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ORIGINAL EMPIRICAL RESEARCH

The effect of superstitious beliefs on performance expectations

Lauren Block · Thomas Kramer

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Abstract We explore superstitious beliefs as a basis of product performance expectations and their impact on initial purchase likelihood and subsequent satisfaction. In doing so, we demonstrate instances when superstition-driven expectations cause consumers to make purchase decisions that run counter to economic rationality. In the first set of studies we find that Taiwanese consumers are relatively more likely to purchase a product with positive superstitious associations based on its "lucky" color, and are more likely to purchase and are willing to pay more money for a product with a smaller but "lucky" number of units contained in the package (e.g., eight tennis balls compared to ten). In contrast, consumers who do not hold such superstitious beliefs adhere to the more rational choice paradigm. Next, we show that the differences in purchase likelihood are driven by superstition-based performance expectations. We further generalize these findings to product satisfaction, and find support for expectation disconfirmation sensitivity as a moderator of the effect.

Keywords Superstition · Consumer behavior · Irrational beliefs · Performance expectations

Lauren Block and Thomas Kramer contributed equally and are listed in alphabetical order. The manuscript benefited greatly from the insightful comments and suggestions received from the editor and four reviewers.

L. Block · T. Kramer (✉)
Department of Marketing and International Business,
Zicklin School of Business, Baruch College/CUNY,
Box 12-240, One Bernard Baruch Way,
New York, NY 10010, USA
e-mail: thomas_kramer@baruch.cuny.edu

L. Block
e-mail: lauren_block@baruch.cuny.edu

Consumer expectations play an important role in marketing because of their impact on initial purchase decisions, satisfaction judgments, and subsequent repurchase behavior (e.g., Kopalle and Lehmann 2006; Oliver 1980; Oliver and Bearden 1985). Research has shown that expectations can be based on variety of factors, including advertising or published quality ratings (Kopalle and Lehmann 1995), trial (Goering 1985), company promises and word-of-mouth (Zeithaml et al. 1988). However, consumers' superstitious beliefs as drivers of expectations have only received scant attention in the marketing literature. This gap in the literature is even more surprising given how frequently marketers rely on superstitions in their communications, thereby potentially creating or changing consumer expectations. For example, prominently featuring a number perceived to be lucky in Western cultures, the Ritz Carlton Hotel in New York offered a July 07, 2007 wedding package with a reception for 77 guests, a seven-tier wedding cake, seven Tiffany diamonds for the bride, and a seven-night honeymoon at any Ritz Carlton in the world for $77,777. On a smaller scale, Wal-Mart ran a "Lucky in Love Wedding Search" contest, in which seven lucky couples were selected to get married in the Wal-Mart lawn and garden area of their local Supercenter on July 07, 2007 and received a wedding reception for 77 guests. Finally, Icelandair recently ran a "Lucky 7s $7" promotion (similar to Continental Airlines' "$888 to Beijing" campaign), which allowed customers to add on several excursions in Iceland for $7 each—as long as they were booked by lucky July 07, 2007.

The economic boon of lucky numbers is not limited to the US and Western cultures. For example, the number 8 is considered lucky in Chinese cultures; astonishingly, at a government auction of license plates in Guangzhou, China, the most expensive plate (AC6688) went for 80,000 yuan, which is noteworthy not only because it is roughly 11 times

the country's per capita income (Yardley 2006), but also because the auction price itself contains the lucky number 8. Importantly, while these are examples of positive economic influences of superstitious beliefs, note that negative superstitious beliefs can lead to severe economic losses. The long-term cost to the airline industry alone due to superstitious beliefs is substantial, with an estimated 10,000 fewer people in the US flying on Friday the 13th (Shields 2008). The lost business due to the fear of flying and decreased daily business transactions in general on this "unlucky" day is $800–$900 million every time the date occurs (Palazzolo 2005; Shields 2008).

Yet despite marketers' reliance on, and marketplace implications of, superstitious beliefs, there is surprisingly little academic or empirical research that systematically studies how such beliefs impact consumer behavior, or more specifically, if or under which conditions superstition-based expectations influence purchase intentions and product satisfaction. Yet, such an investigation is not only important theoretically, but also managerially, given that it can provide marketers with key recommendations (such as raising expectations by systematically changing product colors, changing digits in product prices or adjusting the product quantity sold in a set to make them appear "lucky") to increase choice share of their products and brands or to manage customer satisfaction. Importantly, however, superstitious associations likely represent a double-edged sword for marketers. In particular, if superstitions set up higher performance expectations, consumers may be more likely to purchase the product initially. Yet, these higher performance expectations will be relatively more difficult for marketers to meet or exceed, potentially resulting in lower satisfaction and lower repurchase intentions.

