

The Effect of Ownership History on the Valuation of Objects

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Previous work on the endowment effect has demonstrated that current ownership status affects object valuation and that this effect occurs instantaneously on possession of an object. The current work presents findings from four studies which indicate that the history of past ownership can also affect object valuation. For objects currently in one's possession, we find that valuation increases with duration of ownership. For objects not in one's possession, previous ownership experience increases valuation, and the increase appears to be related to the duration of ownership before loss. In addition, the perceived attractiveness of objects, although not instantly affected by endowment, is found to increase with duration of ownership.

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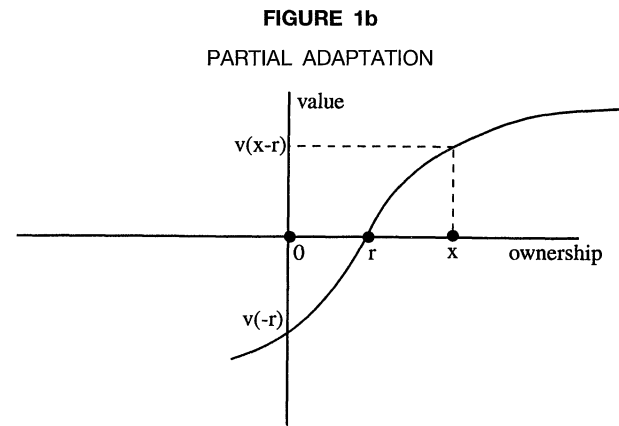
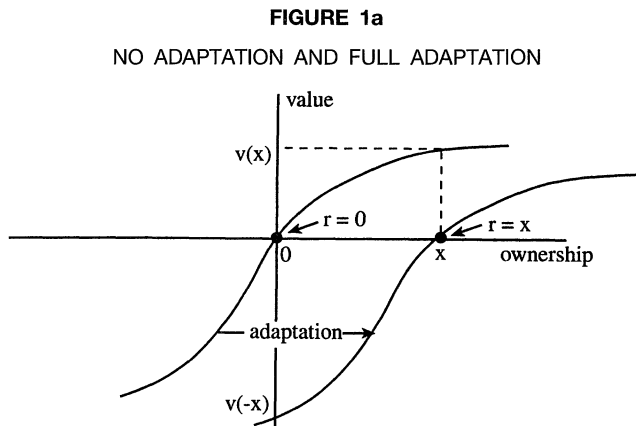
The standard economic theory of preference assumes that ownership, per se, does not affect valuation. Merely possessing an object should not influence its exchange value, except to the extent that owning an object provides information about it. However, research on the endowment effect shows that people tend to be more reluctant to give up an object or attainment than they are eager to acquire it (Kahneman, Knetsch, and Thaler 1990; Knetsch and Sinden 1984; Thaler 1980). The endowment effect has proven robust in studies employing diverse methodologies, including laboratory experiments (e.g., Kahneman et al. 1990), economics-style market experiments (Franciosi et al. 1996), and field studies (e.g., Johnson et al. 1993). These studies have also shown that people become attached to an

object almost instantly upon being endowed with it, which prompted Kahneman et al. (1990) to label it the "instant endowment" effect.

Although previous research has demonstrated that the effect of ownership on object valuation begins immediately following possession of the object, complete adaptation to ownership is likely to take time. If so, then we should expect the increase in valuation that occurs immediately following possession to intensify with duration of ownership. Furthermore, since attachments do not generally disappear the instant we physically lose our possessions, adaptation to loss is also likely to take time. Thus, the value of an item owned in the past might be greater than the value of an item never owned, and duration of previous ownership and time elapsed since loss are both likely to affect the value attached to reclaiming a previously owned item.

The four studies presented in this article extend prior research on the endowment effect by demonstrating that object valuation is affected by both past and present ownership status—that is, by the history of ownership. The first three studies were designed to test for history-of-ownership effects under different conditions. The hypotheses tested in these studies were derived from a theoretical account of present- and past-ownership effects—based on adaptation-level theory and loss aversion—which is discussed in the next section of our article. After running the first three studies, we became aware of two additional possible explanations for the observed effects—namely elaboration-based familiarity and motivated taste-change. We review these alternative mechanisms in the discussion section after the third study and test the more plausible of the two—motivated taste-change—in a fourth experiment.

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THEORY AND HYPOTHESES

The theoretical framework that led us to predict past-ownership effects is a generalization of the most widely accepted explanation for the endowment effect, first proposed by Thaler (1980) and later elaborated on by Tversky and Kahneman (1991), which is based on the concept of *loss aversion*. Integrating their analysis with insights from adaptation-level theory, we propose a shifting-reference-point account (see also Hoch and Loewenstein 1991) that predicts effects of both past and present ownership on object valuation.

Adaptation, in the context of object ownership, is the tendency for people to become psychologically accustomed to changes in their material situation. Adaptation has two main consequences: (1) a diminution in one's hedonic response to the change and (2) increased sensitivity to departures from the new state of affairs (Helson 1947). For example, one typically appreciates the speed of a new computer, but only for a limited period. However, if the new computer breaks, forcing one to go back to the original one, the old computer may seem intolerably slow. In the large literature on adaptation (reviewed in Frederick and Loewenstein [1998]) it has been found that people adapt to both negative events (such as loss of income or physical disabilities) and positive events (such as getting promoted or the comfort of a new car).

Loss aversion refers to the widespread tendency for people to place greater weight on losses than on gains of equal absolute magnitude (Kahneman and Tversky 1979; Tversky and Kahneman 1991). Loss aversion can be easily observed in decision-making behavior: most people will have no interest in a gamble that offers a 50 percent chance of gaining or losing \$100.

