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**Article (Accepted version)  
(Refereed)**

**Original citation:**

Martiny, Sarah E., Gleibs, Ilka H., Parks-Stamm, Elizabeth J., Martiny-Huenger, Torsten, Froehlich, Laura, Harter, Anna-Lena and Roth, Jenny (2015) *Dealing with negative stereotypes in sports: the role of cognitive anxiety when multiple identities are activated in sensorimotor tasks*. *Journal of Sport & Exercise Psychology*, 37 (4). pp. 379-392. ISSN 0895-2779

DOI: [10.1123/jsep.2014-0284](https://doi.org/10.1123/jsep.2014-0284)

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Available in LSE Research Online: December 2015

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Counteracting Negative Stereotypes in Sports: Examining the Impact of Multiple Identities  
on Sensorimotor Tasks

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*Authors' note:* We thank Miriam Haase and Karin Ott for their help with the development of the materials of the experiment and the data collection.

\*\*\*\*Accepted for publication in: *Journal of Sport and Exercise Psychology*\*\*\*\*

### Abstract

Based on research on stereotype threat and multiple identities, this work explores the beneficial effects of activating a positive social identity when a negative identity is salient on women's performance in sports. Further, in line with research on the effects of anxiety in sports, we investigate whether the activation of a positive social identity buffers performance from cognitive anxiety associated with a negative stereotype. Two experiments tested these predictions in field settings. Experiment 1 ( $N = 83$ ) shows that the simultaneous activation of a positive (i.e., member of a soccer team) and a negative social identity (i.e., woman) led to better performance than the activation of only a negative social identity for female soccer players. Experiment 2 ( $N = 46$ ) demonstrates that identity condition moderated the effect of cognitive anxiety on performance for female basketball players. Results are discussed concerning multiple identities' potential for dealing with stressful situations.

**Word count abstract: 148**

**Word count text: 7654**

**Key words:** stereotype threat, multiple identities, sensorimotor tasks, sports, cognitive anxiety, gender

### Counteracting Negative Stereotypes in Sports:

#### Examining the Impact of Multiple Identities on Sensorimotor Tasks

Women in sports face many stereotypes (Chalabaev, Sarrzin, Fontayne, Boiché, & Clement-Guillotin, 2013) including those that ‘sports are for men’ or that they cannot play football (basketball, etc.) well. Stereotype threat research has shown that the activation of a negative stereotype in a performance situation can lead to a decrease in performance for stereotyped group members (e.g., Steele & Aronson, 1995). Negative stereotypes can be activated by highlighting a specific social identity of a person (e.g., Steele & Aronson, 1995); in sports, highlighting a woman’s gender identity activates negative stereotypes about women’s athletic abilities.

Even though numerous studies have investigated stereotype threat effects in the cognitive domain (overview by Inzlicht & Schmader, 2012), much less is known about stereotype threat effects in the sensorimotor domain (overview by Stone, Chalabaev, & Harrison, 2012). In the present work we extend previous research by combining theories on stereotype threat and multiple social identities to predict outcomes in sensorimotor tasks. We investigate the consequences of the simultaneous activation of multiple social identities compared to the activation of only one (negative) social identity on females’ performance in complex sensorimotor coordination tasks (e.g., soccer dribbling and basketball shooting). Additionally, we examine the role of cognitive and somatic anxiety in the classic stereotype threat situation compared to one in which also a positive identity is activated. We argue that whereas cognitive anxiety negatively affects performance in the classic stereotype threat condition, this relationship disappears when a positive social identity is also made salient.

#### **Multiple Identities and Stereotype Threat**

The fact that every person belongs to a variety of different groups and thus possesses multiple social identities (e.g., being a woman, a mother, a researcher, a psychologist, and a soccer player) was often overlooked in early stereotype threat research. However, this is important as work in the social identity tradition (Tajfel & Turner, 1979) has shown that people have a strong motivation to see themselves and the group they belong to positively (i.e., have a high group-based self-esteem; e.g., Taylor & Brown, 1988). This means that when negative performance-related stereotypes are activated about a specific ingroup, group members are likely motivated to leave this negative group in order to join more positively stereotyped groups when this is possible (e.g., Ellemers, Spears, & Doosje, 1997). These findings are in line with recent research that investigated the consequences of the activation of multiple identities in stereotype threat situations. This research shows that the activation of an additional positively stereotyped social identity can reduce the deleterious effects of the activation of a negatively stereotyped social identity on performance in the cognitive domain (e.g., Gonzales, Blanton, & Williams, 2002; Gresky, Ten Eyck, Lord, & McIntyre, 2005; R. J. Rydell, McConnell, & Beilock, 2009; R. J. Rydell, Rydell, & Boucher, 2010). The positive effect of the simultaneous activation of a positive identity can be explained by social identity theory (Tajfel & Turner, 1979) as it enables group members to restore their positive self-esteem by focusing on the positively stereotyped group.

In the current research, we extend this work from cognitive-performance tasks to sensorimotor tasks. Even though cognitive performance is important in many areas of everyday life (e.g., workplace, schools), sensorimotor coordination is what actually gets us through everyday life. It is the basis of mundane actions like grabbing a cup or crossing a street and more complex actions like operating a car or propelling a ball into a small basket.

