

The Psychological Benefits of Superstitious Rituals in Top Sport

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The Psychological Benefits of Superstitious Rituals in Top Sport:

A Study Among Top Sportsmen

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Abstract

The current research addresses the psychological benefits of superstitious rituals in top sport, examining the circumstances under which top-class sportsmen are especially committed to enacting rituals prior to a game (ritual commitment). Consistent with hypotheses, findings revealed that ritual commitment is greater when (a) uncertainty is high rather than low, and (b) the importance of the game is high rather than low. Complementary analyses revealed that the state of psychological tension mediated both the effect of importance and uncertainty on ritual commitment. Moreover, players with an external locus of control exhibited greater levels of ritual commitment than players with an internal locus of control. The results are discussed in terms of the tension-regulation function of superstitious rituals in top sport.

The Psychological Benefits of Superstitious Rituals in Top Sport:

A Study Among Top Sportsmen

Some football players want to enter the field first, others want to enter the field last, whereas still others want to touch the grass just upon entering the field. And yet some players want to wear the same shirt, the same clothes, or even the same underwear for a long series of matches. It is not difficult to list more examples of what may be termed *superstitious rituals*. In fact, most sportsmen seem to be at least somewhat superstitious, especially those performing at the top. Why is it that seemingly sane sportsmen sometimes act in rather unusual ways before a match? Do they need to engage in such acts in every match? Does it also depend on the team that they are playing? And does it matter whether the stakes are high or low? The present research addresses these questions, thereby seeking to illuminate the broader psychological benefits that top sportsmen may derive from engaging in rather unusual behaviors.

Superstitious Rituals: Broad Explanations

Superstitious rituals are defined as unusual, repetitive, rigid behavior that is perceived to have a positive effect by the actor, whereas in reality there is no causal link between the behavior and the outcome of an event (Womack, 1992). Superstitious rituals differ from a normal routine in that the person gives the action a special, magical significance. However, the distinction between superstition and preparing for the game is not always clear. As noted by Vyse (1997, p. 90): "It is often difficult to draw the line between superstition and useful preparation". For some superstitious rituals it is easy to see they have no function in a useful preparation but most superstitions are hard to distinguish from preparing for performance. A function of rituals might be preparing mentally for each performance. In this sense, rituals seem to serve a rational and useful purpose (cf. Neil, 1980).

How does this superstitious behavior originate and why does it continue? Several possible behavioral and cognitive explanations for superstitious behavior may be advanced. First, one line of reasoning may be derived from classic work by Skinner (1948, 1953), who discovered that superstitious behavior can arise through conditioning. In one of his famous experiments of operant conditioning, Skinner gave pigeons in the so-called “Skinner box” food at irregular intervals. Hence, it was left to chance as to what kind of behavior was being reinforced. The results were astonishing. The pigeons kept doing what they did at the moment the food was administered – for example, a pigeon that just turned its head, continued turning his head, and a pigeon that happened to walk around, continued walking around. The behavior was hard to unlearn, because the reinforcement (food) was administered at irregular intervals. Skinner (1948) labeled this curious behavior superstitious, arguing that: “The bird behaves as if there were a causal relation between its behavior and the presentation of food” (p. 171). In a later article he suggested that seeing a causal relationship between behavior and the “consequences” could also explain the occurrence and maintenance of superstition in humans (Skinner, 1953).

A second, complementary explanation may be derived from Langer and colleagues’ work on illusion of control (Langer, 1975, 1977; Langer & Roth, 1975). Langer stated that, in general, people are inclined to see themselves as a cause, even in situations when they are not influencing the situation. This explanation holds that people carry out superstitious behaviors in order to influence situations in which in reality they have no control. According to Langer, this is especially true in situations where chance as well as skill play a role. In competitive sports, there is always a mixture of chance as well as skill that determine the outcome of a match. Therefore, in these situations people will probably be more prone to the illusion of control and superstition.

Several explanations may be provided to account for the inclination to see “control” (often taking the form of ability or skill) in an event which outcome is completely determined by chance. A

first possibility is that people are inclined to see a causal link between their actions and outcomes, where in fact there is none. This explanation is similar to what Skinner (1948) concluded from his research on pigeons. A second explanation is that people suppose that the world is fair (“just world hypothesis”, Lerner, 1965). The just world hypothesis states that people have a need to believe that their environment is a just and orderly place where people usually get what they deserve and deserve what they get. By fostering this illusion, people can behave as if chance plays no part, and only a direct relationship between behavior and the consequences of behavior exists. A third, more attributional explanation holds that people are generally inclined to attribute success to their skills and abilities, and failure to external circumstances (Feather, 1969). This might be the reason why people are inclined to mistakenly attribute positive outcomes, which in reality occur as a result of luck, to their skills and abilities. Thus, people may by nature be inclined to confuse skill and chance, which may explain why people think they can influence chance or fate by carrying out superstitious rituals.

