

# Performance Brand Placebos: How Brands Improve Performance and Consumers Take the Credit

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This research examines how consumption of a performance branded product systematically improves objective outcomes in a variety of contexts. Five field and laboratory studies demonstrate that this performance brand effect emerges through psychological mechanisms unrelated to functional product differences, consistent with a placebo. Furthermore, whereas this effect emerges only when there is an expectation that the performance branded product affects outcomes, consumers attribute gains to themselves. The performance brand placebo is due to a lowering of task-induced anxiety, driven by heightened state self-esteem. Several theoretically relevant boundaries are revealed. Stress mindset moderates the effect, strengthening with the belief that stress is debilitating and weakening (to the point of reversal) with the belief that stress is enhancing. Moreover, those consumers lower in preexisting domain self-efficacy beliefs exhibit more substantial performance gains, whereas for those particularly high in domain self-efficacy, the placebo is mitigated.

*Keywords:* brands, placebo, performance anxiety, stress mindset

Firms frequently promise consumers that use of their brands will improve performance outcomes. From the middle-school child considering the premier brands of soccer shoes, to the college graduate weighing which graduate test prep course to take, a ubiquitous marketing message

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from such brands remains “you will perform better with us.” Firms often construct compelling arguments as to why their performance brands are effective at improving performance. Claims of superior materials, craftsmanship, design, or other components can be quite convincing, and certainly true in some instances. However, when products or services are functionally homogeneous, could the simple belief that a particular brand is effective at enhancing performance actually improve performance *objectively*? To answer this question, we develop and empirically validate a framework for performance brand consumption by drawing on the literature examining placebo effects (Plassmann et al. 2008; Shiv, Carmon, and Ariely 2005; Waber et al. 2008), performance anxiety and stress responses (Crum, Salovey, and Achor 2013; Eysenck et al. 2007), and self-attributions (Malle 2006). In doing so, our research increases knowledge at the intersection between branded consumption and consumer performance outcomes. Doing so also helps address whether premium sneakers or test prep courses for the student athletes of your family represent wise investments.

Performance brand offerings—branded goods and services expected to enhance personal performance outcomes—span a variety of multibillion dollar industries.

In the United States alone, exam preparation products and services represent a \$7.3 billion industry, athletic apparel \$9.9 billion, and overall sporting goods a staggering \$63 billion (Barnes Reports 2013; Statistica Dossier 2014). Surprisingly, how the consumption of performance brands within these industries influences objective performance is not well understood theoretically and has received relatively little attention in the consumer behavior literature. Our research focuses on the implications of performance brand consumption for the consumer's mental and emotional state in influencing task outcomes, rather than the material differences that such brands may provide. We demonstrate that performance brand consumption has objectively measurable effects on performance despite illusory (i.e., immaterial) brand differences, consistent with a placebo effect (Shiv et al. 2005). In doing so, our research contributes to the literature in five ways.

First, our work expands research examining positive placebo effects beyond subjective outcomes (e.g., perceived pain reduction) to explain how actual objective outcomes are systematically improved or harmed by performance brand consumption. Whereas recent research has documented a placebo that *undermines* performance due to marketing actions (e.g., Shiv et al. 2005; Wright et al. 2013), little consumer research exists on placebos that *enhance* objective performance. This lack of understanding exists despite the multibillion dollar global industries around brand-driven performance products. By exploring the intersection of brand consumption and consumer performance, our work begins to address these theoretical and substantive gaps.

Second, we shed insight into the psychological underpinnings of the performance brand placebo by proposing and providing empirical support for an anxiety-reduction mechanism. Specifically, a performance brand is shown to improve state self-esteem and, in turn, reduce stress-induced anxiety, thereby enhancing performance. In doing so, we expand understanding of the implications of branded consumption for related stress responses. Furthermore, we demonstrate that the psychological underpinnings of brand-driven enhancing performance placebos are fundamentally different in nature from those of traditional subjective placebo effects documented in the literature (Hróbjartsson and Gøtzsche 2004).

Third, we identify theoretically and pragmatically relevant moderators that provide boundaries for the placebo effect on objective performance. As a first moderator, consistent with an anxiety-reduction mechanism for the placebo, we demonstrate the moderating role of individual stress mindset (i.e., whether stress has a debilitating or enhancing effect on individuals; Crum et al. 2013). Specifically, the positive performance placebo strengthens with the belief that stress is debilitating and weakens (to the point of reversal) with the belief that stress is enhancing. Doing so also contributes to the emerging literature examining how the emotional arousal associated with

stress and anxiety may either enhance or debilitate depending on consumer belief (Brooks 2013; Crum et al. 2013). As a second moderator, we examine the impact of domain self-efficacy beliefs (i.e., preexisting personally held beliefs about one's capability to produce attainments in a specific domain; Bandura 1997, 2006) on the strength of the performance brand placebo. Consistent with an anxiety-reduction account, individuals holding unfavorable views of their own domain self-efficacy (who experience heightened task anxiety; Bandura 1991) receive a greater objective boost from the performance brand placebo effect. As a third moderator, we refine the performance brand construct by distinguishing performance brands from prestige brands (Park, Milberg, and Lawson 1991; Wilcox, Kim, and Sen 2009) that may be highly regarded by consumers but do not carry strong associations of positive performance expectations and therefore do not drive a performance placebo.

Fourth, this work expands understanding of brand-related consumer attribution processes. Our work reveals that consumers do not give performance brands credit for the performance boost. Although use of performance brands can lead to better outcomes for consumers, both in terms of personal performance and self-esteem, we find that consumers credit the boost to themselves rather than the brand. Previous research has argued that consumers purchase brands to help construct their self-concept and bolster self-esteem (Reimann and Aron 2009), which can improve consumer-brand connections (Escalas and Bettman 2005). However, our research demonstrates that performance outcomes are attributed to both the brand and the self, with credit for the boost in performance outcomes going to consumers themselves. In that regard, consumers can be said to give only partial rather than full credit to the brand for performance outcomes.

Finally, our findings have implications for marketers and consumers of performance brands. Our findings that performance brands enhance consumer proficiency but do not receive credit is ironic in light of recent research and criticism suggesting that brand premiums in functionally homogeneous product categories lead to wasteful spending that harms consumers (Bronnenberg et al. 2014). Indeed, our research suggests that such performance brands, absent functional differences, may provide objective benefits that help consumers. Consumers' failure to fully acknowledge the performance brand's contribution creates a dilemma for marketers wishing to receive more of the credit for fulfilling their promise of better performance. These and other managerial implications are expanded on in the General Discussion section.

## THEORETICAL FRAMEWORK

The present research focuses on the impact of consuming performance brands on individuals in accomplishing

outcomes, in the absence of material product differences. Admittedly, there likely do exist material, substantial differences between many performance branded products available to consumers. For example, the specialized construction process to create a Louisville Slugger may result in greater balance and rebound against a baseball, thereby improving batting performance. However, such actual functional differences associated with performance brands are not the focus of our present research. Rather, we focus on the impact of performance brands in changing proficiency at the target endeavor, absent any material or functional differences. Such an improvement in performance due to illusory (i.e., immaterial) brand differences is consistent with a placebo effect.

### Performance Brand Placebos

What is a placebo? A formal definition has been the topic of substantial debate (Moerman and Jonas 2002). Chaucer's character, Placebo, is a shameless flatterer who bolsters and strengthens the confidence of the vain Januarie in *The Canterbury Tales*. Claims about placebos have been frequent and far-ranging in the medical literature over time, dating back in modern form nearly a century (Kerr, Milne, and Kaptchuk 2008). Within the medical literature, the placebo has been defined as "a substance or procedure that is without specific activity for the condition being treated," and the placebo effect is any therapeutic effect produced by such a placebo (Shapiro and Shapiro 1997). Furthermore, this inert substance is presented to the recipient as an active substance, that is, a "sham procedure" (Finniss et al. 2010). Thus a placebo effect is any measurable difference between a control group and a separate group that receives the exact same treatment (product/service) but believes the treatment to be fundamentally different.

*Subjective Placebo Outcomes.* A meta-analysis of medical placebo effects since 1946 conducted by Hróbjartsson and Gøtzsche (2004) found that placebos did significantly improve *subjective* outcomes (e.g., self-reports of experienced pain) but had no significant effects on *objectively* measurable outcomes (e.g., hypertension). That is, placebos did not result in distinguishable physiological outcomes versus a no-placebo control. Thus if brand-driven performance placebos exist, it is unlikely that these emerge due to direct physical changes to the consumer, but rather because use of the brand alters some aspect of the consumer's mental state at the time of performance.

Consumer behavior research examining placebo effects due to marketing actions have also predominantly observed subjective placebo effects. For example, Waber et al. (2008) demonstrated that individuals who consumed a discounted analgesic reported experiencing more pain from electrical shocks to the wrist. These results are consistent

with a classic study by Branthwaite and Cooper (1981) in which women who received a sugar pill positioned as a premium aspirin brand reported greater headache relief versus women consuming the same sugar pill positioned as unbranded. Similarly, Plassmann et al. (2008) demonstrated that the pleasure experienced from consuming a wine was greater when consumers believed that wine to be higher priced.

The finding that subjective interpretations of product experience can assimilate to expectations has been long established in behavioral literature (Herr, Sherman, and Fazio 1983; Hoch and Ha 1986) and provides an intuitive and reasonable mechanism for the emergence of subjective placebos. Indeed, given that premium prices and brands typically carry with them heightened expectations, the emergence of positive placebos for subjective outcomes seems to directly follow. Whether a similar effect emerges in unambiguous, objective performance outcomes is less certain, however. Put simply, can marketing assets and actions such as brands and price changes lead to actual performance changes, that is, cause performance placebo effects?

