

Please share your stories about how Open Access to this article benefits you.

The Endowment Effect as Self-Enhancement in Response to Threat

by Promothesh Chatterjee, Caglar Irmak,
and Randall L. Rose

2013

This is the published version of the article, made available with the permission of the publisher. The original published version can be found at the link below.

Promothesh Chatterjee, Caglar Irmak, and Randall L. Rose . 2013.
“The Endowment Effect as Self-Enhancement in Response to Threat.”
Journal of Consumer Research 40(3): 460-476.

Published version: <http://dx.doi.org/10.1086/671344>

Terms of Use: <http://www2.ku.edu/~scholar/docs/license.shtml>

The Endowment Effect as Self-Enhancement in Response to Threat

PROMOTHESH CHATTERJEE
CAGLAR IRMAK
RANDALL L. ROSE

The discrepancy between willingness to pay (WTP) and willingness to accept (WTA) for a product, referred to as the endowment effect, has been investigated and replicated across various domains because of its implications for rational decision making. The authors assume that implicit processes operate in the endowment effect and propose an explanation that is derived from the two main accounts of the effect, ownership and loss aversion. Based on the implicit egotism and self-affirmation literatures, the model argues that selling is perceived as an implicit self-threat and that sellers, as a part of their automatic defense mechanism, respond to this self-threat by enhancing the value of the self-associated object. Five studies test these conjectures and provide support for the proposed model.

A part of our depression at the loss of possessions is due to our feeling that we must now go without certain goods that we expected the possessions to bring in their train, yet in every case there remains, over and above this, a sense of the shrinkage of our personality, a partial conversion of ourselves to nothingness, which is a psychological phenomenon by itself. (William James, "The Consciousness of Self," 293)

Since William James's classic work (1890), psychologists have linked the self not only to physical and mental being but also to material possessions (e.g., Belk 1988; Wicklund and Gollwitzer 1982). While this stream of research recognizes that intermingling of self and possessions influences how a possession is viewed (Beggan 1992), the endowment effect literature that examines how people value

possessions had neglected the linkage between self and possession until recently (Morewedge et al. 2009; Peck and Shu 2009).

According to the endowment effect (Thaler 1980), people often demand significantly more to give up an object than they would be willing to pay to acquire it. Although the disparity between willingness to accept (WTA) and willingness to pay (WTP) has been demonstrated in numerous settings (Carmon and Ariely 2000; Johnson, Haubl, and Keinan 2007; Kahneman, Knetsch, and Thaler 1990; Morewedge et al. 2009; Nayakankuppam and Mishra 2005; Peck and Shu 2009; Sen and Johnson 1997), the quest for explaining its underlying process still continues. In particular, while some research suggests that the endowment effect is a manifestation of loss aversion (Carmon and Ariely 2000; Johnson et al. 2007; Kahneman et al. 1990), other research suggests that it is ownership, rather than loss aversion, that leads to the effect (Maddux et al. 2010; Morewedge et al. 2009; Peck and Shu 2009). According to the loss-aversion account, selling an item is perceived as loss, compared to the seller's reference point of having the item; in contrast, buying is perceived as gain, compared to the buyer's reference point of not possessing an item. Because individuals are loss averse, they tend to value the items they consider selling more than they value the items they consider buying.

According to the ownership account, the endowment effect stems from the associations formed between people and their possessions (Beggan 1992; Belk 1988). People generally have positive attitudes toward themselves; thus, possessions, which are associated with the self, are also likely to be favorably evaluated (Gawronski, Bodenhausen,

Promothesh Chatterjee is assistant professor of marketing at the Kansas University School of Business, University of Kansas, 1300 Sunnyside Avenue, Lawrence, KS 66045-7585 (chatterjee@ku.edu). Caglar Irmak is assistant professor of marketing, Terry College of Business, University of Georgia, 310 Herty Drive, Athens, GA 30602 (irmak@uga.edu). Randall L. Rose is professor of marketing, Moore School of Business, University of South Carolina, 1705 College Street, Columbia, SC 29208 (rosel@moore.sc.edu). The paper is based on the first author's dissertation under the guidance of the other two authors. The authors wish to thank the editor, associate editor, and reviewers for their helpful input.

Mary Frances Luce served as editor and Baba Shiv served as associate editor for this article.

Electronically published June 10, 2013

and Becker 2007). Importantly, according to this account, potential loss of the item is not a part of the equation: the value of the item comes from its attractiveness (i.e., its association with the self). Thus, it is the ownership role—not necessarily the selling role—that causes the consumer to evaluate the possession at a premium (Morewedge et al. 2009).

We argue that both ownership, which results in self-object association, and potential loss of the self-associated object (i.e., considering selling the item) are necessary for the endowment effect to occur. Thus, neither account alone is a complete explanation for the endowment effect. Therefore, we propose a model of the endowment effect based on self-enhancement in response to self-threat that employs elements of both loss aversion and ownership. To demonstrate our case, we show that considering selling an item creates an implicit self-threat, and sellers as a part of their automatic defense mechanism respond to this self-threat by enhancing the value of the self-associated object. Similar effects of self-threat on interpersonal evaluations have been shown before (e.g., Baumeister 1982), but the present research is the first that shows the role of such threat in the context of the endowment effect.

This paper extends research on the endowment effect in several significant ways. First, our findings suggest that ruling out the ownership or loss aversion account of the endowment effect is not necessary, as each account explains part of the underlying process. Our research shows that, in line with the ownership account, self-enhancement plays an important role in the endowment effect; however, different from the ownership account, we find that self-enhancement is the consequence of the self-threat caused by the potential loss of the possession. Consequently, we argue that both ownership (i.e., that people become attached to their possessions) and loss aversion (i.e., the potential loss of possessions) are important to the endowment effect. Thus, the conceptual approach taken in the present research provides a framework that is consistent with elements of both explanations.

Second, we show that the threat arising from the potential loss of possession is the result of an implicit or nonconscious process that is unlikely to be detected by self-reports or introspection. This conclusion is consonant with research that has failed to detect loss aversion at a conscious level (Brown 2005). In order to demonstrate the underlying process we use response latency and other unobtrusive measures in our experiments to show that implicit self-threat mediates the endowment effect.

Third, in line with the role of self-threat as a mediator we argue that the endowment effect is a particular manifestation of self-enhancement. The self-enhancing character of the endowment effect is demonstrated by our finding that an important moderator of the effect is self-affirmation. We show that, when the self is affirmed before judging the selling value of a possession, the discrepancy between a seller's willingness to accept and a buyer's willingness to pay is reduced, because the negative effect of threat to self

is diminished. These findings also support the idea that loss in this context goes beyond the loss of the benefits of the owned object and extends to self-diminishment due to the loss of a self-associated item.

Next we review the pertinent literature to develop our proposed account and test it with five studies. In the first study, we use an indirect measure of self-threat (response latency) and find that the perception of threat mediates the endowment effect. In study 2, we provide evidence for the roles of both self-object association that arises from ownership and implicit self-threat due to consideration of selling the self-associated object in the endowment effect. In study 3, we show that, in line with our conceptualization, a self-affirmation manipulation mitigates the endowment effect, and we rule out arousal as a potential alternative explanation. In study 4, we show that the endowment effect is enhanced when the self-threat is increased. Finally, in study 5, we use signatures as a proxy for measuring self-enhancement to illustrate the role of self-enhancement in the endowment effect. These studies provide converging evidence toward the role of self-threat and self-enhancement in the endowment effect. This is followed by a more general discussion and prospects for future research.

THE UNDERLYING PROCESS OF THE ENDOWMENT EFFECT

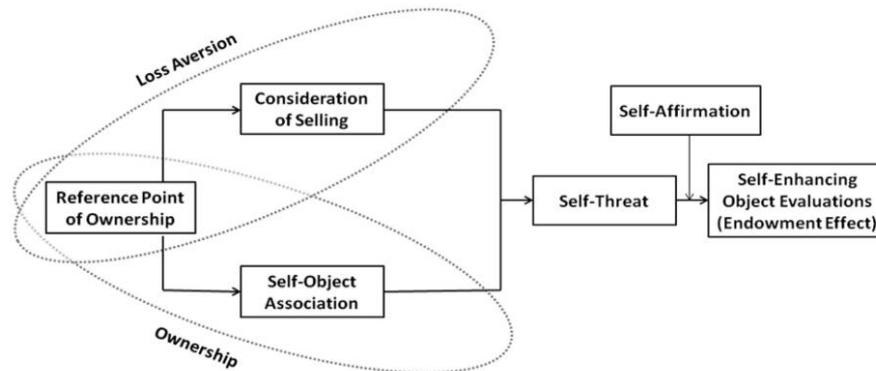
As noted in the introduction, loss aversion and ownership accounts dominate the rather large literature on the endowment effect. As recent research has focused on the relative validity of these two accounts (Liersch et al. 2011; Morewedge et al. 2009), we first look into the main tenets of these accounts and then present our approach that is consistent with elements of both.

The loss aversion account of the endowment effect is based on two main principles from prospect theory (Kahneman and Tversky 1979). First, people are generally loss averse; that is, losses are accorded greater weight in judgment than the equivalent amount of gains. Second, loss or gain depends on the reference point of the person; trade of an object is considered as loss by sellers whose reference point is having the possession of the object, while it is considered as gain by buyers whose reference point is not owning the object. Prior research supports the loss aversion account by showing that both sellers and buyers focus on the aspects of the object and/or the trade that they forgo in the exchange (Carmon and Ariely 2000; Johnson et al. 2007; Nayakankuppam and Mishra 2005).

Other research, however, suggests ownership as the primary reason for the endowment effect (Ariely and Simonson 2003; Maddux et al. 2010; Morewedge et al. 2009; Peck and Shu 2009). According to this account, potential loss of the item (i.e., considering selling the item) is not necessary for the item to be evaluated positively—merely owning the item is sufficient. Importantly, perceived ownership, not necessarily legal ownership, is sufficient for such effects to be observed (see, e.g., Carmon, Wertenbroch, and Zeelenberg

FIGURE 1

THE ENDOWMENT EFFECT AS SELF-ENHANCEMENT IN RESPONSE TO THREAT



NOTE.—The figure presents our conceptual model and highlights how loss aversion and ownership both are necessary for endowment effect.