Figure 1a illustrates how adaptation and loss aversion can account for the endowment effect, using the value function incorporated in Kahneman and Tversky's prospect theory (1979). Loss aversion is captured by a slope discontinuity at the adaptation level or *reference point* (the point where the value function crosses the abscissa), with greater steepness for negative than for positive de-

partures from the reference point. Adaptation is expressed by shifts in the reference point in the direction of the current endowment. The left-hand value function in Figure 1a illustrates the situation of an individual who does not know that he is about to receive a new object (i.e., prior to any adaptation; $r = 0$). At this point in time he would experience positive value, $v(x)$, if he received the object, but feel affectively neutral, $v(0) = 0$, if he failed to receive it. The right-hand value function depicts the same individual's situation after he has received and fully adapted to possession of the object, $r = x$. At this point, object ownership has become the status quo ($v(x - r) = v(0) = 0$), but removal of the object would be viewed as a loss (i.e., $v(0 - r) = v(-r) = v(-x)$). The value of object possession in both cases is equal to the difference in value between possessing and not possessing the object (i.e., $v(x - r) - v(-r)$). If the individual has not adapted at all (left-hand value function; $r = 0$), then the value of object possession simplifies to $v(x)$. When the individual has completely adapted to possession (right-hand value function), then $r = x$ and the value of object possession is $-v(-x)$. The endowment effect is explained by the fact that, because of loss aversion, the value of gaining an object for an individual who does not possess it, $v(x)$, is smaller than the value of not losing it for an individual who does possess it and has adapted to such possession, $-v(-x)$.

The loss-aversion account of the endowment effect can be generalized to accommodate the impact of both past and current ownership on object valuation by taking into account the gradual nature of adaptation. The sense of ownership need not be all-or-nothing because individuals may not adapt instantly and fully to the acquisition or loss of an object. Thus, as illustrated in Figure 1b, r may lie between the extremes of 0 (no adaptation) and x (full adaptation), and the value of object possession will fall commensurately between $v(x)$ and $-v(-x)$.¹ Between

¹Although the adaptive-reference-point account makes specific predictions about valuation, it is vague at a process level. Mugs, pens, and many other objects are discrete (i.e., nondivisible), but in the shifting-reference-point model postulated above, intermediate values between

these extremes, the value of object possession will be a monotonic, increasing function of the individual's degree of adaptation to possession, r . This monotonic relationship between adaptation and value, combined with the fact that adaptation to gains and to losses takes time, has straightforward implications for past-ownership effects.

First, if people adapt to ownership gradually, we should expect to observe an increase in object valuation as a function of duration of ownership, until complete adaptation has occurred. That is,

H1: *Duration-of-current-ownership effect:* An individual's selling price for a current possession will increase as a function of how long the person has owned the object.

Second, duration of ownership should influence the acquisition value of objects owned in the past that are no longer in one's possession. The longer one had owned the object before losing it, the greater should have been that individual's adaptation to ownership, and thus the greater should be the value placed on reacquiring the object. This is the basis for our second hypothesis.

H2: *Duration-of-prior-ownership effect:* An individual's buy-back price for a previously owned object will increase as a function of how long the person had owned the object.

Since not ever having owned an object is the shortest possible duration of prior ownership, Hypothesis 2 implies that someone who owned an object in the past for any duration should, all else being equal, value it more highly than someone who had never owned the object.

Third, the longer that an individual has had to adapt to a loss, the greater will have been the shift in the adaptation level, and the less motivated he should be to get the object back again. This suggests that valuation should diminish as a function of time elapsed since loss.

H3: *Time-elapsed-since-loss effect:* An individual's buy-back price for a previously owned object will decrease as a function of how much time has passed since the object was lost.

The time-elapsed-since-loss effect is akin to the infamous "rebound effect," according to which the motivation to replace a former significant other is highest in the immediate aftermath of the breakup.

owning and not owning an object are possible. It is not clear how such intermediate reference-point values would be represented at a cognitive level since there is no obvious visual image that corresponds to 50 percent ownership of a mug. To deal with shifting reference points in a world with discrete outcomes we need to recognize the existence of multiple discrete reference points (e.g., Boles and Messick 1995; Kahneman 1992; Neale and Bazerman 1991) that include both what one currently has and what one had in the past.

STUDY 1

The first experiment was designed to test Hypothesis 1 (the duration-of-current-ownership effect) and Hypothesis 2 (the duration-of-prior-ownership effect).

Method

Subjects were 74 M.B.A. and 64 executive M.B.A. students enrolled in negotiation courses at two different American universities. In both classes, the study was run as part of a demonstration of psychological influences on negotiations. The study took approximately 25 minutes.

At the start of the class period, half of the students in each class were endowed with a mug. Approximately 20 minutes later, on the basis of a coin flip, half of the students who had been endowed with a mug lost it, while half of those without a mug obtained one. This created four groups of subjects. One group started with mugs and lost them after 20 minutes, another group received mugs immediately and got to keep them, a third group started without mugs but received them 20 minutes later, and the fourth group never received mugs. At the end of the period, minimum selling prices were elicited from all students who currently possessed a mug, while maximum choice prices (dollar values such that they would be indifferent between receiving that amount or receiving a mug) were elicited from those who did not. Our first prediction (Hypothesis 1) was that sellers who had possessed the mug for the entire 20 minute period would provide higher selling prices than those who had just acquired the mug. Our second prediction (Hypothesis 2) was that choosers who had lost the mug in the coin toss portion of the study would give higher choice values than those who had never owned the mug (whose duration of prior ownership was zero). In other words, past ownership should increase value.

In the first phase of the experiment, the course instructor placed a mug on every other desk occupied by a student. Thus, after all the mugs had been distributed, half of the students in each class had been endowed with a mug. These students were told, somewhat vaguely, that the mug was theirs, but that they might have an opportunity to sell it later. After a delay of approximately 20 minutes, during which other class business was discussed, the professor announced that the study involving the mugs would commence, and all students were presented with a form containing written instructions. The professor read the instructions aloud while students read to themselves. The front page of the form instructed subjects to indicate if they possessed a mug. It then stated: "To ensure fairness and randomization, if you have a mug, turn to a person near you who does not have a mug. If you do not have a mug, turn to a person near you who does have a mug."

"The person who does not have a mug flips a coin; the person who has the mug calls it. If the person who has the mug calls it correctly then he or she keeps it."

