken away from execution rather than by conditions that draw attention to performance. If the skill-focused condition had just required more attention in Gray's work, then novices should have been harmed by this condition as well, but they were not.

Turning back to stereotype threat, if negative stereotypes serve to reduce or consume working memory capacity via worries about the situation and its outcome, then high-level motor skills should not be harmed. As demonstrated above, such skills are not harmed by situations (e.g., external dual-tasks) that consume working memory. However, if stereotype threat increases the attention paid to execution, similar to explicit monitoring theories' account of how performance pres-

sure harms execution, then performance should suffer. To test these ideas, Beilock et al. (2003) had expert male golfers (with 2 or more years of high school varsity golf experience or a PGA handicap of 8 or less), who were highly identified with athletics, perform a series of golf putts on an indoor putting green before and after either receiving a negative stereotype about golf putting ("men are poorer putters than women") or receiving control information ("putting performance differs as a function of skill level").

Results demonstrated that the experts who received the stereotype putted significantly worse than the experts in the control condition. These findings are consistent with the idea that stereotype threat operates in well-learned motor skills by increasing the amount of attention devoted to monitoring and controlling step-by-step performance, attention that is known to disrupt the practiced and proceduralized skills of experts (Beilock, Carr, et al., 2002).

If stereotype threat does indeed harm high-level putting performance by prompting explicit attention to execution, then it follows that drawing attention away from performance should reduce this type of maladaptive attentional control. In a second experiment, Beilock and colleagues (2003) had another group of expert male golfers perform a series of golf putts in both single-task and dual-task conditions, with the order of these conditions counterbalanced across participants, both before and after receiving stereotype threat information that "men are poorer putters than women." The single-task condition involved putting in a normal environment. The dual-task condition involved putting while monitoring a series of auditorally presented words for a randomly embedded target word. Each time the target word was presented, the golfers were instructed to repeat it out loud.

As mentioned above, high-level motor skills are thought to be based on procedural knowledge that does not require constant control and operates largely outside of working memory; thus attention can be devoted to a secondary task without significantly disrupting primary task performance (Allport, Antonis, & Reynolds, 1972). As a result, under no-threat conditions, expert golf putting should not be significantly harmed by the addition of a second task to primary putting performance (i.e., the dual-task condition). Indeed this effect was demonstrated in Gray's (2004) work mentioned above (see also Beilock, Carr, et al., 2002; Beilock et al., 2004; Perkins-Ceccato et al., 2003). More interesting, however, under stereotype threat, the dual-task condition may actually help performance if the secondary task prevents stereotype-induced attention from being devoted to experts' automated or proceduralized performance processes (for a similar prediction with choking under pressure, see Lewis & Linder, 1997). Thus, adding another task while under stereotype threat may serve to improve performance, a prediction directly at odds with a working memory account of stereotype threat derived from cognitively-based tasks such as math.

Prior to the introduction of the negative stereotype, performance across the single-task and dual-task conditions did not differ among the expert golfers, replicating previous work showing that high-level motor skills are not compromised by situations that draw attention away from execution (Allport et al., 1972; Beilock, Carr, et al., 2002; Beilock et al., 2004; Gray, 2004; Leavitt, 1979; Smith & Chamberlin, 1992). In contrast, following the introduction of stereotype threat, experts' putting performance was significantly better in the dual-task condition than in the single-task condition. If stereotype threat affects performance by prompting explicit attention to execution in well-learned motor skills such as golf putting,

then drawing attention away from performance such as through the introduction of a secondary task should reduce this type of maladaptive attentional control. This is precisely the pattern of data observed.

Thus, a working-memory explanation of stereotype threat does not seem to apply to all task types. Cognitive tasks such as math problem-solving may be susceptible to working memory constraints because they require the manipulation of sequential steps and the maintenance of a large amount of information in working memory as the skill is executed (Beilock, Kulp, Holt, & Carr, in press). If the capacity of the working memory system to maintain this relevant information is disrupted, then performance may suffer. However, high-level proceduralized motor skills such as golf putting do not rely on attention in the same manner. These skills are thought to run largely outside of working memory without conscious attentional control (Beilock, Carr, et al., 2002; Beilock et al., 2004; Gray, 2004). As a result, such skills are harmed when *too much* attention is prompted to skill execution, rather than too little.