*Objective Performance.* Important evidence for an objective performance placebo was first established by Shiv et al. (2005), who demonstrated that discounting the price of an energy drink resulted in lower performance on puzzle tasks versus a full-priced alternative. This work established a performance-*diminishing* placebo (driven by price discounts), and it identified product expectancies as important to the emergence of the performance placebo. Wright et al. (2013) replicated Shiv et al.'s (2005) price discount-driven performance placebo effect, and Amar et al. (2011) observed a relationship between brand reputation and product effectiveness. Neither work expanded on underlying processes for performance diminishment, whereas Irmak, Block, and Fitzsimons (2005) point to the role of motivation in placebo effects. As Shiv et al. (2005) acknowledge, "Given the substantial power and robustness of placebo effects, these effects are most likely multiply determined."

Against this backdrop, the present research posits that brands can elicit performance placebo effects, and, furthermore, that objective performance may actually be *enhanced* through consumption of a performance brand. Whereas prior research has demonstrated that marketing actions that reduce product expectancies may undermine objective performance, we propose that brands can carry positive expectancies that improve performance outcomes. In this research, we define "performance brands" as branded goods and services that carry strong, positive performance expectancies specific to a task or set of tasks. We also explore the underlying mechanisms for a performance-enhancing brand placebo, proposing that the mental state of the placebo recipient plays a critical role. Specifically, we theorize that the performance brand

placebo emerges because consumption of a performance brand reduces experienced stress and associated maladaptive anxiety by bolstering state self-esteem.

### Anxiety Reduction and Boosted State Self-Esteem

State anxiety typically arises from a stressful situation in which outcomes are uncertain or uncontrollable, when performance evaluation is a certainty, or when the individual otherwise perceives a threat to the self (Derakshan and Eysenck 2009; Raghunathan and Pham 1999). More generally, state anxiety has been described as an outcome of experienced stress (Duhachek 2005; Friedman, Clark, and Gershon 1992). The experience of state anxiety has been demonstrated to redirect attention and cognitive resources away from consciously pursued outcomes (Eysenck et al. 2007) and to increase ruminative thought (Carver and Scheier 1988), thereby interfering with performance in achieving those outcomes. As such, the negative impact of anxiety on physical and cognitive performance is well documented across a variety of disciplines including verbal and mathematic test taking (Ashcraft and Faust 1994; Elliot and McGregor 1999), athletic competition (Hall and Kerr, 1998; Hanton, Mellalieu, and Hall 2002), performing arts such as music (Deen 2000; Ryan 2004), dance (Tamborrino 2001), and acting (Wilson 2002), and even sexual performance (McCabe 2005) and public speaking (Brooks 2013; Merritt, Richards, and Davis 2001) (for a review also Eysenck 1992; Spencer, Steele, and Quinn 1999; Steele 1997; Steele and Aronson 1995; Stone et al. 1999). For example, within the realm of athletic competition, Burton (1988) observed that swimmers higher in anxiety immediately prior to a competition race swam slower versus expectations.

Given this relationship, strategies that reduce anxiety should therefore improve objective performance—as research in a variety of contexts attests (cf. Eysenck et al. 2007). For example, Algaze (1995) demonstrated that a workshop intervention aimed at reducing academic anxiety resulted in improved performance. However, research has not to our knowledge examined the implications of branded product consumption in reducing anxiety and thereby enhancing performance—the focus of the present research. Specifically, we theorize that task-related anxiety may be reduced by the consumption of a performance brand. We also develop theory that suggests this reduction is due to a bolstering of the consumer's state self-esteem (consistent with an affectively felt sense of personal worth; Ferraro, Escalas, and Bettman 2011; Heatherton and Polivy 1991; Pelham and Swann 1989), which stems from the consumption of a performance brand.

Brand use is closely linked to consumer perceptions of the self (Berger and Heath 2007; Dolich 1969; Escalas and Bettman 2005; Kleine, Kleine, and Kernan 1993; Landon

1974), and consumption of a performance brand should activate a schema that is either congruent with a preexisting positive self-image (of proficiency) or congruent with an idealized self (Belk 1988; Berger and Ward 2010; Fournier 1998; Muniz and O'Guinn 2001; Sirgy 1982). To the extent that the brand is congruent with the perceived or idealized self, it should reinforce that positive self-view and accordingly bolster self-esteem (Ferraro et al. 2011).

Moreover, heightened self-esteem is closely related to anxiety, such that anxiety decreases as self-esteem rises (whether trait or state) (Baumeister et al. 2003; Brockner 1983; Heatherton and Polivy 1991; Leary et al. 1995; Pyszczynski et al. 1989; Tennen and Herzberger 1987). For example, Greenberg et al. (1992) manipulated state self-esteem through feedback on a personality test: participants then exposed to stressors (e.g., an artificially low IQ test result or alarming image) reported less anxiety when their self-esteem had been heightened. Furthermore, heightened self-esteem can serve to attenuate task-induced anxiety, both in competitive and noncompetitive contexts. For example, elite Swedish athletes training for the Olympics demonstrated lower anxiety during competitive performances as their self-esteem increased (Koivula, Hassmén, and Fallby 2002). Similarly, state anxiety among professional orchestral and student musicians has been demonstrated to decrease as self-esteem increases (Langendörfer et al. 2006; Sinden 1999).

In summary, we predict that consumption of a performance brand lowers the consumer's task-induced anxiety and thus improves his or her objective performance due to heightened state self-esteem. Formally:

**H1:** Consumption of a performance brand improves objective performance outcomes.

**H2:** The performance brand placebo effect proposed in hypothesis 1 is mediated by (a) heightened state self-esteem that (b) subsequently lowers anxiety.

### Attributions for Performance Gains

Hypotheses 1 and 2 predict that consumption of a performance brand enhances objective performance, which raises an interesting question: To what extent do consumers attribute performance to the brand versus the self? On the one hand, use of a performance brand could draw attention to the brand. Inasmuch as attributions are inaccurate and tend to be driven by salient factors (cf. Kelley 1973), improved performance may be attributed to the performance brand itself. Similarly, branded consumption has been linked to heightened connection with that brand (Escalas and Bettman 2005), which also suggests that the connected brand will receive credit for performance enhancement. On the other hand, research has argued that placebo effects in general occur largely outside of conscious awareness (Shiv

et al. 2005; Stewart-Williams and Podd 2004), potentially decreasing the likelihood of attributions to the brand. In addition, our work argues that the performance brand will heighten state self-esteem, which could lead consumers to infer that the self is primarily responsible for positive outcomes. For example, heightened self-esteem has been linked positively to self-serving biases (e.g., Blaine and Crocker 1993), self-delusions (e.g., Colvin, Block, and Funder 1995), and narcissism (e.g., Jordan et al. 2003). Moreover, attributions for positive outcomes tend to be remarkably self-serving (Bradley 1978; Malle 2006; Miller and Ross 1975). Indeed, Fitch (1970) showed that subjects attribute significantly more causality to internal sources for success outcomes than for failure outcomes; importantly, this effect strengthened as self-esteem was enhanced. Given that the performance brand enhances state self-esteem, we predict that consumers will become more likely to attribute performance to themselves. In contrast, we expect that acknowledgment of the brand’s contribution will not similarly increase. Unlike the prediction for performance outcomes in hypothesis 2, we expect mediation of performance brand effects via state self-esteem (but not anxiety) inasmuch as enhanced self-esteem can improve attributions to the self directly. Formally:

**H3:** Consumption of a performance brand (a) increases performance attributions in favor of the self by (b) heightening state self-esteem.

If supported, hypotheses 1, 2 and 3 pose an interesting paradox for marketers: A performance brand may provide

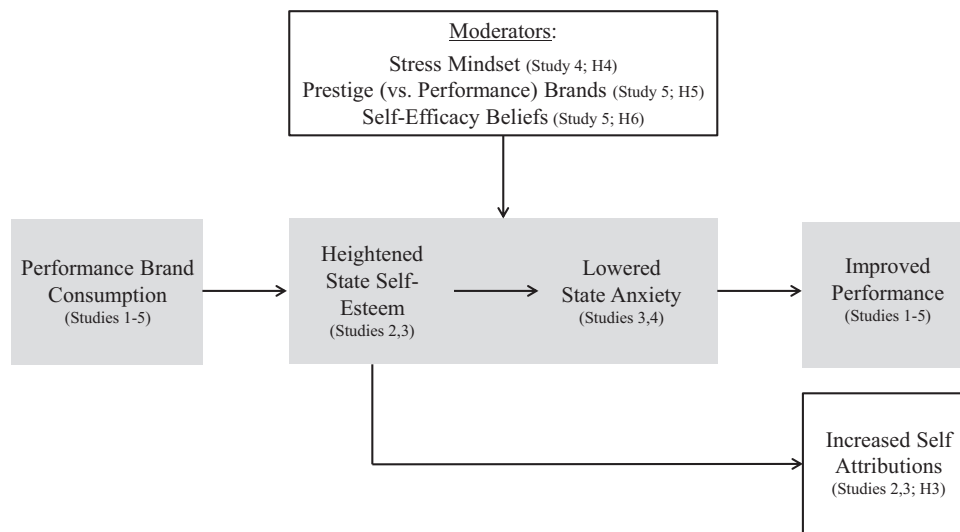
placebo benefits to consumers that include objective performance outcomes, thereby living up to its brand promise—but consumers will downplay the performance brand’s contribution and credit themselves with heightened performance.