Besides the importance of sensorimotor coordination for important daily tasks like operating a car, being physically active (e.g., as a member of a sports team) has been shown to have positive effects on people's health and wellbeing in general (e.g., Bize, Johnson, & Plotnikoff, 2007; Fox, 1999; Hassmen, Koivula, & Uutela, 2000). Furthermore, many stereotypes regarding the ability of different groups in certain kinds of sensorimotor tasks exist (e.g., the poor ability of women compared to men in driving; e.g., Yeung & von Hippel, 2007). Thus, it is important to investigate stereotype threat effects in the sensorimotor domain. In the present work we examine whether the simultaneous activation of a positively stereotyped identity can eliminate the deleterious effects of a negatively stereotyped identity on performance in complex sensorimotor tasks.

### **Stereotype Threat Effects in Sports**

One important area in which the effects of negative stereotypes on performance in sensorimotor tasks have been studied is the sports domain. For example, early studies investigating stereotype threat effects in sports asked African-American and White American participants to perform a golf putting task (Stone, Lynch, Sjomeling, & Darley, 1999). In detail, Stone et al. (1999) labeled the exact same task either as being diagnostic for "sports intelligence" or as measuring "natural athletic ability." In the first case, African-American participants performed worse than White American participants as intelligence is stereotypically associated more strongly with Whites than with African-Americans. However, in the second condition African-Americans outperformed Whites as athletic ability is stereotypically associated more strongly with African- than with White Americans.

Stereotype threat also affects women's sport performance; research has shown that women dribbled slower through a difficult soccer course when the task was labeled either as

measuring athletic ability or technical soccer ability compared to when it was labeled as sports psychology (Chalabaev, Sarrazin, Stone, & Cury, 2008). Again, this is assumed to be the result of the prevailing stereotypical belief that women in general are worse than men in athletic and technical domains compared to “psychology”-related domains. Similar performance-hindering effects for females have also been found in golf (Stone & McWhinnie, 2008), basketball (Hively & El-Alayli, 2014; Laurin, 2013), and tennis (Hively & El-Alayli, 2014). In the following section we will turn to factors that contribute to such performance-hindering effects and how they might be diminished by the activation of positive identities.

### **Mechanisms Underlying Stereotype Threat**

In the domain of cognitive performance, stereotype threat and its underlying processes have been intensively studied in the last decades (reviewed by Inzlicht & Schmader, 2012; Schmader, Johns, & Forbes, 2008). Recently researchers systematically examining the role of underlying processes have argued that the activation of negative performance-related stereotypes increases uncertainty and vigilance for threat-related cues (see Schmader et al., 2008 and Schmader & Beilock, 2012 for a review), which trigger threat-related interpretations of the achievement situation. The processes underlying stereotype threat in sports and sensorimotor tasks in general have not yet been studied in detail. This is surprising considering the importance of sensorimotor tasks in everyday life (e.g., Yeung & von Hippel, 2007).

Increased uncertainty, vigilance for threat-related cues, and threat-related interpretations of achievement situations due to negative stereotypes are manifestations of anxiety experienced in the performance situation. The role of anxiety in general— independent

of the activation of negative performance-related stereotypes— has been investigated in detail in sports research. Especially important for the present work is the distinction made between cognitive anxiety and somatic anxiety (Martens, Burton, Vealey, Bump, & Smith, 1990). Cognitive anxiety is defined as “negative expectations and cognitive concerns about oneself, the situation at hand, and potential consequences” (Morris, Davis, & Hutchings, 1981, p. 541). This definition highlights the role of cognitive anxiety as a process leading to stereotype threat effects: uncertainty in the form of cognitive concerns can lead to vigilance of threat-related cues and threat-related interpretations of the situation and one’s performance. Somatic anxiety refers to physiological arousal (Woodman & Hardy, 2003). Somatic anxiety reaches its peak at the onset of a task and then descends during task performance (Martens et al., 1990), whereas cognitive anxiety is high during the entire task performance. Research has shown that cognitive anxiety is more consistently and strongly related to sports performance than somatic anxiety (review by Morris et al., 1981).

Thus, as the activation of negative performance-related stereotypes especially increases the vigilance to threat-related cues and threat-related interpretations of performance and failure which otherwise might have been interpreted as normal setbacks (see Schmader et al., 2008 and Schmader & Beilock, 2012 for a review), the negative effect of cognitive anxiety on sports performance should be especially pronounced when negative performance-related stereotypes about one’s ingroup are salient. This should be the case because when threatened, group members are more attentive to threat-related cues (Schmader & Beilock, 2012) and monitor their actions in order to avoid mistakes (Beilock, Jellison, Rydell, McConnell, & Carr, 2006). Being more attentive to threat-related cues and monitoring one’s actions in order to avoid mistakes can have negative effects on performance in sensorimotor



tasks because increased attention to proceduralized task control can hinder performance as it disrupts the otherwise fluent, automatic execution (e.g., Beilock et al., 2006; Langer & Imber, 1979). Ambiguous cues and anxious thoughts interpreted in the light of a negative stereotype (Barrett & Swim, 1998) would therefore be more likely to hinder performance.

However, as outlined earlier, when a positively stereotyped social identity is simultaneously activated along with a negatively evaluated identity, group members have the possibility of focusing on a part of their self that is associated with high performance in the target domain in order to protect their self-esteem (Tajfel & Turner, 1979). Although still concerned about themselves, their performance and the situation at hand, with the additional activation of a positive identity (compared to the presence of only a negative identity) it is more likely that ambiguous cues and cognitive concerns will not be interpreted as threatening or portending failure, and thus the negative effect of cognitive anxiety on performance should be reduced or even disappear.