2003). Two principles on which the ownership account of the endowment effect is built are: (1) people get attached to what they own, that is, people's possessions become a part of themselves (Beggan 1992; Belk 1988; Dittmar 1992) and (2) most people have a positive attitude toward themselves (Brown 1998; Steele 1988), and, thus, they are likely to see their possessions, which are associated with the self, as attractive (see "the mere ownership effect"; Beggan 1992).

We suggest that loss aversion and ownership accounts of the endowment effect each tell part of the story and that parts of each account are needed to provide a complete picture of the endowment effect. Thus, in the next section, we examine self-threat as the central theoretical construct tying together these proposed mechanisms of the endowment effect that have heretofore been viewed as competing.

Selling as Self-Threat

The loss aversion and ownership accounts of the endowment effect both take the reference point of ownership as their starting point. However, the two accounts diverge from each other in important ways. First, the loss aversion account includes consideration of selling and, therefore, anticipation of a potential loss as a fundamental antecedent to the endowment effect. The ownership account focuses on the association between the object and the self, thus emphasizing self-object association as the process underlying the effect.

We propose that the development of a self-object association coupled with consideration of selling the object leads to self-threat, which, in turn, leads to self-enhancing object evaluations. In other words, the endowment effect occurs as a response to the self-threat created by the potential loss of the self-associated item. Thus, both elements are an integral part of the endowment effect: self-object association

created by ownership and consideration of selling the self-associated object. These two elements together create self-threat, which, in turn, motivates self-enhancement through assigning higher valuation to the endowed item (see fig. 1).

Gawronski et al. (2007) showed that implicit evaluations of the self tend to transfer to the chosen object by virtue of self-object association. Thus, their work provides evidence that ownership leads to self-object association, the first key element of our theoretical account. This transfer of self-evaluation to the object is in line with the self-enhancement mechanism proposed to underlie the mere ownership effect (Beggan 1992). The notion that items may be perceived to be more attractive to their owners who tend to associate themselves with their possessions is a central tenet of the ownership account of the endowment effect. However, in contrast to the ownership account, we argue that self-enhancement does not occur just because the item is a part of the extended self. It also occurs because of the threat to self from the potential loss of the item (i.e., consideration of selling the item). Thus, in our theory attachment to the object is a necessary precondition for the endowment effect. But the process by which the endowment effect occurs is not self-enhancement due to self-object association; rather, the endowment effect is a manifestation of self-enhancement that occurs in response to the threat created by thoughts of selling the owned object.

Therefore, in line with the loss aversion account the second element of our explanation includes consideration of selling as an integral part of the endowment effect. We propose that consideration of selling an object creates a self-threat when the self is associated with the object by virtue of ownership. More specifically, our account hinges on the threat to self that is created when sellers consider parting with their possession. Such threat may be thought as directed toward what William James in his classic "The Conscious-

ness of Self” (1890) calls the “material self.” James’s notion of material self included, in addition to an individual’s own body, his family and possessions. More recently, the material self was conceptualized as part of an individual’s extended self (Belk 1988) that can form an important component of self-definitions (Wicklund and Gollwitzer 1982). We reason that when an object becomes part of the self (as is the case when an object is acquired by consumers), being asked to give up a part of the self (as is the case when the consumer is asked to sell) can lead to diminishment of the self. Importantly, diminishment of the self has been associated with perceptions of threat (Delorme, Zinkhan, and Hagen 2004) that are psychologically discomforting. For example, Campbell and Sedikides (1999, 25) suggest that self-threat occurs “when favorable views about oneself are questioned, contradicted, impugned, mocked, challenged, or otherwise put in jeopardy.” Thus, if self-threat is said to occur, there must exist conditions that are unfavorable to the self. We argue that potential loss of a self-associated object constitutes such a condition.

Findings from recent research in neuroscience support our conjecture of the role of self-threat in the endowment effect. For instance, Weber et al. (2007) conducted an fMRI study to understand the endowment effect. They noted a significantly greater activation in the brain’s amygdala (which is generally associated with experience of negative affect such as fear and distress along with activity in the insula) during the selling trials than the buying trials. Another study by De Martino, Camerer, and Adolphs (2010) offered more corroborative evidence. Two participants in their study suffered from an extremely rare genetic disease known as Urbach-Wiethe disease and, as a consequence, had lesions in selective portions of the amygdala. It was known that both of these participants had difficulty in processing fear but otherwise were normal. Each participant was compared to a control group of six healthy adults matched on age, gender, income, and education. While control participants exhibited typical levels of loss aversion, neither of the two amygdala-damaged participants exhibited loss aversion. Also consistent with the notion of self-threat, Knutson et al. (2008) found that while participants considered selling, there was a positive correlation between activation in the right insula and estimates of the endowment effect. The insula activation has been observed in participants in other distressing contexts such as unfair ultimatum game offers (Sanfey et al. 2003) or social exclusion (Eisenberger, Lieberman, and Williams 2003). These results are consistent with our conjecture that giving up possessions can be self-threatening.

The Endowment Effect as Self-Enhancement

Given that loss of a possession may be self-threatening, what are the consequences of such self-threat and diminishment? According to self-affirmation theory (Steele 1988), most people aspire to maintain a positive self-image. Thus, when people encounter an unfavorable or threatening situation, they respond defensively by focusing on their positive personal qualities (Baumeister 1982). The implicit egotism

literature suggests that in such situations, anything that is associated with the self, including self-associated objects (i.e., possessions) is likely to be favorably evaluated (Koole et al. 1999; Pelham, Mirenberg, and Jones 2002). For instance, people under self-threat (i.e., asked to write about a personal flaw) showed greater liking for strangers whose arbitrary participant numbers (e.g., 12-03) resembled their birthdays (Jones et al. 2004). Self-threat also increased preference for Japanese teas whose brand names resembled participants’ own first names (Brendl et al. 2005). More generally, self-affirmation theory (Steele 1988) asserts that when people perceive a threat to self, they attempt to restore self-worth because “the overall goal of the self-system is to protect an image of its self-integrity” (Sherman and Cohen 2006, 5). One way to accomplish this restoration goal is to employ defensive responses that directly reduce the threat. For instance, when individuals’ view of their intelligence is “shaken,” they subsequently show a greater interest in purchasing intelligence-related objects, such as fountain pens, in order to bolster their self-views (Gao, Wheeler, and Shiv 2009). Similarly, consideration of selling an owned object may threaten the material self. Accordingly, we expect that self-threat from losing (i.e., selling) the self-associated object would lead people to bolster the value of the self-associated object.

Importantly, according to self-affirmation theory, because individuals care about the overall worth and integrity of the self, they can respond to threats in one domain by affirming the self in another domain (see Sherman and Cohen [2006] for a review). If, as we propose, the valuation of the self-associated object is instrumental to restoring self-worth, then we expect affirming sellers in a domain different from the one related to the object in question to eliminate the need to restore self-worth and, thus, ameliorate the endowment effect. This conceptualization also suggests that the endowment effect can be accentuated if sellers are threatened in a domain that is different from the one relevant to the self-associated object. In other words, sellers may respond to a threat in another domain of self by increasing the value they assign to the self-associated object (i.e., enhance the material self). Next, we report five studies that test our predictions, which together suggest that the endowment effect is a self-enhancement response to the self-threat generated by the consideration of selling the self-object associated object.

STUDY 1: THREAT PERCEPTIONS MEDIATE THE ENDOWMENT EFFECT

The main objective of this study is to show evidence for the mediating role of self-threat in the endowment effect. If, as we propose, sellers self-enhance as a consequence of perceiving the impending transaction as a threat to the self, implicit measures of perception of threat should mediate the endowment effect. Since prior research has indicated the limitations of self-reported measures (e.g., thought protocols, rating tasks, etc.) in identifying the role of perception of threat and in line with the suggestions provided by Kahn,

Luce, and Nowlis (2006), response latency measures are utilized. Specifically, people may not be able to articulate the threat that leads to self-enhancement (Hetts, Sakuma, and Pelham 1999; Sherman, Nelson, and Steele 2000; Steele 1997), suggesting that these perceptions may occur at a non-conscious level. Consistent with this, the funneled debriefings in studies of self-threat and enhancement (Brendl et al. 2005; Jones et al. 2004) have often showed that participants were unaware of the basis of their choices, suggesting that threat nonconsciously leads to favorable evaluation of stimuli associated with the self.

The study also addresses two potential criticisms of the endowment effect that are levied by some economists: namely, strategic misrepresentation and wealth effects (Plott and Zeiler 2005). Strategic misrepresentation suggests that buyers and sellers, instead of indicating their true valuation, make first offers as if in a negotiation. To control for this, most researchers exploring endowment effect use the BDM procedure (Becker, DeGroot, and Marschak 1964) that provides an incentive to provide truthful valuation. Participants have to indicate for different amounts of money whether they would prefer the object being traded or money (app. A). The market price is pre-decided by the experimenter, and the transaction takes place according to the indicated preferences at the market price. Thus stating anything but their true valuation costs the participants. To rule out wealth effects, the selling condition involves a choice between selling and not selling the product at different prices whereas the buying condition involves a choice between choosing to receive different amounts of money or the product (Lerner, Small, and Loewenstein 2004). It is worth noting that the buying price involves a choice between a product and money, rather than deciding whether to give up money to obtain an object. Since participants are not required to give up cash for product, the choice, which is equivalent to selling, controls for the wealth effect. We use this procedure in all our studies and use "buyers" and "choosers" interchangeably.

Method

Sixty-one undergraduates in a central university in India were randomly assigned to treatment conditions in a computer-based experiment for partial course credit. Participants were seated in separate cubicles and a coffee mug was kept on the desk in front of them. Participants were told either that the mug was theirs (seller condition) or that they should merely examine the mug (chooser condition). Sellers were told that they would have the opportunity to sell the mug at a later time in the study; choosers were told that they would have the opportunity to choose between the mug and some amount of money in the study. All participants were told that the price of the mug would be determined randomly, so it was in their best interest to indicate the value of the mug to themselves. They were then instructed to answer a few practice questions related to the BDM procedure (Johnson et al. 2007). After the practice questions participants were informed that an actual trading opportunity

would take place after another task, a separate word recognition task.