## EMPIRICAL OVERVIEW

A series of studies was conducted to test our hypotheses; Figure 1 provides an organizing framework. Study 1 examines the impact of performance brands in an athletic context and provides preliminary evidence for a positive placebo on objective performance outcomes. Study 2 explores the underlying psychological process (specifically, the role of state self-esteem), as well as the downstream consequences for consumer attributions regarding performance. Study 3 details the process through which anxiety reduction due to heightened state self-esteem improves performance outcomes, and it provides evidence that the performance brand placebo (and corresponding attributions to the self) generalizes to cognitive tasks. Studies 4 and 5 further refine our theory by exploring boundary conditions for the performance brand placebo effect; hypotheses are introduced with each study. Specifically, study 4 further demonstrates the underlying role of anxiety via stress mindset as a moderator. Finally, study 5 demonstrates (1) the moderating role of domain self-efficacy beliefs and also (2) distinguishes performance brands from other brands that are highly regarded by consumers (i.e., prestige brands). Together, the set of findings

FIGURE 1

### ORGANIZING FRAMEWORK



NOTE.—The shaded path refers to the positive performance brand placebo (i.e., hypotheses 1 and 2).

support a performance brand placebo effect on objective outcomes that is consistent with our theoretical account and the important role played by consumer beliefs (about brands, the self, and anxiety) when using performance brands.

## STUDY 1: A POSITIVE BRAND PLACEBO EFFECT ON PERFORMANCE

The objective of the first study is to provide evidence for an objective positive performance brand placebo. The study utilizes an athletic context and examines how the use of a performance branded product alters athletic performance in a golf putting task. We expect that athletic performance will be enhanced when a strong performance brand is used (i.e., testing hypothesis 1). Although prior work has demonstrated that marketing phenomena that make salient performance deficits can undermine performance (i.e., a negative placebo; Shiv et al. 2005), we hypothesize that a brand carrying strong performance expectancies will enhance performance. To evaluate the direction of the performance brand placebo effect, we test the impact of a strong performance brand versus both a weak performance brand and a nonbranded control.

### Method

*Participants and Design.* The experiment was a 3 group (strong performance brand/weak performance brand/control) between-subjects design. A total of 95 students (35% male) on a large midwestern university campus participated in the study for extra course credit.

*Procedure.* Participants were invited by research assistants into the lab one at a time and were told they would be participating in a market research study about a new prototype golf putter. Participants were randomly assigned to a strong or weak performance brand putter (i.e., Nike vs. Starter brands, based on a pretest described later), or a control group condition in which no brand-related information was provided about the putter. Note that all participants used the same putter (ruling out differences in actual putter performance); however, the putter's label was manipulated to reflect the appropriate condition.

Participants were asked to complete putts on a putting green from three predefined locations exactly 2, 3, and 4.5 feet from the hole. They were instructed to try to get the ball into the hole using the least number of putts possible (practice putts were not allowed). Participants were asked to putt again from the respective initial location if the ball did not go into the hole. A research assistant recorded the number of strokes needed to sink the ball in the hole from each location as a measure of actual performance. After the

putting task, participants responded to background questions (e.g., gender, age).

### Results

*Pretest.* A pretest of performance expectancies was conducted to assess our operationalizations of the strong performance brand (Nike), weak performance brand (Starter), and control with no brand information. The pretest asked 84 students on a large midwestern university campus to rate how a golf putter was expected to influence golf putting performance. All subjects viewed a photograph of the same golf putter with a manipulated brand label and responded to three items measuring performance expectancies (all on a scale from 1 [Not at all] to 7 [Very much] adapted from Shiv et al. 2005): "Using this [brand] golf putter will harm/help my putting performance"; "I feel that using this [brand] golf putter will be very bad/very good at improving my putting performance"; "To what extent could using this [brand] golf putter help your putting performance?" As anticipated, expectancies ( $\alpha = .96$ ) were significantly higher for the strong performance brand (Nike) putter than the weak performance brand (Starter) putter ( $M_{\text{strong}} = 5.02$ ,  $SD = 1.03$  vs.  $M_{\text{weak}} = 3.99$ ,  $SD = 1.34$ ;  $F(1, 55) = 9.96$ ,  $p < .01$ ) and unbranded control ( $M_{\text{strong}}$  vs.  $M_{\text{control}} = 4.10$ ,  $SD = 1.36$ ;  $F(1, 55) = 8.18$ ,  $p < .01$ ). Expectancies did not differ between the weak performance brand and control ( $F(1, 54) = .10$ ,  $p > .75$ ). These results support our operationalizations.

*Objective Performance.* We averaged the number of strokes each participant took from the three predefined locations. On average, participants took 2.24 strokes to sink the putt (min = 1, max = 4.67,  $SD = .86$ ;  $n = 91$ ). Four participants distributed across conditions who took an excessive number of strokes (i.e.,  $> 3$  SD from the initial overall mean,  $n = 95$ ) were omitted from subsequent analyses. (The pattern of results does not change if these data are retained.)

Performance (i.e., average number of strokes) was analyzed as a function of brand condition and revealed a main effect of brand ( $F(2, 88) = 4.19$ ,  $p < .05$ ). More germane to hypothesis 1, a planned contrast indicated that performance outcomes were enhanced through use of the strong performance brand versus the control ( $M_{\text{strong}} = 1.91$ ,  $SD = .71$  vs.  $M_{\text{control}} = 2.49$ ,  $SD = .89$ ;  $F(1, 88) = 7.55$ ,  $p < .01$ ). That is, as expected, fewer strokes were needed to sink putts with a strong performance brand versus the control. Performance outcomes were likewise enhanced when contrasting use of the strong versus weak performance brand ( $M_{\text{strong}}$  vs.  $M_{\text{weak}} = 2.36$ ,  $SD = .90$ ;  $F(1, 88) = 4.49$ ,  $p < .05$ ). In contrast, the planned contrast of weak versus control conditions was not significant ( $F(1, 88) = .41$ ,  $p = .53$ ). These results are consistent with hypothesis 1 and an enhancing effect of brands that carry strong, positive performance expectancies.

## Discussion

Study 1 provides evidence for a positive performance brand placebo on objective outcomes. Golf performance improved (i.e., taking fewer strokes to sink a putt) when a brand associated with strong athletic performance expectations was used, compared to a weak brand or no brand information. These results support our theorizing regarding the performance brand placebo, with objective improvements of over 20% from using a strong performance brand.

## STUDY 2: STATE SELF-ESTEEM MEDIATES PERFORMANCE AND ATTRIBUTIONS

Study 2 serves two primary objectives. First, we explore the psychological process that underlies the positive effect of performance brands on objective outcomes. Specifically, we test the mediating role of state self-esteem in determining performance outcomes (hypothesis 2). Second, we not only examine objective brand performance (as in study 1), but also how consumers account for this increase in performance via attributions to the self (hypothesis 3). Consistent with our theorizing, we predict that a strong performance brand will enhance state self-esteem, which in turn increases objective performance and also attributions to the self for performance. We use an athletic context (golf putting) to build on the results of study 1.

## Method

**Participants and Design.** The experimental design was a 2 group (strong performance brand/control) between-subjects design. A total of 106 students (51% male) on a large midwestern university campus voluntarily participated in the study and received \$5 compensation.

**Procedure.** Students in a class building on a large university campus were intercepted and asked if they would like to volunteer to participate in a market research study. Those who agreed were invited into the lab one at a time. As in study 1, participants were told that they would be participating in a study about a new prototype golf putter and were randomly assigned to either the strong performance brand putter (i.e., Nike, based on the pretest described in study 1) or the control group putter condition in which no brand-related information was provided about the putter. As in study 1, all participants used the same putter (ruling out differences in actual putter performance; to improve our confidence in generalizability of the effect, all participants used a different putter than was used in study 1), and the putter's label was again manipulated to reflect the appropriate condition. Participants were asked to complete putts from three predefined locations on a putting green. The same procedures were followed as in study 1, and a research assistant recorded the number of strokes

needed to sink the ball in the hole from each location as a measure of actual performance.

After the putting task, all participants completed a short questionnaire. Participants responded to the following questions to measure performance attributions: "How much did each of the following contribute to how well you performed in the putting task: The performance and quality of the putter" and "My personal athleticism" (each on 7 point scales with end points "not at all/very much"). Participants also responded to a measure of state self-esteem (adapted from Robins, Hendin, and Trzesniewski 2001): "Please tell us how you felt while putting," (1) I felt good about myself, and (2) my self-esteem was high (each on 7 point scales with end points "strongly disagree/strongly agree"). Finally, participants answered background questions (e.g., gender, age).

## Results

**Objective Performance.** We again averaged the number of putts from the three predefined locations. Participants averaged 1.93 strokes to sink the putts (min = 1; max = 4.33; SD = .76;  $n = 101$ ). We excluded five subjects distributed across conditions because of excessive number of putts (i.e., > 3 SD from the initial overall mean,  $n = 106$ ; the pattern of results does not change if these data are retained.)

Performance (i.e., average number of strokes) was analyzed as a function of brand condition. As expected, fewer strokes were needed with a strong performance brand compared to the control condition ( $M_{\text{strong}} = 1.71$ ,  $SD = .61$ ;  $M_{\text{control}} = 2.14$ ,  $SD = .84$ ;  $F(1, 99) = 8.83$ ,  $p < .01$ ), consistent with hypothesis and a performance brand placebo effect. As in study 1, performance again improved approximately 20% when using a strong performance brand (compared to no brand information).

**Mediation via State Self-Esteem.** As expected, participants' state self-esteem ( $r = .90$ ) was significantly greater in the strong brand versus the control condition ( $M_{\text{strong}} = 5.12$ ,  $SD = 1.04$ ;  $M_{\text{control}} = 4.37$ ,  $SD = 1.19$ ;  $F(1, 99) = 11.34$ ,  $p < .01$ ). This pattern holds if we control for objective performance ( $F(1, 98) = 4.56$ ;  $p < .05$ ), helping rule out the possibility that self-esteem was enhanced because consumers were able to observe their own performance. (In study 3, we further minimize this possibility by using a context in which performance outcomes are not obvious to participants.) That is, the strong brand (compared to no brand information) enhanced state self-esteem.

To assess the mediating role of state self-esteem, we conducted a bootstrap analysis (e.g., Preacher and Hayes 2004, 2008; Zhao, Lynch, and Chen 2010) with brand as the independent variable, actual performance as the dependent variable, and state self-esteem as the mediator. State self-esteem emerged as a significant mediator (Indirect

effect =  $-0.23$ , 95% confidence interval [CI] =  $-0.457$  to  $-0.094$ ). These results support hypothesis 2 and mediation of the performance brand placebo via enhanced state self-esteem.

