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Keep Your Fingers Crossed! How Superstition Improves Performance

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Abstract

Superstitions are typically seen as inconsequential creations of irrational minds. Nevertheless, many people rely on superstitious thoughts and practices in their daily routines in order to gain good luck. To date, little is known about the consequences and potential benefits of such superstitions. The present research closes this gap by demonstrating performance benefits of superstitions and identifying their underlying psychological mechanisms. Specifically, Experiments 1 through 4 show that activating good-luck-related superstitions via a common saying or action (e.g., "break a leg," keeping one's fingers crossed) or a lucky charm improves subsequent performance in golfing, motor dexterity, memory, and anagram games. Furthermore, Experiments 3 and 4 demonstrate that these performance benefits are produced by changes in perceived self-efficacy. Activating a superstition boosts participants' confidence in mastering upcoming tasks, which in turn improves performance. Finally, Experiment 4 shows that increased task persistence constitutes one means by which self-efficacy, enhanced by superstition, improves performance.

Keywords

superstition, performance, self-efficacy

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Human thought and behavior exhibit a host of irrationalities (Gilovich, 1991), and one prominent example of such irrationalities is the prevalence of superstitions. Throughout history and across cultures, many people engage in superstitious thoughts and behaviors (for reviews, see Jahoda, 1969; Vyse, 1997). Eye-opening anecdotes abound. Throughout his entire career, for example, basketball player Michael Jordan wore his old blue University of North Carolina shorts underneath his National Basketball Association uniform, for good luck. Similarly, tennis player Serena Williams once admitted wearing the same pair of socks throughout a tournament, and golf pro Tiger Woods wears a red shirt on tournament Sundays, which is usually the last (and critical) day of a tournament. Indeed, many people develop and observe superstitions, such as crossing their fingers (Vyse, 1997), knocking on wood (Keinan, 2002), or carrying a lucky charm (Wiseman & Watt, 2004). Although superstitions occur in a variety of forms, they may be defined as irrational beliefs that an object, action, or circumstance that is not logically related to a course of events influences its outcome. The superstitions we examined in this study are thoughts and behaviors typically used for good luck.

Prior research on superstition has focused mainly on its antecedents. Thus, it has been demonstrated that people are most likely to engage in superstitions when they experience feelings of uncertainty, high psychological stress, and low levels of perceived control (Keinan, 1994; Malinowski, 1954; Whitson & Galinsky, 2008). Interestingly, the very same characteristics often accompany important performance-related situations (Sarason, 1984; Treasure, Monson, & Lox, 1996). Thus, it is not surprising that superstitious beliefs are particularly prevalent in two groups whose members regularly engage in performance tasks—namely, athletes and students (Albas & Albas, 1989; Womack, 1992).

In marked contrast, little is known about the consequences of superstitions. Although superstitions are often seen as inconsequential creations of irrational minds, it is possible that the extra effort invested into the execution of superstitions may also turn into an advantage for the individuals concerned. In fact, researchers have speculated that engaging in superstitions regulates psychological tension and creates a feeling of control and a sense of predictability in otherwise chaotic environments (Keinan, 2002; Schippers & Van Lange, 2006; Womack, 1992). We propose that over and above these possible psychological benefits, superstitions also entail directly observable performance benefits. More specifically, we

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propose that activating superstitious thoughts and behaviors leads to better performance in a subsequent task.

Why might this be the case? Research on both sides of the hypothesized superstition-performance link suggests that perceived self-efficacy (Bandura, 1977)—that is, people's belief in their capabilities to succeed in a particular situation—may play a central role in turning seemingly irrational superstitious thoughts into directly observable performance benefits. On the superstition side, it has been demonstrated that belief in good luck is related to concepts associated with self-efficacy, such as optimism, hope, and confidence (Darke & Freedman, 1997; Day & Maltby, 2003, 2005). The more people believe in good luck, the more optimistic, hopeful, and confident they tend to be. On the performance side, it is well established that next to existing abilities and skills, one of the most important and consistent predictors of people's performance is their perceived self-efficacy (Bandura, 1997). The more confidence people have in their abilities to master a given task, the better they perform (Feltz, Short, & Sullivan, 2008; Stajkovic & Luthans, 1998). Cognitive factors such as the setting of more challenging goals (Zimmerman, 1995) and motivational factors such as higher persistence in a given task (Bandura & Schunk, 1981) contribute to this effect. On the basis of these findings, we hypothesize that the proposed performance benefits of superstition are produced by heightened levels of self-efficacy. Specifically, we suggest that the activation of a good-luck-associated superstition prior to a specific performance task leads to heightened feelings of self-efficacy toward this task, which in turn leads to better performance.