TABLE 1
MUG VALUATION BY ORIGINAL AND FINAL ENDOWMENT:
EXPERIMENT 1

Final endowment	Initial endowment		All
	Mug	No mug	
Mug	5.26 (.39) <i>n</i> = 48	4.32 (.41) <i>n</i> = 37	4.85 (.28)
No mug	3.36 (.27) <i>n</i> = 34	2.75 (.23) <i>n</i> = 48	3.00 (.18)
All	4.47 (.29)	3.43 (.23)	4.0 (.18)

NOTE.—Standard errors are given in parentheses.

Otherwise, the mug changes hands. Please write the name of the person who you flipped the coin with here.”

Mugs were reallocated between students based on whether they won or lost the coin flip. Students then indicated on the second page of the form whether they had won or lost the flip and finally, they were directed to the third or fourth page of the form, depending on whether or not they won or lost the flip. These pages, which are reproduced in the Appendix, each contained forms eliciting the subject's valuation of the mug.

Results

Responses from the three classes were similar in terms of mean valuation of the mug in each of the four cells. There were no significant differences between the classes on any measure, nor any interactions between class and any other variable or combination of variables. Therefore, all of our analyses are based on the aggregated data from the three classes.

Table 1 presents the main findings. On average, and consistent with the standard endowment effect, the selling prices of those who ended up with a mug (\$4.85) were significantly higher than the choice prices of those who ended up without one (\$3.00; $F(1, 133) = 22.2, p < .0001$). The effect of final mug ownership on valuation was significant both for those who began with a mug ($t(78) = 4.0, p < .0001$) and for those who began without a mug ($t(57) = 3.4, p < .005$).

Consistent with the idea that past ownership matters, the main effect of past ownership was also significant ($F(1, 133) = 4.0, p < .05$). Those subjects who began with a mug valued it more highly ($\bar{X} = \$4.47$) than those who did not ($\bar{X} = \$3.43$). The interaction between initial and final endowment was not significant ($F(1, 133) = 0.11, p > .5$), which indicates that the effect of past ownership was not affected by whether or not subjects were currently in possession of the mug. When the main effect of past ownership was examined separately for

those who ended up with and without mugs, however, both tests fell short of conventional significance levels. The duration-of-current-ownership effect was tested by comparing subjects who started and ended with a mug to those who started without a mug but ended up with one ($t(83) = 1.7, p < .10$). The duration-of-prior-ownership effect was tested by comparing the group that started with but ended without a mug to those that started and ended without a mug ($t(80) = 1.7, p < .10$).

STUDY 2

The group setting and the nature of the endowment manipulation in study 1 introduced two factors other than past ownership that could have contributed to the differences in valuation between the experimental conditions. First, many decisions involve multiple reference points, and other people's possessions are a particularly important point of comparison (Boles and Messick 1995; Kahneman 1992). Subjects in study 1 were aware of one another's conditions. Thus, not only current endowment (i.e., own a mug at time of valuation or not) and previous endowment (i.e., owned a mug 20 minutes ago or did not), but also awareness of the fact that others did or did not have a mug could have affected valuation.

Second, previous research (Loewenstein and Issacharoff 1994) has shown that attachment to objects depends on whether the objects are attained by one's own efforts or by chance—a phenomenon they call “source dependence.” In the first phase of study 1, subjects who began with a mug were simply endowed with it, whereas in the second phase, those who ended up with a mug had in a sense won it on the basis of a coin toss. Perhaps the feeling of having won or lost the mug in the second phase of the experiment may have influenced mug valuations above and beyond the effect of endowment itself.

The second experiment, which focuses exclusively on the duration-of-current-ownership hypothesis (Hypothesis 1), eliminated social comparison by running different experimental conditions in isolation. In addition, because each subject in study 2 received a key chain once and only once, any influence of winning or losing was eliminated.

Method

Subjects were 75 Israeli high school juniors who had been randomly placed in one of four study sections at an Israeli public high school. Each of the four groups was assigned to one of two conditions: short endowment ($n = 37$) or long endowment ($n = 38$). Subjects were told that they were part of a cross-cultural study being conducted by a marketing professor from the United States. To prevent awareness of other conditions, each of the experimental groups was sent to a separate classroom.

In the first phase of the experiment, regardless of the condition to which they were assigned, all subjects were given a key chain and told that it was theirs to keep as a reward for participating in the study. Immediately after

they received the key chains, subjects assigned to the short-endowment condition were given forms and instructions, similar to those used in study 1, which elicited their minimum selling price for the key chain they had just received (in increments of 0.50 shekel, which is equivalent to approximately \$0.15). Subjects assigned to the long-endowment condition were not given the questionnaires until approximately one hour after they had been endowed with the key chains. In both conditions, subjects were given ample time to examine their key chains prior to indicating their minimum selling price. Since all subjects participated in this study on the same morning, there was no opportunity for them to learn about the experiment from one another before participating.

Results

Within each of the two conditions there was no significant difference in the minimum selling price between the two study groups, so the data were aggregated for purposes of analysis. The mean minimum selling price for students endowed with a key chain for only a few minutes was 4.10 shekel, while the mean for subjects who had been endowed for one hour before indicating their minimum selling price was 5.31 shekel, a significant effect in the predicted direction ($t(73) = 2.26, p < 0.05$).

Discussion

Study 2 produced a significant duration-of-current-ownership effect. Unlike study 1, no winning or losing was involved in gaining possession of the items. Furthermore, because each condition was run separately, neither social comparison nor source dependence could account for these results. Considered together, studies 1 and 2 suggest that object valuation is affected not only by whether a person currently possesses an object, but also by how long they have owned it.

STUDY 3

The third study extends the range of hypotheses tested by examining the time-elapsed-since-loss effect (Hypothesis 3) in addition to the hypotheses investigated in the prior studies: the instant endowment effect, the duration-of-current-ownership effect (Hypothesis 1), and the duration-of-prior-ownership effect (Hypothesis 2).

Method

One hundred and seventy-eight undergraduates enrolled in four different sections of an introductory marketing course at an American university participated in the study. The four sections were identical in terms of academic level and subject matter covered. A total of six conditions were run, with two of them being repeated in two different class sections.