We begin in the current research with the impact of superstition-based expectations on purchase likelihood and demonstrate that Taiwanese consumers are more likely to purchase a product in a "lucky" versus neutral color. Next, we find a greater purchase likelihood of a "lucky" product with fewer units contained in the package (e.g., eight tennis balls compared to ten). However, the effect of superstition on purchase likelihood is shown to depend on the degree to which consumers actually hold particular superstitious beliefs. That is, consumers who do not hold superstitious associations with the number 8 adhere to the more rational choice paradigm. Interestingly, we also find that Taiwanese consumers are willing to pay significantly more for a package with fewer units. Importantly, we provide support for our hypothesis that differences in performance expectations drive the effect of superstition on purchase likelihood.

We generalize these findings to the impact of superstition-driven expectations on product satisfaction ratings, and furthermore find support for expectation disconfirmation sensitivity as a moderator of the effect. These results suggest that satisfaction for "lucky" products is independent of positive versus negative expectation disconfirmation—that is, independent of actual product performance. Next, we review relevant previous research and develop our hypotheses, followed by a discussion of a series of studies that tested our predictions. We then discuss the implications of this research for marketers.

Superstitious beliefs

Superstitions are beliefs that run counter to rational thought or are inconsistent with known laws of nature (Vyse 1997). Superstitions can be classified as either cultural or personal, and are invoked either to bring good luck or to fend off bad luck. For example, cultural superstitious beliefs likely to impact consumer behavior include the number 8 bringing good luck and the number 4 bringing bad luck in Chinese cultures, whereas the number 7 and 13 are associated with good luck and bad luck, respectively, in the US and other Western cultures. Examples of personal superstitions or rituals relevant to marketers include consumers' buying and wearing lucky accessories, like charm bracelets, lockets, pens, or cufflinks. Consumption rituals also include using a particular product before an important event that is associated either with high likelihood of failure or a high level of uncertainty (for example, a sports game; Case et al. 2004).

Additionally, the degree to which consumers rely on superstitious beliefs in their consumption decisions is likely to depend on the associated level of stress, risk or uncertainty (Keinan 2002; Malinowski 1954). For example, Keinan (2002) found that residents living in areas more likely to be exposed to a missile attack during the Gulf War were more superstitious (that is, were more likely to engage in "magical thinking") than those living in safer zones. Such an increase in proclivity toward superstitious thought has been found in times of economic uncertainty as well, for example during the great depression (Padgett and Jorgenson 1982). The prevailing view is that resorting to superstitions provides a sense of control, or at least explains why control is not possible (Dudley 1998).

Thus, extant literature explains how individuals rely on superstitious thinking and engage in superstitious rituals expecting that performing this ritualistic behavior will bring them luck, or at least ward off bad luck. That is, positive superstitions (taking an exam with a lucky pen) may set up higher performance expectations (receiving a better grade). Conversely, negative superstitions (taking a taxi with an unlucky license plate number on the day of one's college entrance exam; Yardley 2006) might set up lower performance expectations (failing the exam). Yet, how does this translate to the marketplace? Do products with superstitious associations (such as having a lucky color or price) set up

expectations as to how they should perform? Interestingly, in a prior study by the current authors (Kramer and Block 2008), we find that superstitious associations (e.g., lucky numbers and colors) influence consumer behavior to a great extent, and furthermore often do so through an automatic process. Specifically, they found that following product failure, consumers were less (more) satisfied with a product for which they hold positive (negative) superstitious associations. However, while we suggest that superstition's influence on satisfaction might work through an increase or decrease in product performance expectations, we do not provide any direct evidence or test of this presumption. Thus, a direct test of performance expectations fills in a missing link in the process chain by which superstitious beliefs operate on consumer judgments. Furthermore, we limited our study to the effect of superstitious beliefs on product satisfaction. Although satisfaction with products is, of course, a crucial measure of marketplace success, managers are also fundamentally concerned with the purchase decision itself. However, the effect of superstitious beliefs on purchase has not yet been examined.