In the present article, we examine this possibility. First, we provide empirical evidence for a causal link between superstition and performance—specifically, we show that activating a superstition improves subsequent performance. Second, we shed light on the psychological mechanism that underlies this link by demonstrating that heightened self-efficacy contributes to the beneficial influence of superstition on performance. Third, we demonstrate that increased task persistence is one means by which superstition-boosted self-efficacy enhances subsequent performance.

To make these points, we report four experiments in which we used a variety of procedures to activate superstition and assess participants' performance on motor and cognitive tasks. A pretest identified three commonly held superstitions in our participant population, namely, the general belief in good luck, the belief that keeping one's fingers crossed will bring about a desired outcome, and the belief that wearing a lucky charm will bring good luck. Consequently, we used these superstitions in our experiments.

Experiment 1

Experiment 1 was designed to examine for the first time whether activating a superstition improves subsequent performance. Specifically, we activated the superstitious concept of good luck by associating it with the ball participants used in a putting task.

Method

Participants and design. We recruited 28 university students (12 males, 16 females) as participants and randomly assigned them to a superstition-activated or a control condition.

Materials and procedure. Participants were asked to engage in a 10-trial putting task. A pretest revealed that more than 80% of our participant population believed in good luck, so to activate the superstition, we linked the concept of good luck to the ball participants used during the task (Van Raalte, Brewer, Nemeroff, & Linder, 1991). Specifically, while handing the ball over to the participants, the experimenter said, "Here is your ball. So far it has turned out to be a lucky ball" (superstition-activated condition) or "This is the ball everyone has used so far" (control condition). Finally, participants performed the required 10 putts from a distance of 100 cm.

Results and discussion

We used the number of hits as our central dependent measure, with "hits" defined as successful putts (when the ball actually ended up where it was supposed to be). As predicted, participants performed better when playing with an ostensibly lucky ball ($M = 6.42$, $SD = 1.88$) rather than a neutral ball ($M = 4.75$, $SD = 2.15$), $t(26) = 2.14$, $p < .05$, Cohen's $d = 0.83$.

These findings are an initial demonstration of the performance benefits of superstitions. Individuals indeed performed better if a good-luck-related superstition was activated. To further substantiate this finding, we conducted a second experiment in which we activated a different superstition and assessed performance benefits in a different task. Specifically, participants were or were not exposed to the commonly used superstitious phrase "I keep my fingers crossed" before engaging in a motor-dexterity task.

Experiment 2

Method

Participants and design. We recruited 51 female university students as participants and randomly assigned them to one of three experimental conditions: superstition activated ("I press the thumbs for you," which is the German equivalent to the English expression "I keep my fingers crossed"), first control ("I press the watch for you"), or second control ("on 'go' you go").

Materials and procedure. Participants were first informed that they would engage in a motor-dexterity task. They were given a transparent plastic cube, which contained 36 little balls and a fixed slab with 36 little holes in it. Participants were instructed to place each ball as quickly as possible into one of the holes by carefully tilting the cube in different directions. For participants in the experimental condition, a superstition

was activated by using the German phrase "I press the thumbs for you" as a starting signal for the task. For participants in the first control condition, the experimenter used an almost identical starting signal, but replaced the word "thumbs" with the word "watch," thereby eliminating the superstitious meaning of the phrase. These two signals imply similar levels of encouragement, so participants in the two conditions should have felt similarly inclined to perform well on the task. In the second control condition, an ordinary starting signal ("on 'go' you go") was given.

Subsequently, participants judged how they had felt during the task, using a 9-point scale (1 = *not good at all*, 9 = *very good*).

Results and discussion

The time participants needed to solve the task served as our performance measure. As predicted, the activation of the superstition influenced subsequent performance, $F(2, 48) = 3.16$, $p < .05$. Specifically, participants in the superstition-activated condition ($M = 191.5$ s, $SD = 117.1$ s) solved the task faster than participants in the first control condition ($M = 319.7$ s, $SD = 223.6$ s), $t(48) = 2.0$, $p < .05$, Cohen's $d = 0.72$, and the second control condition ($M = 342.3$ s, $SD = 181.8$ s), $t(48) = 2.36$, $p < .03$, Cohen's $d = 0.98$. Performance did not differ between participants in the two control conditions, $t < 1$, n.s. Further, participants' judgments about their feelings during the task did not depend on condition, $F < 1$, n.s.