### **The Present Research**

In the present work we examine sports performance outcomes under stereotype threat when a positively stereotyped social identity is activated along with a negative stereotype. Based on social identity theory (e.g., Tajfel & Turner, 1979) in combination with recent developments in stereotype threat theory (Inzlicht & Schmader, 2012; Schmader et al., 2008), we derived two main predictions: First, we predict that activating only a negatively stereotyped social identity will lead to lower performance compared to the simultaneous activation of a negatively and a positively stereotyped social identity. Second, we predict that the activation of this positively stereotyped social identity buffers women's performance

from the negative effect of cognitive anxiety associated with stereotype threat (a moderation effect).

### **Pilot Study: Negative Stereotypes about Women in Sports**

The activation of negative performance-related stereotypes can only decrease performance if the targeted group members know about the stereotype (e.g., Aronson, Quinn, Spencer, 1998). Importantly however, research has shown that targeted group members do not need to believe themselves in the stereotype (e.g., Betz, Ramsey, & Sekaquaptewa, 2013; Huguet & Regner, 2009). For example, work by Huguet and Regner (2009) showed stereotype threat effects in math for middle-school girls even when they did not believe in the negative stereotype about women and math. In the light of these findings, we conducted a pilot test to make sure that our research involved sports in which negative stereotypes about women are widespread.

In an online questionnaire we asked 107 German university students ( $M_{\text{age}} = 25.20$ ,  $SD = 5.56$ ; 75 female, one missing), who were informed about the procedure of the study and their rights as participants before starting the study, to indicate their personal beliefs and what they believe are widespread opinions about sports in general and about specific team sports (i.e., soccer, basketball, volleyball, and field hockey). We assumed that our participants would see soccer and basketball as more typically male than volleyball and field hockey, and therefore a stronger negative stereotype about women's performance would exist about the first than the latter two. Additionally we predicted that the first two team sports would be seen as more stereotypically male than sports in general. To test these predictions, we measured participants' agreement with the following statements: "I believe that men have higher abilities in sports/soccer/basketball/volleyball/field hockey than women."; "I believe

that the opinion that men have higher abilities in sports/soccer/basketball/volleyball/field hockey than women is widespread.”; “In my opinion sports in general/soccer/basketball/volleyball/field hockey is a ‘men’s sport’.” (all items ranging from *I do not agree = 1* to *I totally agree = 7*). We further assessed whether participants actively played sports and demographics. Of the sample, 31 participants reported that they were active members of sports teams, including volleyball, handball, skiing and dancing. We computed paired samples *t*-tests for the comparisons between different sports. As can be seen in Table 1, participants perceived it as more of a widespread opinion that men have higher ability levels than women in soccer and basketball compared to volleyball and field hockey and to sports in general. Interestingly however, participants perceived negative stereotypes about women’s soccer ability to be even more widespread than negative stereotypes about women’s basketball ability. However, they perceived soccer and basketball to be significantly more a men’s sport than volleyball and field hockey.<sup>1</sup> Based on these results, we decided to investigate stereotype threat effects for female members of soccer clubs in amateur leagues in the first experiment and female members of basketball teams in the second experiment.

### **Experiment 1: Effects of Multiple Identities on the Performance of Female Soccer Players**

The aim of the first experiment was to test in a field setting whether activating a positive social identity in addition to a negative social identity would indeed lead to higher soccer performance among women compared to activating a negative social identity alone. An identity salience manipulation (e.g., Stone, Harrison, & Mottley, 2012) was selected for its high ecological validity as identity is often highlighted this way—unintentionally—in real life performance situations. We collected the data by visiting the soccer teams’ regular

practice and compared a single (negative) identity condition with a multiple (negative and positive) identity condition.

## Method

### Participants and Design

Eighty-five females from nine female soccer teams from Southern Germany participated voluntarily. All soccer teams played in the same level amateur league. Eighty-three participants were 16 to 44 years old ( $M = 20.84$ ;  $SD = 4.84$ )<sup>2</sup>.

We used one experimental factor with two levels (stereotype activation: single identity vs. dual identity). In the *single identity condition* only a negatively stereotyped social identity was activated (i.e., woman); in the *dual identity condition* a negatively and a positively stereotyped social identity were activated (i.e., woman and member of a soccer team). The time to complete a dribbling soccer course was assessed as the dependent variable.

### Procedure

The procedures of the experiment were in line with the Ethical Principle of the WMA Declaration of Helsinki. In line with research regulations in Germany, no formal approval was required by the Institutional Review Board of the university previous to the experiment because there was no reason to assume that the procedures could entail any lasting harm or risks for the participants. Two female undergraduate students administered the experiment during regular soccer practice. The experiment took place on a small part of the soccer field (15 m x 5 m). The experimenters first prepared the setting for the study (table with first questionnaire, dribble course, table with second questionnaire), while the soccer players warmed up individually. Before the experiment started, participants received verbal information about the procedure of the study, voluntary participation, their rights as

participants and the anonymity of the data collection. They then gave verbal consent directly before the data collection started. Further, before filling out the first questionnaire, participants again read information about the anonymity of the study. In addition, the coach of each team gave approval to data collection. After the experiment, all participants received detailed information about the hypotheses.