Situational and Personal Determinants of Superstitious Rituals

The central purpose of the present research is to examine the circumstances under which superstition will be most pronounced, and to examine individual differences in the extent to which people feel the need to carry out superstitious rituals. When will people be most prone to developing superstitious rituals? We will argue that people carry out rituals in an uncertain situation, in which the outcome is not only uncertain, but also important to them. Another question is if differences in personality will influence the extent to which people feel the need to carry out rituals. We will argue that people who differ in locus of control – the extent to which people see the environment as controllable – also differ in the extent to which they feel tension and are self-confident before a game and hence differ in the extent to which they are inclined to be superstitious.

Uncertainty and Importance of the Outcome. An assumption underlying the present research is that the enactment of superstitious rituals serves the function of reducing psychological tension. It should be clear that prior to a game top sportsmen will experience psychological tension, as the game by itself should activate several specific feelings (e.g., feeling restless), thoughts (e.g., self-doubts), or physiological responses (e.g., trembling) that is captured by the concept of psychological tension. We suggest that psychological tension will general vary from opponent to opponent and from game to game.

To begin with, giving that top sport is about winning versus losing, the standing of the other team (opponent) relative to the own team should be an important ingredient in uncertainty. If one is quite confident that one will beat the opponent, then the uncertainty should be low. However, if the other is about equally good or superior to the own team, then the uncertainty should be high. Hence, we assumed that the relative standing of the opponent causes uncertainty, such that uncertainty is high when the opponent is of an equal or a superior standing, but relatively low when the opponent is of an inferior standing. As a result, psychological tension should be greater when the opponent is at least as good as the own team.¹

There is indeed some evidence suggesting that uncertainty regarding future outcome is an important determinant of superstition. For example, it has often been assumed that the illusion of control tends to be more pronounced for situations in which not only skill but also chance plays a substantial role (Langer, 1975, 1977; Langer & Roth, 1975). For example, it has been argued that people may react to uncertain and unpredictable situations with superstitious beliefs or actions (e.g., Malinowski, 1955; Vyse, 1997), thereby suggesting that superstitious rituals are more likely or more pronounced as situations are characterized by more uncertainty regarding the outcome. However, as far as we know, there is virtually no research that is of direct relevance to the link between uncertainty and superstition. The only research we were able to locate was a study by

Bleak and Frederick (1998), which examined the effects of sport anxiety (i.e., involving measures of somatic anxiety, worry, and concentration disruption) on overall use of superstitious behavior. However, this research did not reveal any significant effects of sport anxiety on overall use of superstitious behavior.

In addition to uncertainty regarding outcomes, we suggest that superstition should also be affected by the importance attached to the outcome in a given situation. When the outcomes are not considered very important, individuals should feel more or less relaxed, and the level of psychological tension should be low. In contrast, when the outcomes are considered very important, people should generally experience greater psychological tension (such as feeling nervous and restless, having obsessive thoughts about the game, or having increased blood pressure). For example, sportsmen typically experience greater psychological tension when playing the finals than when playing a training match. As a result, tendencies toward superstition should be greater when the importance of the outcomes is high rather than low.

While this line of reasoning seems plausible (cf. Vyse), to our knowledge there is no research that has assessed the link between importance and superstition. In fact, we know of only one study investigating the effect of importance of success on use of superstitious behavior (Bleak & Frederick, 1998). This study revealed that the importance of success was unrelated to overall use of superstitious behavior, but was related to the degree to which they reported to engage in specific rituals. Perhaps, some more indirect evidence may be derived from research focusing on self-enhancement, the tendency to believe that one is better than and not as bad as others (cf. Sedikides & Strube, 1997). For example, tendencies toward self-enhancement are stronger for situations (or characteristics) that are considered more important (e.g., Greenwald, 1981, Rusbult, Van Lange, Wildschut, Yovetich, & Verette, 2000; Van Lange, 1991) or more threatening to the self (cf. Taylor & Brown, 1988) than for situations that are considered less important or threatening.

While preliminary, the above lines of research add credence to the possibility that individuals are more likely to engage in superstitious rituals to the extent that a situation is characterized by greater uncertainty and to the extent that outcome is more important to the person.

It is important to note that in the one study that examined uncertainty and importance, Bleak and Frederick (1998) measured individual uncertainty and ratings of importance rather than the uncertainty and importance as key features of the situation – that is, they did not compare different situations which presumably differ in terms of uncertainty or importance. The present research sought to extend this research by focusing on situational differences that are experienced by nearly every sportsman. That is, by systematically comparing different situations, the current research examines the effects of situational uncertainty as well as importance of the goals to be reached on the extent to which participants are committed to engaging in rituals – that is, the extent to which they wish or need to engage in ritual, which we refer to as *ritual commitment*.