In each of the four sections, at the beginning of class,

TABLE 2
SUMMARY OF CONDITIONS IN EXPERIMENT 3

	Never lost	Lost minutes ago	Lost an hour ago
Never owned	Section 4	(null set)	(null set)
Owned for minutes	Sections 1 and 4	Section 1	Section 3
Owned for an hour	Sections 2 and 3	Section 2	(no data collected)

each student was given an index card with a number written on it. Based on their numbers, half the subjects ended up with a plastic yellow key chain embossed with their university logo, and half ended up without one. In some of the conditions subjects were asked to give up their key chains either immediately after receiving them or one hour after receiving them. To avoid resentment toward the experimenter, subjects who were asked to give up their key chains were assured that they would eventually receive some sort of reward for participating.

All subjects in each of the sections were given a questionnaire to elicit their valuation of the key chain. Selling prices were elicited from subjects who ended up with a key chain and choice prices from those who ended up without one.²

Table 2 summarizes the assignment of the students from each section into the six experimental conditions. In the first section, all students were endowed with a key chain at the start of class. Moments later, half were asked to give their key chain up. Immediately after this, key chain values were elicited from all students. This produced data from one group of subjects who had just received a key chain (brief endowment without loss) and from another group who had lost a key chain after owning it for only a few minutes (brief endowment with recent loss). In the second section, all students were initially endowed with a key chain for one hour, at which point half the students gave up their key chains. This produced data from one group of subjects who had owned their key chains for an hour before losing them (long endowment with recent loss) and another group who had owned their key chains for one hour and still had them (long endowment without loss). In the third section, all students were initially endowed with a key chain, half were immediately asked to give them up, and the experimenter returned an hour later to elicit values. This produced data from one group of subjects who had owned their key chains for one hour (long endowment without loss) and from another group who had lost their key chains an hour ago

²The valuation elicitation questionnaires used in this study were similar to those used in studies 1 and 2. However, since the market price for these key chains was only \$1.25, increments of \$0.10 were used and the maximum value that could be indicated was \$6.00.

TABLE 3

KEY CHAIN VALUATION AS A FUNCTION OF TIME OF LOSS AND DURATION OF OWNERSHIP: EXPERIMENT 3

	Never lost	Lost minutes ago	Lost an hour ago
Never owned	\$.45 (.10) <i>n</i> = 23	(null set)	(null set)
Owned for minutes	\$.86 (.11) <i>n</i> = 50	\$.59 (.16) <i>n</i> = 20	\$.65 (.20) <i>n</i> = 21
Owned for an hour	\$1.41 (.18) <i>n</i> = 43	\$1.30 (.23) <i>n</i> = 23	(no data collected)

NOTE.—Standard errors are given in parentheses.

after only owning them for a few minutes (brief endowment, distant loss). In the fourth section, half the subjects were endowed with a key chain, and values were elicited immediately. This produced data from one group of subjects who had never owned a key chain (never endowed) and from another group of subjects who had just had their key chains for a few minutes (brief endowment without loss).

Results

The mean values assigned to the key chains in study 3 appear in Table 3. ANOVA was used to compare these mean values across the six conditions. For two of the six conditions (own for a few minutes without loss and own for an hour without loss), data had been collected in two separate sessions. Within each of these conditions, there was no significant effect based on which of the sessions the subjects had participated in. Therefore, all of the analyses reported are based on the aggregated data for each condition.

Current ownership had a significant effect on those subjects who had possessed the key chain for only a few minutes. Subjects who had just owned the key chain for a few minutes valued keeping it at \$0.86, compared to just \$0.45 for those who did not have a key chain ($F(1, 71) = 5.2, p < .05$). These results reconfirm the “instant endowment” effect.

Duration of current ownership also had a significant effect. Subjects who had owned an item for an hour valued keeping it significantly more (\$1.41) than subjects who had owned it for only a few minutes (\$0.86). This difference was significant ($F(1, 91) = 7.0, p < .01$), adding further support to the duration-of-current-ownership effect (Hypothesis 1).

The duration-of-prior-ownership effect (Hypothesis 2) was also supported. Subjects who had just lost their key chain after owning it for a few minutes valued it at only \$0.59, compared with \$1.30 for those who had just lost

it after owning it for an hour, a significant difference ($F(1, 41) = 5.7, p < .05$).

The time-elapsed-since-loss effect (Hypothesis 3) was not supported, as there was no significant difference between the value of reobtaining a key chain for subjects who had just lost it and the value of reobtaining the key chain for subjects who had lost it an hour ago. Indeed, the \$0.06 difference was neither significant nor in the predicted direction. A possible explanation for the lack of support for Hypothesis 3 is that adaptation to losses takes longer than adaptation to gains and would therefore require a greater time interval to observe. Previous research in a different context has produced evidence for such asymmetric speed of adaptation (Shea 1995).³ Thus, although the results of study 3 fail to support Hypothesis 3, they do not rule it out.

The results presented in Table 3 also show that the impact of duration-of-ownership effects can exceed the impact of current ownership. Subjects who had owned the key chain for an hour but lost it gave choice prices that were actually \$0.44 *higher* than the selling prices of subjects who had owned the chain for just a few minutes and still owned it ($F(1, 41) = 3.7, p < .06$).

Alternative Explanations for Past-Ownership Effects

After examining the results of the first three studies, we became aware that the shifting-reference-point account is not the only possible explanation for past-ownership effects. In this section, we discuss two additional causal mechanisms that could account for the effects observed in the first three studies. The first, elaboration-based familiarity, is ruled out as a sole explanation based on previous research. The second, motivated taste-change, could explain both the instant endowment effect and the past-ownership effects observed in our first three studies. This account is therefore examined in a fourth study.

Familiarity. The longer someone owns an object, the more time he has to examine it, interact with it, and elaborate on its various benefits and potential uses. For example, on being endowed with a mug, one might gradually gain familiarity with the mug's design or mentally simulate bringing it to work to replace the customary paper cups. If thoughts about objects tend to be positive, then thinking about a generally desirable object one is endowed with could account for past-ownership effects. Consistent with this idea, in unpublished research Lewis (1997) gave some subjects an attractive address book and asked them to write a short story about how they might use the book. Story writing significantly increased the valuation of the book, suggesting that merely imagining the use of an object can increase its value.