Therefore, in addition to investigating performance expectations as the underlying process driving the effect of superstitious beliefs on satisfaction, the current paper also seeks to test the impact of superstitious beliefs on the purchase likelihood of products. Specifically, we propose that product attributes with superstitious associations influence performance expectations that in turn determine purchase likelihood. For example, consumers who are deciding between two identical products that only differ in color may choose the one that comes in a "lucky" color over others in a neutral color. Generally, we propose that consumers will be more likely to purchase a product with which they have positive superstitious associations, as compared to a product with which they do not.

Furthermore, we propose that differences in purchase likelihood are driven by superstition-based performance expectations. That is, similarly to consumers who engage in superstitious rituals because they are associated with improved performance, such as wearing a lucky outfit to a job interview or taking exams with a lucky pen, we suggest that performance expectations are also transferred to products with attributes that are associated with superstitious beliefs. Based on the above, we hypothesize:

H1: Consumers will be more likely to purchase a product for which they hold positive (vs. neutral) superstitious associations.

H2: Differences in purchase likelihood are driven by superstition-based performance expectations.

We test our hypotheses in a series of studies with Taiwanese consumers. Being of Chinese cultural background, Taiwanese individuals tend to be more superstitious than their Western counterparts (Simmons and Schindler 2003; Tsang 2004).

Study 1

The objective of study 1 was to test H1 and H2; namely, to test of superstitious associations impact purchase likelihood and to provide evidence for superstition-based performance expectations driving this effect. We chose the color red as the lucky product attribute based on previous findings in the literature demonstrating that consumers perceive this color to be lucky (e.g., Kramer and Block 2008).

Method

Participants and procedure Forty-four students from a Taiwanese university participated in a study on consumer preferences. Subjects read a scenario in which they were told to assume that they were going to the store to buy a new rice cooker and were considering a model that was described in terms of three features (capacity, timer, keep-warm time) that were kept constant between conditions. The fourth attribute, color, differed between conditions, and was either red (positive superstitious beliefs) or green (neutral), depending on randomly assigned condition. Subjects then rated how likely they were to buy the rice cooker, where 1=not at all likely to buy, and 7=very likely to buy. Next, to assess subjects' performance expectations, subjects answered the following question: "In general, how do you expect the rice cooker to perform," where 1=poorly and 7=well. Finally, subjects indicated their agreement (where 1=strongly disagree and 7=strongly agree) on the following scales, "red is a lucky color," and "green is a lucky color" to ascertain that participants differed in their superstitious beliefs concerning the two colors chosen for the study.

Results

Subjects differed in the positive associations they had concerning the two colors [M=5.23 vs. 4.11 for the color red vs. green; $t(43)=3.37$, $p<0.01$]. Next, as expected, subjects were significantly more likely to purchase the red (vs. green) rice cooker [M=4.00 vs. 2.84, respectively; $F(1, 42)=6.54$, $p<0.05$]. Furthermore, subjects' performance expectations were significantly higher for the red (vs. green) rice cooker [M=5.84 vs. 4.96, respectively; $F(1, 42)=4.17$, $p<0.05$].

To test whether differences in performance expectations were driving the effect of superstitious associations on

purchase likelihood, we conducted a mediation analysis as per Baron and Kenny (1986). First, as described above, the results of a regression analysis showed that superstitious associations had a significant effect on purchase likelihood [β=0.367; $t(42)$=2.56, $p<0.05$] and on performance expectations [β=0.304; $t(42)$=2.04, $p<0.05$]. Furthermore, performance expectations also had a significant effect on purchase likelihood [β=0.394; $t(42)$=2.75, $p<0.01$]. Lastly, when both superstitious associations and performance expectations were included in the model, performance expectations remained a significant predictor [β=0.312; $t(41)$=2.13, $p<0.05$], whereas superstitious associations became insignificant [β=0.271; $t(41)$=1.85, ns], demonstrating full mediation (Baron and Kenny 1986).

Discussion

Consistent with our proposition, the current study demonstrated that performance expectations were driving the effect of superstitious associations on purchase likelihood. In particular, we showed that participants were more likely to purchase a rice cooker with positive (vs. neutral) associations, that they expected better performance for the rice cooker with positive (vs. neutral) associations, and that these performance expectations were mediating the relationship between the superstitious product attribute and purchase likelihood.

Our next study seeks to provide additional support for a performance expectation-based process explanation by contrasting purchase likelihood judgments made by participants who hold a particular superstitious belief and a control group that does not. That is, if the findings we have obtained so far are based on specific superstitious beliefs concerning a lucky color that lead to differing performance expectations as we hypothesize, then we should replicate our previous results with participants who hold those particular superstitious beliefs, but not with those who do not. Additionally, the next study sought to generalize the prior results from a lucky color to a lucky number.