Participants were then told that their main task would be to dribble through a course as quickly as possible. Participants were instructed that if they made a mistake while dribbling through the course, they had to return to the point where the mistake was made and continue from there. They were informed that this task was used by the DFB (Deutscher Fußball Bund; German Soccer Association) to select professional soccer players. They were also told that before and after the dribbling task they would be asked to fill out a questionnaire.

One of the experimenters then dribbled through the course to demonstrate the task. Afterwards, each participant received an index card that randomly assigned her to one of the two conditions and determined the order of participants. The experimenters were blind to condition. Participants were individually called to fill out the first questionnaire, and then they were asked to dribble through the course; directly afterwards they filled out the second questionnaire. Participants were instructed not to communicate with each other during the experiment. The participants who had not yet participated started their regular soccer practice instructed by the coach. Participants who had finished the experiment continued their soccer practice on a separate field. The experiment took between 5 and 10 minutes per participant.

### **Identity Activation**

The first questionnaire contained the stereotype activation. Independent of condition, all participants were asked to first generate a confidential code to link the two questionnaires

and their performance. Below the generation of the code, a drawing of the course was presented within which the dribble route was marked. The identity activation procedure followed. Participants in the *single identity condition* were asked to answer four items adopted from the identification measure used by Doosje, Branscombe, Spears and Manstead (1998) concerning their identification as women (e.g., “I identify with women”; “I like being a woman”; “Being a woman is an important part of myself”; “I feel addressed when statements about ‘women’ are made”;  $\alpha = .70$ ) on a seven- point Likert scale ranging from *I do not agree (1)* to *I totally agree (7)* with the goal of making the negative identity (i.e., woman) salient. Participants in the *dual identity condition* were additionally asked to answer the same four items concerning their identity as a member of a soccer team ( $\alpha = .84$ ). Thus, in addition to activating the negatively stereotyped identity as a woman, the positively stereotyped identity as a member of a soccer team was activated. To control for order effects, the presentation of the identification items in the dual identity condition was counterbalanced.

### **Performance Task**

The participants’ task was to dribble through a course as fast as possible and without making mistakes. The course was developed by the DFB (German Soccer Association) to select talented players (Deutsche Sporthochschule Köln [German Sport University Cologne], 2006). The slalom poles were positioned 1.5 m away from each other which makes it difficult to dribble through them quickly. The task was designed to require both concentration and ball-handling skills.

The procedure was as follows: One experimenter placed the ball on the start line and started the timer when the participant crossed the line. The time measurement ended as soon

as the participant crossed the end line. When a participant made a mistake (i.e., lost the ball), she had to return to the point where she had lost the ball and continue from there.

### **Questionnaire**

After dribbling through the course, participants filled out a second questionnaire. We again assessed identification with both groups using the same items as in the pretest questionnaire (identification as women:  $\alpha = .78$ ; identification as a member of a soccer team:  $\alpha = .78$ ) participants' knowledge about the negative stereotype of women in soccer ("I think that many people believe that men play better soccer than women."), years as an active member of a soccer team, and whether participants had any recent injuries or illnesses. In addition, we asked participants to report demographics such as their high school grade in sports and age.<sup>3</sup>

## **Results**

### **Checks and Data Screening**

Because 13 participants reported either severe injuries or illness and thus were not able to perform the dribbling task as they normally would, their data were excluded from the following analyses (single identity condition:  $n = 5$ , dual identity condition:  $n = 8$ ).<sup>4</sup> The data of 70 participants remained in the analyses. In line with earlier stereotype threat research (e.g., Steele & Aronson, 1995) we aimed at controlling for prior ability level in the following analyses. As the dribbling task required advanced ball-handling skills acquired through soccer practice, we first tested whether participant's years as an active player on a soccer team was a valid measure of prior ability. Thus, we correlated each participant's years as an active player on a soccer team with performance in the dribbling task. As expected, the more years participants reported to have been a member of a soccer team, the faster they dribbled

through the course,  $r(70) = -.39, p = .001$ , independent of condition. This supported the use of years as an active player on a soccer team as a valid indicator of prior soccer ability.

To make sure that the female identity activation did indeed activate a negative stereotype concerning their soccer abilities, we tested whether participants' acknowledgment of a stereotype about men's better ability in soccer significantly differed from the scale midpoint. As predicted, participants strongly agreed with the statement that many people believe that men play better soccer than women ( $M = 6.56, SD = .91$ ),  $p < .001$ .

### **Performance**

We predicted that the activation of a negatively stereotyped social identity (i.e., gender) would lead participants to perform worse (i.e., slower course completion) than those with a simultaneous activation of negatively and positively stereotyped social identities (i.e., gender and member of a soccer team) as the positively stereotyped social identity would neutralize the effect of the negatively stereotyped identity. To test this prediction, we used a linear regression with identity activation condition as predictor (1 = single identity condition, -1 = dual identity condition), including the z-standardized number of years played as covariate and time (in seconds) needed for the task as the criterion. The linear regression model was significant,  $F(2,67) = 9.44, p \leq .001$ , explaining about 22% of the variance. Not surprisingly, the regression coefficient for prior ability level was significant,  $\beta = -.41, t(67) = -3.75, SE = 0.14, p < .001, 95\% CI [LBCI: -0.822, UBCI: -0.251]$ ; the more years participants played, the faster they completed the course. Importantly, the regression coefficient for identity activation condition was also significant,  $\beta = .26, t(67) = 2.42, SE = 0.14, p = .018, 95\% CI [LBCI: 0.060, UBCI: 0.629]$ . Descriptive statistics indicated that participants in the dual identity condition ( $M = 13.58, SE = 0.20$ ) completed the course significantly faster than



participants in the single identity condition ( $M = 14.27$ ,  $SE = 0.20$ ; for the correlations between the identification measures and performance see Table 2).