³Shea (1995) found that consumption tends to decline more slowly in response to an anticipated decline in income than it rises in response to an anticipated increase.

Although elaborating on the potential uses of an object appears to increase valuation, familiarity is unlikely to be the sole cause of past-ownership effects. First, although focusing on uses stresses benefits and is therefore likely to lead to positive thoughts, attention paid to more general object characteristics might lead to more mixed evaluations. An opportunity to gain more knowledge about an item is only likely to increase valuation if the information gained as a result is positive (i.e., reveals that the quality of the object surpasses initial expectations). However, there is no reason to think that the information gained about objects over time will generally be favorable. Indeed, there is good reason to think that the information obtained about chosen objects will, on average, be generally *unfavorable*, since people will be more likely to select objects whose desirability they overestimate than objects whose desirability they underestimate (Harrison and March 1984).

Second, the familiarity account is problematic in the case of evaluations of adverse outcomes because it actually makes the wrong predictions regarding the effect of endowment on valuation. If merely thinking about desirable outcomes increases their value, and this continues over time, then, by similar reasoning, thinking about undesirable outcomes should intensify their negative value. However, several studies that have employed negative outcomes such as tasting a bitter substance (Coursey, Hovis, and Schulze 1987; Gibbs 1992; see also Thaler 1983) have observed the opposite effect. Subjects valued avoiding unpleasant outcomes less when they were endowed with them.

Additional evidence that increased familiarity by itself can not account for past-ownership effects comes from an experiment conducted by the current authors as part of a separate research project. Subjects were asked to report what they remembered about the mug they were endowed with (e.g., its color and where it was produced). No correlation was found between subjects' selling prices and their recall of the features of the mug.⁴ Although it is risky to draw inference on the basis of null effects, when combined with previous work examining the evaluation of negative outcomes discussed earlier, the evidence suggests that familiarity per se is unlikely to account for the range of effects observed in the first three studies.

Motivated Taste-Change. An additional account that could explain the effects observed in the first three studies is the motivated taste-change mechanism proposed by Beggan (1992). Beggan argues that possessions are treated as extensions of the self (see Belk 1988) and as such are rendered more attractive, consistent with peo-

ple's general tendency to make self-enhancing judgments. Using Likert scales to assess the attractiveness, value, and quality of design of objects, Beggan found that simply possessing an object caused subjects to rate it more positively.⁵

Motivated taste-change could potentially explain the endowment effect. Furthermore, if motivated taste-change takes time to reach its full effect, it could also explain the duration-of-ownership effects we have observed which were predicted in Hypothesis 1 through Hypothesis 3. The motivated taste-change account is also consistent with results obtained with unpleasant endowments. Gibbs (1992) found that subjects who expected to receive a large number of tastes of a bitter substance rated the first taste as less bad than those who expected the first taste to be their last. These changes may have resulted from subjects' motivation to decrease the aversiveness of the experience, which should have been greater if they expected to receive a large number of tastes. The same logic could explain why experimental subjects who were made to expect to suffer (e.g., by eating a worm or receiving an electric shock) were subsequently more likely to choose to suffer (by voluntarily eating the worm or taking the shock) than those who did not initially expect to suffer (e.g., Aronson, Carlsmith, and Darley 1963; Comer and Laird 1975). Moreover, consistent with the notion that motivated taste-change could take time, "choosing to suffer as a consequence of expecting to suffer" (Comer and Laird 1975) did not appear to be instantaneous. Giving subjects an expectation of suffering without giving them time to think about it did not increase their willingness to experience the event (Aronson et al. 1963).⁶

Although motivated taste-change could possibly explain the endowment effect, no research has demonstrated this to be the case. Indeed, in research examining the effects of ownership on both perceived attractiveness and valuation, Kahneman and Loewenstein (1993) found that, although ownership had a positive effect on object valuation, it had no effect on the perceived attractiveness of those same objects, as would be predicted by a motivated taste-change account of the endowment effect. Furthermore, there appears to be no evidence that motivated taste-change, if it does occur, underlies duration-of-own-

⁴The lack of correlation between ability to recall features and object valuation observed in that experiment does not contradict the findings of Lewis (1997). Lewis demonstrated that thinking about *uses* can increase the valuation of owned objects. Uses tend to be positive. She did not examine whether elaboration on uses mediated either the endowment effect or past-ownership effects.

⁵Beggan's findings have been recently challenged by Barone, Shimp, and Sprott (1997a, 1997b; see Beggan and Scott [1997] for a response). In a series of studies using several different objects, they failed to observe consistent increases in perceptions of object attractiveness or usefulness as a function of mere ownership. These researchers also observed that the degree to which subjects liked the experimenter who gave them the objects moderated whether mere ownership affected perceptions of object attractiveness.

⁶The shifting-reference-point account can explain these same results involving unpleasant outcomes. Once individuals psychologically adapt to the idea of experiencing an unpleasant future event, avoiding it may be seen as a gain. In contrast, before adapting to such an event, experiencing it could be perceived as a loss, while not experiencing it would seem like the status quo. Thus, if adaptation takes time, then having time to adapt to a future unpleasant experience will lessen the motivation to avoid it.

ership effects on object valuation. Indeed, in Beggan's own work, examining the effect of ownership on perceived attractiveness, object valuation was never measured.

The first three studies identified effects that are consistent with both the shifting-reference-point mechanism and the motivated taste-change account, so they do not help to discriminate between these explanations. However, the distinction between the two accounts is an important one. Motivated taste-change suggests that the increases in valuation as a result of ownership and duration of ownership will be mediated by increases in perceived attractiveness. Thus, one should expect increasing appreciation of an object over time, and this, in turn, should increase object valuation. In contrast, the shifting-reference-point account suggests that the resistance to giving up what one has can be attributed to an innate aversion to loss, whereas the increase in the valuation of owned objects over time can be attributed to gradual adaptation and resultant stronger aversion to loss. Thus, unlike the motivated taste-change account, the shifting-reference-point account does not depend on changes in the perceived attractiveness of the items in question. Given the overlap in their predictions of the effects of past and present ownership on object valuation, we decided to compare the motivated taste-change and shifting-reference-point accounts in a fourth study that incorporates additional measures intended to examine the role of each of these potential mediating factors.