In particular, we investigate superstitious beliefs concerning numbers by manipulating the quantity of a product sold in a set, which will be either eight or ten tennis balls. As discussed, Taiwanese consumers hold the superstitious belief that the number 8 is lucky, but US consumers do not. Thus, support for a superstition-based performance expectation explanation is provided if Taiwanese participants are more likely to purchase a product sold in a set of eight (positive superstitious beliefs) versus ten (neutral). Additionally, given that positive superstitious associations are believed to set up higher performance expectations, we propose that Taiwanese subjects will be significantly more dissatisfied in case of product failure of the tennis balls sold in a set of eight versus ten (see e.g., Oliver 1980, and Oliver and Bearden 1985 for a discussion of the role of expectations in product satisfaction judgments). In contrast, the number of units in the set should have no effect on purchase likelihood and satisfaction for US participants, since they do not hold positive superstitious associations with the number 8.

Note that, for the Taiwanese participants, we expect that while purchase likelihood increases for a product sold in a set of eight (positive superstitious beliefs), under conditions of product failure, satisfaction decreases relative to the product sold in a set of ten (neutral beliefs). Thus, we demonstrate that in using positive superstition in their marketing mix, marketers potentially have to trade off greater purchase likelihood with lower subsequent satisfaction. That is, raising performance expectations by associating their brands with superstitious beliefs may simultaneously increase purchase likelihood but decrease satisfaction.

Study 2

Method

Participants and procedure Seventy-nine students from a Taiwanese university and 90 students from an East Coast university participated in a study on consumer preferences in small groups for class credit in a 2 (superstitious beliefs: held vs. not held) × 2 (package size: lucky eight vs. neutral ten) between-subjects design. Subjects read a scenario in which they were told to imagine that they were going to buy tennis balls and had come across a package by Gamma Championship that contained either eight or ten tennis balls per pack, depending on randomly assigned condition; no information related to the price of the tennis balls was provided. Next, subjects were asked to indicate their purchase likelihood of the tennis balls.

Subjects were then instructed to assume that they had purchased the tennis balls and it turned out that they had fallen apart after just a few matches of tennis. Subsequently, subjects rated their satisfaction with the tennis balls on the following scales (where 1=strongly disagree and 7=strongly agree; α=0.84), "I am satisfied with my decision to buy the tennis balls," "I think it was the wrong thing when I decided to buy the tennis balls" (reverse-scored), "My choice to buy the tennis balls was a wise one," and "I am not happy that I bought the tennis balls" (reverse-scored). Next, the Taiwanese subjects rated the extent of their knowledge of spoken and written English (where 1=not at all and 7=very much so). Lastly, all subjects indicated their ethnicity, followed by manipulation check items (where 1=strongly disagree and 7=strongly agree) on the following scales: "8 is a lucky number," and "the number 10 brings good luck," to ascertain that the two

groups differed in the degree to which they held superstitious beliefs concerning the two numbers.

Results

Manipulation check Taiwanese subjects who rated their knowledge of English as lower than the scale midpoint were eliminated from the data analyses below. US subjects who self-identified their ethnicity as Asian were also eliminated, leaving a final sample size of 69 Taiwanese and 73 US subjects. As expected, the Taiwanese participants indicated significantly more positive associations with the number 8 (vs. 10); M=5.33 vs. 3.68, respectively; t (68)=8.18, p<0.001. The two numbers did not generate significantly different associations for the US participants (M=3.10 vs. 2.86). Additionally, participants from the two cultures differed significantly in how much they agreed that eight was a lucky number [M=5.33 versus 3.10; F(1, 140)= 72.34, p<0.001].

Purchase likelihood As expected, a 2 (superstitious beliefs: held vs. not held) × 2 (package size: lucky eight vs. neutral ten) between-subject ANOVA on the purchase likelihood ratings yielded a significant superstitious beliefs by package size interaction; F(1, 138)=6.39, p<0.05. The main effects for superstitious beliefs and for package size were not significant. Follow-up planned contrasts showed that those who held the superstitious beliefs associated with the number 8 (i.e., Taiwanese) were directionally more likely to purchase the tennis balls that were sold in a set of eight versus ten [M=4.23 vs. 3.63; F(1, 138)=2.03, p>0.10]. Conversely, those who did not hold the superstitious beliefs with the number 8 (i.e., US participants) were significantly more likely to purchase the tennis balls that were sold in a set of ten versus eight [M=4.31 vs. 3.43; F(1, 138)=4.69, p<0.05].