Experiment 3

Our first two experiments suggested that the activation of a superstition prior to a performance task can improve subsequent performance. In the following experiments, we set out to extend these initial demonstrations in two important ways. First, we moved beyond simply demonstrating the performance-enhancing influence of superstition to examining the psychological mechanisms that produce these effects. Specifically, we tested whether superstition leads to improved performance by elevating individuals' perceived self-efficacy. Second, we used a different type of superstitious belief. In Experiments 1 and 2, superstitions were externally activated by another person. In real life, however, superstitious thoughts or behaviors are often initiated and performed by individuals themselves. Hence, in our final two experiments, we used an idiosyncratic superstitious belief to examine whether superstitions related to good luck improve subsequent performance by enhancing people's self-efficacy beliefs. In Experiment 3, we assessed how well participants performed in a memory game (also known as Pelmanism or Pairs) if they were in the presence, versus the absence, of their personal lucky charm. In addition, we assessed participants' self-efficacy beliefs with respect to the upcoming memory game to examine whether the hypothesized performance benefits of superstition were indeed produced by an increase in perceived self-efficacy.

Method

Participants and design. We recruited 41 university students (8 males, 33 females) as participants and randomly assigned them to the presence (of a lucky charm) condition or the absence (of a lucky charm) condition. Participants were contacted by telephone and asked to bring a personal lucky charm to the experimental session. They were not invited to the experimental session if they did not possess a lucky charm.

Materials and procedure. Participants were asked to take part in two ostensibly unrelated experiments. The first was introduced as a survey on lucky charms in which participants answered several questions about the object they had brought. As part of this survey, the experimenter took the lucky charm to a different room to photograph it. For participants in the presence condition, the experimenter returned their lucky charm prior to the subsequent performance task. For participants in the absence condition, the experimenter left the lucky charm in the adjacent room, ostensibly because of problems with the camera. The latter participants executed the performance task in the absence of their personal good-luck-associated object.

In the second experiment, after reading the instructions for the performance task, participants judged their perceived level of self-efficacy on five items (e.g., "I am confident that I will master the upcoming memory task well"); responses were made on 9-point scales (Cronbach's $\alpha = .93$; Cronbach, 1951). In addition, participants indicated their momentary level of anxiety by responding to all 20 items of the State-Trait Anxiety Inventory (Spielberger, Gorsuch, & Lushene, 1970).

Next, participants performed the memory task. For this task, 36 game cards that depicted geometric figures were placed facedown on a "table" (the task was performed at the computer, but on the computer screen, it looked as if the cards were placed facedown on a table). Each figure matched just one other figure in shape and color. The participants' task was to find these 18 identical pairs of pictures by turning 2 cards faceup in each trial. (If they did not match, the computer program turned them back facedown automatically. If the cards matched, they remained faceup.) After all pairs had been exposed, participants judged their current mood on a 9-point scale. Finally, participants were interviewed to determine whether they saw a connection between the studies and what they thought the purpose of the studies was. No participant accurately reported the real purpose of the study.

Results and discussion

We used a combined measure of the time and the number of trials participants needed to complete the memory task (Cronbach's $\alpha = .68$) as our dependent measure. As we predicted, participants who were with their lucky charm performed better in the memory game ($M = -.27$, $SD = .67$) than those who were without it ($M = .28$, $SD = .97$), $t(39) = 2.13$, $p < .05$,

Cohen's d = 0.66. Moreover, participants with their lucky charm reported higher levels of self-efficacy (M = 6.64, SD = 1.53) than participants without it (M = 5.10, SD = 1.68), $t(39)$ = 3.07, $p < .01$, Cohen's d = 0.96. Participants' reported degree of anxiety, however, did not differ between conditions (with lucky charm: M = 36.38, SD = 5.40; without lucky charm: M = 39.75, SD = 10.61), $t(39) = 1.29$, $p = .20$, n.s. Also, the conditions did not differ with respect to reported mood, $t = 1$.

To examine whether self-efficacy mediated the effect of superstition on performance, we conducted a bootstrapping analysis (Preacher & Hayes, 2004). This analysis revealed that self-efficacy mediated the effect of the lucky-charm manipulation on performance in the memory game, yielding a point estimate for the indirect effect of −0.17 and a 95% confidence interval of −0.42 to −0.01.

These findings shed initial light on the psychological mechanism that is responsible for the performance benefits of superstitions. Specifically, this result suggests that, in line with our reasoning, activating a superstition indeed leads to superior performance because it elevates participants' self-efficacy concerning an upcoming task.