This word recognition task was actually a lexical decision task (Meyer and Schvaneveldt 1971). In a typical lexical decision task participants are presented, either visually or auditorily, with a mixture of words and pseudo-words. Their task is to indicate, usually by pressing a button, whether the presented stimulus is a word or not. The analysis is based on the difference among the conditions in terms of reaction times to the words and pseudo-words.

In this study participants were told that either words or nonwords would appear on the computer screen. If they see a word, they should press "P" on the keyboard and if they see a nonword, they should press "Q" as fast and accurately as possible. A few neutral words (such as wood, gown, etc.) and nonwords (such as norkt, tlun, etc.) were given for practice (10 trials) so that the participants could get used to the task and the response times of these words could be used as the baseline reaction time for each participant (to use as a covariate while analyzing the data; Fazio 1990). High-threat words (loss, death, endanger), low-threat words (safety, shelter, shield), or nonwords (definity, attent, glame) then appeared on the computer screen in a random order. Consistent with prior research using such indirect measures (Mishra 2009), an overall high perceived threat score (S_h) was calculated for each participant by averaging the response times for the high-threat words. Similarly, an overall low perceived threat score (S_l) was calculated for each participant by averaging the response times for the low-threat words. Finally, a single measure of perceived threat was calculated for each participant by subtracting the response time for low-threat words from the response time for high-threat words ($S_h - S_l$). Negative or low positive values of the difference score would indicate a higher perceived threat and vice versa. Analysis was also done without difference scores, with response latency for neutral and nonwords as covariates. An overall high perceived threat score (S_h) was calculated for each participant by averaging the response times for the high-threat words. Low values of the response times indicated a higher implicit threat and vice versa. Similar results were obtained, and therefore we report findings based only on the difference score analysis.

After participants completed the word recognition task, they were asked to provide responses about the mug that they were presented with in the beginning of the study. Participants then indicated their reservation prices using the BDM procedure. Finally, they answered questions related to mood and involvement. They indicated how they were feeling at that moment on a 7-point scale anchored by sad-happy, bad mood-good mood, irritable-pleased, depressed-cheerful. Involvement with the study was measured using a single item that asked them to indicate their level of involvement with the task on a 7-point scale (1 = low, 7 = high). All transactions were completed based on a randomly selected market price and the results of the BDM procedure, and each participant received a mug or money.

Results and Discussion

The Endowment Effect. Mood and involvement measures did not significantly influence the results (all $p > .10$) and, hence, they will not be discussed. Because the study was conducted in India, participants indicated their valuation in Rupees (Rs). A t -test indicated a significant difference between the buyers' prices ($M = \text{Rs } 4.08$, $SD = \text{Rs } 1.33$) and sellers' prices ($M = \text{Rs } 9.15$, $SD = \text{Rs } 1.77$; $t(59) = -12.64$, $p < .0001$), thereby replicating previous findings of the endowment effect literature.

Mediating Role of Threat Perceptions. To understand the nature of the distribution of the response latencies, a Shapiro-Wilk test was conducted on the response latencies of high-threat words, low-threat words, and the difference score. The response latency for the high-threat words was distributed normally (Shapiro-Wilk $W = 0.98$, $p > .35$), whereas the distribution for low-threat words was right-skewed and nonnormal ($W = 0.91$, $p < .05$). The difference score was left-skewed and failed the Shapiro-Wilk test ($W = 0.90$, $p < .05$); thus, the difference score was nonnormal. We performed a mediation test with high-threat response latency as per Preacher and Hayes (2004), and results indicated a significant indirect effect of high-threat words on the WTA-WTP discrepancy. In our computations we used the difference score even though it was nonnormal because we believe theoretically that the difference score captures the net threat. We did not log transform the difference scores because of the occurrence of negative numbers.

A t -test indicated a significant difference between buyers' and sellers' threat perceptions, measured as response latency ($M_{\text{buyers}} = -111.6$ milliseconds, $SD_{\text{buyers}} = 151.8$ milliseconds; $M_{\text{sellers}} = -262.4$ milliseconds, $SD_{\text{sellers}} = 167.9$ milliseconds; $t(59) = 3.68$, $p < .001$). The larger negative difference in the seller condition indicates that sellers responded faster to threat words (relative to nonthreat words) than did buyers, as would be expected if threat words were more readily available in memory to sellers than to buyers. Because the difference score does not tell us whether participants were faster to recognize high-threat words, slower to recognize low-threat words, or both, we performed separate t -tests for response latency for the high-threat and low-threat words. There was a significant difference between the buyer and seller response times to high-threat words ($M_{\text{buyer}} = 649.81$ milliseconds vs. $M_{\text{seller}} = 498.8$ milliseconds, $t(59) = 10.13$, $p < .001$), but no difference in response times to low-threat words ($M_{\text{buyer}} = 765.38$ milliseconds vs. $M_{\text{seller}} = 756.4$ milliseconds, $t(59) = .19$, $p = .84$).

Given this result, we used the recommended indirect bootstrapping technique for testing the mediating role of relative threat perceptions as represented by the difference score (Preacher and Hayes 2004). Analyses revealed that buyer-seller role had a significant indirect effect through perceived threat on price ($\beta = .50$, 95% CI = .0077, 1.02). These results demonstrate the mediating role of implicit threat in the endowment effect. In the next study our aim is to build on our explanation of the role of self-threat by demonstrating

the effect of strength of attachment (i.e., ownership) on self-threat and, in turn, on selling prices.

STUDY 2: EVIDENCE FOR SELF-OBJECT ASSOCIATION AND SELF-THREAT

Our main contention in this research is that the endowment effect is driven by self-object attachment that in turn creates the self-threat experienced when sellers are asked to give up the object. While study 1 provided support for the mediating role of self-threat in seller-buyer price discrepancy, demonstrating the effect of self-threat on product valuations of sellers who have weaker and stronger attachment to the object would provide further evidence in favor of our theorizing. Therefore, the main objective of study 2 was to assess support for processes of self-object attachment and enhanced level of self-threat. Specifically, we predict that (1) sellers who have stronger attachment to the object will set a higher price for the object and (2) the difference between selling prices will be mediated by self-threat. Furthermore, it may be argued that our evidence of self-threat from study 1 may have been confounded by use of the word "loss" in the lexical task. Thus, another objective of this study was to replicate the findings from study 1 (i.e., the mediating role of self-threat) in a different context.

Method

Ninety-five students at the University of Kansas participated in the study for partial credit. The study was a single factor (product evaluation: superficial vs. thorough) between-participants experimental design. Similar to prior research (Shu and Peck 2011, study 2; Strahilevitz and Loewenstein 1998, study 2) examining process evidence, we consider only the sellers because the objective of the study was to provide evidence toward both self-object association and self-threat. The participants were seated in separate cubicles in front of computers and randomly assigned to the superficial or thorough examination condition. All participants were endowed with a liquid pencil that looked like a pen although it had an eraser with it. As in the previous studies, they were familiarized with the BDM procedure and were given some practice questions to answer on a computer. Subsequently, in the superficial product evaluation condition they were asked to describe their surroundings in detail using a regular pencil, whereas in the extended product evaluation condition they were asked to describe the surroundings using the liquid pencil. The idea behind such a procedure was to enhance product attachment via touch (Peck and Shu 2009).

Then participants were again directed to the computers for the remaining part of the study and told that before they completed the BDM procedure for the transaction, they would have to complete a word task. The prediction here was that sellers in the thorough evaluation condition should complete more self-threat related words in a fill-in-the-blanks task than the sellers in the superficial evaluation condition. The participants were then directed to a perceptual identification task. Participants were told that a series of words would flash very

quickly on the computer screen one at a time, followed by a series of # signs. The participants were further instructed to type in the word they thought they saw, and if they couldn't see anything, they should guess what the word might be. After they typed in the word, they should hit "Enter" and the next word would be presented. The first five trials were neutral words (e.g., sofa, lamp) that served as practice trials. Subsequently, a total of 30 words (8 target and 22 filler words) were shown at a presentation rate of 200 milliseconds each and backmasked until participants hit "Enter." The 8 target words were drawn from the following list: peril, hazard, endanger, threat, harm, warning, risk, anxiety, distress, and discomfort. The actual target words were randomly ordered within the word list. After the perceptual identification task, participants were directed to the BDM task to elicit their reservation prices.

Results and Discussion

Enhanced WTA in the Thorough Evaluation Condition.

The first evidence toward our thesis that both self-object association and self-threat drive the endowment effect would be given by an enhanced reservation price in the thorough evaluation condition. Following Peck and Shu's (2009) suggestion that touch enhances the feeling of product ownership, we sought to see if thorough examination because of product usage increases the self-object attachment and consequently enhances the implicit self-threat and valuation. As expected, a *t*-test revealed a significant difference between the reservation prices of the sellers (superficial vs. thorough; $M_{\text{superficial}} = \2.73 vs. $M_{\text{thorough}} = \$4.67$, $t(93) = 3.23$, $p = .002$). Thus, the findings replicate previous research that implicates a role of self-object association in the endowment effect.

Mediation by Self-Threat. In the perceptual identification task participants were asked to identify filler and threat words that were flashed for a brief time period. The logic was that sellers in the thorough evaluation condition would make fewer mistakes in identifying threat words because of higher perception of self-threat than the sellers in the superficial evaluation condition. A *t*-test confirmed the prediction; in the superficial evaluation condition participants made more mistakes than in the thorough evaluation condition ($M_{\text{superficial}} = 3.27$, $SD = 3.2$ vs. $M_{\text{thorough}} = 1.93$, $SD = 1.72$; $t(93) = 2.50$, $p < .01$). Next, we tested whether our measure of self-threat mediated the difference in reservation prices across the two conditions. We performed a mediation analysis as per Preacher and Hayes (2004). We found the mean indirect effect from the bootstrap analysis as .3634 with a 95% confidence interval excluding zero (0.11 to 0.76) that indicates a mediation of the effect by our measure of self-threat. Thus, our results support the contention that both self-object association and self-threat are necessary for the endowment effect. Given this role of self-threat, in the next study we investigated whether reducing the implicit threat leads to lower selling prices and mitigates the endowment effect.