Importantly, those who held superstitious beliefs (vs. those who did not) associated with the number 8 were significantly more likely to purchase the lucky eight tennis balls [M=4.23 vs. 3.43, respectively; F(1, 138)=4.26, p< 0.05], but the two groups did not differ in their purchase likelihood of the ten tennis balls [M=3.63 vs. 4.31, respectively; F(1, 138)=2.36, p>0.10].

Product satisfaction A 2 (superstitious beliefs: held vs. not held) × 2 (package size: lucky eight vs. neutral ten) between-subject ANOVA on the satisfaction index yielded a marginally-significant main effect of package size. Specifically, subjects were marginally more satisfied with the neutral (vs. lucky) package size [M=2.72 vs. 2.39, respectively; F(1, 138)=3.02, p<0.10].

Importantly, the expected superstitious beliefs by package size interaction was significant [F(1, 138)=5.45, p< 0.05]. Follow-up planned contrasts showed that following product failure, those who held the superstitious beliefs associated with the number 8 (i.e., Taiwanese) expected to be significantly less satisfied with the tennis balls that were sold in a set of eight versus ten [M=2.30 vs. 3.16; F(1, 138)=7.78, p<0.01]. However, the number of tennis balls did not affect satisfaction ratings of those who did not hold the superstitious beliefs with the number 8 (i.e., US participants; M=2.48 vs. 2.35 for the eight vs. ten tennis balls, respectively; F<1).

Discussion and follow-up study

The results of study 2 provide additional evidence for the effect of superstitious beliefs on purchase likelihood. In support of hypothesis 1, we once again showed that superstitious beliefs affect purchase intentions. In particular, we found that superstitious associations with the number 8 led Taiwanese participants to indicate greater purchase likelihood for a set that contained fewer tennis balls, while the reverse was found for the US participants for whom superstitious associations with the number 8 do not exist. As well, consistent with a superstition-based explanation, differences in purchase likelihood between the Taiwanese and US participants were significant only for the "lucky" set size but not for the neutral one. Note that the null effect for culture casts doubt on an alternative explanation suggesting that the Taiwanese participants were simply more likely to purchase the tennis balls, regardless of set size.

Additionally, we found that following product failure, Taiwanese consumers expected to be significantly less satisfied with a product that contains an attribute (i.e., the package size) with which they have positive superstitious associations, as compared to a product that does not. These results replicate those obtained by Kramer and Block (2008). However, this effect was limited to those consumers for whom the number 8 is associated with good luck. We were therefore able to extend prior literature on superstitions in the marketplace in an important way; namely, by finding support for the moderating role of the degree to which particular superstitions are held in the impact of superstitious beliefs on consumer behavior.

Next, we wanted to test if positive superstitious associations would even be reflected in a willingness to pay more money for a package with a lower but lucky (vs. greater but neutral) number of tennis balls. That is, one limitation of study 2 was that we did not provide subjects with prices for the two packs of tennis balls. Consequently, one could argue that differences in purchase likelihood between Taiwanese and US participants may be driven by differences in inferred prices for the eight versus ten tennis balls. To test this alternative explanation and to examine the impact of superstitious beliefs on consumers' willingness to pay, we ran one follow-up study in the US and one in Taiwan.

In particular, 41 US subjects received the same description of eight versus ten tennis balls as in main study 2 and were asked to indicate how much they were willing to pay for the pack of tennis balls. Results showed that there was no difference in the amount subjects were willing to pay for the pack with eight versus ten tennis balls (M=US$ 11.90 vs. 11.40, respectively; $F<1$).

Next, we ran the same follow-up study in Taiwan with 40 subjects. That is, subjects received the same description of eight versus ten tennis balls and were asked to indicate how much they were willing to pay for the pack of tennis balls. Interestingly, results showed that Taiwanese subjects were willing to pay significantly more for the pack with eight versus ten tennis balls [M=NT$ 342.63 vs. 227.10, respectively; $F(1, 38)=4.56$, $p<0.05$]. That is, consumers who held superstitious beliefs related to the number 8 were willing to spend over 50% more money for 25% fewer tennis balls.

A series of studies has now demonstrated a robust effect of superstitious beliefs on the purchase likelihood and product satisfaction judgments of individuals who hold particular superstitious beliefs. Furthermore, we have argued and shown that the differences in purchase likelihood are the result of differential levels of performance expectations set up by superstitious beliefs. Although the previous study has found evidence of the impact of superstitious beliefs on satisfaction ratings in cases of product failure (i.e., negative expectation disconfirmation), study 3 seeks to generalize this effect to instances when products perform as well as or better than expected (positive expectation disconfirmation).