Experiment 4

Having identified self-efficacy as a mediator for the observed superstition-performance link, in Experiment 4, we set out to examine more closely the psychological processes at work. Specifically, we aimed to demonstrate how heightened self-efficacy improves performance in the present context. Previous research demonstrated that two mechanisms allowing highly self-efficacious individuals to perform better than others are their tendency to set higher goals (Zimmerman, 1995) and their tendency to persevere longer in tasks (Bandura, 1986). We designed our final study to explore whether these two mechanisms also contribute to the performance benefits of superstition. Using the same idiosyncratic superstition as in Experiment 3, we had participants who were in the presence or absence of their lucky charm engage in an anagram task. We assessed participants' self-efficacy, performance goals, and task persistence, in addition to their performance. We hypothesized that the presence of their lucky charm would boost participants' self-efficacy, which in turn would lead to higher self-set goals and increased persistence—both of which would improve performance.

Method

Participants and design. We recruited 31 university students (4 males, 27 females) as participants and randomly assigned them to the presence (of a lucky charm) condition or the absence (of a lucky charm) condition.

Materials and procedure. The general procedure, including the cover story and the manipulation of the two experimental conditions, was identical to that of Experiment 3. After we manipulated the presence or absence of the lucky charm, and after participants had read the instructions for the upcoming performance task, participants indicated their perceived self-efficacy on the same five items as in Experiment 3 (Cronbach's α = .92) and set themselves a specific goal for this anagram task. (The goal-setting instructions were as follows: "Please set a goal. What percentage of all possible word solutions do you want to detect in the following task?")

Next, participants performed the anagram task (e.g., Crusius & Mussweiler, 2010; Shah, 2003). They were presented with a string of eight letters (*D*, *S*, *E*, *T*, *N*, *R*, *I*, and *E*) and instructed to generate as many different German words as possible, using from two to eight of these letters per word. Finally, participants were probed for suspicion. Two participants identified the real purpose of the study and were therefore excluded from our analyses.[1]

Results and discussion

We used the number of correctly identified words in the anagram task as the dependent measure of performance. As expected, participants in the presence of their lucky charm performed better (M = 45.84, SD = 22.17) than participants in the absence of their lucky charm (M = 30.56, SD = 17.05), $t(27) = 2.1$, $p < .05$, Cohen's d = 0.77, and also reported a higher degree of self-efficacy (M = 7.35, SD = 1.11, vs. M = 6.41, SD = 1.36), $t(27) = 2.01$, $p < .05$, Cohen's d = 0.75. Moreover, replicating the result of Experiment 3, a bootstrapping analysis revealed that self-efficacy mediated the effect of the lucky-charm manipulation on performance, yielding a point estimate for the indirect effect of 3.17 and a 95% confidence interval of 0.005 to 7.75.

To further examine the psychological mechanisms that underlie this influence, we analyzed participants' task goals and persistence. As expected, participants who were in the presence of their lucky charm set higher goals (M = 79.62, SD = 9.01) than participants whose lucky charm had been removed (M = 63.44, SD = 18.63), $t(27) = 2.86$, $p < .01$, Cohen's d = 1.11, and also persisted longer in working on the anagram task (M = 739.95 s, SD = 477.91 s, vs. M = 421.39 s, SD = 260.55 s), $t(27) = 2.16$, $p < .05$, Cohen's d = 0.83. The results of further bootstrapping analyses revealed that both of these effects were mediated by participants' perceived self-efficacy (goal: point estimate for indirect effect = 2.99, 95% confidence interval from 0.11 to 7.19; persistence: point estimate for indirect effect = 58.34, 95% confidence interval from 0.07 to 138.02). Moreover, a final bootstrapping analysis revealed that participants' persistence mediated the effect of self-efficacy on performance, yielding a point estimate for the indirect effect of 6.84 and a 99% confidence interval from 2.27 to 13.28; in contrast, participants' self-set goal, with a point estimate of 0.08 and a 95% confidence interval from −5.05 to 3.83, did not mediate the effect of self-efficacy on performance.

Together, these findings provide further insights into the psychological processes that are triggered by the activation of a good-luck superstition. The increased levels of self-efficacy

that result from activating a superstition lead to higher self-set goals and greater persistence in the performance task. Furthermore, this increased persistence mediates the effect of self-efficacy on performance.