STUDY 3A: SELF-AFFIRMATION MITIGATES THE ENDOWMENT EFFECT

One of our basic contentions in this research is that sellers perceive the impending transaction as a threat to the self and, hence, enhance the value of the threatened aspect of the self (i.e., set a high price for the owned product). One way to test this conjecture is to examine the effect of self-affirmation (Steele 1988) on selling prices. As mentioned before, people can respond to self-threats not only by boosting or defending the threatened aspect of the self but also by affirming any valued aspect of the self (Steele 1988).

As an example of the self-affirmation process we describe the work of Sherman et al. (2000), who examined defensive responses to threatening health information in the context of breast cancer prevention. Participants read a (fabricated) scientific report linking caffeine consumption to fibrocystic disease, which leads to breast cancer. Women were either coffee drinkers or non-coffee drinkers, and it was suggested that women could reduce their risk for this disease by reducing their consumption of coffee. Those in the no-affirmation control condition exhibited defensive responses consistent with those found in prior research (i.e., coffee-drinking women were more critical of the scientific article and more resistant to changing their behavior than were the non-coffee-drinking women). However, coffee-drinking women, who had completed a self-affirmation scale that enabled them to assert the personal importance of a central value, were more open to the message than any other group and intended to reduce their coffee drinking accordingly. This interesting finding has been attributed to the fact that since the motivation to protect self-worth was satisfied via this self-affirmation manipulation, people who would have otherwise felt threatened by the health message proved more open and more willing to engage in adaptive behavior change. Similarly, we argue that if sellers perceive the anticipated transaction as a threat, then self-affirmation through assertion of an important value should reduce the perceived threat and thus influence their subsequent product valuation. We designed our experiment keeping the aforesaid logic in mind.

Method

The experiment had a 2 (role: chooser vs. seller) \times 2 (self-affirmation: affirmation vs. control) between-subjects design, in which participants were randomly assigned to one of the four conditions. One hundred undergraduates in India participated in a computer-based study and were granted partial course credit for their participation. In this study, participants were presented with a key chain. Sellers were endowed with a key chain and were told that they would have the opportunity to sell the key chain during the study. Choosers were shown the key chain and were told that they would have the opportunity to choose between different sums of money or the key chain during the study. All participants then completed some trial runs to ensure that they understood the BDM procedure (Johnson et al. 2007). Subsequently, before

eliciting their reservation prices, participants were directed to the self-affirmation or control manipulation depending on the condition they were in. In the self-affirmation condition, participants were told, "Please write down the most important value to you (e.g., 'academic achievement,' 'making money,' 'helping others,' 'being friendly,' etc.). Please describe a few personal experiences in which you have acted consistently with this value." In the control condition, participants were told, "Please list, in as much detail as you can, everything that you ate or drank in the past 48 hours." These treatments were drawn from the self-affirmation literature (McQueen and Klein 2006). Then participants completed the price-elicitation form to indicate their reservation prices and responded to the same mood and involvement related questions as in study 1. Finally, transactions were completed based on a randomly selected market price and the results of the BDM procedure, and all participants received either a key chain or money.

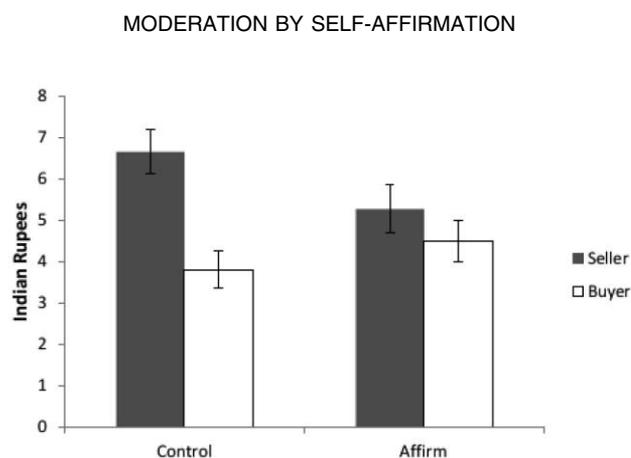
Results and Discussion

Mood and involvement measures did not significantly influence the results (all $p > .10$) and, hence, they will not be discussed. An ANOVA was conducted with reservation price in Rupees (Rs) as the dependent variable and role (choosers vs. sellers), self-affirmation (affirmation vs. control), and their interaction as the predictors. Consistent with the typical endowment effect findings there was a main effect of role such that sellers valued the key chain more than buyers ($F(1, 96) = 12.1, p < .0001$). More importantly, the main effect was qualified by a significant two-way interaction between role and self-affirmation ($F(1, 96) = 3.96, p < .05$). Simple contrasts revealed no significant difference between selling and buying prices in the affirmation condition ($M_{\text{seller}} = \text{Rs } 5.27, M_{\text{buyer}} = \text{Rs } 4.5; t(52) = 1.10, p = .27$). On the other hand, as expected, selling prices were significantly higher than buying prices in the control condition ($M_{\text{seller}} = \text{Rs } 6.66, M_{\text{buyer}} = \text{Rs } 3.81; t(44) = 3.71, p < .001$; see fig. 2). The difference in the selling prices between control and affirmation conditions was also marginally significant ($M_{\text{control}} = \text{Rs } 6.66, M_{\text{self-affirmation}} = \text{Rs } 5.27; t(47) = 1.85, p < .06$).

It can be argued that the self-affirmation procedure may have induced a positive mood in the participants, causing sellers to quote a lower reservation price. However, our data suggest that this is not the case as mood and involvement measures did not influence the results. This pattern of results is consistent with self-affirmation literature that has not found self-reported affect mediating the self-affirmation findings (Tesser 2000).

To summarize, in the control condition selling prices were significantly higher than buying prices, replicating the endowment effect. More importantly, selling and buying prices were not significantly different in the self-affirmation condition, lending support to our contention that one reason why the endowment effect occurs may be that consideration of selling a possession may induce self-threat. As such, affirming the self prior to valuing the object appeared to di-

FIGURE 2



NOTE.—The analysis focuses on the right side, which shows that the endowment effect is mitigated after affirmation.

minish the threat of selling and to eliminate the endowment effect.

STUDY 3B: RULING OUT AROUSAL AS AN ALTERNATIVE EXPLANATION

A potential alternative explanation for the results of studies 1 and 2 is that salience of loss is heightened for sellers and the accompanying arousal causes faster reaction times to loss-related words compared to low-threat words and non-words. Similarly, in study 3A, affirming one's most important value may reduce the sense of loss of giving up the key chain, thereby mitigating the feeling of arousal. To rule out arousal as a potential alternative explanation, we reversed the order of manipulation from the previous study. Instead of the assignment of seller/buyer role and trial runs of BDM procedure followed by the self-affirmation manipulation and the actual BDM procedure, we had the participants go through the self-affirmation manipulation first, followed by the assignment of seller/buyer role, the BDM practice, and actual task. The logic behind this was that if self-affirmation occurs first, while it may reduce self-threat by providing a buffer (Sherman et al. 2000), it would not reduce the potential arousal since arousal would happen only after the assignment of seller role and BDM task. Thus, we expect to find a mitigation of the endowment effect even when the self-affirmation takes place before the BDM task, which would not be expected if arousal were the underlying mechanism.

Method

Similar to the previous experiment, this study had a 2 (role: chooser vs. seller) \times 2 (self-affirmation: affirmation vs. control) between-subjects design in which participants

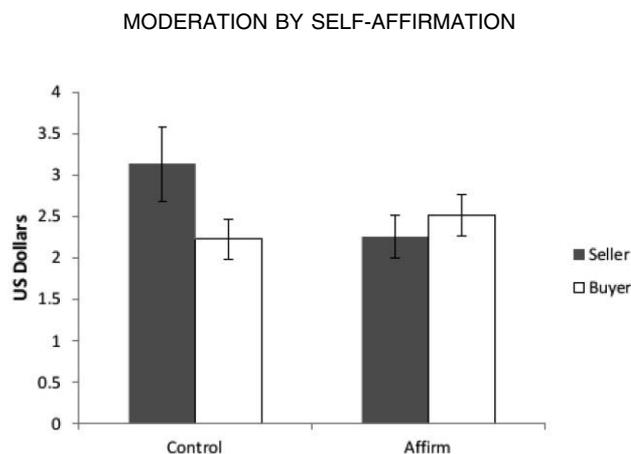
were randomly assigned to one of the four conditions. One hundred and eight undergraduates at the University of Kansas participated in a computer-based study and were granted partial course credit for their participation. Unlike the previous study where the participants were asked to complete some trial runs of the BDM procedure, the participants were directed to the self-affirmation or control manipulation depending on the condition they were in. In the self-affirmation condition participants were told, "Please write down the most important value to you (e.g., 'academic achievement,' 'helping others,' 'being friendly,' etc.). Please describe a few personal experiences in which you have acted consistently with this value." We corrected a limitation of the previous study. Specifically, the value, "making money," was not included in the list in order to avoid any potential confound related to monetary value. In the control condition participants were told, "Please list, in as much detail as you can, everything that you ate or drank in the past 48 hours." These conditions were based on the self-affirmation literature (McQueen and Klein 2006). Participants then were presented with a mug and randomly assigned to the seller or chooser condition. Sellers were endowed with a mug and were told that they would have the opportunity to sell the mug during the study. Choosers were shown the mug and were told that they would have the opportunity to choose between different sums of money or the mug during the study. Then participants did trial runs of the BDM procedure and finally completed the price-elicitation form to indicate their reservation prices and responded to the same mood- and involvement-related questions as in the previous study.