As we have shown in study 2, if positive (vs. neutral) superstitious associations set up relatively higher product performance expectations, then failure to meet these expectations results in lower product satisfaction. Notably, meeting or exceeding these expectations following positive expectation disconfirmation should also result in lower product satisfaction for products with positive (vs. neutral) superstitious associations, because the superstitious associations set up relatively higher performance expectations, which should become more difficult to meet or exceed. By the same token, exceeding the relatively lower performance expectations set up by the neutral (vs. positive) superstitious associations is likely to result in a "nice surprise," or relatively higher product satisfaction levels, as compared to the product with positive superstitious associations. Therefore, regardless of disconfirmation type (negative vs. positive), we expect that satisfaction for products that contain attributes with positive superstitious (vs. neutral) associations will be lower.

H3: Consumers will be less satisfied with a product for which they hold positive (vs. neutral) superstitious associations following instances of both negative and positive expectation disconfirmation.

Additionally, we examine a potential moderator of the effect in the next study. In particular, if our results are obtained because superstitions influence how well consumers expect products to perform as we have argued, then we should find a greater impact of superstitious beliefs on satisfaction for consumers who are relatively more (vs. less) sensitive to the disconfirmation of these expectations. This expectation is consistent with findings by Kopalle and Lehmann (2001), who argue and show that consumers who are relatively more disconfirmation-sensitive are more satisfied (dissatisfied) when products perform better (worse) than expected. Therefore, we hypothesize:

H4: Consumers high (vs. low) in expectation disconfirmation sensitivity will be less satisfied with a product for which they hold positive (vs. neutral) superstitious associations.

Study 3

Method

Participants and procedure Ninety students from a Taiwanese university participated in a study on consumer preferences in small groups for class credit in a 2 (expectation disconfirmation: positive vs. negative) × 2 (superstitious associations: positive vs. neutral) × 2 (disconfirmation sensitivity: high vs. low) design, where expectation disconfirmation and superstitious associations were manipulated factors, and disconfirmation sensitivity was a measured factor. As in study 2, subjects read a scenario in which they were told to imagine that they were going to buy tennis balls and had come across a package by Gamma Championship that contained either eight or ten tennis balls per pack, depending on randomly assigned superstitious association condition. Subjects were then instructed to assume that they had purchased the tennis balls and that it turned out that they had fallen apart after just a few matches of tennis (negative disconfirmation condition) or that it turned out that the balls were very fast and lasted a very long time (positive disconfirmation condition). Subsequently, subjects rated their satisfaction with the tennis balls on the same satisfaction scales as in the previous studies (α=0.86).

Next, to assess disconfirmation sensitivity, subjects completed the six-item Expectation Disconfirmation Sensitivity scale developed by Kopalle and Lehmann (2001), which includes items such as, "I notice when product performance does not match the quality I expect from the product," and "I typically compare a product's performance

to my expectations for that product." Lastly, as a confound check, subjects rated the extent of their knowledge of spoken and written English (where 1=not at all and 7=very much so).

Results

Nine subjects who rated their knowledge of English as lower than the scale midpoint were eliminated, leaving a final sample size of 81. Subjects were divided into a high versus low expectation disconfirmation sensitivity group based on a median split of their disconfirmation sensitivity score (α=0.74). A 2 (expectation disconfirmation: positive vs. negative) × 2 (superstitious associations: positive vs. neutral) × 2 (disconfirmation sensitivity: high vs. low) between-subject ANOVA on the satisfaction index yielded a main effect for disconfirmation [$F(1, 73)=26.45$, $p<0.01$]. As shown in the Table 1 and Fig. 1, subjects were significantly more satisfied following positive (M=5.11) versus negative (M=3.41) performance expectation disconfirmation.

Furthermore, we also obtained a main effect for superstitious associations [$F(1, 73)=4.36$, $p<0.05$], indicating that subjects were significantly less satisfied with the tennis balls that came in a set of eight (M=3.89) versus ten (M=4.55). However, as expected, this main effect for superstitious associations was not qualified by a superstitious association by expectation disconfirmation interaction ($F<1$), providing evidence that consumers are less satisfied with a product for which they hold positive (vs. neutral) superstitious associations following instances of both negative disconfirmation and positive disconfirmation. Thus, results support H3.