STUDY 4

To test whether changes in object valuation are mediated by changes in the perceived attractiveness of the object, as suggested by the motivated taste-change account of the endowment and duration-of-ownership effects, a final study was conducted to examine the effects of endowment and duration of current ownership on both object valuation and attractiveness ratings.

Method

Ninety-five undergraduates at an American university participated in the study. They were told that it involved assessing the value and desirability of prizes that might be used in future studies. Subjects were randomly assigned to one of three experimental conditions: not endowed with a mug (no endowment), endowed with a mug for a few minutes (short endowment), and endowed with a mug for fifty minutes (long endowment).⁷ Subjects in each of

the three conditions were asked to complete three questionnaires. The first questionnaire was included to create a time interval between when subjects received the mug and when they gave judgments of attractiveness and valuations. The content of the first questionnaire was unrelated to the current research. The second questionnaire elicited ratings of the mug's attractiveness to self and to others. The third questionnaire elicited the monetary value of the mug.

Subjects assigned to the no-endowment condition received no mug and simply completed the time-filler questionnaire followed by the attractiveness- and value-elicitation questionnaires. Those assigned to the short-endowment condition completed the time-filler questionnaire before receiving the mugs or being told that they would receive them. Then, after receiving their mugs, they completed the attractiveness- and value-elicitation questionnaires. Subjects in the long-endowment condition were immediately endowed with a mug, completed the time-lag questionnaire, and finally were given the attractiveness- and value-elicitation questionnaires.

In the questionnaire that elicited evaluations of the mug's attractiveness, subjects were told that their responses would be used to assess the appeal of various items as rewards for participants in future experiments. The questionnaire directed the attention of subjects to a display of objects at the front of the room. These objects had been placed on the table only after the first two questionnaires had been completed. The objects included the mug that had been given to the subjects in the two endowed conditions, a pen, a T-shirt, a pair of sweat socks, a key chain, and a gift box of chocolates. On the first page of the questionnaire, subjects were asked to rank the six items in terms of how attractive they would have been to them as a reward for participating in the study (with 1 indicating most attractive and 6 indicating least attractive). On the second page, subjects were asked to guess what percentage of the students who had completed this questionnaire would rank the mug higher than the pen in terms of attractiveness. They were told that a correct guess would automatically enter them into a lottery with a cash prize of \$20. Immediately after completing the second questionnaire, each subject completed a value elicitation questionnaire similar to the ones used in the first three studies.

Results

MANOVA was used to examine differences across conditions in object valuation, attractiveness to others, and attractiveness to self. For all the dependent measures we compared no endowment to short endowment and

⁷The study was carried out in one morning over three experimental sessions. In each of the sessions, subjects were randomly assigned to two of the three experimental conditions, which were run separately in two different rooms. In the first session the no-endowment and short-endowment conditions were run, in the second session the no-endowment and long-endowment conditions were run, and in the final session the long-endowment and short-endowment conditions were run. Each experimenter ran each condition once, in one of the three sessions. Thus, each condition was run at two different times, with two different subject groups and two different experimenters. Within each condition, there

was no significant effect on any of the dependent measures attributable to which particular session the subjects had participated in. Therefore, all of the analyses we report are based on the aggregated data from the three sessions.

TABLE 4
MUG VALUATION AS A FUNCTION OF OWNERSHIP STATUS
AND DURATION OF ENDOWMENT: EXPERIMENT 4

	Selling price	Self-ranking	Percent estimates
Not endowed	\$2.69 (.25)	4.03 (.19)	41.75 (3.5)
Minute endowed	\$3.95 (.36)	3.69 (.26)	42.63 (3.7)
Hour endowed	\$4.97 (.32)	2.94 (.25)	50.36 (3.7)

NOTE.—Standard errors are given in parentheses.

short endowment to long endowment.⁸ Table 4 presents the main findings.

Instant Endowment. As in previous studies, endowment increased the value of the mug. The average selling price for subjects endowed with a mug for only a few minutes was \$3.95 compared to an average choice price of \$2.69 for those not endowed with a mug ($F(1, 62) = 9.18, p < .005$). However, endowment did not increase attractiveness rankings significantly. Subjects who had just been endowed with a mug gave it an average ranking of 3.69, compared to 4.03 for subjects who had not been endowed with a mug ($F(1, 62) = 1.12, p > .25$). Thus, brief ownership did not improve evaluations of attractiveness significantly. Instant endowment also had no effect on perceived attractiveness to others. Subjects not endowed with a mug estimated that 41.7 percent of other students would rank the mug as more attractive than the pen compared with 42.6 percent for subjects who had just received the mug ($p > .5$). In short, instant endowment increased value significantly, but contrary to the self-enhancement account of the endowment effect, there was no significant effect for endowment on either attractiveness to self or perceived attractiveness to others.

Duration of Current Ownership. Consistent with Hypothesis 1, subjects who had been endowed with the mug for one hour required more to give it up (on average, \$4.97) than those who had been endowed with the mug for just a few minutes (on average, \$3.95), a significant difference ($F(1, 62) = 4.7, p < .05$). In contrast to the results for instant endowment, however, duration of current ownership also had an effect on attractiveness to self. Subjects who had owned the mug for an hour before being asked to rank it relative to the other items gave it

an average ranking of 2.94, whereas subjects who had been endowed with the mug for only a few minutes gave it an average ranking of 3.69. This difference was statistically significant ($F(1, 62) = 4.1, p < .05$). Perceived attractiveness to others showed a similar but not significant effect. Subjects who had owned the mug for an hour estimated on average that 50.4 percent of the subjects would prefer the mug to the pen. Those who had just been endowed with the mug estimated that on average only 42.6 percent of the subjects would prefer the mug to the pen ($F(1, 61) = 2.2, p < .15$).