Results and Discussion

Mood and involvement measures did not significantly influence the results (all $p > .10$). An ANOVA was conducted with reservation price as the dependent variable and role (chooser vs. seller), self-affirmation (affirmation vs. control), and their interaction as the predictors. The difference in the selling prices in the control and affirmation conditions was significant ($M_{\text{control}} = \$3.14$, $M_{\text{self-affirmation}} = \2.27 ; $t(53) = 2.04$, $p < .05$). This main effect was qualified by a two-way interaction between role and self-affirmation that was marginally significant ($F(1, 105) = 3.7$, $p = .057$). Simple contrasts revealed no significant difference between selling and buying prices in the affirmation condition ($M_{\text{seller}} = \$2.27$, $M_{\text{buyer}} = \$2.51$; $t(59) = .63$, $p = .53$). On the other hand, as expected, selling prices were significantly higher than buying prices in the control condition ($M_{\text{seller}} = \$3.14$, $M_{\text{buyer}} = \$2.23$; $t(45) = 2.00$, $p < .05$; see fig. 3).

To summarize, selling and buying prices were not significantly different in the self-affirmation condition, even when the self-affirmation manipulation preceded the assignment of the seller/buyer role, lending support to our contention that one reason why the endowment effect occurs may be that consideration of selling a possession induces self-threat and not arousal. In the next study we investigate whether increasing self-threat enhances the endowment effect.

FIGURE 3



NOTE.—The analysis again focuses on the right side, which shows that the endowment effect is mitigated after affirmation.

STUDY 4: SELF-THREAT AUGMENTS THE ENDOWMENT EFFECT

In this research we argue that the idea of parting with the possession as a consequence of selling implicitly threatens the self, and sellers as a part of their automatic defense mechanism self-enhance by adding value to the self-associated object (the owned product). If this argument is valid, inducing further threat to the self should cause selling prices to increase to a greater extent. The idea here is that in the face of self-threat people use the first opportunity that arises to restore their self-worth (Steele 1988), be it to defend themselves in the same domain as the self-threat (Gao et al. 2009) or in a different domain (Sherman et al. 2000). Because buyers do not associate the product with the self, the valuation of it will not serve as self-affirmation; thus buyer prices are unlikely to be influenced by the threat, thereby augmenting the endowment effect. The objective of study 4 was to test this hypothesis.

Method

One hundred and three undergraduates from the University of South Carolina participated in the study. The study had a 2 (role: chooser vs. seller) \times 2 (self-threat: present vs. absent) between-subjects design. Participants were presented or endowed with a mug (depending on the condition they were randomly assigned to) that had the insignia of the university at which the study was conducted. Participants were then given instructions about the BDM procedure and, as in previous studies, did some trial runs to ensure that they have understood the procedure before actual price elicitation. Subsequently participants were directed to an ostensibly separate study to undergo the threat manipulation. In the self-threat-present condition participants were asked

to summarize a difficult paragraph about statistics (on structural equations modeling using LISREL); in the self-threat-absent condition (i.e., control condition) participants summarized a comprehensible statistics passage (see app. B for the manipulations). This manipulation of self-threat has been successfully utilized in prior research (McGregor, Nash, and Inzlicht 2009; McGregor et al. 2008; McGregor and Jordan 2007).

Participants were then directed to the BDM procedure for actual elicitation of the reservation price. We ended with taking the mood and involvement measures and completing the transactions as in previous studies.

Results and Discussion

Mood and involvement did not influence the results (all $p > .10$) and, hence, are not discussed. An ANOVA was conducted with reservation price as the dependent variable and role, self-threat, and their interaction as the predictors. There was a main effect of role ($F(1, 99) = 65.67, p < .0001$) and a main effect of self-threat ($F(1, 99) = 4.41, p < .05$). The results also indicated a significant interaction between role and self-threat ($F(1, 99) = 4.35, p < .05$). Simple contrasts revealed that selling prices in the self-threat-present condition were significantly higher than buying prices ($M_{\text{seller}} = \$5.72$ vs. $M_{\text{buyer}} = \$2.38; t(50) = 7.24, p < .0001$), whereas this difference was smaller in the control condition ($M_{\text{seller}} = \$4.35$ vs. $M_{\text{buyer}} = \$2.36; t(49) = 4.23, p < .001$; see fig. 4). Importantly, the difference in the seller prices across the two conditions was significant ($M_{\text{threat}} = \$5.72$ vs. $M_{\text{control}} = \$4.35; t(50) = 2.97, p < .01$). Thus, these results in conjunction with those of the previous studies provide converging evidence toward the proposed self-threat account.

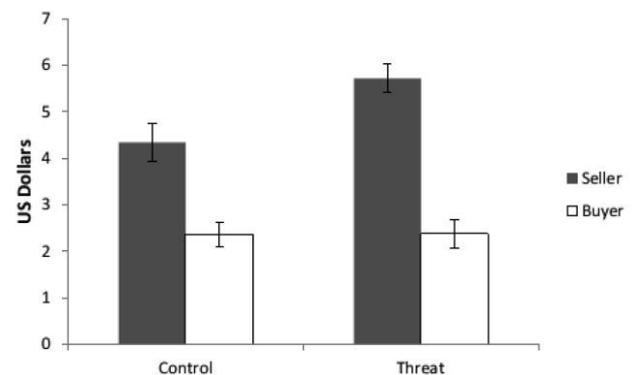
STUDY 5: ENDOWMENT EFFECT AS SELF-ENHANCEMENT

We have shown that when sellers are asked to provide their reservation prices for the endowed item, implicit self-threat leads to higher reservation prices unless sellers are able to self-affirm via another mechanism. Further, the endowment effect becomes stronger when self-threat is increased. In study 5, we seek to provide evidence that the endowment effect occurs as a result of self-enhancement due to self-threat. In other words, we aim to show that the endowment effect is a manifestation of implicit self-enhancement.

Since self-enhancement does not always occur at a conscious level (Banaji and Prentice 1994; Koole et al. 1999; Tesser 2000), we followed prior research (Koole 2000; Rudman, Dohn, and Fairchild 2007; Zweigenhaft and Marlowe 1973) that used signature size as a measure of implicit self-enhancement. For instance, Zweigenhaft and Marlowe (1973) find evidence that signature size is significantly correlated with explicit measures of the self-concept. The added advantage of signature over other measurement techniques is that participants do not realize that they are providing

FIGURE 4

MODERATION BY SELF-THREAT



NOTE.—The analysis shows that the endowment effect is enhanced after threat is increased.

self-evaluations when they sign their names, thereby reducing self-presentational concerns. Further, prior research has demonstrated that people provide a larger signature following a threat, an outcome that is attributed to self-enhancement (Rudman et al. 2007). Following the same logic, we predict that if sellers are threatened when they are asked to provide a reservation price for the endowed item, then they should provide a larger signature before they set their selling price. On the other hand, sellers' signature size after setting their reservation prices should not be enlarged as self-enhancement is established via according greater value to the endowed product. Thus, we expect sellers' signature size to increase before actual price elicitation but decrease after price elicitation compared to a baseline condition. As a result, we expect to observe the endowment effect if prices are elicited before the signature, as we theorize that both setting a higher selling price and putting a larger signature are means of self-enhancement. We do not expect any difference for the buyers' signature size because they do not feel self-threat; thus, they do not need to self-enhance.

Method

Eighty-nine undergraduate students at the University of South Carolina participated in the study for partial credit of course requirements. In line with its objectives the study had a 2 (role: chooser vs. seller) \times 2 (signature timing: before vs. after price elicitation) between-subjects design. Before the actual experiment started, as in all previous studies, all participants were requested to sign a consent form as a part of Institutional Review Board requirement, which helped us collect the baseline signature size. Participants were then randomly assigned to a chooser or seller condition. We again used a coffee mug as the stimulus. Similar to previous studies, participants were provided instructions about the

BDM task according to their role in the transaction (seller or chooser) and were given a practice questionnaire to ensure that they understood the BDM procedure. In the signature-before-price elicitation condition immediately after completing the BDM practice task, participants were asked to sign a form titled "Research Credit." As a cover story participants were told that the signatures were needed in order for them to be granted study credit for their participation in the experiment. We computed signature size, our proxy for self-enhancement, by drawing the smallest possible rectangle around each participant's signature (Koole 2000). The resulting height and width were multiplied to yield each participant's signature area. As we had two signatures (baseline and before/after price elicitation), we took a difference of the two signatures (the size of the last signature – the baseline signature) as our measure of self-enhancement.

Next, participants were directed to complete the actual BDM task to elicit the reservation price. In the signature-after-price elicitation condition participants first filled the BDM questionnaire indicating their reservation price and then signed the "Research Credit" form. Finally, transactions were completed based on the randomly chosen market price.

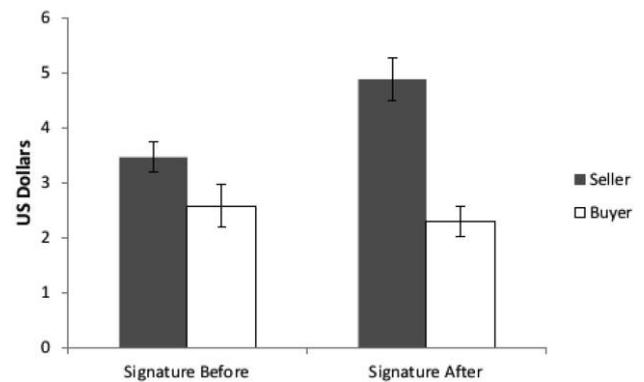
Results and Discussion

An ANOVA was performed with role and signature instance as predictors and reservation price as the dependent variable. There was a significant main effect of role ($F(1, 85) = 27.97, p < .0001$) that was qualified by a significant role \times signature-timing interaction ($F(1, 85) = 6.71, p < .05$). Consistent with the endowment effect, in the signature-after-price-elicitation condition there was a significant difference between sellers' and buyers' reservation prices ($M_{\text{seller}} = \$4.89$ vs. $M_{\text{buyer}} = \$2.29; t(41) = 5.49, p < .0001$); however, the endowment effect was mitigated in the signature-before price elicitation condition ($M_{\text{seller}} = \$3.47$ vs. $M_{\text{buyer}} = \$2.58; t(44) = 1.93, p = .06$; see fig. 5).