Importantly, the results also revealed a significant superstitious associations by disconfirmation sensitivity interaction; $F(1, 73)=10.05$, $p<0.01$. As predicted by H4, and supporting our proposition of differential levels of satisfaction being based on differences in performance expectations, there were no differences according to superstitious associations for subjects low in disconfirmation sensitivity [M=4.59 vs. 4.14 for the set of eight vs. ten tennis balls; $F(1, 73)=1.37$, ns]. However, subjects high in disconfirmation sensitivity were significantly less satisfied with the set of tennis balls that came in a set of eight (M=3.30) versus ten (M=4.94); $F(1, 73)=10.19$, $p<0.01$. No other main or interaction effects were significant.

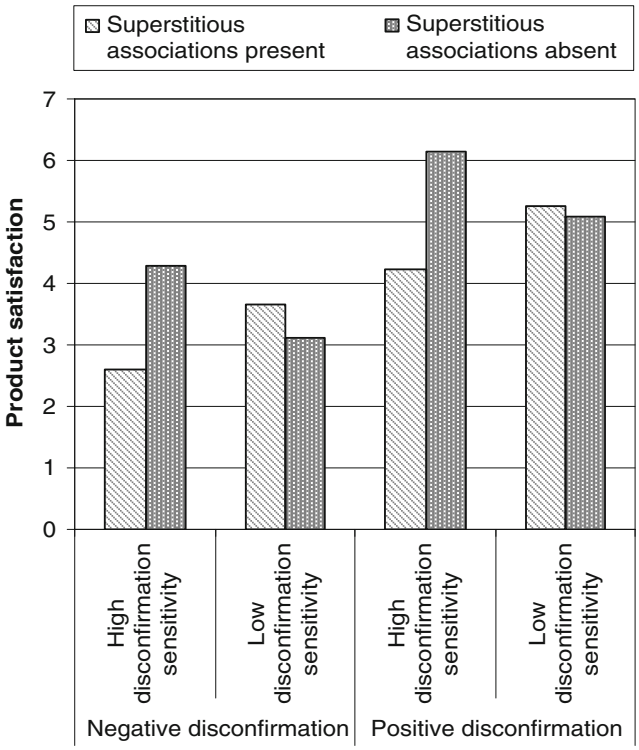

Figure 1 Study 3: the effects of expectation disconfirmation, superstitious associations, and confirmation sensitivity on product satisfaction.

Discussion

The results of study 3 extended previous findings in the literature in important ways. Firstly, we provided additional evidence for our proposition that superstitions are related to performance expectations. That is, we found significant differences in product satisfaction ratings due to superstitious beliefs only for those subjects who were relatively more sensitive to the disconfirmation of expectations. Secondly, we demonstrated that the impact of superstitions

Table 1 Study 3: the effects of expectation disconfirmation, superstitious associations, and confirmation sensitivity on product satisfaction

	Negative disconfirmation		Positive disconfirmation	
	High disconfirmation sensitivity	Low disconfirmation sensitivity	High disconfirmation sensitivity	Low disconfirmation sensitivity
Superstitious associations present	2.60 a	3.66 c	4.23 a	5.27 c
Superstitious associations absent	4.29 b	3.11 c	6.14 b	5.08 c

Means within a disconfirmation condition with different letter are different at $p<0.05$.

on satisfaction generalizes to instances when products perform better than expected. That is, regardless of product performance, satisfaction was found to be relatively lower for products with positive (vs. neutral) superstitious associations.

General discussion

Although much research has investigated the process of creating expectations and their subsequent effect on purchase likelihood and satisfaction, superstitions have heretofore not been considered as a basis for how well products are expected to perform. Additionally, even though marketers often appeal to consumers' superstitious beliefs in their communications, surprisingly little research has investigated the effectiveness of such strategies. The findings of the current research therefore start to fill an important gap in the literature.

In particular, we showed that superstitious beliefs may cause consumers to make purchase decisions that seem to run counter to economic rationality, such as intending to purchase a product set with a lower but "lucky" (vs. greater but neutral) quantity in the package. The impact of superstition was also found to be reflected in differences in willingness to pay. That is, Taiwanese study participants were willing to spend over 50% more money for 25% fewer tennis balls because of their positive superstitious beliefs with the number 8 (vs. 10). Further, we showed differential levels of performance expectations were the process underlying the effect of superstition on purchase likelihood.

