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In defining limits to loss aversion, Novemsky and Kahneman (2005) offer important new data and a needed summary of appropriate ways to think about loss aversion. In this comment to Novemsky and Kahneman's article, the authors consider the new empirical results that involve probabilistic buying and selling, suggesting caution in generalizing the results to nonprobabilistic commerce. The authors expand Novemsky and Kahneman's summary by exploring two critical constructs that help define the boundaries of loss aversion: emotional attachment and cognitive perspective. Emotional attachment alters loss aversion by moderating the degree to which parting with an item involves a loss, whereas shifts in cognitive perspective explain why items typically viewed as a loss are given more or less weight. The goal is to use these constructs to characterize more specifically contexts in which losses loom larger than gains and to suggest specific ways that research into loss aversion could evolve.

When Do Losses Loom Larger Than Gains?

Kahneman and Tversky's (1979) famous dictum that losses loom larger than gains implies that people impute greater value to a given item when they give it up than when they acquire it. This has been shown most vividly in gambles in which gains and losses can be simultaneously considered and in riskless choice in which there is a contrast between buying and selling (Tversky and Kahneman 1991). However, loss aversion does not only mean that people are averse to losses; after all, the word "loss" denotes something inherently aversive, just as the word "gain" denotes attractiveness. Another important aspect of loss aversion is reference dependence. Without reference dependence, the concept of losses looming larger than gains might not have had such a deep impact on psychology and economics, because researchers have long postulated diminishing returns over the full range of most utility functions. For example, Coombs and Avrunin (1977) argue that virtually all one-dimensional characteristics exhibit diminishing returns. Thus, a loaf of bread to a starving person is extremely valuable, but the incremental worth of successive loaves certainly diminishes.

Reference-dependent loss aversion specifies that losses with respect to a current endowment loom larger than gains. The critical aspect is that local loss aversion is more compelling than general diminishing returns. The implication of

stronger loss aversion with respect to a current endowment is that the utility of a good, instead of being represented by a continuous utility function over the entire range of an attribute, must be represented by several curves, one for each reference level. Such multiple utility curves produce preference reversals through what might be considered a normatively inconsequential shift in the reference point.

Novemsky and Kahneman (2005; hereinafter NK) focus on the boundaries of loss aversion. The first part of their article characterizes several clever tests of contexts in which loss aversion increases and decreases. The second part provides a more broad-ranging discussion of appropriate ways to think about loss aversion. We comment on NK's findings and propose two psychological approaches to loss aversion that suggest additional boundary conditions.

THE NEW EMPIRICAL STUDIES

Novemsky and Kahneman offer a broad range of different tests that are performed with different stimuli at different times and for different populations. In such cases, it is sometimes tempting to try to tease out the differences in results that arise from such conditions. Instead, they focus on the commonalities that are found across the studies (see Figure 1 in NK).

Three important results emerge from the studies. First, NK replicate the endowment effect, whereby, on average, people must be paid twice as much to give up a good than they are willing to pay to acquire it. Second, they replicate the finding of no loss aversion for money by showing that the value of an item in a free choice (certainty equivalent) is the same as its value in purchasing. Third, they provide important new results on probabilistic buying and selling. In

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the valuations, the buying or selling only occurs probabilistically. Novemsky and Kahneman compare probabilistic selling to putting the good in the pot of a poker game, whereas probabilistic buying is analogous to putting money into a poker pot that contains the good. In the former case, the loss of the good may or may not bring about positive monetary rewards, whereas in the latter, the good may or may not be acquired. Novemsky and Kahneman find that the addition of (balanced) risk to selling does not affect valuations, implying that there is no risk aversion beyond the standard loss aversion for parting with a product under certainty. In contrast, the addition of risk to buying creates risk aversion with respect to possibly losing that money. Novemsky and Kahneman qualify this latter result because it is somewhat less reliable empirically.

Two methodological issues arise with the examination of the results, and both are related to probabilistic transactions. First, the probabilistic commerce used in NK's article is different from the buying or selling of small items that constitute the standard tests of the endowment effect. In addition to adding another aspect of uncertainty to the transaction, the novelty of this procedure raises questions about the ways that the cognitive processing of such probabilistic transactions differs from that of nonprobabilistic transactions. Do these methods invoke different psychological processes or different scripts? More important, do they invoke a different approach and attitude to risk? The analogy to a poker game provides clarity for the reader, but if the respondents developed the same analogy, their responses would be colored by their beliefs about gambling in general and having prized possessions in a poker pot in particular. Given the novelty of the task, the appropriate question is whether the expressed willingness to trade would change after experience with probabilistic commerce. To the extent that probabilistic transactions are somewhat different from certain commerce, the conclusions based on these mechanisms would benefit from further investigation before a more general interpretation of the results is possible.