*Attributions.* How did participants account for their performance? Participants were significantly more likely to attribute their performance to the self (i.e., personal athleticism) when using the strong performance brand versus the control ( $M_{\text{strong}} = 3.98$ ,  $SD = 1.30$ ;  $M_{\text{control}} = 3.26$ ,  $SD = 1.56$ ;  $F(1, 99) = 6.34$ ,  $p = .01$ ). Attributions to the brand did not differ ( $M_{\text{strong}} = 4.47$ ,  $SD = 1.24$ ;  $M_{\text{control}} = 4.08$ ,  $SD = 1.26$ ;  $F(1, 99) = 2.47$ ,  $p > .10$ ). That is, participants attributed their improved performance to the self (personal athleticism), consistent with hypothesis 3a.

A follow-up bootstrap analysis finds that the impact of performance brand on attributions to the self is mediated by state self-esteem (indirect effect =  $.139$ , 90% CI,  $.002$ – $.421$ ), consistent with hypothesis 3b. (We note that this indirect effect pattern holds [indirect effect =  $.142$ , 95% CI,  $.013$ – $.423$ ] when controlling for actual performance as a covariate). That is, the performance brand heightens state self-esteem, which drives consumers to take the credit for improved performance (rather than increasing performance attributions to the brand). These results support hypothesis 3.

## Discussion

Study 2 again demonstrates a positive performance brand placebo on objective outcomes while shedding light on the process that underlies the effect. Consumption of a strong performance brand enhances state self-esteem, which in turn has a positive impact on performance. Furthermore, we reveal that consumers attribute these performance gains to themselves due to enhanced state self-esteem, whereas the performance brand received no additional credit for performance.

### STUDY 3: PROCESS ROLE OF ANXIETY

The objective of study 3 is twofold. First, study 3 extends our investigation to include the role of anxiety reduction in driving the performance brand placebo. Whereas study 2 establishes that a strong performance brand enhances state self-esteem and thereby improves performance, we propose that the performance gains due to enhanced state self-esteem emerge from a reduction in task-related anxiety. Specifically, a strong performance brand should enhance state self-esteem and, in turn, reduce anxiety, thereby positively affecting objective performance (i.e., hypothesis 2).

Second, our evidence thus far for a performance brand placebo has emerged for athletic performance, and the

current study extends our findings to cognitive performance in problem-solving tasks (i.e., hypothesis 1). We also test whether the tendency to attribute performance gains to the self replicates in this context (i.e., hypothesis 3). The manipulated product was a pair of noise-blocking foam earplugs positioned to improve concentration on a cognitive test.

## Method

*Participants and Design.* The design was a 2 group (strong performance brand/control) between-subjects design. A total of 91 undergraduate students (76% male) at a large midwestern university voluntarily participated for extra credit in an introductory business course.

*Procedure.* Participants entered the behavioral laboratory and were seated separately in individual cubicles containing a computer workstation and an opaque sealed plastic container that contained the performance brand product, a pair of foam earplugs. Inside the container was a sealed plastic bag containing the earplugs manipulated to either have a strong performance brand (3M) logo or no brand information. All participants used the same actual model of earplugs. The 3M brand was selected based on the results of a pretest described later.

Participants were told that the main part of the study was a math test, and that during this test they would wear a pair of foam earplugs to minimize distractions and improve concentration. Participants then received the performance brand manipulation by taking the earplugs from the container and wearing them (stimulus available in the online appendix). Participants then proceeded to the performance task, which consisted of five mathematics problems classified as moderately difficult by the SAT College Board Preparation Guide in 2014 (e.g., “Samantha is packing for a trip. Of the towels in the closet, 6 are brown. She will randomly pick one of the towels to pack. If the probability is  $2/5$  that the towel she will pick is brown, how many towels are in the closet?” 15/18/20/30/36).

Participants next responded to process measures of anxiety (“I felt anxious”), motivation (“I felt motivated”), and enjoyment (“I enjoyed myself”), each on 7 point scales, with end points “not at all/a lot.” The latter measures were included to examine alternative mediating processes. State self-esteem (“I felt bad about myself” (reverse scored), “My self-esteem was high”;  $r = .71$ ) was also recorded. Participants also responded to performance attribution measures (“To what extent would you attribute your performance on this test to: your innate intelligence/ability, your education, and the earplugs”; each on 7 point scales with end points “not at all/a lot”). Because individuals might be reluctant to claim innate intelligence, we included education as an additional self-attribution measure. Finally,



participants responded to background questions (e.g., gender, age).

## Results

*Pretest.* A pretest was administered to 57 students on a large midwestern university campus to indicate how two types of earplugs (i.e., strong performance brand “3M” or no brand information in the control condition) were expected to affect concentration on a math test. All participants viewed the same picture of foam earplugs with manipulated brand labels. As in study 1, we used the following three items to measure brand performance expectancies (all on a scale from 1 [Not at all] to 7 [Very much]; adapted from Shiv et al. 2005): “Wearing these [brand] earplugs will harm/help my concentration on a math test”; “I feel that wearing these [brand] earplugs is very bad/very good at improving my concentration on a math test”; “To what extent can wearing these [brand] earplugs improve your concentration on a math test?” As anticipated, performance expectancies ( $\alpha = .93$ ) were significantly higher for the strong performance brand earplugs than the unbranded control ( $M_{\text{strong}} = 4.83$ ,  $SD = 1.17$  vs.  $M_{\text{control}} = 3.95$ ,  $SD = .95$ ;  $F(1, 55) = 9.73$ ,  $p < .01$ ).

*Objective Performance.* Performance was measured via the number of questions correctly answered (out of 5) on the cognitive performance task. In support of hypothesis 1, analysis revealed improved objective performance for the strong performance brand versus control condition ( $M_{\text{control}} = 2.38$ ,  $SD = 1.13$  vs.  $M_{\text{strong}} = 2.89$ ,  $SD = 1.06$ ;  $F(1, 89) = 4.77$ ,  $p < .05$ ). Consistent with hypothesis 2, state self-esteem was higher ( $M_{\text{control}} = 4.35$ ,  $SD = 1.46$  vs.  $M_{\text{strong}} = 4.93$ ,  $SD = 1.16$ ;  $F(1, 89) = 4.39$ ,  $p < .05$ ) and anxiety was lower ( $M_{\text{control}} = 3.40$ ,  $SD = 1.85$  vs.  $M_{\text{strong}} = 2.73$ ,  $SD = 1.45$ ;  $F(1, 89) = 3.74$ ,  $p = .056$ ) for the strong performance brand; figure 2 offers an illustration.

*Serial Mediation.* What role did state self-esteem and anxiety play in improving objective performance? To assess mediation, we conducted a bootstrapping analysis (Preacher and Hayes 2004, 2008; Zhao et al. 2010) with performance brand condition as the independent variable, state self-esteem and anxiety as serial mediators, and objective performance as the dependent variable. The predicted indirect effect via state self-esteem and, in turn, anxiety was significant (Indirect effect = .036, 95% CI, .003–.131), supporting hypothesis 2. That is, a strong performance brand heightened state self-esteem, which in turn decreased anxiety and thereby improved objective performance. Analyses do not support mediation via motivation or enjoyment; a separate bootstrapping mediation model examining the indirect effects of anxiety, motivation, and enjoyment in parallel revealed that the anxiety pathway remained marginally significant (Indirect effect = .068; 90%

CI, .002–.189), whereas no indirect effect was observed for motivation or enjoyment (90% CIs contained 0).

*Attributions.* Analysis indicated that the strong performance brand increased attributions to the self ( $r = .75$ ;  $M_{\text{control}} = 4.46$ ,  $SD = 1.56$  vs.  $M_{\text{strong}} = 5.07$ ,  $SD = 1.32$ ;  $F(1, 89) = 4.02$ ,  $p < .05$ ). Attributions to the earplugs were unaffected by brand condition ( $M_{\text{control}} = 2.49$ ,  $SD = 1.59$  vs.  $M_{\text{strong}} = 2.80$ ,  $SD = 1.50$ ;  $F(1, 89) = .89$ ;  $p > .30$ ). Moreover, a bootstrapping analysis with performance brand condition as the independent variable, state self-esteem as mediator, and attribution to the self as dependent variable indicated a significant indirect effect (indirect effect = .16, 95% CI, .031–.386). (We note that this indirect effect pattern holds when controlling for actual performance as a covariate [indirect effect = .09; 90% CI, .007–.269]. Also, as expected, an analysis testing serial mediation involving anxiety [i.e., brand—state self-esteem—anxiety—attribution] is not supported; recall that an enhanced state self-esteem is expected to facilitate attributions to the self directly rather than via anxiety.) These results support hypothesis 3a and 3b and replicate study 2: a strong performance brand (versus no brand information) heightens state self-esteem, which in turn increases performance attributions toward the self—with no similar increase in attributions to the performance branded product.

## Discussion

Study 3 demonstrates that a performance brand heightens state self-esteem and, as a result, (1) reduces anxiety and thereby improves performance, and (2) increases consumer attributions for performance to the self (with no increase in attributions to the brand). Thus together, studies 1, 2, and 3 provide support for hypotheses 1, 2, and 3: a positive brand placebo effect on objective performance that is attributed to the self and is mediated by state self-esteem enhancement and anxiety reduction.