Situational uncertainty and importance will be manipulated by means of six scenarios in which situations of matches will be described. Situational uncertainty will be operationalized as *relative standing*: It was assumed that participants would feel more uncertainty playing a superior or equal opponent versus a rather weak opponent. Importance is operationalized in terms of the nature of the game the team has to play: The finals (importance of outcome is high) versus a training match (importance of outcome is low). Thus, ritual commitment is expected to vary as a function of both uncertainty and importance of the situation. Moreover, we hypothesized that these effects will be mediated by psychological tension. That is, we expect that psychological tension is enhanced by relative standing as well as by the importance attached to the outcome, and that both effects can at least partially account for their effects on ritual commitment.

Locus of Control. Considerable research has revealed that individuals differ in the extent to which they perceive the environment as controllable. Individuals with an internal locus of

control (“internals”) are inclined to see events as the consequence of their actions whereas individuals with an external locus of control (“externals”) are inclined to see the same events as unrelated to their actions and rather as a consequence of luck, chance, fate, powerful others, or as unpredictable (Rotter, 1966). The concept of locus of control is strongly related to social learning theory. For example, Strickland (1989, p. 1) argued that internal and external orientations of people have to do with “generalized expectancies that reflect consistent individual differences among individuals in the degree to which they perceive contingencies or independence between their behavior and subsequent events”. The locus of control concept is one of the most widely explored concepts in many areas of psychology, and has been associated with behaviors as diverse as social action, (Gore & Rotter, 1963; Sank & Strickland, 1973; Strickland, 1965) coping with diseases, (Reid, 1984), divorce, (Statlender, 1983), and boredom (Schippers, 1998), health-related behaviors, (Strickland, 1978), conformity, (Crowne & Liverant, 1963), and job involvement, (Reitz & Jewell, 1979, for reviews see Furnham & Steel, 1993; Lefcourt, 1976, 1981, 1983, 1984; Strickland, 1989). The general pattern is that, relative to externals, internals experience greater levels of control, lower levels of “learned helplessness” (when challenged), and engage more actively in several coping strategies when problems have arisen (Benassi, Sweeny, & Dufour, 1988; Seligman & Maier, 1967).

However, it is surprising that past research on the relationship between locus of control and superstition has not yielded unequivocal findings. Although most researchers have found that externals are more prone to engage in superstitious rituals (Tobacyk & Milford, 1983, see also Vyse, 1997), there is also evidence in support of the opposite (Van Raalte, Brewer, Nemeroff, & Linder, 1991). We suggest that two lines of reasoning can be advanced to account for these contradictory findings. The first line of reasoning is that externals rely more on superstitious behavior. The rationale for this line of reasoning is that, because externals describe more control

to external factors, they may experience a stronger need to engage in superstitious rituals in order “to influence luck.”

The second line of reasoning involves that internals will rely more on superstitious behavior. The rationale for this line of reasoning is that internals, experiencing greater control, as well as exhibiting greater illusion of control, will try to make the situation more “controllable” by carrying out superstitious rituals. We know of only one (albeit a very interesting) study, which provides some preliminary evidence in support of this line of reasoning. In that study, Van Raalte et al. (1991) first assessed locus of control and then asked participants without experience in playing golf to putt a golf ball. Subjects were free to choose a golf ball from four colors, and had 50 putts each. Superstitious behavior was operationalized in this study as the extent to which subjects chose the same colored golf ball for the next drive after having made a putt. It was found that participants who believed that their actions could control chance were more likely to choose the same colored “lucky” ball after successful putt – hence suggesting that internals are more inclined to engage in superstitious ritual than externals.

Based on the above lines of reasoning and empirical evidence, we advanced two competing hypotheses. One may advance the hypothesis that externals would feel more tension and exhibit greater ritual commitment than internals, or the hypothesis that internals would feel more tension and exhibit greater ritual commitment than externals.

Research Overview and Hypotheses

The major purpose was to examine the situational (relative standing and importance) and person-related determinants (locus of control) of ritual commitment among top-class sportsmen. Relative standing and importance were manipulated in six realistic scenarios. In examining relative standing, we varied three opponents that they would face in a match: An opponent that is believed to be inferior, equal, or superior to their own team, whereby the relative standing was

based on past performance. We assumed that uncertainty (and psychological tension) would be larger when the opponent is superior or equal to their own team than when the opponent is inferior to their own team. In examining importance, we varied between a very important match (i.e., the finals) and an unimportant match (i.e., a training match). Hence, the six scenarios systematically manipulated the relative standing (superior, equal, inferior) and the importance of the match (finals versus training match).