Although these findings are consistent with self-efficacy research, one might ask why only task persistence, but not goal setting, mediated the link between self-efficacy and performance. One explanation for this finding may be rooted in the kind of performance task that we studied and its specific requirements. It seems only natural that not all potential mediators will play a role for each performance task. For example, findings in other research contexts consistently suggest that performance in anagram tasks is particularly well predicted by persistence (Friedman & Elliot, 2008; Markman, McMullen, & Elizaga, 2008). Future research will have to examine which types of tasks are most strongly influenced by which mediators. Critically, however, the present results establish that, in our paradigm, task persistence drives the effects of superstition-enhanced self-efficacy on performance.

General Discussion

In sum, these four experiments yielded two main insights. First, we demonstrated a causal effect of an activated good-luck-associated superstition on subsequent performance. Participants for whom a superstition was activated performed better in various motor and cognitive tasks compared with participants for whom no such concept was activated. Second, we showed that these performance-enhancing effects are mediated by an increase in perceived level of self-efficacy. Activating a good-luck superstition leads to improved performance by boosting people's belief in their ability to master a task.

One may wonder whether the beneficial effects of superstition on performance would also hold in real-life situations. In fact, correlational support for this possibility exists in the realm of sports. Buhrmann and Zaugg (1981) found that for competitive basketball players, superstitious beliefs and performance are positively related: Superior teams, as well as superior players within a team, exhibit more superstitious behaviors. In light of the present findings, this suggests that even in real-life performance situations, superstitious thoughts and behaviors result in performance benefits.

Although in combination our four experiments draw a consistent picture of the performance benefits of superstitions, there may be some ambiguities concerning the individual studies. Regarding Experiments 3 and 4, for example, one might wonder whether the reported difference in performance resulted from the presence or from the absence of the lucky object. Given the findings of the first two experiments, in which participants in a good-luck condition uniformly outperformed those in a neutral control condition, it seems reasonable to assume that the obtained performance differences in Experiments 3 and 4 also reflect performance benefits. We did not find any suggestion that the removal of a lucky charm caused feelings of anxiety or worry that may have produced performance decrements.

In the present research, we focused on the performance benefits of superstitions. In theory, however, it is also possible to imagine situations in which the engagement of an irrational thought or behavior could adversely affect performance. In particular, this might be true for thoughts or behaviors that are believed to invite failures or misfortunes. An interesting area for study might also be the examination of thoughts and behaviors—such as not crossing the path of a black cat or not stepping under an open ladder—that are intended to avoid bad luck. Although negatively framed, they are eventually directed to a positive and successful outcome (the avoidance of bad luck), just as in the case of the superstitions investigated in the present work. However, because the prevalence of good-luck-related superstitions by far exceeds the occurrence of negatively framed irrational thoughts (Albas & Albas, 1989), we put our main research focus on the beneficial effects of superstitions. In many domains, it is crucial to achieve the best performance possible, and much effort is put into researching and developing new training methods (Raab, Masters, & Maxwell, 2005), teaching styles (Schwartz, Merton, & Bursik, 1987), performance analyses (Damisch, Mussweiler, & Plessner, 2006), and learning materials (Schank & Cleary, 1995) so that people can reach this goal. The present findings suggest that engaging in superstitious thoughts and behaviors may be one way to reach one's top level of performance.

This study is in line with prior research examining the influence of seemingly irrelevant factors, such as one's arm position (Friedman & Elliot, 2008), specific colors (Elliot & Maier, 2008; Hill & Barton, 2005), or preperformance routines (Lobmeyer & Wasserman, 1986), on intellectual and physical performance. For example, it has been shown that routine movements executed prior to motor tasks (e.g., a basketball free throw) improve subsequent performance (Lobmeyer & Wasserman, 1986). It is important to note that such routine movements differ from superstitions in important ways. First, in marked contrast to superstitions, routine movements lack magical meaning. Second, the performance-enhancing effects of routine movements and superstitions arise from different underlying mechanisms. Routine movements operate primarily via focused attention and the preparation of critical motor sequences (Czech, Ploszay, & Burke, 2004); the performance benefits of superstitions, as demonstrated in this study, are produced by self-efficacy.

The observation that a superstitious thought or behavior leads to subsequent performance improvement may help explain the prevalence and maintenance of superstitious thoughts and practices across different eras and cultures (Jahoda, 1969). And, with respect to truly outstanding performances, the present findings suggest that it may have been the well-balanced combination of existing talent, hard training, and good-luck underwear that made Michael Jordan perform as well as he did.

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Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

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Note

1. Including these participants in our analyses did not change the pattern of results.

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