### **Discussion**

The present results show that an alternative positive social identity can eliminate the deleterious effects of negative stereotypes in sports. This is first evidence that multiple social identities can eliminate the stereotype threat effect in sensorimotor tasks. We demonstrated that the additional activation of a positive identity benefits group members' performance compared to only activating a negatively stereotyped identity. This result is parallel to R. J. Rydell et al.'s. (2009) finding that dual identities can help to restore high cognitive performance in the face of negative stereotypes. The present study provides the first empirical evidence that dual identities might function in a similar way in sensorimotor domains.

Importantly, the present experiment was conducted in a field setting. That is, the female soccer players performed on a soccer task at the same place they normally practice for their matches and play matches. This ensured high ecological validity and thus makes it even more likely that the results are transferable to everyday life performance situations in sports.

### **Experiment 2: The Moderating Role of Identity Salience on the Relationship between Cognitive Anxiety and Women's Performance in Basketball**

The aim of the second experiment was to examine how the addition of a positive social identity to an activated threatening identity interacts with the cognitive anxiety elicited by a performance situation. On the one hand, the addition of a positive social identity might eliminate or reduce cognitive anxiety itself (as seen in main effect improvements in working memory capacity following dual identity activation; R. J. Rydell et al., 2009). On the other hand, a positive social identity might provide a non-threatening interpretation of the anxiety

(Ben-Zeev, Fein, & Inzlicht, 2005; G. Jones, Hanton, & Swain, 1994). As outlined earlier, we argue for the interpretation hypothesis because in competitive, public achievement situations in sports (with an activated negative stereotype in both conditions), cognitive anxiety should be high in both conditions. However, what may differ between the two conditions through the activation of this second positive identity is the interpretation of this anxiety for performance (G. Jones, Swain, & Hardy, 1993). More precisely, we hypothesize that the mean level of cognitive anxiety will be the same in the two identity conditions, but the relationship of cognitive anxiety to performance will differ. This means that if only a negative social identity is activated this will increase group members' monitoring of threat-related cues (Schmader & Beilock, 2012) and their monitoring of their own actions in order to avoid mistakes (Beilock et al., 2006). This will lead them to interpret encountered cues and cognitive concerns as indicating their failure and consequently hinder performance. However, when a positive social identity is activated simultaneously, group members may protect their self-esteem by relying on the positively stereotyped social identity (Tajfel & Turner, 1979). They might not think "Oh no, I missed, women just can't do basketball!" but "Oh no, I missed, never mind, every good basketball player misses once in a while." Thus, we predict an interaction: The effects of cognitive anxiety on performance will be moderated by identity salience. In this case, cognitive anxiety would predict performance in the negative identity condition, but not in the dual identity condition.

In the present experiment we assessed not only cognitive anxiety but also somatic anxiety, as researchers have argued that physiological arousal contributes to the decrease in performance observed in stereotype threat situations (e.g., Schmader et al., 2008). However, as research in the sports domain has consistently found that cognitive anxiety is more

strongly related to performance than somatic anxiety (for a review see Morris et al., 1981), we hypothesized that the moderation of stereotype activation on performance should be stronger for cognitive anxiety than for somatic anxiety.

## Method

### Participants and Design

Sixty-two females from seven female basketball teams from Southern Germany, present in their regular practice and willing to contribute, participated. All basketball teams played in the same level amateur league. Three of the teams consisted of junior players (16 to 19 years old<sup>5</sup>), and the other teams were adult players, 18 years and older. Overall, the remaining forty-six participants were 16 to 49 years old (one missing;  $M = 21.76$ ;  $SD = 7.80$ ).

In this experiment we used one experimental factor (stereotype activation: single identity vs. dual identity) and one quasi-experimental factor (level of cognitive anxiety). Again, in the *single identity condition* only a negatively stereotyped social identity was activated (i.e., woman); in the *dual identity condition* a negatively and a positively stereotyped social identity were activated (i.e., woman and member of a basketball team). Performance was measured on a shooting task completed under time pressure. We used number of baskets (i.e., accuracy) and time needed to complete the task as dependent variables.

### Procedure

Two female university students administered the experiment during regular basketball practice. The experiment took place on the basketball court. The experimenters first set up the experiment (bench on the side with first questionnaire, tape on the ground to mark the four sectors next to the zone in front of the basket, bench on the other side with second

questionnaire) while participants warmed up for 20 minutes. During the warm up, players did not attempt any shots at the basket to ensure that their performance in the following experiment was not influenced by prior success or failure feedback. Then as in Experiment 1, the procedure of the study and their rights as participants were explained in detail to the players and they gave verbal consent. In addition, the coach had given consent before data collection. Afterwards participants received detailed information about the experiment. The procedure of the study was explained as follows: First they would fill out the first questionnaire, and then they would perform the task. In this task they had to take ten shots at the basket from different positions under time pressure. After performing this task the players filled out the second questionnaire. Then the task was demonstrated by one of the experimenters.