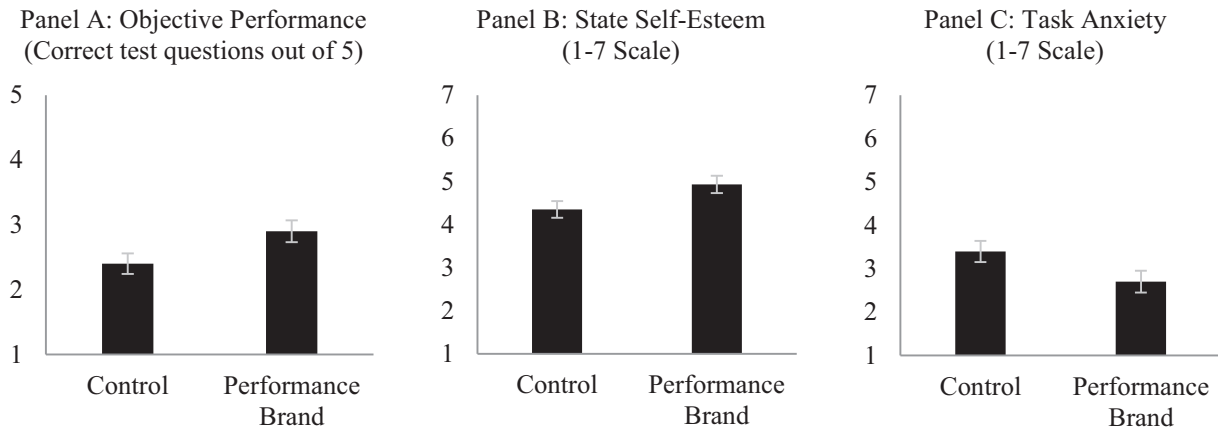
In the subsequent studies, we explore boundary conditions that alter the performance brand placebo effect on objective outcomes. Study 4 focuses on the moderating role of stress mindset (Crum et al. 2013), thereby shedding further light on the role of anxiety in determining the performance brand placebo. Study 5 focuses on the moderating role of domain self-efficacy beliefs (Bandura 1997, 2006), and also distinguishes performance brands from other brands that are highly regarded by consumers (i.e., prestige brands; Broniarczyk and Alba 1994; Park, Milberg, and Lawson 1991).

### STUDY 4: STRESS MINDSET AND REVERSAL OF THE PERFORMANCE BRAND PLACEBO

The primary objective of study 4 is to provide further evidence for the role of anxiety reduction in the performance brand placebo via a theoretically relevant moderator and

FIGURE 2

## COGNITIVE PERFORMANCE BRAND PLACEBO (STUDY 3)



boundary condition. Study 3 provides support for the role of anxiety by showing how a strong performance brand reduces anxiety and therefore enhances performance. Because performance contexts can lead to stress that creates anxiety, the present study investigates individual beliefs about the nature of experienced stress (stress enhances vs. stress debilitates; Crum et al. 2013) and their impact on the performance placebo. That is, we provide further process evidence for the underlying anxiety mechanism via the theoretically relevant moderator of stress mindset (cf. Spencer, Zanna, and Fong 2005).

Our identification of the role of anxiety in determining the performance brand placebo introduces stress mindset as a mechanism by which this effect may potentially be heightened, lessened, or even reversed. Recent research has shown that exposure to environmental stressors (consistent with those that induce anxiety) may have varying effects on individuals based on individual stress mindset (Crum et al. 2013). Specifically, a majority of individuals hold the belief that stress is debilitating: the experience of stress typically undermines self-reported psychological health and work performance, consistent with the conceptualization of stress as inducing maladaptive anxiety. However, a minority of individuals believe that stress is enhancing: rather than maladaptive anxiety, stress actually improves self-reported psychological health and work performance. This view is consistent with recent research that indicates that some individuals may reframe anxiety as excitement and thereby enhance performance outcomes (Brooks 2013). We have previously argued that a decrease in performance-induced anxiety underlies the performance brand placebo. If so, then the strength of the positive placebo should increase with personal beliefs that stress is debilitating. In contrast, as personal beliefs that stress is

enhancing increase, the placebo effect should weaken and may reverse; that is, performance may worsen because the placebo *alleviates* stress. Formally,

**H4:** The positive impact of the performance brand placebo increases (decreases) as the belief that stress is debilitating (enhancing) increases.

If supported, the present study will (1) demonstrate a boundary condition that weakens or even reverses the performance brand placebo, and (2) further support the role of anxiety as the underlying mechanism for the performance brand placebo. Further, this study will also (3) demonstrate that stress mindset influences actual task performance outcomes, an effect that Crum et al. (2013) were unable to document.

As a secondary objective, the current study also provides further evidence for generalizability of a performance brand placebo on cognitive performance. Whereas studies 1 to 3 manipulated the brand of a tangible good, this study investigates service brands positioned on performance—namely, cognitive test preparation (such as Kaplan and Princeton Review) brands—and their impact on cognitive test performance.

## Method

**Participants and Design.** The experimental design was a 2 group (strong performance brand/weak performance brand) between-subjects design, with a continuous measure of stress mindset (Crum et al. 2013). Participants were 84 students (54% male) at a large midwestern university who participated voluntarily in return for course credit.

**Procedure.** Participants first completed an established measure of stress mindset (Crum et al. 2013). The stress

mindset scale measures the degree to which individuals believe that stress enhances versus debilitates performance. Sample items include “Experiencing stress enhances my performance and productivity” and “The effects of stress are negative and should be avoided” (measured on 7 point scales with end points “Strongly disagree” to “Strongly agree”; the online appendix shows the full 8 item scale). The measure of stress mindset was embedded within a longer questionnaire to disguise its purpose.

In an ostensibly unrelated task, participants next were informed that they would be trialing a new test preparation smartphone application that delivers lessons to improve performance on the Graduate Management Admission Test (GMAT). Based on a pretest (described later), participants in the strong performance brand condition were told that the developer was Kaplan (a well-established brand familiar to participants), whereas those in the weak performance brand condition were told that the developer was Laserprep (a fictitious brand unknown to participants). Aside from the brand name, the introduction did not differ by condition; the full text is available in the online appendix.

To give participants actual consumption experience with the performance brand, participants then sampled a lesson described as taken from the target test prep module. All participants proceeded through the same lesson, adapted from Kaplan (2004, 41). The lesson took approximately 5 minutes and provided material regarding how to answer critical reasoning questions. After completing the lesson, participants answered five critical reasoning multiple-choice questions taken from Kaplan (2004)’s GMAT practice question bank (a sample item is shown in the online appendix). Finally, participants responded to background questions (e.g., gender, age).

## Results

**Pretest.** A pretest was administered to 57 students on a large midwestern university campus to rate how lessons from the two test preparation companies (i.e., strong performance brand Kaplan and weak performance brand Laserprep) were expected to influence GMAT performance. As before, we used the following three items to measure brand performance expectations (all on a scale from 1 [Not at all] to 7 [Very much]; adapted from Shiv et al. 2005): “The lesson from [brand] will harm/help my GMAT performance”; “I feel that the lesson from [brand] is very bad/very good at improving my GMAT performance”; “To what extent could the lesson from [brand] improve your GMAT performance?” Performance expectancies ( $\alpha = .96$ ) were significantly higher for the strong performance brand than for the weak performance brand ( $M_{\text{strong}} = 4.63$ ,  $SD = 1.04$  vs.  $M_{\text{weak}} = 3.85$ ,  $SD = 1.15$ ;  $F(1, 55) = 11.39$ ,  $p < .01$ ).

**Objective Performance.** Analysis of performance (number of test questions correctly answered) was conducted as a

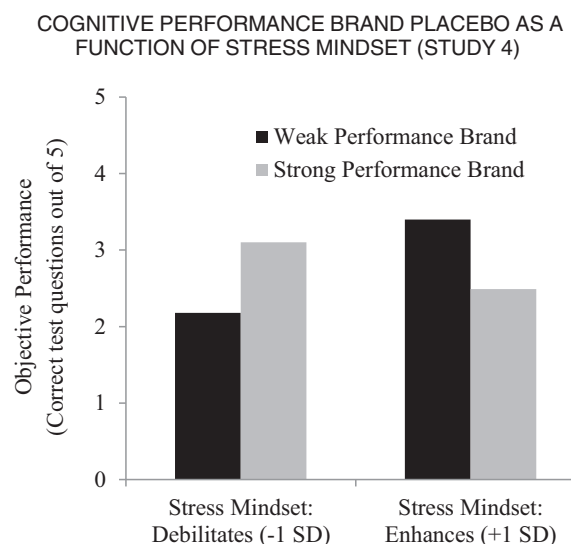
function of brand condition, stress mindset ( $\alpha = .78$ ;  $M = 3.54$ ,  $SD = .87$ ; mean centered), and their interaction. Analysis of variance revealed the expected two-way interaction ( $F(1, 80) = 11.35$ ,  $p = .001$ ); main effects were not significant ( $F$ 's  $< 1$ ). We note that between manipulated conditions, stress mindset did not vary significantly ( $F < 1$ ); nor did the time spent on the lesson or questions ( $F$ 's  $< 1.5$ ).

To understand the nature of the interaction, spotlight analyses were conducted at higher and lower levels of stress mindset ( $\pm 1$  SD). A significant positive effect emerged at low levels of stress mindset (i.e., stress was seen as strongly debilitating) ( $\beta = .91$ ;  $t(80) = 2.22$ ,  $p < .05$ ), whereas this effect reversed at high levels of stress mindset (i.e., stress was seen as strongly enhancing) ( $\beta = -.105$ ;  $t(80) = -2.56$ ,  $p < .05$ ). See figure 3 for an illustration. Floodlight analysis results (Johnson and Fay 1950; Spiller et al. 2013) were also consistent with our theory: A strong performance brand has an enhancing effect at stress mindset levels below the Johnson-Neyman point of 2.81 ( $t(80) = 1.99$ ,  $p = .05$ ) and a debilitating effect at stress mindset levels above 4.09 ( $t(80) = -1.99$ ,  $p = .05$ ). Consistent with hypothesis 4, a strong performance brand improved objective performance when stress was seen as debilitating but undermined performance when stress was seen as enhancing.