The second methodological issue relates to the use of Becker, DeGroot, and Marschak's (1964; hereinafter BDM) procedure. The BDM procedure ensures that all participants have a (weakly) dominant strategy to reveal their maximum willingness to pay (WTP) truthfully. Although BDM has many desirable theoretical properties, the extent to which the properties hold empirically is subject to ongoing debate (e.g., Wertenbroch and Skiera 2002). Ariely, Mazar, and Köszegi (2005) manipulate the price distribution used in the BDM procedure and show that a right-skewed distribution (uniform distribution between \$1 and \$14, with an additional peak at \$25) produces different values than a left-skewed distribution (uniform distribution between \$1 and \$14, with an additional peak at \$.10). The two distributions altered WTP, almost tripling the value of a mug between the left-skewed distribution (mean = \$3.33) and the right-skewed distribution (mean = \$8.47).

In addition to the general questions about how people respond to the BDM procedure, conceptually this process adds another layer of risk to the decision. For example, in the certainty equivalence condition, the bidder does not know whether the trade will occur until the random BDM procedure is completed. This additional risk means that the indifference levels are not determined with certainty but only with less risk than in risky buying or selling. To

explore whether the procedural randomness clouds the meaning of both the certainty and the random conditions, it would be useful to test whether single binary choices yield the same results as those that use the BDM procedure. Such a comparison requires many more respondents because the distribution of acceptable levels would be known only through the analysis of choices across respondents, but it would shed light on the similarity of the BDM method (with its increased efficiency) and binary choice.

In summary, the advantage of probabilistic buying and selling is that it enables new questions to be answered with respect to buying and selling. However, the very novelty of the method calls for tests of the stability and meaning of the task, particularly when it is wedded to the BDM procedure. Although it is possible that the results would remain largely unchanged, there is a need to test the behavioral stability of probabilistic commerce with respect to both experience and context, as well as the impact of the additional level of risk that the BDM procedure imposes.

WHAT MODERATES LOSS AVERSION FOR GOODS?

In this section, we note a few topics that we consider fruitful avenues for further investigation. When we stand back and examine the literature on the endowment effect, it is difficult not to be impressed by how much attention the phenomenon has attracted in terms of number of publications. At the same time, it is surprising to observe how little is known about the psychology that underlies the phenomenon. We draw readers' attention to two different psychological approaches to the endowment effect—emotional attachment and changes in cognitive perspective—in the hope that future investigations will follow with more robust psychological investigations.

Emotional Attachment

A seemingly plausible mechanism to produce the endowment effect is emotional attachment. From this affective perspective, reluctance to give up items increases as consumers' attachment to the items increases. An endowment effect due to attachment is often adaptive in that progressive experiences of ownership enable people to adjust other possessions as well as their endowment of skills, akin to building up consumption capital (Becker and Stigler 1977). We speculate that the instantaneous endowment effects often observed in the literature (e.g., Kahneman, Knetsch, and Thaler 1990) result from generalized response tendencies in relation to possessions, even when such consumption capital may not have been built up yet (e.g., when respondents have not had a chance to use their mugs).

Strahilevitz and Loewenstein (1998) take the attachment-based approach to the endowment effect seriously and propose that consumers adapt to ownership over time. They posit a gradual adaptation process as the consumer's psychological state moves from no ownership, to partial ownership, to complete ownership. On the basis of this proposition, they show that prior ownership can increase the value that consumers place on an object. Thus, the value increases with the duration of ownership, as does the perceived attractiveness of the owned item. Furthermore, they show that higher valuations of items once owned persist for some period. That is, consumers continue to value an item even

after they have lost it, and that positive valuation diminishes only with time.

Carmon, Wertenbroch, and Zeelenberg's (2003) theory of option attachment provides a more direct test of the attachment process. Building on the feelings-as-information theory (e.g., Pham et al. 2001; Schwarz 2001), they propose that losing an item is experienced as unpleasant, yielding psychological discomfort, which positively colors the valuation of the threatened item. In support of this theory, they manipulate the extent to which respondents become attached to different options in the choice set they faced as part of their prechoice deliberations (i.e., by manipulating the physical proximity of the items, the substitutability of the choice options, or the degree to which respondents elaborated on the benefits of the options). The attachment to a considered option created a sense of prefactual ownership such that consumers experienced not choosing it as a loss. The resultant mental endowment effect does not require actual possession. As a result, respondents who developed option attachment evaluated forgone options more positively than did respondents who did not. Important from the perspective of affect as a driver of the endowment effect, evaluations of forgone options were mediated by ratings of psychological discomfort.