Participants were randomly assigned to one of the two conditions and were individually called to fill out the first questionnaire. The experimenters were blind to condition. Further, participants were instructed not to communicate with each other during the whole experiment. The participants who had not yet participated started their regular basketball practice on the other half of the court instructed by the coach. Participants who had finished the experiment continued their basketball practice separately. The experiment took between 5-8 minutes per participant.

### **Identity Activation**

As in Experiment 1, we used an identity salience manipulation. However, we changed the identification items to more clearly tap into self-stereotyping as one component of social identification (Leach et al., 2008). We also reworded the previously-used items so that our non-academic sample could understand them ("I feel addressed when statements about \_\_\_\_\_

are made”; “Things that concern \_\_\_\_\_ also concern me.”; “When it is a matter about \_\_\_\_\_, I feel addressed.”; “I feel connected to other \_\_\_\_\_”; “I feel like I belong with other \_\_\_\_\_”; women:  $\alpha = .89$ ; member of a basketball team:  $\alpha = .93$ ; female basketball player:  $\alpha = .95$ ).<sup>6</sup> In the single identity condition participants answered these items only concerning women. In the dual identity condition participants answered these items concerning women, members of a basketball team, and female basketball players. We randomized the order in which the items on the positive and the negative identity appeared. The items on the subgroup (i.e., female basketball players) were always included last.

### **Performance Task**

The performance task was an adopted subtask (“Würfe außerhalb der Zone” [Shots outside the zone]) of an established performance diagnostic test in basketball (Der Heidelberger-Basketball-Test, HBT, Bös et al., 1987). This test was developed at the Institute for Sports and Sport Sciences Heidelberg with the goal to evaluate the level of fitness and basic technical skills in basketball.

To conduct this test, the area around the zone was divided by tape on the floor into four equally sized sectors. Participants’ task was to shoot ten times as quickly as possible from one of the four different sectors around the zone. After each shot on the basket they had to choose a new sector so that they didn’t shoot consecutively out of the same sector. The task started when a participant got a ball and was standing in Sector 2 (the one on the left back). The experimenter gave a sign and started the stopwatch and made notes concerning the outcomes of the shot (hit or miss). The time measurement ended as soon as the tenth ball had left the participant’s hand. The *accuracy* (ranging from 0 to 10) and the *time* participants needed to complete the task were the dependent measures.

## Questionnaire

After task performance, participants filled out a second questionnaire. First, we again assessed identification with all three groups using the same items as in the pretest questionnaire (women:  $\alpha = .92$ ; member of a basketball team:  $\alpha = .93$ ; female basketball player:  $\alpha = .93$ ). To measure cognitive and somatic anxiety we translated and adopted the cognitive anxiety and the somatic anxiety subscales of the Revised Competitive State Anxiety (CSAI-2R; Cox, Martens, & Russell, 2003) into German. For each subscale four items were selected (“In the completed basketball task ...”; Cognitive anxiety: “I was concerned that I may not do as well as I could”; “I was concerned about choking under pressure.”; “I was concerned about performing poorly.” and “I was concerned that others will be disappointed with my performance.”;  $\alpha = .77$ ; Somatic anxiety: “I felt jittery.”; “My body felt tense.”; “My heart was racing.”; and “I felt tense in my stomach.”;  $\alpha = .73$ ; all ranging from *I do not agree* = 1 to *I totally agree* = 7). Further, we assessed participants’ knowledge of the existence of the negative stereotype (“I think that the belief that men have better abilities in basketball than women is widespread.”), years as an active member of a basketball team, dominant hand, and whether participants had any recent injuries or illnesses. In addition, we asked participants to report demographics such as their high school grade in sports and age.<sup>7</sup>

## Results

### Checks and Data Screening

Because eight participants reported either severe injuries or illness and thus were not able to perform the task as they normally would, their data was excluded from the following analyses (single identity condition:  $n = 3$ , dual identity condition:  $n = 5$ ; see Footnote 4). The data of 38 participants remained in the analyses.

As the task was assumed to require advanced motor skills that are acquired through basketball practice, we again tested the measure's validity by correlating the years of basketball practice with performance (accuracy and time) independent of condition. As expected, the more years participants reported to have been a member of a basketball team, the more baskets they made,  $r(38) = .48, p = .002$  and the less time they took to finish the task,  $r(38) = -.50, p = .001$ . These correlations support the use of years as an active basketball player as a valid indicator of prior basketball ability.

As cognitive and somatic anxiety were assessed after the experimental manipulation, we tested whether they were influenced by experimental condition. We conducted two linear regressions to test this precondition with effect coded condition (1 = single identity condition, -1 = dual identity condition) as predictor and cognitive and somatic anxiety, respectively, as dependent variable, controlling for prior ability level (z-standardized). Both regressions were not significant, both  $ps \geq .50$ , and no regression coefficients were significant, all  $ps \geq .40$  (for means, *SDs* for each condition and correlations see Table 3), indicating that the mean levels of cognitive and somatic anxiety were not influenced by condition.

To make sure that the female identity activation did indeed activate a negative stereotype concerning their basketball abilities, we tested whether participants' acknowledgment of a stereotype about men's better ability in basketball significantly differed from the scale midpoint. As predicted, participants strongly agreed with the statement that many people believe that men play better soccer than women ( $M = 6.11, SD = 1.43$ ),  $p < .001$ .