## Discussion

Study 4 provides a deeper understanding of the role of anxiety in determining the strength and direction of the placebo effect. Specifically, whether branded performance

FIGURE 3



consumption improves or undermines task outcomes was determined by individual beliefs in the enhancing or debilitating nature of experienced stress. When individuals held the belief that stress is debilitating, a stronger performance brand resulted in a positive performance placebo—consistent with study 3, in which decreased anxiety resulted in enhanced performance. However, among those who perceived stress as enhancing, a stronger performance brand actually *harmed* performance. That is, for individuals who thrive under stress, the anxiety-alleviating effects of performance brands actually resulted in lower performance, revealing an important boundary condition of the performance brand placebo.

### STUDY 5: THE MODERATING ROLES OF SELF-EFFICACY AND THE PRESTIGE/PERFORMANCE DISTINCTION

The primary objectives of study 5 are to assess two additional, theoretically relevant boundaries on the performance brand placebo. First, we seek to distinguish performance brands from another form of high-equity brand—prestige brands (Park et al. 1991). In doing so, we further support our theory that brands must carry strong, positive performance expectancies to boost objective performance. As a second objective, we test whether preexisting beliefs about one's self-efficacy (i.e., capability) in the domain of the task (Bandura 1997, 2006) moderates the performance brand effect. As a supplemental objective, we also seek to enhance the generalizability of our findings by executing this study as a field experiment that employs a more diverse participant sample.

#### Performance versus Prestige Brands

The performance brands that we have utilized in our previous studies have all been consistent with high equity (Keller 1993) or otherwise premium brands. This raises the question, does another category of premium brands—prestige brands—similarly impact performance? Our theory suggests not. That is, whereas performance brands hold strong performance expectancies (consistent with prior studies), prestige brands hold strong prestige expectancies (i.e., of status and/or luxury; Broniarczyk and Alba 1994; Park et al. 1991; Wilcox et al. 2009). Thus given that prestige brands' status and/or luxury expectancies are not perceived as relevant to the performance task at hand, they should be less consistent with an idealized self in the current situation, reduce anxiety toward task performance to a lesser extent, and thereby elicit a weaker effect on performance. This prediction is consistent with extant placebo research that has established a connection between product expectancies and performance outcomes (Shiv et al. 2005). Of course, some brands may carry both strong performance expectancies and high prestige expectancies. Consistent

with our theory, the strong performance expectancies carried by such brands would elicit the performance brand placebo. Accordingly, we propose that performance brands improve objective outcomes more so than prestige brands. Stated more formally:

**H5:** Performance brands elicit a placebo on objective performance outcomes, whereas prestige brands do not.

#### Domain Self-Efficacy Beliefs

Our second objective for study 5 is to assess preexisting beliefs about one's domain self-efficacy as a moderator of the performance brand placebo. Drawing on prior research, we adopt the definition of domain self-efficacy as a personally held belief about one's capability at producing attainments in a specific domain (Bandura 1997, 2006). That is, domain self-efficacy is a task-specific belief about personal capability at performing well at a specific task or set of tasks. We importantly note that domain self-efficacy is a specific rather than a generalized trait (Bandura 1997), which is distinct from more generalized, global views of the self such as self-esteem (c.f. Stajkovic and Luthans 1998). Indeed, prior research explicitly distinguishes between self-efficacy as a cognitive belief in personal capability at a fairly narrow task or set of tasks, whereas self-esteem is a more broadly held, affectively felt sense of personal worth (e.g., Bandura 2006; Blascovich and Tomaka 1991; Pelham and Swann 1989; Rosenberg et al. 1995).

How does domain self-efficacy moderate the effect of performance brands? Classic work by Bandura (1982) argued that low self-efficacy is accompanied by self-doubts that "create stress and impair performance by diverting attention from how best to proceed with the undertaking to concerns over failings and mishaps" (123). Subsequent research supports this proposition (e.g., Jex and Bliese 1999; Saks 1994). That is, individuals low in self-efficacy beliefs about their capabilities at a task are more likely to experience debilitating anxiety when performing that task. We theorize and demonstrate in studies 3 and 4 that performance brands may buffer against such anxiety. Accordingly, we propose that as individual self-efficacy decreases, the opportunity for anxiety mitigation to improve performance increases. In contrast, individuals with higher levels of self-efficacy should have lower levels of anxiety to mitigate, thereby weakening the performance brand placebo effect. Formally:

**H6:** The positive impact of the performance brand placebo increases as preexisting domain self-efficacy beliefs decrease.

Furthermore, consistent with our conceptualization of performance brands versus prestige brands (hypothesis 5), we predict that the moderating pattern proposed in

hypothesis 6 will hold for performance brands but not for prestige brands (which lack strong performance expectancies and therefore do not elicit a performance brand placebo).

## Method

*Participants and Design.* Participants were 77 members of a health club (74% male) in the Midwest who voluntarily participated in return for \$5 (Mean Age = 26.46, SD = 10.39). This field experiment employed a three group (performance brand/prestige brand/control) between-subjects design. Domain self-efficacy beliefs (Bandura 2006) were measured as a continuous covariate.

*Procedure.* Research assistants invited participants entering the health club to participate in a market research study. Participants were told that they would be participating in a brief market research study conducted by a sporting goods retailer evaluating several prototype golf putters, and responded to various background questions (e.g., gender, age) as part of an initial questionnaire. Before learning about the golf putter brand, individuals provided a three item measure of golf putting self-efficacy (“On a scale from 1 to 7, how capable are you at golf putting?”, “On a scale from 1 to 7, how experienced of a golf putter are you?”, “On a scale from 1 to 7, how confident are you about your golf putting skills?”; Bandura 2006). Participants were then randomly assigned to the performance or prestige brand putter (i.e., Nike vs. Gucci brands, based on a pretest described later), or a control group condition in which no brand-related information was provided about the putter. As in studies 1 and 2, all participants used the same putter, with the label manipulated to reflect the appropriate condition. Participants proceeded to sink three putts from predefined locations (same as in studies 1 and 2) and then received compensation for their participation.

## Results

*Pretest.* A pretest of expectancies was conducted among 140 students on a large midwestern university campus to assess our operationalizations of performance and prestige brands (strong performance brand Nike, strong prestige brand Gucci, and a control with no brand information). All participants viewed a photograph of the actual putter used in the study with a manipulated brand label and responded to performance expectancy questions identical to those used in the pretest of study 1. Participants were also asked to rate prestige expectancies of the respective putter they evaluated: “Using this [brand] golf putter will harm/help my prestige”; “To what extent could using this [brand] golf putter indicate that the user is prestigious [not at all/a lot]?”; “I feel that using this [brand] golf putter is [very good/very bad] at signaling high social status” (each on 7 point scales). Finally, the pretest also included an

established measure of brand equity (Brady et al. 2008; sample item: “On a scale from 1 to 7 [with end points “low quality/high quality”], how would you rate the quality delivered by the [brand] putter?”).

As expected, performance expectancies were significantly higher for the strong performance brand putter versus the strong prestige brand putter ( $M_{\text{performance}} = 4.95$ ,  $SD = 1.22$  vs.  $M_{\text{prestige}} = 4.12$ ,  $SD = 1.43$ ;  $F(1, 91) = 8.96$ ,  $p < .01$ ) and the control condition ( $M_{\text{performance}}$  vs.  $M_{\text{control}} = 4.06$ ,  $SD = 1.29$ ;  $F(1, 89) = 11.33$ ,  $p < .01$ ). Furthermore, the prestige brand’s performance expectancies did not differ significantly from the control ( $F < 1$ ,  $p > .80$ ). Also as expected, prestige expectancies were significantly higher for the prestige brand than both the performance brand ( $M_{\text{prestige}} = 5.25$ ,  $SD = 1.36$  vs.  $M_{\text{performance}} = 4.62$ ,  $SD = 1.30$ ;  $F(1, 91) = 5.19$ ,  $p < .05$ ) and the control condition putter ( $M_{\text{prestige}}$  vs.  $M_{\text{control}} = 4.01$ ,  $SD = 1.35$ ;  $F(1, 94) = 20.47$ ,  $p < .01$ ). Finally, overall brand equity was high and similar for the performance and prestige brands ( $M_{\text{performance}} = 5.24$ ,  $SD = 1.31$  vs.  $M_{\text{prestige}} = 4.94$ ,  $SD = 1.36$ ;  $F(1, 91) = 1.17$ ,  $p > .25$ ), and both the performance brand’s ( $F(1, 89) = 40.04$ ,  $p < .01$ ) and prestige brand’s ( $F(1, 94) = 26.61$ ,  $p < .01$ ) brand equity was significantly higher than that of the control condition ( $M_{\text{control}} = 3.63$ ,  $SD = 1.12$ ). These results support the intended operationalizations of performance and prestige brands.

*Outcomes for Performance versus Prestige Brands.* We averaged the number of strokes each participant took from the three predefined locations. On average, participants took 1.81 strokes to sink the putt ( $SD = .86$ ;  $\text{min} = 1$ ;  $\text{max} = 4.00$ ;  $n = 76$ ). We excluded one participant because of excessive number of putts (i.e.,  $> 6$  SD above the initial overall mean,  $n = 77$ ).

Objective performance (i.e., average number of strokes) was analyzed as a function of brand condition ( $F(2, 73) = 6.49$ ,  $p < .01$ ). As expected, participants in the performance brand condition succeeded with fewer putts on average than both the prestige brand ( $M_{\text{performance}} = 1.44$ ,  $SD = .40$  vs.  $M_{\text{prestige}} = 2.11$ ,  $SD = .88$ ;  $F(1, 73) = 12.19$ ,  $p < .01$ ) and control condition ( $M_{\text{performance}}$  vs.  $M_{\text{control}} = 1.91$ ,  $SD = .73$ ;  $F(1, 73) = 5.99$ ,  $p < .05$ ). The prestige and control conditions did not vary in performance ( $F(1, 73) = 1.11$ ,  $p = .30$ ). These results indicate that the performance brand effect does not extend to other high-equity branded products that do not carry relevant performance expectancies for the focal task. That is, in support of hypothesis 5, it is not enough for a brand to have high brand equity. Rather, the brand must also carry performance expectancies to elicit the performance brand placebo effect.