To summarize, we advanced the following hypotheses. First, we expected that when relative standing of the opponent is either superior (high uncertainty) or equal (moderate uncertainty), sportsmen/women will be higher on ritual commitment than when relative standing of the opponent is inferior (low uncertainty) (*Hypothesis 1*). Second, we expected greater levels of ritual commitment when the importance of the outcome is high rather than low (*Hypothesis 2*). Third, we wished to test competing hypotheses regarding the link between locus of control and ritual commitment, predicting that externals would exhibit greater levels of ritual commitment than internals (*Hypothesis 3a*), or, conversely, that internals would exhibit greater levels of ritual commitment than externals (*Hypothesis 3b*). Finally, as alluded to earlier, we expected the extent to which people experience psychological tension before a match to mediate the predicted effects of uncertainty and importance on ritual commitment (*Hypothesis 4*). In a more exploratory vein, we examined whether psychological tension may also illuminate the potential association between locus of control and ritual commitment.

Method

Participants and Experimental Design

One hundred and ninety-seven top-class sportsmen (145 men, 52 women) from 23 top-ranking Dutch football (e.g., Ajax, PSV, Willem II), volleyball (e.g., Piet Zoomers/Dynamo) and hockey clubs (e.g., the Amsterdam Hockey and Bandy club) participated in this study. The age of

the players varied between 15 and 35 (mean age 24 years). The experimental design of this study was tested in a 3 (relative standing: superior vs. equal vs. inferior) by 2 (importance of outcome: high vs. low) by 2 (locus of control: internal vs. external) factorial design, with relative standing and importance of outcome as within-participant variables and locus of control as a between-participants variable.

Procedure

Participants were recruited by contacting the trainers/coaches of top ranking sport teams. Top-ranking sport teams were chosen because it was assumed that in those teams superstitious rituals would be most pronounced (see Neil, Anderson, & Sheppard, 1981)². All but one of the contacted clubs agreed to participate. Only one player refused to fill out the questionnaire, yielding a nearly 100% response rate. Participants were informed that they would be questioned about their superstitions. They then filled out a questionnaire. This took place in the player's home or canteen. For two clubs and one national team the questionnaires were sent by post.

Questionnaires

Locus of control. Twelve questions were selected to measure locus of control (Andriessen, 1971; Rotter, 1966). An example of such a question is: Even if you do your utmost, without luck things will not succeed (1 = not at all true, 6 = true). Cronbach's alpha for the twelve questions was .72.

Superstition. Superstition was measured in several ways. An open question about superstitious rituals stated: "What rituals do you perform before a game?" This question was asked to determine the kind and amount of superstition among sportsmen.

Furthermore two Likert-type questions were asked to assess the extent to which participants perceived themselves as superstitious. These questions stated: "How superstitious do you find yourself in comparison to other sportsmen?" and "How superstitious do other sportsmen find

you?” We used a six-point scale ranging from 1 (not at all superstitious) to 6 (very superstitious). Responses to these questions were highly correlated ($r(158) = .69, p < .001$). Thus, these two items were collapsed to form a scale two-item scale of self-rated superstition.³

Six vignettes were designed in which participants were asked to imagine a certain match. By means of the vignettes the following variables were manipulated:

- (1) *Relative standing*. Relative standing was manipulated by varying the relative strength of the fictitious opposing team, by stating that it was either a team against which their team has lost many of the previous matches (Superior opponent), a team against which their team has won as often as it has lost (Equal opponent) or against an opponent which their team has won most matches from (Inferior opponent).
- (2) *Importance of Outcome*. Importance of the outcome was manipulated by the type of match the participants were asked to imagine. They were either asked to imagine they were about to play the finals (high importance) or a training match (low importance).

An example of a vignette is: “Imagine that you play in the finals. You will be playing another team against which your team has usually lost (e.g., lost seven times, won only once, and the match ended in a draw twice)”. This example outlines the high importance, superior opponent condition. The questionnaire of the volleyball teams was slightly adjusted in that the team, for instance, lost nine times and won only once, because in volleyball a draw is not possible.

Following each vignette, seven same Likert-type questions were asked. The first three included *manipulation checks*. In order to check if the given situations were recognizable, the first question asked whether participants could imagine the vignette for themselves (1 = absolutely not, 6 = absolutely). The second manipulation check asked whether participants expected to win or lose the fictitious match (1 = lose for sure, 6 = win for sure). The last manipulation check asked how important it was for the participants to win the match (1 = not at

all important, 6 = very important). In order to assess *psychological tension* in each situation, they were asked how tense they were before the match (1 = not at all, 6 = very).