Evidence for Self-Enhancement. An ANOVA with role, signature timing, and their interaction term as predictors and difference in signature size as the dependent variable yielded a significant main effect of signature timing ($F(1, 85) = 7.86, p < .05$) that was qualified by an interactive effect of role and signature timing ($F(1, 85) = 6.14, p < .01$). Follow-up analysis yielded a significant difference between the buyer and seller signature sizes when signatures were assessed before price elicitation ($M_{\text{buyer}} = .03$ vs. $M_{\text{seller}} = 1.5; t(44) = 2.04, p < .05$), but not when the signature sizes were assessed after price elicitation ($M_{\text{buyer}} = -.14$ vs. $M_{\text{seller}} = -1.24; t(41) = 1.47, p > .10$). More importantly, as predicted, there was a significant difference in the sellers' signature sizes before and after price elicitation ($M_{\text{before}} = 1.5$ vs. $M_{\text{after}} = -1.24; t(45) = 3.84, p < .001$), but there was no significant difference across these conditions for the buyers ($M_{\text{before}} = .03$ vs. $M_{\text{after}} = -.14; t(40) = .22, p > .10$). We also compared the difference between baseline signature size and signature size before price elicitation for sellers and found a significant difference ($M_{\text{baseline}} = 10.65$

FIGURE 5

MODERATION BY SIGNATURE TIMING



NOTE.—The analysis shows the influence of signature timing on the endowment effect.

vs. $M_{\text{before}} = 12.15; t(24) = 4.39, p < .001$). The difference between baseline signature size and signature size after price elicitation for sellers was not significant ($M_{\text{baseline}} = 13.48$ vs. $M_{\text{after}} = 12.24; t(21) = -1.85, p = .08$). These contrasts were not significant for buyers' signatures ($p > .10$).

These results are consistent with our argument that the endowment effect is a manifestation of self-enhancement. When sellers self-enhanced by increasing their signature size before they set their prices, this form of self-enhancement eliminated the endowment effect. When they set their selling price before providing their signature, they appeared to self-enhance by setting a higher price for the object, leading to the endowment effect. In addition, sellers' signature size was unchanged in this condition, suggesting that setting higher selling prices fulfilled the need for self-enhancement.

GENERAL DISCUSSION

Across five studies we investigated the roles of implicit self-threat and self-enhancement in the endowment effect. Our findings demonstrated that, because of the association between the self and the owned product, the impending sale appears as an implicit threat to the seller. As a result, sellers enhance the value of the self-associated object, leading to the endowment effect.

The present research has important contributions to the endowment effect literature. We suggest that both loss aversion and ownership explanations are valid and provide an integrative framework to understand this important phenomenon. While attachment to the owned object is one of the main tenets of the ownership account (Morewedge et al. 2009) and loss of the possession is key to the loss aversion account (Kahneman et al. 1990), our results suggest that loss of an object one is attached to drives the endowment effect. Ariely,

Huber, and Wertenbroch (2005) proposed emotional attachment as a plausible mechanism for the endowment effect. Further, they “speculate that the instantaneous endowment effects often observed in the literature result from generalized response tendencies in relation to possessions, even when . . . respondents have not had a chance to use their mugs” (135). Our findings empirically support and extend this speculation as we show that attachment to possessions creates self-threat when people consider giving up their possessions. As we show in our studies, such self-threats operate outside of people’s awareness; as a result, they may well manifest as generalized response tendencies in relation to possessions.

While the ownership account suggests that the endowment effect occurs because of self-enhancement, our findings suggest that the endowment effect is a way self-enhancement manifests itself. According to the ownership account, self-enhancement happens before people are asked to sell the item: people value themselves and, hence, their possessions. We argue that self-enhancement happens through the assignment of value to the owned object after threat. In this way, our account assumes self-enhancement to be an outcome of the endowment effect, while the ownership account considers it an antecedent to it. The present research is the first demonstration of this important theoretical distinction.

Building upon the loss aversion account of the endowment effect, our results may be interpreted as self-object association increasing the relevance and/or changing the quality of the loss for sellers. Furthermore, our findings suggest that loss aversion for sellers is profound because of the self-object associations caused by ownership. Attachment to the endowed object may be enhancing the meaning of the loss to sellers, increasing the magnitude of the loss compared to the otherwise (objectively) equivalent amount of gain. In fact, our conceptualization of self-threat reflects this enhancement of loss due to the juxtaposition of self-object association and consideration of selling (see fig. 1).

One of the most intriguing aspects of our findings is that self-threats can be countered by assigning a high selling price to owned objects. Our findings build upon self-affirmation theory (Steele 1988) by demonstrating that mere assignment of a high selling price to an object can be instrumental in self-affirmation. In line with self-affirmation theory that suggests that when encountering self-threats people utilize the first opportunity to restore self-worth (Sherman and Cohen 2006), we found that self-threat in a domain unrelated to the self-associated object can lead to assignment of higher selling prices to the object. That is, inducing self-threat by challenging statistics skills led to higher selling prices for a university insignia coffee mug. We believe that these results have implications not only for the endowment effect but also for pricing in general by demonstrating the impact of self-threat and self-affirmation on pricing decisions. For instance, it would be interesting to see whether such effects extend to negotiation contexts or have an impact on marketers’ pricing strategies.

The notion of implicit self-threat used in our research may

help clarify the nature of loss aversion in the context of the endowment effect. As we noted previously, self-reports do not capture loss aversion (Brown 2005), but there is distinct neural activity for loss and gain domains in both risky as well as riskless choice (Knutson et al. 2008; Tom et al. 2007). Findings from this research, based on the notion of implicit threat and automatic defense response, offer a plausible mechanism for loss aversion: the endowment effect may be a manifestation of self-enhancement due to self-threat from a forthcoming loss of a self-associated object. From this perspective, findings from recent research on the endowment effect related to differential foci (Carmon and Ariely 2000; Johnson et al. 2007; Nayakankuppam and Mishra 2005) can be explained as a consequence of self-enhancement due to perceived threat. For instance, in order to self-enhance, sellers may be more likely to focus on positive (vs. negative) aspects of the self-associated object (Nayakankuppam and Mishra 2005).

Although this research furthers our understanding of the underlying process of the endowment effect, some questions remain for future research to answer. Morewedge et al. (2009) introduced an “owner-buyer” condition in addition to the traditional seller and buyer conditions typically found in endowment effect studies. Owner-buyers were endowed with a mug and subsequently provided their buying prices for another identical mug. They found that, consistent with the endowment effect, sellers set significantly greater prices than buyers who had not been endowed with a mug. However, they also found that owner-buyers and sellers expressed equivalent reservation prices, despite the fact that the former group faced no apparent threat to self. So the question arises as to how this empirical result is explained by our theory. We believe that the most plausible explanation for the effects observed in the Morewedge et al. studies relates to the activation of self-object associations in memory. It is possible that seeing an identical product being put up for sale makes salient the association between the owned product and the self and activates a feeling of self-threat because it is easy to imagine that one’s own possession is being sold. In effect, the consumer (the owner-buyer in this case) experiences the feeling of loss vicariously. It is also possible that feelings of attachment to a product may transfer to identical or even very similar products, and when those products are offered for sale, a threat to self is perceived more directly. In order to examine this possibility, the ideal comparison would be to create an owner-seller and owner-buyer condition (that is, endow both seller and buyer with one object and then elicit prices for another similar object). If object-attachment transfers to identical objects offered for sale or if the owner-buyer feels threat vicariously, then owner-buyers and owner-sellers should report equivalent reservation prices.

There is some evidence in the literature that calls into question the essential roles of ownership and loss aversion. For example, some studies have shown that uncertain possessions, in which participants may lose the item they received in the exchange, can manifest the endowment effect, suggesting that ownership is not needed for the endowment

effect to occur (Liersch et al. 2011). In contrast, other studies have shown that repeated selling experiences mitigate the endowment effect, thereby calling into question the role of loss aversion (List 2003). What these studies suggest to us is that there are additional moderators of the endowment effect that have not yet been identified. According to our framework, ownership and loss aversion together lead to self-threat; thus, self-threat is an essential part of our model. To explain the seemingly inconsistent findings in the literature within our framework, we can speculate that, perhaps, sellers' agents experience vicarious ownership by virtue of taking responsibility for selling the owners' possessions; as a result, they may feel self-threat due to selling a vicariously owned object. Perhaps repeating sales transactions causes an adaptation to loss such that self-threat is experienced less acutely as it occurs in close succession, thereby reducing the endowment effect over transactions. Clearly more research is needed to explore these interesting theoretical nuances.

While the role of sellers in the endowment effect is clearly delineated in our framework, the buyer's role needs further explication. According to our theory, the endowment effect is a consequence of sellers' self-enhancement due to the self-threat arising from the potential loss of self-associated object. We assumed that there is no self-object connection for buyers; therefore there is no consequent self-threat to buyers. However, as shown in prior research (e.g., Carmon et al. 2003), buyers may also form self-object associations if they contemplate buying and using the object (see Irmak, Wakslak, and Trope [2013] for a similar argument). As a result, they may also experience self-threat; however, the extent of such threat is likely to be significantly lower than what sellers experience (unless buyers already own a similar or identical product as in the owner-buyer condition created by Morewedge et al. [2009]). Since we did not include a buyer condition in study 2, we were unable to measure threat to buyers and investigate the effect of ownership manipulation on buyers. While the design of the study was consistent with prior research and having a buyer condition in

the study was not relevant to our theorization, we acknowledge the importance of clearly elucidating the role of buyers in the process and leave this exploration to future research.

In our studies even when sellers did not spend much time with the product (similar to other "instant endowment effect" research), we observed implicit self-threat. One interesting question is whether or not assuming the seller role (i.e., consideration of selling something, anything) is more powerful than attachment to the object in producing the threat. Perhaps generalized response tendencies are related to the selling role rather than to possessions as Ariely et al. (2005) suggest. Our finding that stronger attachment leads to greater self-threat and thus higher selling prices, however, supports the conclusions of Strahilevitz and Loewenstein (1998) and Peck and Shu (2009), regarding the important role of attachment. Another interesting question concerns variation in attachment strength and the ease with which self-threat (and consequently the endowment effect) could be mitigated using a self-affirmation manipulation. Perhaps a very strong self-affirmation task would be required to offset the increased sense of threat when attachment is very strong. The domain in which self-affirmation occurs could also be an important factor in such cases. Self-affirmation in a domain that is relevant to the product (vs. in a domain not related to the product) may be more powerful in mitigating the endowment effect. Future research is needed to uncover how the process of self-affirmation influences the perception of self-threat in the context of the endowment effect.