*Moderation via Domain Self-Efficacy Beliefs.* To test the moderating role of domain self-efficacy beliefs, we next analyzed performance as a function of brand

condition, domain self-efficacy (constructed from the three item measure,  $\alpha = .89$ ,  $M = 3.40$ ,  $SD = 1.45$ , mean centered), and their two-way interaction. Analysis of covariance revealed main effects of brand condition ( $F(2, 70) = 7.64$ ,  $p < .01$ ) and domain self-efficacy ( $F(1, 70) = 10.41$ ,  $p < .01$ ), qualified by a two-way interaction ( $F(2, 70) = 3.20$ ,  $p < .05$ ). Follow-up spotlight analysis was conducted to determine the nature of this interaction (figure 4).

We first contrasted the performance brand versus the control condition at higher and lower levels of self-efficacy ( $\pm 1$  SD). A significant performance-enhancing effect emerged at low levels of self-efficacy ( $\beta = -.71$ ;  $t(48) = -3.29$ ,  $p < .01$ ), whereas no effect was observed at higher levels of self-efficacy ( $\beta = -.29$ ;  $t(48) = -1.34$ ,  $p = .19$ ). Consistent with our theory and hypothesis 6, the performance brand had positive effects on performance for individuals low in self-efficacy beliefs—but this brand placebo effect diminished for individuals high in self-efficacy beliefs. Contrasting the performance brand versus the prestige brand condition, a similar pattern emerged: An enhancing effect of the performance brand at low levels of self-efficacy ( $\beta = -1.10$ ;  $t(47) = -4.58$ ,  $p < .01$ ) and no effect at high levels of self-efficacy ( $\beta = -.25$ ;  $t(47) = -1.02$ ,  $p = .31$ ), providing further support for H6. Contrasting the prestige versus control conditions, no effects are observed at either level of self-efficacy ( $p$ 's  $> .20$ ). This overall pattern supports hypotheses 5 and 6: a placebo effect on objective outcomes emerges for a

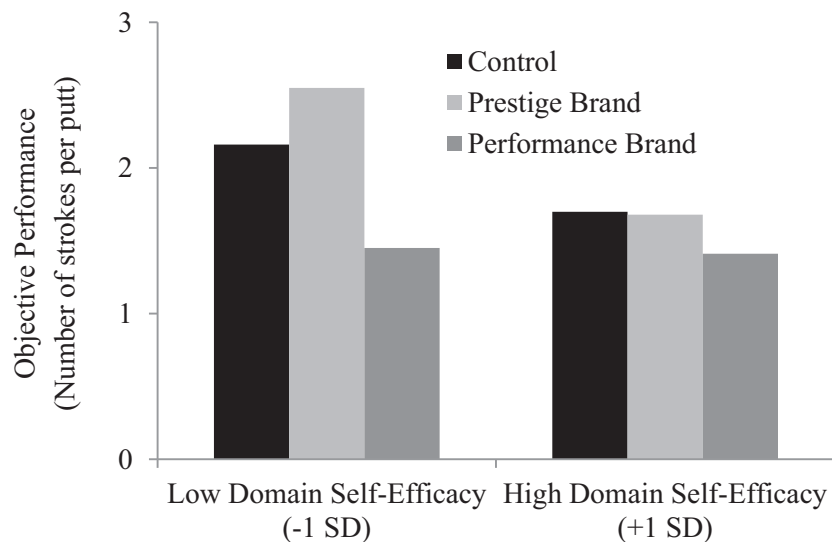
performance brand but not a prestige brand, and the placebo is stronger at lower levels of self-efficacy. Floodlight analysis results (Johnson and Fay 1950; Spiller et al. 2013) were also consistent with our theory. Regarding the performance versus control interaction, the floodlight analysis revealed a significant effect of performance brand (vs. control) at self-efficacy levels below the Johnson-Neyman point of 4.07 ( $t(48) = -2.01$ ,  $p = .05$ ), and no effect at levels above that point. Analysis of the performance versus prestige interaction also revealed a consistent pattern of results: a significant effect of performance brand emerged below 4.28 ( $t(47) = -2.01$ ,  $p = .05$ ) but was mitigated at higher levels of self-efficacy.

## Discussion

These results expand on our general findings pertaining to hypotheses 1 and 2 by demonstrating theoretically and pragmatically relevant boundary conditions regarding the performance brand placebo and its anxiety-reduction mechanism. Importantly, we demonstrate that performance brands, rather than prestige brands, elicit a placebo effect on objective outcomes. Moreover, we demonstrate that domain self-efficacy beliefs moderate the strength of the performance brand placebo such that the effect is stronger for consumers who have lower domain self-efficacy beliefs. We note that we replicated the moderating role of domain self-efficacy beliefs in a separate study using the same cognitive test performance context as in study 4 (i.e., GMAT

FIGURE 4

ATHLETIC PERFORMANCE BRAND PLACEBO AS A FUNCTION OF SELF-EFFICACY (STUDY 5)



NOTE.—Improved performance is indicated by a reduced number of putts.

test preparation). Results again revealed that the performance brand placebo effect emerged for those with low (test-taking) domain self-efficacy beliefs, and it was mitigated at higher levels of domain self-efficacy beliefs. For brevity's sake, we report the results of this additional study in the online appendix.

## GENERAL DISCUSSION

The present research investigates the impact of performance brand consumption on task performance in a variety of contexts. Our theoretical framework proposes that consumption of a brand that carries performance-enhancing expectations results in psychological changes for consumers (enhanced state self-esteem and reduced anxiety) that in turn improve an individual's objective performance outcomes. Furthermore, consumers attribute this improved performance to themselves.

A set of five studies provides support for the performance brand placebo across a variety of brands, product categories, and athletic and cognitive performance contexts. In each study, a performance brand affects proficiency in a target endeavor, absent any functional product differences (i.e., the product was materially identical)—consistent with a placebo effect. Study 1 demonstrates that use of a performance brand can positively impact objective performance outcomes. Studies 2 and 3 replicate the performance brand placebo effect while providing evidence that heightened state self-esteem drives anxiety reduction and subsequent performance improvements, as well as increased attributions of performance to the self (with no similar increase for the brand). Studies 4 and 5 examine theoretically and pragmatically relevant boundary conditions for the performance brand placebo. Study 4 examines stress mindset: Performance brands improve (undermine) outcomes when individuals believe that stress is debilitating (enhancing). Moreover, study 5 examines domain self-efficacy beliefs and distinguishes between performance brands and prestige brands: Performance brands improve outcomes as domain self-efficacy decreases, and the placebo does not emerge for prestige brands. Together, these findings contribute to the literature examining placebo effects, stress responses, human performance, and brand consumption while identifying important implications for consumers and marketers.

### Limitations

Our research is not without limitations, which provide opportunities for further inquiry. First, the majority of our studies were conducted in controlled settings of relatively short duration for both task performance and brand experience (e.g., a short putting task, a sample lesson plan). As a result, our findings may not generalize to the longer term use of performance brands under conditions where repeat

learning and adapting to use of the brand might alter outcomes. Second, we provide some variation in performance contexts, both athletic and cognitive, but make no claims to generalizability across all brands and performance tasks. We do provide evidence for generalizability across brand positioning (performance vs. prestige) and consumers (stress mindset, self-efficacy)—but further research is needed to identify additional factors that affect the emergence of the performance brand placebo. Third, we included unbranded control conditions to establish that the performance brand placebo represents an enhancement due to heightened expectancies. However, unbranded products may vary in performance expectancies that could alter the performance placebo. For example, if unbranded products were to carry performance expectancies as high as performance brands, then we would not expect a positive placebo effect to emerge. Fourth, the possibility of experimenter effects is acknowledged in studies 1 and 2 inasmuch as experimenters were aware of the brand condition and may have inadvertently influenced participants' performance in the golf putting task (akin to the "Clever Hans" effect). However, experimenter effects seem unlikely in studies 3–5, where performance was not observable and experimenter effects cannot account for the interaction patterns. Finally, we note that all of our studies were conducted in the individualist culture of the United States. In particular, cultural differences have been shown to play a role in both brand perceptions (e.g., Erdem, Swait, and Valenzuela 2006) and internal versus external attributions (e.g., Choi and Nisbett 1998)—and further cross-cultural research is certainly merited.

### Contributions and Future Research

*Placebo Research.* We distinguish our work from prior research on placebo effects in several ways and in doing so expand knowledge in this area. First, prior research on marketing-driven placebos has focused primarily on subjective consumer effects and not objective performance outcomes of the type we examine here (Branthwaite and Cooper 1981; Kerr et al. 2008; Plassmann et al. 2008; Waber et al. 2008). Recent research has begun to examine placebo effects on objective performance (Shiv et al. 2005; Wright et al. 2013) and has primarily documented performance-diminishing placebo effects (e.g., driven by price discounts) in cognitive performance contexts. Our research builds on this work to demonstrate that marketing actions can lead to superior (i.e., enhanced) performance on target outcomes in both cognitive and athletic contexts. That is, brand perceptions can make one perform better, even in the absence of material product differences.

Second, our research contributes to understanding of the psychological processes that underlie placebo effects. The mechanisms through which traditional subjective placebos occur are varied and remain the source of some controversy (Stewart-Williams 2004), and the processes that

drive objective performance placebos are not well understood (Berns 2005). We build on prior research examining objective placebos (Shiv et al. 2005) by demonstrating that heightened performance expectancies are necessary for a positive performance placebo to emerge. Moreover, our work provides insight into the mechanisms through which the placebo effect occurs—namely that a performance brand heightens state self-esteem and reduces anxiety, thereby improving performance. This process explanation is novel to the placebo literatures.