### **Performance**

We predicted a two-way interaction between cognitive anxiety and stereotype activation on performance. As outlined earlier, we argued that whereas participants' performance in the single identity condition would be hindered by cognitive anxiety, cognitive anxiety should not affect performance when a positively stereotyped group membership was also made salient. To test this prediction we conducted a linear regression with effect coded condition (1 = single identity condition; -1 = dual identity condition), *z*-standardized cognitive anxiety, and the interaction between condition and cognitive anxiety as predictors, controlling for *z*-standardized prior ability level. The complete regression models were significant for both dependent variables: accuracy (see Table 4):  $F(4,33) = 5.51$ ,  $p = .002$ , explaining about 40% of the variance; and time:  $F(4,33) = 3.54$ ,  $p = .016$ , explaining about 30% of the variance. Further, in line with our predictions, we found a significant interaction effect for accuracy,  $\beta = -.33$ ,  $t(33) = -2.16$ ,  $SE = 0.31$ ,  $p = .038$ , 95% CI [*LBCI*: -1.283, *UBCI*: -0.039]. For time spent on the task the interaction was not significant,  $\beta = .22$ ,  $t(33) = 1.31$ ,  $SE = 1.99$ ,  $p = .20$ , 95% CI [*LBCI*: -1.453, *UBCI*: 6.66]. We then used simple slopes analysis (Aiken & West, 1991) to investigate the interaction effect for accuracy in detail. The simple slope analysis revealed that in the single identity condition the higher participants' cognitive anxiety was, the less accurate they were ( $\beta = -.45$ ,  $p = .008$ ); in the dual identity condition accuracy was not predicted by cognitive anxiety ( $\beta = .22$ ,  $p = .41$ ; see Figure 1). We also conducted simple slope analyses for the time spent on the task to see if the effect points in the same direction. The pattern was not significant, but pointed in the same direction: For participants in the single identity condition, the more cognitive anxiety they reported, the more time they needed to complete the task ( $\beta = .32$ ;  $p = .18$ ); this was not true for the dual identity condition ( $\beta = -.12$ ;  $p = .57$ ).



We conducted the same linear regressions with the two different dependent variables with somatic anxiety (z-standardized) and its interaction with condition as predictors, controlling for prior ability level. In all cases, neither the main effects, nor the interactions between somatic anxiety and condition were significant, all  $ps \geq .10$ .

### **Discussion**

In line with our predictions, we found that the activation of an additional positive social identity buffered participants from the negative effect of cognitive anxiety on performance. This means that cognitive anxiety negatively predicted performance (i.e., accuracy of the shots) only in the condition where only a negative social identity was salient. As predicted and in line with earlier research demonstrating that cognitive anxiety is more closely related to sport performance than somatic anxiety (review by Morris et al., 1981), somatic anxiety did not have an effect.

Importantly, even though the experiment had relatively low statistical power, we found a significant interaction and simple slope for participants' accuracy when shooting on a basket. However, when examining the second outcome variable (time spent on the task), we only found non-significant effects in the same direction. The small number of participants in this study left us with limited statistical power to test this hypothesis. However, the pattern of the results rules out a speed-accuracy trade-off as an alternative interpretation of our accuracy findings. To examine whether a positive social identity buffers individuals from the effect of cognitive anxiety on accuracy as well as time spent on the task, future research should examine this research question with a larger sample.

In line with past research demonstrating that the activation of a negative stereotype affects performance through distracting thoughts and cognitive concerns (e.g., Cadinu,

Maass, Rosabianca, & Kiesner, 2005), the current study suggests that dual identity activation disrupts the negative effect of cognitive anxiety on performance by providing individuals with a different framing and interpretation of their cognitive anxiety, rather than reducing levels of cognitive anxiety. As the present research did not assess participants' interpretation of the situation and the anxiety, we suggest future research explore interpretations and framings of anxiety based on one's activated identity (as in the interpretation of anxiety as debilitating or facilitative in G. Jones, Hanton, & Swain, 1994).

### **General Discussion**

The results of the present research show, first, that the activation of a positive identity can buffer women's performance from the effect of a negative social identity in sensorimotor tasks (Experiment 1). Second, the results suggest that a positive social identity achieves this result by protecting threatened individuals from the effect of cognitive anxiety— but not somatic anxiety— on performance (i.e., accuracy of the shots; Experiment 2). Women in both conditions reported moderate levels of cognitive anxiety, but cognitive anxiety only harmed performance when a negative social identity alone was salient. This means that when female players were reminded only of their female identity, the more they were concerned about their performance and the situation, the worse they performed. This relationship disappeared when a positively stereotyped identity was also salient, possibly by giving participants the ability to focus on this positive aspect of the self and thus eliminating the performance-hindering effect of the cognitive concerns. This provides support for theories suggesting that it is not merely worries or concerns but the relationship of these concerns to a negative stereotype (e.g., confirming a negative stereotype; Steele, 1997) that affects performance. These results were obtained in two different sports (i.e., soccer and basketball) in which

strong negative stereotypes about women's performance are widespread as was demonstrated in the pilot study.

In the present work we aimed at comparing the performance of women in sports in a classic stereotype threat condition to women's performance in a multiple identity condition. One might argue that a limitation of the present studies is the absence of a baseline condition. A control condition without the activation of a negative social identity would allow us to evaluate whether the positive identity neutralizes the effect of the activation of the negative identity, as suggested above, by interrupting the effect of anxiety on performance, or if it leads to a stereotype boost relative to the no-identity baseline (Shih, Pittinsky, & Ho, 2012). However, a no-identity baseline in a stereotype threat situation is not meaningful in practice. In a stereotype threat situation, one's negative identity is activated. Thus, in the present research, the activation of a single negative identity served as the baseline in a stereotype threat situation, and the additional activation of a positive identity as the comparison.