Ritual commitment was assessed by two questions. The first asked how annoying they thought it was if, for whatever reason, they were not able to carry out the rituals they mentioned before (1 = not at all annoying, 6 = very annoying). The second asked how important participants found it to carry out the rituals they mentioned before (1 = not at all important, 6 = very important). Responses to the two questions were significantly correlated ($r(158)$ s varied from .83 to .90, all $ps < .001$). Thus, the responses to these two questions were averaged in subsequent analyses.

Demographics. Demographic questions regarded age, gender, level of education and nationality.

Results

Manipulation Checks

We conducted 2 (importance: high vs. low) x 3 (relative standing: inferior vs. equal vs. superior) x 2 (locus of control: internal vs. external) univariate analyses of variance (ANOVA), with ability to imagine the situation outlined in the vignette (judgments of realism), expectations regarding winning or losing and importance attached to winning, respectively, as dependent variables.

Judgments of realism. The results revealed that participants were quite able to imagine the situations outlined in the vignettes (overall mean $M = 4.64$). A main effect for the extent to which participants were able to imagine the situation, showed that participants were best able to depict the situation playing against an inferior opponent, $M = 4.99$. The situation playing against an equal opponent could be imagined to a lesser extent, $M = 4.66$, and the situation playing against a superior opponent, least well, $M = 4.28$; $F(1,152) = 43.75$, $p < .001$. This may be due to the fact

that top-ranked clubs are more likely to face an inferior opponent than a superior or even equal opponent; moreover, such judgments may also be subject to mechanisms causing unrealistic or illusory forms of superiority. No further effects were found to be significant.

Expectations of winning versus losing. For the question about whether participants expected to win or lose the fictitious match, a main effect for relative standing revealed that they were less confident of winning when facing a superior opponent, $M = 4.43$, than when facing an inferior opponent, $M = 5.52$, with intermediate levels when facing an equal opponent, $M = 5.14$; $F(1, 152) = 202.97, p < .001$. These findings are perfectly consistent with the intended manipulation of relative standing, although it seemed that people were quite confident of winning even when facing a superior opponent. Interestingly, though descriptively much smaller than the above effect, a main effect for importance revealed that when importance of outcome is high (i.e., playing finals) participants have higher expectations of winning, $M = 5.10$, than when importance of outcome is low (i.e., playing a training match; $M = 4.97$; $F(1, 152) = 6.15, p < .05$). No further effects were found to be significant.

Importance of winning. For the question about how important it was for the participants to win the match, a main effect for importance revealed that participants find it more important to win the game when the importance of the outcome is high (“playing finals”; $M = 5.68$) rather than low (“playing a training match”; $M = 4.69$; $F(1, 155) = 117.62, p < .001$). No other effects were found to be significant; hence, the findings are perfectly consistent with the intended manipulation of importance of outcome.

Descriptive Statistics: Prevalence of Superstitious Rituals

One hundred and fifty-eight participants (80.3%) mentioned one or more superstitious rituals they performed before a game, with an average of 2.6 rituals per person. The kind of rituals they mentioned varied from wearing the same shoes for every match to eating four

pancakes before a home match. Striking rituals were: Putting a piece of chewing gum in a trampled part of the football pitch, wearing shin guards all the way from home to the place of the game (even when having to wear them for over 70 miles), having to see number thirteen at least once before the game, kissing a football shirt, and smoking a cigarette in the morning before the game. An overview of recurring rituals mentioned by the sportsmen is presented in Table 1. From these results it can be concluded that superstitious rituals are common among top-class players. No differences in kinds or amount of rituals were found between the three sports.

As can be seen in Table 1, it is often hard to distinguish superstitious rituals from useful preparation. As a case in point, participants often mentioned that they did the preparation before the game in a fixed order. Some even described in minute detail all the rituals they performed before the game, from 9.00 A.M. until the onset of the game in the evening. If the ritual consisted of eating special food, they often described the food in detail (i.e., eating steak with mushrooms, two slices of bread with cheese, drinking Red Bull). Warming-up rituals were also abundant: Participants often mentioned they would do the exercises in a fixed order or practice with a set teammate. If they were not able to carry out these rituals, they would feel unhappy about it. Some even mentioned that “things would definitely go wrong” if they didn’t carry out their rituals. Idiosyncratic rituals, which can be seen as “pure rituals” because they have nothing to do with useful preparation for the game, are mentioned under the heading of “other” in Table 1, because these are often quite unique, and therefore do not fit in under the other headings.

Effects of Relative Standing, Importance, and Locus of Control: Hypotheses 1 Through 3

To test Hypotheses 1 through 3, we conducted a 3 (relative standing: superior vs. equal vs. inferior opponent) x 2 (importance: high vs. low) x 2 (locus of control: internal vs. external) analyses of variance on ritual commitment. Consistent with Hypothesis 1, this analysis revealed a main effect for relative standing, $F(2, 312) = 14.83, p < .001$, indicating that when playing a

superior, $M = 3.01$, or equal opponent, $M = 2.98$, ritual commitment is higher than when playing an inferior opponent, $M = 2.84$. As more direct test of Hypothesis 1, planned comparisons revealed a significant contrast of inferior opponent versus equal opponent and superior opponent, $F(1, 156) = 14.83, p < .001$.