Immediate endowment thus had a significant effect on object valuation but not on the measures of perceived attractiveness to others or self; results that are inconsistent with the self-enhancement account of the endowment effect. However, duration of current ownership did significantly increase both valuation and perceived attractiveness to self.

To test whether changes in the desirability of the mug in the three conditions were responsible for the different valuations (i.e., that the effects of the endowment and duration manipulations were mediated by the perceived desirability of the objects), a regression analysis of mediation was performed (Baron and Kenny 1986). First, we regressed the attractiveness-ranking variable on two endowment-indicator variables: (1) owned at all (endowed for either a long or a short period vs. not endowed) and (2) owned for one hour (endowed for an hour vs. either endowed for only a few minutes or not endowed). This analysis indicated that the attractiveness variable was significantly related to the second endowment variable ($p < .03$) but not to the first ($p > .3$).⁹ The same regression was performed using estimates of the mug's attractiveness to others, but this produced no significant coefficients. Second, as presented in Table 5, we regressed the selling price variable on (1) the two endowment conditions (col. 1), (2) the ranking and estimate of attractiveness to others (col. 2), and both sets of variables simultaneously (col. 3). As can be seen in the first two columns of Table 5, the price variable was strongly related to the two endowment-effect variables, only weakly related to rank, and not significantly related to estimates of attractiveness to others. Furthermore, when the two sets of variables are combined in the regression presented in the third column, the attractiveness-ranking and the estimate-of-attractiveness-to-others variables diminish in size and significance, whereas the experimental-manipulation variables remain virtually unchanged in magnitude or significance. Moreover, adding the two attractiveness measures to the equation of column 1 explains very little additional variance. It therefore seems unlikely that changes in the perceived desirability of the mug played a significant mediating role in the changes in valuation induced by the endowment manipulation. Still, the mediating role of perceived attractiveness can not be entirely ruled out. The coefficients on

⁸To correct for the fact that our comparisons are nonorthogonal, we would need to drop the significance level to $p < .025$. However, the need for such correction is eliminated by the fact that we are making directional predictions, which allows for one-tailed tests. The results of two-tailed comparisons with no adjustment for nonorthogonal comparisons were reported here, as they would lead to the same conclusions and rigor as a one-tailed test with an appropriate adjustment for nonorthogonality.

⁹A parallel analysis using ordered logit produced nearly identical results.

TABLE 5
REGRESSION ANALYSIS OF MUG VALUATION: EXPERIMENT 4

Dependent variable: Selling price	(1)	(2)	(3)
Constant	2.7 (8.8)	6.4 (4.9)	4.0 (3.1)
Endowment (vs. no endowment)	1.3 (2.9)		1.2 (2.8)
Long endowment (vs. short or no endowment)	1.0 (2.3)		1.0 (2.2)
Ranking (self)		-.45 (-2.1)	-.18 (-.9)
Estimate (others)		-.02 (-1.5)	-.01 (-1.1)
	$F(2, 92) = 13.9, p < .0001$ $R^2 = .23$	$F(2, 92) = 2.3, p < .11$ $R^2 = .05$	$F(4, 90) = 7.2, p < .0001$ $R^2 = .24$

NOTE.—*t*-statistics are given in parentheses.

the ranking and percentage estimate variables may be biased downward because they were both measured with error, whereas the experimental condition was not. In such cases, mediation analyses are prone to type II errors.

More generally, it is possible that the lack of support for the motivated taste-change account resulted from weaknesses in our measures of object desirability. To eliminate error variance that would have arisen from subjects' different interpretations of the rating scale, instead of eliciting a numerical desirability rating, we measured the mug's desirability relative to other objects. However, the ranking task introduces its own source of error variance; namely, differences in subjects' relative evaluations of the objects other than the mug. Thus, further research is needed before the motivated taste-change account of either the endowment effect or of duration-of-ownership effects can be rejected definitively.

GENERAL DISCUSSION

The research presented here indicates that past ownership can increase the value that individuals place on objects. In all four experiments we found support for the duration-of-current-ownership effect, according to which selling prices increase as a function of how long an object has been owned. The results of the first and third experiments indicate that having once owned an item may increase the value attached to attaining it, suggesting that a psychological sense of ownership may persist, even after an item is physically lost.¹⁰ The third study also

offers support for the duration-of-prior-ownership effect, which predicts that the longer an item is owned before being lost, the more it will be valued. Together, these results demonstrate that the influence of endowment goes beyond the instant effect of current ownership.

In addition to the hypotheses that were supported by our results, we also predicted a time-elapsedsince-loss effect. This was tested in study 3 by comparing the choice prices of subjects who had lost a key chain minutes ago to the choice prices of those who had lost it an hour ago. As mentioned earlier, the fact that this prediction was not supported could indicate either that the hypothesis is false or that the effect of time elapsed since loss requires a time interval longer than one hour.

Study 4 provided mixed support for the alternative causal mechanisms discussed in this article. Consistent with a motivated taste-change mechanism that requires time to occur, differences in attractiveness rankings between the short-duration and long-duration ownership conditions paralleled differences in selling prices. Contrary to the predictions of motivated taste-change, however, no significant difference in subjects' attractiveness rankings was observed between the short-duration-ownership and no-ownership conditions. Moreover, a test of mediation failed to support the motivated taste-change account for either the endowment effect or the duration-of-ownership effect.

¹⁰The results from studies 1 and 3 have ramifications for the question of whether the endowment effect should be interpreted as a form of self-prediction bias (see Tversky and Kahneman 1991). Our notion of bias is based on Kahneman's distinction between decision utility and experience utility (see, e.g., Kahneman and Snell 1990). Decision utility reflects the preferences that are implied by an individual's decisions. Experience utility reflects the actual pleasure, pain, or sense of well-being that follows from those decisions. Bias, in this framework, refers to a systematic departure of decision utility from experience utility—a

tendency to make decisions that achieve suboptimal levels of experience utility. Applied to the endowment effect, we would say that an individual was biased if he was strongly resistant to parting with an object but, on losing it, did not display strong negative feelings or an elevated motivation to regain the object. However, the duration-of-past-ownership effect observed in studies 1 and 3 suggests that an individual who loses an object will, in fact, be more eager to obtain the object (i.e., to regain it) than someone who had never possessed it. People may exaggerate the intensity or duration of misery they will experience on losing an object, but their reluctance to part with objects is reflected in an enhanced desire to regain lost objects.