In comparing the two experiments, we did not find a significant independent effect of the moderator (identity condition) on performance in the second experiment as we found in the first. This may suggest that the negative stereotype about women's basketball ability is not as impactful for women in Germany as the negative stereotype about their soccer ability. In Germany, soccer is the most popular sport; in a survey conducted in 2014, 34.6% of a German sample said that soccer is their favorite sport (statista, Das Statistik-Portal, 2014; followed by 16% saying boxing), whereas only 4.1 % chose basketball as their favorite sport. Thus, soccer is much more important to Germans than basketball (Gethard, 2006) and very strongly associated with men (i.e., in our pilot study, participants believed the negative stereotype about soccer is significantly more widespread than the negative stereotype about

women and basketball, see Table 1). This suggests the stereotype threat induced by activating a female identity was not as threatening for women's performance on the basketball court as on the soccer field.

In the second experiment, anxiety was measured after task performance because we aimed at measuring participants' actual experience of anxiety, not their anticipated anxiety. Because this was a novel task to participants, we thought it would be difficult for participants to anticipate how they would feel or what they would think during the task, and the field setting made measurement during the task impossible. As our main concern was their actual experience of anxiety, we measured this after the task. However, the interaction between cognitive anxiety and identity condition in Experiment 2 leads to a number of questions to be explored in future research. How does the activation of a second identity buffer women's performance from the effects cognitive anxiety in a stereotype threat situation? As performance can impact post-performance measures of anxiety (McAuley, 1985) and cognitive anxiety can change during performance when feedback is given (Morris & Fulmer, 1976), future research should measure cognitive anxiety before (e.g., G. Jones, Swain, & Hardy, 1993), during (Hatzigeorgiadis, Zourbanos, Mpoumpaki, & Theodorakis, 2009) and after the task to better understand how (and when) the activation of multiple identities buffers women from the effects of anxiety.

What do these results tell us about multiple identities and their psychological role in sports performance and in general? Concerning performance situations, the present work showed that the activation of a positive social identity together with the activation of a negative social identity can eliminate performance decreases even in sensorimotor tasks. These are important results from a practical perspective as activating multiple identities is an

easy to implement intervention in real-life achievement situations in sports. Thus, in a female soccer match no matter which social identities have been activated before, the final sentence of the coach to motivate his or her team should be “You’re women and the best soccer players. Go and beat them!”

In general, social psychologists have argued that larger networks of social identities (multiple identities) provide individuals with a source of ‘social capital’ and function as a psychological resource (J. M. Jones & Jetten, 2011; Putnam, 2000; Thoits, 1983). Individuals whose self-views are characterized by complex multiple identities are particularly buffered against negative effects of stressful events (Gresky et al., 2005; Linville, 1985; see also Iyer, Jetten, Tsivrikos, Postmes, & Haslam, 2009). In addition, J. M. Jones and Jetten (2011) demonstrated that eliciting multiple identities helped individuals persist on difficult cognitive as well as physical tasks. Thus, it seems that multiple social identities do not only buffer against the negative effects of stereotype threat, but in general activating multiple identities helps people to persist and protects them against threats. In light of this, interventions that aim to decrease the risk of stereotype threat could emphasize the restorative function of multiple identities. In addition to deemphasizing threatened social identities (e.g., Danaher & Crandall, 2008) or providing positive role models (e.g., Blanton, Crocker, & Miller, 2000; Marx & Ko, 2012; Marx & Roman, 2002; McIntyre et. al., 2005; McIntyre, Paulson, & Lord, 2003), we can model interventions that emphasize our complexity as social beings and highlight that we have more than one identity to draw strength from.

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## Footnotes

<sup>1</sup>We computed the paired *t*-tests also only for the group of participants being active athletes ( $n = 31$ ), to make sure that the gender-stereotypically of the different sports is also known to athletes. The results remained exactly the same as the results presented in Table 1. As in Table 1, all differences except the difference between “In my opinion soccer is a ‘men’s sport’” and “In my opinion basketball is a ‘men’s sport’” were significant.

<sup>2</sup>Unexpectedly, two girls participated who were younger than 16 years (the legal age to provide informed consent). Their data were excluded from data analyses.

<sup>3</sup>In addition we assessed the following variables: perceived difficulty, effort, soccer-related self-concept, task motivation, domain identification, own belief in the stereotype, how often they played soccer a week, and gender of the coach.

<sup>4</sup>The excluded participants reported moderate to severe injuries or illnesses that would have hindered their performance in the dribbling task. They still showed up at the soccer practice because they felt that they were able to participate in specific parts of the practice not related to speed.

<sup>5</sup>Unexpectedly, sixteen girls participated who were younger than 16 years. Their data were excluded from data analyses.

<sup>6</sup>In the dual identity condition, in addition to the activation of the positive and negative social identity, we also activated the subgroup (i.e., female basketball players). We did so because we wanted a stronger manipulation of the dual identity condition (by priming both separately and together).

<sup>7</sup>In addition we assessed the following variables: masculinity, femininity, pictorial measure of self-categorization (Schubert & Otten, 2002), domain identification, commitment,

domain specific self-concept, motivation, perceived task difficulty, gender of the coach, own belief in the stereotype, and the belief that the stereotype is widespread.