Future research is needed to better understand the nature of performance brand placebos. In particular, study 4 demonstrates that performance brands can enhance or undermine performance outcomes as a function of individual stress mindset. Future research could examine other factors that determine whether performance brands lead to similar enhancing or debilitating effects. For example, task difficulty (e.g., Ilyuk, Block, and Faro 2014) likely plays an important role: tasks that are very easy (difficult) may evoke such low (high) levels of anxiety that the anxiety-reduction mechanisms of a performance brand cannot operate. Similarly, a truly elite performance brand (e.g., one exclusive to world-class athletes and not generally used by consumers) might undermine performance outcomes of typical consumers by inadvertently heightening anxiety or undermining state self-esteem (through feelings of inadequacy to handle the elite brand). Indeed, an interesting question is whether the performance expectancies of the brand needs to be within “reach” level of the consumer, consistent with the literature on the impact of attainable goals on individual performance (e.g., Scott and Nowlis 2013).

Of considerable interest is the use of performance brands over time. Study 5 demonstrates that the performance brand placebo increases as consumer self-efficacy beliefs decline. Hence low-efficacy consumers could strategically use performance brands to enhance their performance. An interesting avenue for future research would be the exploration of consumer lay theories regarding the use of performance brands, particularly their strategic deployment to enhance performance (e.g., Molden and Dweck 2006; Wang, Keh, and Bolton 2010). Related to this, could the performance brand placebo eventually “wear out” for consumers who repeatedly use performance brands? In a preliminary exploration of this question, we observed in a separate field study (omitted for brevity) that health club members primed to think about the performance brands that they would wear during their upcoming workout subsequently exercised more intensely. This preliminary finding suggests that consumers could potentially become desensitized to the performance brand placebo over extended time periods of brand use. However, at the same time, the finding also suggests that the placebo could be elicited by drawing attention to the use of performance brands. Future research is merited to explore the implications of chronic performance brand consumption.

*Human Performance and Stress Responses.* Our research also contributes to the emerging literature on individual stress mindset, which demonstrates that the emotional arousal associated with stress and anxiety may either enhance or debilitate depending on consumer belief (Brooks 2013; Crum et al. 2013). Building on the research of Crum et al. (2013), we demonstrate that stress mindset moderates the performance brand placebo such that positive (negative) performance outcomes emerge with increasing beliefs that stress is debilitating (enhancing). Whereas Crum et al. (2013) demonstrated that stress mindset may influence subjective measures of well-being over time, our work is the first to show (1) that stress mindset can influence objective performance for specific task outcomes and (2) that stress mindset may alter the impact of state anxiety (i.e., episodic rather than sustained stress) upon task performance.

Additional research is certainly warranted in this space. For example, in a recent study, Brooks (2013) showed that individuals can cope with anxiety stemming from anticipation of performance tasks by reappraising the pre-performance anxiety as excitement. Building on this work, and considering that consumers build close relationships with brands (e.g., Fournier 1998), could consumption of closely held performance brands (or performance brands with “exciting” personalities; e.g., Aaker 1997) reframe task anxiety into excitement? Future research should examine the potentially complex relationship between anxiety-excitement framing and performance brand consumption.

*Branded Consumption.* An additional way that our work extends consumer research is via its focus on performance brands. Despite the vast and growing body of work examining brands in consumer research (e.g., Ferraro, Bettman, and Chartrand 2009; Johnson, Matear, and Thompson 2011; Swaminathan, Stilley, and Ahluwalia 2009; Sweldens, Van Osselaer, and Janiszewski 2010), the implications of performance brands for placebo effects, and the underlying processes, are not well understood. Brands are frequently considered the most valuable intangible asset of a firm (e.g., Keller and Lehmann 2006), but research is needed to better understand how these assets improve consumers’ performance—and, ultimately, serve as an objectively valuable asset to the consumer.

Our research shows that consumption of performance brands can objectively improve outcomes across a variety of tasks—yet due to enhanced state self-esteem, consumers seem to attribute the performance boost to themselves rather than the performance brand. (Consumers attribute performance to both the brand and the self, but the positive placebo is credited to consumers themselves.) This finding contributes to the attribution literature (Kelley 1973; Malle 2006) by demonstrating how consumption of performance brands can paradoxically mask the effect of the brand (i.e., a form of misattribution). Future research could investigate this attributional process. For example, given consumers’



need for agency (Baumeister 1998; Bhattacharjee, Berger, and Menon 2014), does self-attribution represent a coping mechanism to avoid harming the self-concept? What individual, situational, and performance factors alter the extent to which performance changes resulting from brand consumption are attributed to the brand versus the self? And from a brand equity perspective, how might firms enhance attributions that favor the brand while protecting attributions to the consumer's self?

Our findings are also relevant for research examining brand-exposure effects in driving behavioral outcomes (e.g., Chartrand et al. 2008; Fitzsimons, Chartrand, and Fitzsimons 2008). Whereas extant work has demonstrated behavioral effects of brands through mere exposure (e.g., exposure to the Disney versus E! television brands increases honesty), our research finds that emergence of the performance brand placebo effect is contingent on not just exposure to a brand but that the brand has relevance for performance (i.e., it carries strong performance expectancies). This finding also distinguishes our work from Park and John (2014), who emphasize that the brand-exposure effect observed in their studies is not a placebo effect, as those studies employ branded products that possess no performance-relevant attributes. In revealing that performance brands are defined by their performance expectancies, we also distinguish performance brands from another category of high-equity brands—prestige brands (Park et al.; Wilcox et al. 2009).

Exploring additional concepts from the branding literature provides opportunities for future research on performance brand placebos. For example, brand consciousness (Sproles and Kendall 1987) or brand attachment (Park et al. 2010) may alter the impact of brands on performance. Brand-conscious consumers typically consider branded products to be higher quality and more efficacious (Sproles and Sproles 1990) and highly brand-attached consumers see branded products as more instrumental to relevant outcomes (Park et al. 2010). If so, will performance brand placebos emerge more strongly for such consumers, and will brand-conscious or brand-attached consumers thereby have an advantage over less brand-conscious consumers in contexts that involve branded consumption? Likewise, certain brand personalities (Aaker 1997) could be more (or less) prone to elicit performance brand placebos. For example, Aaker, Fournier, and Brasel (2004) show that consumers tend to build deeper relationships with sincere brands compared to exciting brands. Could these deeper relationships result in stronger placebo effects and alter attributions to the brand versus self for enhanced performance? Future research should examine the relationship between brand relationship tendencies and emergence of brand-induced placebo effects.

### Substantive Implications

Our research has important implications for marketers, particularly brand managers of products that serve as

performance aids. Our research is particularly relevant given recent criticism that branding efforts in the absence of material product differences victimize consumers (e.g., Bronnenberg et al. 2014; Sheth and Sisodia 2007). Our findings suggest that strong brands can improve consumers' objective performance across a variety of (cognitive and athletic) tasks. In particular, our studies demonstrate that for a brand to impact performance, consumers must believe that the brand is relevant to improving the target outcome. Hence marketers should emphasize the performance characteristics of their brands and position their brands on relevant performance dimensions. Ironically, studies 2 and 3 indicate that consumers who receive gains from the use of a strong performance brand do not increase the amount of credit given to the brand but rather take more credit for themselves. This finding provides an interesting paradox for firms that would likely desire some of the credit for this benefit to consumers. Indeed, if consumers appropriately credit a performance-enhancing brand, they may be more likely to choose that brand at the point of purchase. Thus strong brands might want to emphasize their performance-enhancing credentials—not only to promote their brands but to promote attributions for performance crediting their brands. A word of caution, however, seems warranted. To the extent that a placebo is responsible for some of the performance differences among brands that do vary materially, then firms are susceptible to criticism for exaggerating the true performance benefits arising from material differences in such brands. Research conducted by firms on their performance brands should, therefore, take into account the possibility of performance brand placebos, both in new product development and market research, and in subsequent marketing (e.g., to ensure truth in advertising).

Finally, our research also has implications for consumer advocates and consumers themselves who wish to enhance their performance. Take, for example, the results of studies 1 and 2, in which consumers golfed better when using a club that carried a strong performance brand. Similarly, study 3 demonstrated improved test performance when using a strong performance brand. Selectively investing in strong performance brands across different domains (e.g., athletic equipment, testing aids) could deliver benefits by heightening state self-esteem and reducing task anxiety. Indeed, performance brands can help to “take your game to the next level” (Nike 2015)—as long as you believe in them.

### DATA COLLECTION INFORMATION

All studies were designed collectively by the research team. Study 1 was collected from undergraduate students at the University of Notre Dame in January 2015 by research assistants under the guidance of Frank Germann.

This study was analyzed by Frank Germann and Lisa Bolton in consultation with Aaron Garvey. Study 2 was collected from undergraduate students at the University of Notre Dame in March 2015 by research assistants under the guidance of Frank Germann. This study was analyzed by Frank Germann and Aaron Garvey in consultation with Lisa Bolton. Study 3 was collected at the University of Kentucky in April 2015 by research assistants under the guidance of Aaron Garvey. This study was analyzed by Aaron Garvey in consultation with the rest of the research team. Study 4 was collected at the University of Kentucky in February 2014 by research assistants under the guidance of Aaron Garvey. This study was analyzed by Aaron Garvey in consultation with the rest of the research team. Study 5 was collected from public volunteers at the Rolf Sports Recreation Center at the University of Notre Dame in June 2015 by research assistants under the guidance of Frank Germann and Aaron Garvey. This study was analyzed by Frank Germann and Aaron Garvey in consultation with Lisa Bolton. Pretests for studies 1, 3, 4, and 5 were collected from undergraduate students at the University of Notre Dame by research assistants under the guidance of Frank Germann. These pretests were analyzed by Frank Germann in consultation with the rest of the review team.

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