Consistent with Hypothesis 2, a main effect for importance of the outcome revealed that when importance was high, $M = 3.27$, ritual commitment was higher than when importance was low, $M = 2.61$; $F(1, 156) = 65.20, p < .001$. There were no significant interaction effects.

Finally, we advanced competing hypotheses regarding the link of locus of control with ritual commitment. Consistent with Hypothesis 3a (and inconsistent with Hypothesis 3b), the analysis revealed that externals, $M = 3.20$, exhibited greater levels of ritual commitment than did internals, $M = 2.69$; $F(1, 156) = 5.29, p < .05$. Thus, individuals who are prone to believe that outcomes are externally determined (rather than determined by themselves) exhibit greater ritual commitment.

The Mediating Role of Psychological Tension: A Test of Hypothesis 4

We hypothesized that psychological tension may mediate the effects of uncertainty (caused by variation in relative standing) and importance, and suggested that it may mediate the link between locus of control and ritual commitment. To test mediation, we need to examine, first, the effects of the independent variables (i.e., relative standing, importance, and locus of control) on psychological tension – the presumed mediating variable. Hence, we conducted a 2 (importance: high vs. low) x 3 (relative standing: superior vs. equal vs. inferior) x 2 (locus of control: internal vs. external) univariate analysis of variance (ANOVA) on psychological tension. The analysis revealed that all effects were significant – and in a manner consistent with hypotheses. First, a main effect for relative standing, $F(2, 312) = 27.32, p < .001$, revealed greater levels of tension for a superior opponent, $M = 3.25$, or equal opponent, $M = 3.28$ than for an

inferior opponent, $M = 2.90$. As a more direct test, planned comparisons revealed a significant contrast of inferior opponent versus equal opponent and superior opponent, $F(1, 156) = 32.32, p < .001$. Second, a main effect for importance, $F(1, 156) = 89.58, p < .001$, revealed greater levels of tension when importance was high, $M = 3.52$, rather than low, $M = 2.76$. And third, a main effect for locus of control, $F(1, 156) = 4.88, p < .05$, revealed that that participants with an external locus of control, $M = 3.31$, exhibited greater tension than individuals with an internal locus of control, $M = 2.98$. There were no significant interaction effects.

Next, we conducted a 3 (relative standing) x 2 (importance) x 2 (locus of control) analysis of variance in which we included psychological tension as a covariate. This analysis revealed, first, that the F -value associated with the contrast of an inferior opponent versus a superior opponent and an equal opponent dropped from $F(1, 156) = 14.83, p < .001$ (in the previous analysis without the covariate) to $F(1, 155) = 7.01, p < .001$. The mediator (psychological tension) caused a significant decline in the strength of the effect of uncertainty, $Z = -3.23, p < .005, p < .005$.

Second, the analysis revealed that the F -value of the effect of importance of outcome declined from $F(1, 156) = 65.20, p < .001$ (in the previous analysis without the covariate) to $F(1, 155) = 10.81, p < .001$, a significant decline, $Z = 5.43, p < .001$.

Third, the analysis revealed that the effect of locus of control remained significant, and did not exhibit a significant decline – from $F(1, 156) = 5.29, p < .05$ (without covariate) to $F(1, 155) = 4.58, p < .05$ (with covariate), a non-significant decline, $Z = -1.32, ns$.

Thus, consistent with Hypothesis 4, psychological tension mediated both the effect of uncertainty (caused by variations in relative standing), and the effect of importance of the outcome. In both cases, we found significant mediation, even though the effect remained significant – evidence in support of partial mediation. The effect of locus of control was not

mediated by psychological tension. Taken together, the present findings suggest that external circumstances regarding the outcome (importance) and the opponent (relative standing) influence psychological tension, which in turn influence the extent to which an individual wishes or needs to enact superstitious rituals.

Discussion

The present research examined situational and person-related influences on ritual commitment among sportsmen, that is, the desire or need to enact superstitious rituals before a match. The results provided good evidence in support of most hypotheses. First, consistent with Hypothesis 1, relative to an inferior opponent, an opponent that was believed to be superior or equal to the own team elicited greater levels of ritual commitment. Second, consistent with Hypothesis 2, ritual commitment was greater when the importance of the outcome was believed to be high (i.e., finals) rather than low (i.e., a training match). Third, locus of control appeared to be significantly associated with both ritual commitment and psychological tension, such that relative to externals, internals exhibited greater levels of ritual commitment and psychological tension (supporting Hypothesis 3a). Finally, consistent with Hypothesis 4, psychological tension appeared to mediate the effects of relative standing and importance on ritual commitment.