Additionally, we demonstrated for both purchase likelihood and satisfaction that previous findings were due to superstitious beliefs concerning lucky and unlucky numbers. Furthermore, we were able to find support for expectation disconfirmation sensitivity as a moderator of the impact of superstitious beliefs on product satisfaction. Interestingly, the extent to which satisfaction ratings for "lucky" products were lower than for neutral products was found to be independent of actual product performance.

By investigating the influence of superstitions in the marketplace, we add to the nascent literature on the impact of irrational beliefs on consumer behavior. For example, Argo et al. (2006; see also Morales and Fitzsimons 2007) recently published a provocative demonstration of irrationality in retail environments. Drawing on the anthropological framework of the laws of sympathetic magic, Argo et al. demonstrate that product evaluations and purchase intentions were lower if the product was believed to have been touched by a prior consumer ("consumer contamination"). Interestingly, Argo et al. document the effect of consumer contamination even when the consumer did not actually see the physical contact, but was merely told it had occurred.

Taken together, the current and the Argo et al. (2006) studies speak to the important implications for marketing managers of a systematic study of magical beliefs and superstitions. For example, we showed that managers are able to increase purchase likelihood by strategically managing the color of their products. Specifically, the color red is considered lucky in Chinese cultures, and on special occasions like weddings, red is the color of the ritual garments. Furthermore, lucky numbers, such as those associated with package size, are likely to be appreciated by consumers.

Importantly, in two studies not reported here,[1] we show that Taiwanese consumers are more likely to purchase a product at a relatively higher "lucky" price (i.e., TW $888) than at a lower "neutral" price (i.e., TW $777), and are less likely to purchase a product at a relatively lower "unlucky" (i.e., TW $444) price than at a higher "neutral" (i.e., TW $555) price. Consistent with Simmons and Schindler's (2003) field study of price endings in Chinese advertisements, we varied prices across conditions keeping the same left-most digit. As Simmons and Schindler noted, changing the left-most digit has a tremendous impact on profits; subsequently the right-most digits are most under the control of marketers.

Our results suggest that marketers may be able to strategically manage purchase likelihood through consumers' performance expectations with relatively easy-to-implement attribute changes in product price or color. Managers will be especially interested in the finding that superstitions may increase consumers' purchase likelihood for items offered at higher, lucky, prices. In fact, we show that purchase likelihood increases despite a reduction in product set size, which is especially encouraging for managers.

Thus, in general, featuring lucky colors or numbers may reduce consumer uncertainty associated with the purchase decision, increase purchase likelihood, and provide companies with a competitive advantage. Although not tested directly in this research, the impact of superstitious beliefs may even generalize to product launches on lucky dates (i.e., August 08 for Chinese cultures or July 07 for Western cultures). Yet, incorporating superstitious elements into products is not a panacea for marketing success; in fact, raising expectations with positive superstitious associations may initially induce purchase, but subsequently actually decrease repurchase rates or positive word-of-mouth because these high expectations are difficult to meet or exceed. Interestingly, this is the case regardless of actual product performance.

Clearly, more studies are needed so that we can present a comprehensive understanding of the retail and product implications stemming from a study of irrational beliefs in

[1] Details can be obtained from the authors.

the marketplace. For example, are Chinese consumers, or American consumers of Chinese descent, always more likely to purchase products with lucky associations? Furthermore, managers might be particularly interested in the interaction between superstitious beliefs and product experience. For example, would the influence of superstitious beliefs on satisfaction and purchase intent decline as experience with the product increases? This is in line with research demonstrating that the impact of cognition versus affect on satisfaction judgments changes over time (Homburg et al. 2006). Specifically, Homburg, Koschate, and Hoyer show that the influence of affective factors on satisfaction judgments decreases over time, and that this is accompanied by a corresponding increase in the impact of cognitive factors. Since superstitious beliefs are primarily affective, one could analogize that the impact of such beliefs might deteriorate with increased product ownership or category expertise.

Along these lines, future research might study how much adherence to superstitious beliefs leading to non-rational or sub-optimal choices costs an individual or a business over the long-term. How much more profit could Taco Bell have earned if they had altered their seven-layer Crunchwrap Supreme into an eight-layer one for Chinese consumers? Similarly, the current $4/$4/$4 promotion by Domino's Pizza may not be as well received by Chinese consumers as had been hoped by the company. With one of the luckiest days of the century for Western cultures recently passed (July 07, 2007) and one of the luckiest days of the century for Eastern cultures still fresh in memory (August 08, 2008), the study of superstition in the marketplace is both important and timely.

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