Thus our understanding of the processes underlying stereotype threat in sport may be greatly informed by work from the “choking under pressure” literature, and more generally from research in cognitive psychology that seeks to identify mechanisms involved in skill success and failure. However, at this point very little work has explored how stereotype threat might exert its effect in athletics and whether such performance decrements result from too much, or too little, attention to execution. In fact it may be that stereotype threat is really a very specific form of choking under pressure, pressure that results from the fear of confirming a negative stereotype about how one should perform. Future research examining such an idea in sport will not only serve to further our understanding of the stereotype threat phenomenon, but of choking under pressure as well.

Although the results of Beilock et al. (2003) suggest that stereotype threat may be similar to other performance related failures in sport (i.e., pressure-induced explicit monitoring), they also suggest how stereotype threat in athletics differs from other phenomena. For example, one might consider whether Beilock et al.’s findings are simply yet another demonstration of expectancy effects (e.g., Rosenthal & Jacobson, 1966). That is, the golfers in Beilock et al.’s study exerted less effort because they perceived that the experimenter was biased against them as a result of the negative stereotype they received. Although all stereotypes involve expectancies, Beilock et al. found that stereotype threat did not always harm performance. For example, in their second study the dual-task condition alleviated stereotype-induced performance decrements.

This is consistent with the idea that stereotype threat prompts attention to execution and that the addition of a secondary task can alleviate such unwanted control. These findings are inconsistent, however, with an explanation that the golfers in Beilock et al.’s work exerted less effort because they perceived that the experimenter was biased against them. If this latter possibility was viable, experts should perform equally poorly under both the single- and dual-task stereotype threat conditions, but they did not.

Where Do We Go From Here?

At present there is a limited amount of work demonstrating that stereotype threat occurs in sports skills. However, because of the pervasiveness of athletic stereotypes (R.E. Hall, 2002) and the importance placed on achieving optimal lev-

els of sport performance (Beilock & Carr, 2001), more work is needed to help us better understand the significant implications of stereotype threat in sport.

For example, it might be tempting to conclude from Beilock et al.'s (2003) work that stereotype threat has one kind of impact on attentional control and working memory in cognitive skills and another kind of impact on attention in motor skills. It seems more likely, however, that stereotype threat always exerts at least two different effects: it fills working memory with worries *and* it entices the performer to pay more attention to step-by-step control, resulting in a double whammy. However, these two effects may be differentially relevant to performance depending on the attentional demands of the task being performed. That is, how stereotype threat manifests itself may not be dependent on task type per se, but rather on how task performance is represented and implemented.

Math problem solving may be especially susceptible to working memory constraints because it requires the real-time manipulation and storage of multiple numbers in order to solve a problem. Well-learned motor skills that operate largely outside of working memory are almost certainly not based on such a representation (Fitts & Posner, 1967; Proctor & Dutta, 1995). Thus, to the extent that stereotype threat disrupts or reduces working memory, it is more likely to be revealed in activities that are attention-demanding and sequentially executed. This suggests that the types of processes governing stereotype-threat-induced impairment are most likely based on performance representation and implementation rather than simply on task domain (though often the two are related). Indeed, future research is needed to identify the specific task demands that result in stereotype threat decrements as a function of too little or too much attention to skill execution.

Another open question in sport is whether, under certain conditions, stereotypes might actually lead to performance enhancement instead of performance decrements. So far we have focused on situations in which negative performance stereotypes can harm skill execution. However, it is also possible that membership in a social group associated with a positive performance stereotype might improve task execution. Shih, Ambady, Richeson, Fujita, and Gray (2002) recently found that the subtle activation of a positive self-relevant stereotype (e.g., "Asians are good at math") actually led to better performance in mathematics for Asian American students than when this stereotype was not activated. Thus, although awareness of the "White men can't jump" stereotype may be detrimental to Caucasian basketball players, the opposite stereotype that "Black men can jump" might actually enhance the performance of African American basketball players.

Walton and Cohen (2003) suggested that stereotype-induced improvements (stereotype lift) may be observed not only when a positive stereotype is associated with one's own group, but also for members of higher status groups who are aware of negative stereotypes associated with lower status groups. For example, a White quarterback may show performance improvement merely because he is aware of the stereotype that Blacks are not as athletically intelligent as Whites. Walton and Cohen further suggest that stereotype lift may even occur when such stereotypes are not explicitly mentioned, reflecting the automatic nature of how stereotypes affect behavior. It should be noted that in the work of Stone et al. (1999) noted earlier, positive stereotypes made salient about Whites ("sports intelligence") and Blacks ("natural athletic ability") while performing a golf task did not enhance performance relative to White and Black individuals who did not receive this information. Thus the pervasiveness of stereotype lift in sport has yet to be established.

However, given that stereotype threat is a viable phenomenon in both sport and academic domains, it seems likely that stereotype lift occurs across domains as well.