In a similar vein, the notion of endowment as an extension of attachment has also been examined in the domain of online auctions. In this environment, Ariely and Simonson (2003) propose that the highest bidders in an auction, realizing that they are the leaders of the auction, begin to think more concretely about possessing the item and therefore become partially attached to it, producing a pattern that Ariely and Simonson term a "pseudoendowment effect." This analysis, reinforced by other empirical evidence (Heyman, Orhun, and Ariely 2004), suggests that consumers who have entered the highest bid and anticipate winning the auction become attached to the auctioned item and incorporate it into their psychological, as opposed to real, endowment. Thus, when someone else enters a higher bid, the consumer who considers him- or herself the highest bidder faces the possibility of losing the item and, as a result of the pseudoendowment effect, may increase his or her bid beyond the initial WTP.

In summary, there is evidence that affect-based attachment might be a central driver of the endowment effect. A way to test this proposition would be to manipulate respondents' affective attachment (or its salience) to the object of a trade to determine the extent to which it moderates the endowment effect. For example, student respondents should be more emotionally attached to coffee mugs with their own university's logo than to mugs with a different, or perhaps even a competing, school's logo. Consistent with this proposition, Dhar and Wertenbroch (2000) find a greater reluctance among their respondents to give up (affect rich) hedonic than (affect poor) utilitarian items, a result to which we return subsequently. A better understanding of attachment to objects, over time and as a function of the environment, and reasons for the acquisition would also yield additional insights and clarity to understanding the affective underpinnings of the endowment effect.

Changes in Cognitive Perspective

A cognitive approach to the endowment effect is based on the difference in tasks for buyers versus sellers and on

ways that the difference in tasks can alter information processing. Carmon and Ariely (2000) propose that the buying and selling price gaps can be accounted for by considering the different perspective on the exchange for buyers versus sellers. In particular, they proposed that both sellers and buyers focus on what they stand to give up in a transaction, which means that buyers and sellers focus on different aspects of the exchange when they provide valuations of an item that is to be traded. Specifically, they suggest that sellers naturally focus on the aspects of the exchange that they might lose if the exchange occurs (i.e., the item in question), whereas buyers naturally focus on the aspects of the exchange that they might lose if the exchange occurs (i.e., the expenditure). This leads sellers to come up with higher prices and buyers to come up with lower prices, thus resulting in buyer-seller price gaps. In studies of purchases of National Collegiate Athletic Association basketball tickets, Carmon and Ariely find evidence of shifts in cognitive perspective as measured by verbal protocols, by importance ratings of different aspects, and by implied preferences in a conjoint study. Moreover, they find that manipulation of the salience of the ticket benefits or of the opportunity costs of buying the tickets enhances or reduces buyer-seller price gaps.

The differential perspective account suggests that differential decision-making roles impose a differential focus on the attributes of the transaction (see, e.g., LeBoeuf and Shafir 2004), which can moderate the endowment effect. This view of the endowment effect leads to other predictions about the circumstances in which the endowment effect will and will not be observed. In particular, when the sellers' goal is to sell the product to earn revenue, their focus might be on the aspects of the transaction that they stand to gain rather than to lose, and in this case, the endowment effect should not be observed. However, research on the endowment effect has typically not examined owners of goods who are in a selling frame of mind. Instead, researchers have induced endowments experimentally, only then to ask respondents to part with their newly acquired possessions. An exception is Simonson and Drolet (2004), who show that when consumers have decided to sell an item, the prevailing market price becomes the primary driver of their minimum asking price. Further research could uncover additional ways that the frame of mind that people bring to a transaction affects the endowment effect.

The critical importance of the purpose of the exchange is consistent with NK's P_2 , which states that goods exchanged as intended are not evaluated as losses. We suggest that a reason for the proposition to hold is the change in cognitive perspective with its concomitant emphasis on different aspects of the trade that change sellers' evaluations. A case in point is Lerner, Small, and Loewenstein's (2004) recent finding that previously induced emotions affect the cognitive appraisal objectives with which people approach a transaction. For example, they find that endowment reverses when sadness prompts people to try to change their circumstances by engaging in transactions; sad (acquiring) choosers' indifference prices exceeded sellers' willingness to accept, thus facilitating the trade (the cognitive appraisal objective). In support of our view that changes in cognitive perspective may moderate the endowment effect, it is important to note that Lerner, Small, and Loewenstein's affect manipulation is independent of any emotional attach-

ment that respondents feel to the particular object that is to be traded. Rather, the appraisal objectives induced by affect that is unrelated to the trade “persist beyond the (affect-) eliciting situation, becoming an implicit lens for interpreting subsequent situations” (Lerner, Small, and Loewenstein 2004, p. 337), such as the trade. In general, manipulations that direct respondents’ attention to different aspects and objectives of the trade could have major moderating effects on loss aversion. For example, different decision frames, word cues, or differential salience of information about sellers’ goals could all lead to changes in the cognitive perspective from which respondents view the trade.