The present research makes a unique contribution to the existing literature in that superstition was assessed quantitatively among a large group of top-sportsmen, looking at the combined effects of personality and situational differences on superstitious behavior, as well as the mediating effect of psychological tension. These findings are in line with the notion that superstitious behavior will be most pronounced when (a) uncertainty is either high or moderate, (b) importance of succeeding is high, and (c) when a person perceives success as dependent on external factors rather than as being under his own control. Importantly, the finding that psychological tension was found to mediate the effects of relative standing and importance on ritual commitment

supports the notion that the functionality of superstition may glean from reducing psychological tension in players. As noted earlier, several theorists have advanced this claim, but the empirical body of knowledge is exceedingly small. Hence, an important contribution of the present research is that it provides empirical support for a compelling argument that is often advanced but hardly tested.

Moreover, the tension-reducing role of superstitious behavior extends the literature in showing that the conditioning explanation provided by Skinner (1948, 1953) as well as the confusing-skill-with-chance explanation provided by Langer (1975, 1977; Langer & Roth, 1975) can be enriched with the tension-reducing effect of rituals. The conditioning might exist, because sportsmen may try to ward off tension by enacting rituals, which may explain why sportsmen hold on to rituals, even when the desired outcome (winning the game) is not obtained. That is, sportsmen may use rituals as a way of preparing mentally for a game. The present findings extend the confusion-skill-with-chance argument, in that, perhaps, the reduction in psychological tension before a match may be experienced as an important outcome as such. That is, one may speculate that in preparing for a match, the most important concern is to regulate one's own psychological and physical state, and that sportsmen may thus *realistically* see a strong link between enacting superstitious rituals and a desired outcome. This link between enactment of rituals and the outcome of tension-reduction may be a stronger cause of ritual commitment than the more distal link between enactment of rituals and the outcome of the match. Such reasoning emphasizes the regulatory function of superstitious rituals, which we believe is important to our understanding of why such rituals may come into being and persist.

We suggest that the tension-regulating function of superstitious rituals may more often help than harm a team member to perform well and contribute to team performance. As a case in point, research by Lobmeyer and Wasserman (1986) indicated that rituals carried out just before

taking a free throw during a basketball game do appear to influence subsequent performance in a positive way. Moreover, their work suggested that subsequent performance was only promoted in those who believed that the enactment of superstitious rituals would have beneficial effects on performance. This (potentially) illusory effect of rituals on performance is called *psychological placebo* by Neil (1980), who seeks to explain the positive effects of rituals in terms of self-fulfilling prophecies and confirmation processes: Rituals “work” because the person believes in them and expects this. The results of the current study showed that superstitious individuals are less self-confident and experience a higher level of psychological tension before a match than less superstitious persons. These findings indicated that rituals can play a role in reducing psychological tension for sportsmen. Furthermore, these findings support the idea that some perceptual biases (i.e., superstition) may be “highly adaptive under many circumstances” (Taylor & Brown, 1988, p. 205).

One may also argue that the enactment of rituals enhance the probability of reaching the “Ideal Performance State” (IPS; Garfield & Bennet, 1984; Williams, 1986), which is characterized by feeling relaxed (both mentally and physically), feeling full of energy, experiencing extraordinary awareness, and being focused on the present as well as feeling in control. An Ideal Performance State is often associated with a disorientation of time and place, and the person has the feeling as if things happen in slow motion. These positive states, which parallel the optimal experience of flow (Csikszentmihalyi, 1990, Csikszentmihalyi & LeFevre, 1989), may be expected to help rather than harm performing well, perhaps more so for challenges that are closer in time. The practical implication may be for trainers/coaches to acknowledge the potential benefits of superstitious rituals in terms of tension-reduction, and consequently encourage or at least not discourage the enactment of rituals by sportsmen.

Although we thus far discussed the potential benefits and functionality of the use of rituals, one might argue that the use of rituals can go too far. For instance, some rituals may become obsessive, or too many rituals “have” to be carried out – in either event, they may harm rather than help performing. For example, McCallum (1992) describes how a player obsessively carries out so many rituals, that he loses twelve pounds in ten days. In an interview (De Lange, 1996) a karate practitioner tells that he had the superstitious ritual of touching his pants during a karate tournament. This meant that by doing this, his guard was down for a moment, providing his opponent with an opportunity to score. In the examples mentioned, the rituals might be useful in reducing anxiety, but could be detrimental for performance. In those cases, it might be better to perform other rituals, with no harmful side effects, which can be carried out under all circumstances. Trainers/coaches should pay attention to the occurrence and development of superstition in players and teams, and should be able to coach and give guidance in this respect as well. Future research could focus on the functionality of different kinds of rituals, for instance by assessing the effects of kind of rituals on tension and performance of sportsmen.