If stereotype lift does occur in sport, how might it happen? Although stereotype threat may induce experts to attend to their motor skill performance, this attention may have different effects depending on where it is allocated. For instance, if experts devote this additional attention to higher-level activities (e.g., strategizing about future moves and game plans) rather than on lower-level, more-proceduralized actions (e.g., concentrating on how their wrist is positioned as they hit a drive in golf), their performance may actually improve. Indeed, Kanfer and Ackerman (1989) demonstrated that allocating attention to performance outcomes and goal attainment, self-evaluation, and self-reactions enhances skill execution at later stages of learning and higher levels of proficiency. It may be that providing a positive performance stereotype increases self-efficacy and confidence in task performance, which in turn increases the attention that individuals devote to higher-level and metacognitive aspects of performance. Indeed, focusing on more-abstract, higher-level goals is thought to be especially likely when performers expect and experience success rather than failure (Vallacher & Wegner, 1987).

Another possible mechanism by which activating positive self-relevant stereotypes improves performance may be through direct priming (for a review, see Bargh & Chartrand, 1999). Work by Dijksterhuis and van Knippenberg (1998) has shown that priming "college professor" in college students leads to better performance on trivia questions (relative to a control condition). This is presumably because the activation of social categories associated with intellectual ability has a direct impact on behavior in ways congruent with the activated mental associations. In essence, the priming of a highly intellectual group leads to better intellectual performance. Although such direct priming effects can occur for people who are not members of the activated social groups, it is reasonable to assume that group members are especially likely to be aware of, and thus show effects resulting from, the priming or salience of positive stereotypes associated with their social groups.

This raises another interesting question: How do people think about their group memberships? People are often thought of as members of a single social group (e.g., women, Latinos). Yet in reality individuals are members of multiple social categories (e.g., Asian women, Black men). Thus it may be important to consider the specific aspects of one's social memberships that are implicated by stereotype threat. For example, consider a situation in Major League Baseball where a Cy Young Award winning left-handed pitcher is facing a right-handed batter in a crucial at-bat in the playoffs. If the pitcher thinks about himself as a "southpaw" or left-hander, the negative stereotype that left-handed pitchers perform poorly when pitching to right-handed batters may become salient and the pitcher may experience stereotype-induced performance failure. On the other hand, if the pitcher thinks about himself as a Cy Young Award winner, the positive stereotype (being an elite baseball pitcher) may prevail, leading to performance improvement.

Although such a possibility has yet to be explored in sports, there is some initial evidence for this dissociation in more academic domains. Shih et al. (2002) had Asian women perform math problems either after reflecting on their gender (activating a negative stereotype that women are poor at math) or after reflecting on their ethnicity (activating a positive stereotype that Asians are good at math). Consistent with the scenario regarding the left-handed Cy Young winner proposed above, performance on the math problems suffered when women reflected on their

gender, but improved when women thought about their ethnicity. This finding reveals that the way in which people categorize themselves can significantly alter the impact that performance stereotypes have on skill execution.

Finally, in addition to thinking about how stereotypes might affect performance, it is also important to consider the consequences of stereotype threat. First, stereotype threat may induce a self-fulfilling prophecy in which negative performance stereotypes lead to poor performance, which in turn perpetuate the stereotype. Second, stereotype threat may also result in withdrawal from the performance domains in which the negative stereotypes occur (Steele, 1997) or in reduced effort in the stereotyped skill area (Stone, 2002). Steele (1997) suggests that the proportion of women pursuing careers in science is low and continues to drop at various points along the path to career success, from undergraduates to graduates to professionals, possibly due to stereotype threat. Parallels to this may exist in sport as well. For example, the number of Blacks in professional golf and other sports thought to implicate athletic intelligence is surprisingly low. And to the extent that negative athletic stereotypes steer individuals away from challenging these notions, a self-perpetuating cycle is maintained.

In conclusion, stereotype threat is a robust phenomenon that occurs across diverse social groups and task domains. Yet, although stereotype threat work is abundant for academic, cognitively-based tasks, less is known about its impact and the cognitive mechanisms by which it operates in sports skills. More research is needed to help us gain a better understanding of the role that negative stereotypes play in explaining less-than-optimal performance in sports. It is our hope that such work will not only shed light on the implications of stereotype threat in motor skills, but that it will ultimately lead to the development of training regimens that alleviate the unwanted effects of stereotype threats.

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Acknowledgment: This work was supported by NIMH Grant MH068279.

Manuscript submitted: October 16, 2003; *Revision accepted:* July 15, 2004