ATTACHMENT, PERSPECTIVE CHANGE, AND LOSS AVERSION FOR MONEY

Another direction for further research is the examination of what types of experiences or goods will not show the endowment effect, or show less of it. The two possible moderators of loss aversion and the endowment effect that we propose, attachment and perspective change, can be brought to bear on this question in general and on NK’s finding of no loss aversion for money in particular.

It has been argued that the lack of loss aversion for money arises because money is not useful in and of itself, and its only usefulness is its ability to purchase other goods and experiences. This analysis suggests that there are most likely other cases in which the endowment effect is not observed, that is, when the traded goods are viewed as mere currencies of exchange. For example, in a barter society, in which items are exchanged only to be traded again later, a feeling of endowment may be moderated because the good is designated for transaction and not for consumption. An interesting aspect of money as a currency of exchange is the way mental budgets prescribe an intended use (Heath and Soll 1996; Thaler 1985) and how this can interact with the endowment effect. More precisely, people tend to strongly resist spending money that is not designated for a given use, and therefore its use can be interpreted as a loss. In contrast, money that is intended to be spent but is not “burns a hole in one’s pocket,” and not spending it can be interpreted as a loss. This view of a buyer’s perspective on money is the mirror image of the view that we previously noted in which a seller who has decided to sell an item changes his or her perspective, resulting in a greater emphasis on completing the transaction and a relatively lower evaluation of the item (e.g., Drolet and Simonson 2004; Lerner, Small, and Loewenstein 2004).

Novemsky and Kahneman’s finding that there is no loss aversion for money that is held for transaction purposes is also consistent with recent findings that suggest that the magnitude of the endowment effect is different between hedonic and utilitarian goods. Hedonic goods and attributes are those that are primarily consumed for the positive affective experience and pleasure that they provide. Utilitarian goods and attributes are those that are primarily consumed for instrumental purposes. Dhar and Wertenbroch (2000) show that consumers weigh hedonic attributes more heavily when they decide which one of two options (a hedonic and a utilitarian item) in their possession to give up (a forfeiture choice) than which one of the same two options to obtain (an acquisition choice). They propose that this is because

hedonic goods are affectively richer sources of prefactual thinking about what not having an item would be like. An implication of the findings is that there is less reference dependence for money because money that is held to be spent is perfectly instrumental, making it a utilitarian good.

In general, the greater reference dependence for hedonic goods that Dhar and Wertenbroch’s (2000) findings imply suggests that the affective content of the traded or chosen good enhances loss aversion. In turn, the affect associated with the traded item may be linked to how attached consumers feel about the item and may mediate the effect of attachment on loss aversion. Carmon, Wertenbroch, and Zeelenberg’s (2003) and Ariely and Simonson’s (2003) findings of mental or pseudoendowment effects as a function of option attachment to an item and the mediating discomfort from giving it up thus provide another clue that emotional attachment, in addition to cognitive perspective change, is a key driver of the endowment effect.

To conclude, NK have done the field an excellent service by specifying some boundaries of loss aversion. Their work suggests that there is no loss aversion for money when consumers intend to spend the money. By carefully defining the limits of loss aversion, they caution the field not to overuse loss aversion as a theoretical account. We propose possible additions to these limits by exploring two additional factors that both mediate and moderate loss aversion, emotional attachment and cognitive perspective change. Neither of these provides a comprehensive explanation of loss aversion. However, we hope that they help focus future investigations of the limits and origins of loss aversion.

Finally, it is important to observe that research on the endowment effect has tended to focus on small and rather meaningless goods. The appeal of these is obvious—simplicity, cost, and manipulability. At the same time, the possibility of a better theoretical understanding of the endowment effect should encourage the examination of products, services, and rights about which people substantially care. Following this path, it might also be useful to examine a dramatic endowment effect—for example, loss aversion with respect to a person’s child. On the one hand, it is difficult to imagine an offer that would be sufficiently attractive that a person would be willing to give up his or her child. On the other hand, it is also the case that if a person is not that particular child’s parent, the amount he or she would be willing to pay for the privilege of parenting the child is likely to be very small (if at all positive). Given the strength of a child-based endowment effect, the examination of relationships and traded goods that are not common market goods might help clarify the endowment effect and its psychological mechanisms.

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