We should briefly outline some limitations of the present research. To begin with, while the sample is unique in that superstitious rituals should matter the most to those who are often faced with high-stake situations characterized by uncertainty regarding the outcome, it is important to note that all participants were players involved in team sports rather than individual sports. Thus, one should be careful in generalizing the present findings to other samples or other situations. Perhaps more importantly, the present research used a scenario methodology, which is characterized by some well-known methodological limitations. For example, one may to some degree question whether participants can place themselves into the hypothetical situations (e.g., to “experience” the high-stake situation), whether tendencies toward favorable self-presentation underlie the present findings, and whether imagined responses in hypothetical situations match

actual responses in actual situations. However, some of these limitations would not seem to be crucial. For example, top sportsmen should have little if any problem imagining the hypothetical situations (i.e., the situations should be very real for them), and their willingness to list a substantial number of superstitious rituals would not immediately follow from tendencies toward favorable self-presentation. Nevertheless, it would be desirable for future research to complement this work by examining actual behavior, and perhaps by using alternative measures for assessing psychological tension (e.g., physiological measures, such as heart rate variability), which should also reveal an important mediational role.

Concluding Remarks

Although the enactment of superstitious rituals often does not make sense to observers, it may serve an important tension-regulation function for sportsmen before a match. The regulation of psychological tension becomes especially important in situations characterized by uncertainty and high importance. While the enactment of superstitious rituals are often believed to be unrelated to any outcome, the present findings suggest that at least one important outcome is likely to be obtained – that is, regulating psychological tension. This immediate outcome may be very important to subsequent performance, and perhaps even more so when the performance is closer in time. As such, the present research contributes not only to extant theorizing about superstitious rituals but also to how coaches and fellow teams members should perhaps judge such rituals – as an inherent part of mental and physical preparation to an important match in which the outcome is rather uncertain.

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Footnotes

¹ One could argue that the condition “playing an equal opponent” should be exactly in between the conditions playing a superior or inferior opponent. However, we expected greater ritual commitment when playing an equal opponent or a superior opponent rather than an inferior opponent. This expectation is partially based on the notion that “losses loom larger than gains” and that people are more strongly oriented toward minimizing losses than maximizing gains (e.g., Kahneman & Tversky, 1984). We suggest that the possibility of losing, coupled with the belief that one is able to minimize the likelihood of a loss, is relatively higher when playing an equal team or a superior team. Hence, level of uncertainty (and as a consequence, level of ritual commitment) should be greater when playing an equal or superior team rather than playing an inferior team.

² One could argue that players of top-ranking clubs will find it important in all situations to win. In that case, no differences with respect to superstition would be found in different situations. However, as will be described in the results, we did find differences in how much importance players attached to winning for different kinds of matches.

³ Due to missing values on one of the measures, and to use the same sample in all analyses, we disregarded the data of 29 participants. Alternative treatment of missing values, such as disregarding data per measure, yielded virtually identical findings. Hence, all analyses are based on a sample of 158 participants.

Table 1.

Recurring rituals mentioned by participants.

Kinds of rituals	Number of times mentioned			
	Football <i>N</i> = 97	Volleyball <i>N</i> = 52	Hockey <i>N</i> = 48	<i>Total</i> <i>N</i> = 197
Eating special food	43	10	13	66
Being involved in relaxing activities (e.g., watching TV, go for a walk)	42	4	5	51
Entering the field in a prescribed order, fixed place in dressing room, arriving at the stadium in a fixed order (first, second)	30	10	6	46
Wearing special clothes (e.g., swimming trunks under football pants)	16	12	23	51
Go to bed early	15	1	3	19
Dress in a certain order	13	6	8	27
Warming-up (e.g., in a special place, same order of exercises)	12	4	7	23
Taking the time for pre-game activities	11	7	7	25
Look after equipment (e.g., polish shoes)	10	2	6	18
Doing things in a fixed order	8	2	3	13
Personal care (e.g., not shaving, paint nails)	7	4	8	19
Going to the toilet (e.g., fixed time, fixed number of times)	7	2	5	14
Interpersonal rituals (e.g., wishing everyone good luck one by one, fixed roommate, hitting leg guards keeper)	4	4	11	19
Getting up at a set time	4	1	5	10

Staying home evening before the game	4	1	1	6
Eating in a special place	3	2	2	7
Driving a set route to the stadium	3	0	0	3
Celibacy before the game	2	0	1	3
Praying/cross oneself	2	0	1	3
Other (e.g., call upon deceased, kiss shirt, put car in same place)	11	5	10	26
<i>Total</i>	247	77	125	479

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