In our view the endowment effect is a ubiquitous manifestation of fundamental human tendencies to protect the self. Thus the current research provides one significant step toward understanding this interesting and important phenomenon but also has broad potential implications. Despite the large body of literature devoted to the endowment effect, it is clear that there is still a lot to learn about the underlying processes and that continuing work in this area could offer substantial benefits to our understanding of consumer behavior and human behavior in general.

APPENDIX A STUDENT SURVEY

For each of the possible prices below indicate whether you wish to:

- Sell your mug and receive this price (Choose receiving this amount of cash)
- or
- Keep your mug and take it with you (Receive the mug and take it with you)

For each price indicate your decision by marking an X in the appropriate column.

IMPORTANT: The experimenter has already determined the market price of the mug. You will receive (sell) the mug at your specified price if the selected price is equal or lower (higher) than the market price. [*In consideration of space, the form has been truncated at Rs 9*]

At a price of Rs.1 I will sell (choose to receive the mug)	_____	I will not sell (choose to receive Rs.1 cash)	_____
At a price of Rs.2 I will sell (choose to receive the mug)	_____	I will not sell (choose to receive Rs.2 cash)	_____
At a price of Rs.3 I will sell (choose to receive the mug)	_____	I will not sell (choose to receive Rs.3 cash)	_____
At a price of Rs.4 I will sell (choose to receive the mug)	_____	I will not sell (choose to receive Rs.4 cash)	_____
At a price of Rs.5 I will sell (choose to receive the mug)	_____	I will not sell (choose to receive Rs.5 cash)	_____
At a price of Rs.6 I will sell (choose to receive the mug)	_____	I will not sell (choose to receive Rs.6 cash)	_____
At a price of Rs.7 I will sell (choose to receive the mug)	_____	I will not sell (choose to receive Rs.7 cash)	_____
At a price of Rs.8 I will sell (choose to receive the mug)	_____	I will not sell (choose to receive Rs.8 cash)	_____
At a price of Rs.9 I will sell (choose to receive the mug)	_____	I will not sell (choose to receive Rs.9 cash)	_____

APPENDIX B

THREAT MANIPULATION IN STUDY 3

Threat-Present Condition

INSTRUCTIONS: The passage below is from an introduction to a statistical procedure called Linear Structural Relations, or LISREL. LISREL is a tool for analyzing causal relations among different variables. We are interested in assessing how understandable it is to you. Please take five minutes to read the passage below, and then summarize it as best you can.

The measurement model specifies the relations between unobserved and observed, or latent and manifest, variables. The basic LISREL Model contains three sub-models: A) Two measurement models: X-measurement model (this relates the manifest to latent variables among the independent variables):

$$X = \Lambda_x \xi + \delta$$

Where, X is a $q \times 1$ matrix of q observed variables, Λ_x is a $q \times n$ matrix of factor loadings (λ) for n factors (regression of manifest variable onto latent variable), ξ is $n \times 1$ vector of latent construct scores, and δ is a $q \times 1$ vector of uniqueness (error) terms. θ_δ is a covariance matrix for the error variances. B) Y-measurement model (this relates the manifest to latent variables among the dependent variables):

$$Y = \Lambda_y \eta + \varepsilon$$

Where, Y is a vector of manifest endogenous variables, Λ_y is a matrix of factor loadings (regression of manifest variable

onto latent variable), η is a matrix of endogenous variables, ε is a vector of error variances (called disturbance terms in the Y-measurement model) and θ_ε is a covariance matrix for the error variances. C) Structural model (this relates the latent constructs to other latent constructs. There is no analog to this in regression:

$$\eta = \Gamma \xi + B \eta + \zeta$$

Where, Γ is an $m \times n$ matrix representing structural relations between the latent endogenous and latent exogenous variables, ξ is a matrix of latent exogenous variables, B is an $m \times m$ matrix representing the structural relations (i.e., regression coefficients) among the latent dependent variables, η is an $m \times 1$ vector of the m latent endogenous (dependent) variables, ζ represents the latent uniquenesses (also called disturbance terms), ϕ is a covariance matrix for the latent exogenous constructs ξ and ψ is a covariance for the disturbance terms ξ . Notice in both cases, it is a simple regression model without an intercept!

Thus, we can predict job satisfaction from personality variables (emotional stability, conscientiousness, agreeableness, extraversion, and openness). Satisfaction is measured with three variables, each personality trait is measured with 25 variables. Thus, we have an X-measurement model, a Y-measurement model, and a structural model.

Please summarize the above passage:

Threat-Absent (Control) Condition

INSTRUCTIONS: The passage below is from an introduction to a statistics textbook. Statistics is a tool which is widely used in Marketing Research. We are interested in

assessing how understandable it is to you. Please take five minutes to read the passage below, and then summarize it as best you can.

Statistics is the science of collecting, organizing, and interpreting numerical facts which we call data. Data bombards us in everyday life. Most of us associate statistics with the bits of data that appear in news reports: baseball batting averages, imported car sales, the latest poll of the president's popularity, and the average high temperature for today. Advertisements often claim that data show the superiority of the advertiser's product. All sides in public debates about economics, education, and social policy argue from data. Yet the usefulness of statistics goes far beyond these everyday examples.

The study and collection of data are important in the work of many professions, so that training in the science of statistics is valuable preparation for a variety of careers. Each month, for example, government statistical offices release the latest numerical information on unemployment and inflation. Economists and financial advisors as well as policy makers in government and business study these data to make informed decisions. Doctors must understand the origin and trustworthiness of the data that appear in medical journals if they are to offer their patients the most effective treatment. Politicians rely on data from polls of public opinion. Market research data that reveal consumer tastes influence business decisions. Farmers study data from field trials of new crop varieties. Engineers gather data on the quality and reliability of manufactured products. Most areas of academic study make use of numbers, and therefore also make use of the method of statistics.

We can no more escape data than we can avoid the use of words. Just as words on a page are meaningless to the illiterate or confusing to the partially educated, so data do not interpret themselves but must be read with understanding. A writer can arrange words into convincing arguments or incoherent nonsense. Similarly, you can manipulate data to be compelling, misleading, or simply irrelevant. Numerical literacy, the ability to follow and understand numerical arguments is important for everyone. The ability to express oneself numerically, to be an author rather than just a reader is a vital skill in many professions and areas of study. The study of statistics is therefore essential to a sound education. We must learn how to read data, critically and with comprehension; we must learn how to produce data that provide clear answers to important questions; and we must learn sound methods for drawing trustworthy conclusions based on data as well as acquire the ability to effectively communicate valid conclusions. Statistics teaches you how to gather, organize, and analyze data, and then to infer the underlying reality from these data. It is a powerful intellectual method that is applied in many contexts and most disciplines. Persons in industry and government make decisions that are increasingly dependent upon the collection and interpretation of data, and employers demand greater quantitative sophistication from their employees (or prospective employees). Indeed, in almost every aspect of our

daily lives we confront data and make judgments based on them, about issues ranging from airline safety to the spread of AIDS. It is now clear that the Challenger disaster never would have occurred if a statistically wise person had seen the data. This did not have to be a statistician, but one (say an engineer) with enough statistical literacy to see the strong relationship between the temperature and the failure rate of the O-rings.

REFERENCES

- Ariely, Dan, Joel Huber, and Klaus Wertenbroch (2005), "When Do Losses Loom Larger than Gains?" *Journal of Marketing Research*, 42 (May), 134–38.
- Ariely, Dan, and Itamar Simonson (2003), "Buying, Bidding, Playing, or Competing? Value Assessment and Decision Dynamics in Online Auctions," *Journal of Consumer Psychology*, 13 (1), 113–23.
- Banaji, Mahzarin, and Deborah Prentice (1994), "The Self in Social Contexts," *Annual Review of Psychology*, 45 (1), 297–333.
- Baumeister, Roy F. (1982), "A Self Presentational View of Social Phenomena," *Psychological Bulletin*, 91 (1), 3–26.
- Becker, Gordon M., Morris H. DeGroot, and Jacob Marschak (1964), "Measuring Utility by a Single-Response Sequential Method," *Behavioral Science*, 9 (July), 222–32.
- Beggan, James K. (1992), "On the Social Nature of Nonsocial Perception: The Mere Ownership Effect," *Journal of Personality and Social Psychology*, 62 (February), 229–37.
- Belk, Russell W. (1988), "Possessions and the Extended Self," *Journal of Consumer Research*, 15 (September), 139–68.
- Brendl, C. Miguel, Amitava Chattopadhyay, Brett W. Pelham, and Mauricio Carvallo (2005), "Name Letter Branding: Valence Transfers When Product Specific Needs Are Active," *Journal of Consumer Research*, 32 (December), 405–16.
- Brown, Jonathan D. (1998), *The Self*, New York: McGraw-Hill.
- Brown, Thomas C. (2005), "Loss Aversion without the Endowment Effect, and Other Explanations for Endowment Effect," *Journal of Economic Behavior and Organization*, 57 (3), 367–79.
- Campbell, W. Keith, and Constantine Sedikides (1999), "Self-Threat Magnifies the Self-Serving Bias: A Meta-Analytic Integration," *Review of General Psychology*, 3 (1), 23–43.
- Carmon, Ziv, and Dan Ariely (2000), "Focusing on the Forgone: Why Value Can Appear So Different to Buyers and Sellers," *Journal of Consumer Research*, 27 (December), 360–70.
- Carmon, Ziv, Klaus Wertenbroch, and Marcel Zeelenberg (2003), "Option Attachment: When Deliberating Makes Choosing Feel like Losing," *Journal of Consumer Research*, 30 (June), 15–29.
- DeLorme, Denise E., George M. Zinkhan, and Scott C. Hagen (2004), "The Process of Consumer Reactions to Possession Threats and Losses in a Natural Disaster," *Marketing Letters*, 15 (4), 185–99.
- De Martino, Benedetto, Colin Camerer, and Ralph Adolphs (2010), "Amygdala Damage Eliminates Monetary Loss Aversion," *Proceedings of the National Academy of Sciences*, 107 (8), 3788–92.
- Dittmar, Helga (1992), *The Social Psychology of Material Possessions*, New York: St. Martin's Press.
- Eisenberger, Naomi I., Matthew D. Lieberman, and Kipling D. Williams (2003), "Does Rejection Hurt? An fMRI Study of Social Exclusion," *Science*, 302 (5643), 290–92.
- Fazio, Russell H. (1990), "A Practical Guide to the Use of Re-

- sponse Latency in Social Psychological Research," in *Research Methods in Personality and Social Psychology*, Vol. 11, Newbury Park, CA: Sage Publications.
- Gao, Leilei, S. Christian Wheeler, and Baba Shiv (2009), "The 'Shaken Self': Product Choices as a Means of Restoring Self-View Confidence," *Journal of Consumer Research*, 36 (June), 29–38.
- Gawronski, Bertram, Galen V. Bodenhausen, and Andrew P. Becker (2007), "I Like It, Because I Like Myself: Associative Self-Anchoring and Post-Decisional Change of Implicit Evaluations," *Journal of Experimental Social Psychology*, 43 (2), 221–32.
- Hetts, John J., Michiko Sakuma, and Brett W. Pelham (1999), "Two Roads to Positive Regard: Implicit and Explicit Self-Evaluation and Culture," *Journal of Experimental Social Psychology*, 35 (6), 512–59.
- Irmak, Caglar, Cheryl J. Wakslak, and Yaacov Trope (2013), "Selling the Forest, Buying the Trees: The Effect of Construal Level on Seller-Buyer Price Discrepancy," *Journal of Consumer Research*, 40 (August), electronically published February 15, 2013.
- List, John (2003), "Does Market Experience Eliminate Market Anomalies?" *Quarterly Journal of Economics*, 118 (February), 41–71.
- James, William (1890), "The Consciousness of Self," in *The Principles of Psychology*, Vol. 1, New York: Henry Holt.
- Johnson, Eric J., Gerald Haubl, and Anat Keinan (2007), "Aspects of Endowment: A Query Theory of Value Construction," *Journal of Experimental Psychology: Learning, Memory and Cognition*, 33 (3), 461–74.
- Jones, John T., Brett W. Pelham, Mauricio Carvallo, and Matthew C. Mirenberg (2004), "How Do I Love Thee? Let Me Count the Js: Implicit Egotism and Interpersonal Attraction," *Journal of Personality and Social Psychology*, 87 (November), 665–84.
- Kahn, Barbara, Mary Frances Luce, and Stephen M. Nowlis (2006), "Debiasing Insights from Process Tests," *Journal of Consumer Research*, 33 (June), 131–38.
- Kahneman, Daniel, Jack L. Knetsch, and Richard Thaler (1990), "Experimental Tests of the Endowment Effect and the Coase Theorem," *Journal of Political Economy*, 98 (December), 1325–48.
- Kahneman, Daniel, and Amos Tversky (1979), "Prospect Theory: An Analysis of Decision under Risk," *Econometrica*, 47 (March), 263–91.
- Knutson, Brian, G. Elliot Wimmer, Scott Rick, Nick G. Hollon, Drazen Prelec, and George Loewenstein (2008), "Neural Antecedents of the Endowment Effect," *Neuron*, 58 (5), 814–22.
- Koole, Sander L. (2000), "Positivity in Self-Evaluation," unpublished doctoral dissertation, University of Nijmegen.
- Koole, Sander L., Karianne Smeets, Ad van Knippenberg, and Ap Dijksterhuis (1999), "The Cessation of Rumination through Self-Affirmation," *Journal of Personality and Social Psychology*, 77 (July), 111–25.
- Lerner, Jennifer, Deborah Small, and George Loewenstein (2004), "Heart Strings and Purse Strings: Carry-Over Effects of Emotions on Economic Transactions," *Psychological Science*, 15 (5), 337–41.
- Liersch, Michael J., Yuval Rottenstreich, Howard Kunreuther, and Min Gong (2011), "Reference-Dependent versus Connection-Based Accounts of the Endowment Effect," Working paper, New York University.
- Maddux, William W., Haiyang Yang, Carl Falk, Hajo Adam, Wendi Adair, Yumi Endo, Ziv Carmon, and Steven J. Heine (2010), "For Whom Is Parting with Possessions More Painful? Cultural Differences in the Endowment Effect," *Psychological Science*, 21 (12), 1910–17.
- McGregor, Ian, and Christian H. Jordan (2007), "The Mask of Zeal: Low Implicit Self-Esteem, and Defensive Extremism after Self-Threat," *Self and Identity*, 6 (2/3), 223–37.
- McGregor, Ian, Reeshma Haji, Kyle A. Nash, and Rimma Teper (2008), "Religious Zeal and the Uncertain Self," *Basic and Applied Social Psychology*, 30 (2), 183–88.
- McGregor, Ian, Kyle A. Nash, and Michael Inzlicht (2009), "Threat, High Self-Esteem, and Reactive Approach-Motivation: Electroencephalographic Evidence," *Journal of Experimental Social Psychology*, 45 (4), 1003–7.
- McQueen, Amy, and William Klein (2006), "Experimental Manipulations of Self-Affirmation: A Systematic Review," *Self and Identity*, 5 (4), 289–354.
- Meyer, David E., and Roger W. Schvaneveldt (1971), "Facilitation in Recognizing Pairs of Words: Evidence of a Dependence between Retrieval Operations," *Journal of Experimental Psychology*, 90 (October), 227–34.
- Mishra, Arul (2009), "Influence of Contagious versus Noncontagious Product Groupings on Consumer Preferences," *Journal of Consumer Research*, 36 (June), 73–82.
- Morewedge, Carey K., Lisa L. Shu, Daniel T. Gilbert, and Timothy D. Wilson (2009), "Bad Riddance or Good Rubbish? Ownership and Not Loss Aversion Causes the Endowment Effect," *Journal of Experimental Social Psychology*, 45 (4), 947–51.
- Nayakankuppam, Dhananjay, and Himanshu Mishra (2005), "The Endowment Effect: Rose-Tinted and Dark-Tinted Glasses," *Journal of Consumer Research*, 32 (December), 390–95.
- Peck, Joanne, and Suzanne B. Shu (2009), "The Effect of Mere Touch on Perceived Ownership," *Journal of Consumer Research*, 36 (October), 434–47.
- Pelham, Brett W., Matthew C. Mirenberg, and John T. Jones (2002), "Why Susie Sells Seashells by the Seashore: Implicit Egotism and Major Life Decisions," *Journal of Personality and Social Psychology*, 82 (4), 469–87.
- Plott, Charles R., and Kathryn Zeiler (2005), "The Willingness to Pay/Willingness to Accept Gap, the 'Endowment Effect,' Subject Misperceptions, and Experimental Procedures of Eliciting Valuations," *American Economic Review*, 95 (3), 530–45.
- Preacher, Kristopher J., and Andrew F. Hayes (2004), "SPSS and SAS Procedures for Estimating Indirect Effects in Simple Mediation Models," *Behavior Research Methods, Instruments, and Computers*, 36 (4), 717–31.
- Rudman, Laurie A., Matthew C. Dohn, and Kimberly Fairchild (2007), "Implicit Self-Esteem Compensation: Automatic Threat Defense," *Journal of Personality and Social Psychology*, 93 (5), 798–813.
- Sanfey, Alan G., James K. Rilling, Jessica A. Aronson, Leigh E. Nystrom, and Jonathan D. Cohen (2003), "The Neural Basis of Economic Decision-making in the Ultimatum Game," *Science*, 300 (5626), 1755–58.
- Sen, Sankar, and Eric J. Johnson (1997), "Mere-Possession Effects without Possession in Consumer Choice," *Journal of Consumer Research*, 24 (June), 105–17.
- Sherman, David A. K., and Geoffrey L. Cohen (2006), "The Psychology of Self-Defense: Self-Affirmation Theory," in *Advances in Experimental Social Psychology*, Vol. 38, ed. M. P. Zanna, San Diego, CA: Academic Press, 183–242.
- Sherman, David A. K., Leif D. Nelson, and Claude M. Steele

- (2000), "Do Messages about Health Risks Threaten the Self? Increasing Acceptance of Health Messages via Self-Affirmation," *Personality and Social Psychology Bulletin*, 26 (September), 1046–58.
- Shu, Suzanne B., and Joann Peck (2011), "Psychological Ownership and Affective Reaction: Emotional Attachment Process Variables and the Endowment Effect," *Journal of Consumer Psychology*, 21 (October), 439–52.
- Steele, Claude M. (1988), "The Psychology of Self-Affirmation: Sustaining the Integrity of the Self," in *Advances in Experimental Social Psychology*, Vol. 21, ed. Leonard Berkowitz, San Diego, CA: Academic Press, 261–302.
- (1997), "A Threat in the Air," *American Psychologist*, 52 (6), 613–29.
- Strahilevitz, Michal A., and George F. Loewenstein (1998), "The Effect of Ownership History on the Valuation of Objects," *Journal of Consumer Research*, 25 (December), 276–89.
- Tesser, Abraham (2000), "On the Confluence of Self-Esteem Maintenance Mechanisms," *Personality and Social Psychology Review*, 4 (4), 290–99.
- Thaler, Richard (1980), "Toward a Positive Theory of Consumer Choice," *Journal of Economic Behavior and Organization*, 1 (March), 39–60.
- Tom, Sabrina M., Craig R. Fox, Christopher Trepel, and Russell A. Poldrack (2007), "The Neural Basis of Loss Aversion in Decision-Making under Risk," *Science*, 315 (5811), 515–18.
- Weber, Bernd, Andreas Aholt, Carolin Neuhaus, Peter Trautner, Christian E. Elger, and Thorsten Teichert (2007), "Neural Evidence for Reference-Dependence in Real-Market-Transactions," *NeuroImage*, 35 (1), 441–47.
- Wicklund, Robert A., and Peter M. Gollwitzer (1982), *Symbolic Self-Completion*, Hillsdale, NJ: Erlbaum.
- Zweigenhaft, Richard L., and David Marlowe (1973), "Signature Size: Studies in Expressive Movement," *Journal of Consulting and Clinical Psychology*, 40 (3), 469–73.