Complementarity of Causal Mechanisms

Although we have described motivated taste-change and shifting reference points as rival explanations of past-ownership effects, the two effects may actually be complementary. Beggan (1992) argues that motivated taste-change contributes to the endowment effect, but the reverse could also be true. If people are motivated to see owned objects as more attractive, in part to justify their reluctance to part with those objects, then loss aversion could also contribute to motivated taste-change.

Familiarity, although ruled out earlier as a singular explanation for past-ownership effects, may have also contributed to the effects observed in our four studies. Both the shifting-reference-points and motivated taste-change accounts rely in part on thoughts about the new possession. It is not ownership per se, but awareness of ownership that causes reference-point shifts. Thus, reference points are a mental construct. Likewise, motivated taste-change inevitably involves some degree of familiarity with the object. Changes in value caused by shifting reference points and motivated taste-change may therefore themselves depend on some degree of familiarity.

Implications

The research presented in this article has diverse implications for understanding how individuals will react to gains and losses that occur over time. We have examined the effects of ownership history on the valuation of concrete objects (mugs and key chains), but it seems likely that such effects also apply to nonobject endowments, such as romantic attachments and academic success. Thus, if the object of one's desire initially accepted one's invitation to dinner, but later changed her mind, we predict that it would be much less painful if she changed her mind two minutes after accepting the invitation than if she changed her mind two hours or two days later. Likewise, learning that a paper you thought was accepted at a journal was "un-accepted" by the new editor should be less painful if notification of the reversal came just a few minutes after getting the good news rather than a few hours or days later.

Beyond the personal experiences of gaining and losing that people experience regularly, it is not difficult to think of situations in which prior ownership and duration of ownership could influence business outcomes. For example, in collective bargaining, individuals who have only very recently obtained health benefits may be more willing to give them up than those who have had these benefits for a more extended period of time. Similarly, individuals who have lost their health benefits after having had them for a considerable length of time may be more eager to reinstate them than individuals who had previously enjoyed those benefits for only a short while.

Duration-of-ownership effects also have implications for retailers interested in determining the optimal duration for their money-back guarantees. Most return policies

have a deadline within which purchased items must be brought back. Presumably the length of this deadline balances several conflicting objectives. On the one hand, long return periods may be desirable because they signal high quality. On the other hand, a longer return period gives consumers more time to change their minds about keeping the product. The duration-of-ownership effect introduces an additional consideration into this calculus. If people tend to wait until the end of the deadline, as research by Tversky and Shafir (1992) suggests, then the duration-of-ownership effect could mean that they would be more likely to return purchased products when given a relatively brief return period than when given a long one. All this suggests that marketers may actually be able to decrease product returns by increasing the length of the return period.

Limitations and Future Research

In our studies, increases in object valuation occur with relatively small increases in ownership duration, ranging from 20 minutes to an hour. Although the effect of such short differences in ownership duration attests to the strength of the effect, the short durations of ownership in our studies should also caution against generalizing the results to much longer ownership durations. We do not know over what time intervals duration effects continue to occur. It is possible, for example, that there would be a significant increase in object valuation between an hour and a day, but no further increment between a day and a week. Future research could investigate these effects with different time scales, and could also test whether the time-elapsed-since-loss effect (Hypothesis 3) could be obtained using longer periods of time between the loss and valuation of a lost object.

It is also worth noting that in all of our experiments subjects were not given an opportunity to actually use the object (e.g., when the object was a coffee mug, they were not given an opportunity to drink from it). Thus, similar to prior endowment-effect studies, our focus is on the effect of ownership per se, as opposed to object usage. It is quite possible that usage of the object intensifies both endowment and duration-of-ownership effects.

The effects of endowment and duration of current and prior ownership demonstrated in studies 1–4 are likely to be much more complex outside the lab. The quality of many purchased items (such as cars) deteriorates over time, and novelty value may decline as well (e.g., the stair climber that was only used a few times before being relegated to the attic). Furthermore, people may be less concerned about losing an object once they feel they have gotten their money's worth from the object. In some situations, these effects may partially or completely offset the types of history of ownership effects that are demonstrated by our studies.

Future work could also examine how the intensity and the speed of duration-of-ownership effects vary across different types of objects, persons, and modes of transfer-

ence. Prior research suggests that all three of these factors might be important for duration-of-ownership effects. For example, it has been documented that the strength of the instant endowment effect varies across objects (Sayman 1996). It has also been suggested that the speed of adaptation varies across persons as well as situations (Frederick and Loewenstein 1998). Furthermore, it has been shown that both the nature of the benefits provided by an object (e.g., status or sentimental value) and the individual characteristics of the owner (e.g., gender and ethnicity) can influence attachment to various material possessions (Csikszentmihalyi and Rochberg-Halton 1981; Wallendorf and Arnould 1988). In light of these findings, it seems very likely that the strength of past-ownership effects will depend on the owner's ethnicity and gender as well as on the nature of the presently or previously owned possession in question.

In addition to the characteristics of the object's owner and the object itself, it is also possible that the context in which an object was obtained could moderate the effect of past ownership on valuation. As mentioned earlier, previous work has demonstrated that the value of an item may depend on whether it was earned as a reward for superior performance or as a random lottery prize (Loewenstein and Issacharoff 1994). Other research suggests that whether a possession was acquired as a "self gift" or "interpersonal gift" can affect the type of attachment that is formed (Kleine, Kleine, and Allen 1995). Thus, it seems plausible that mode of acquisition (i.e., whether something is acquired as a gift, purchase, reward, prize, payment, or trade) could also affect the extent to which duration of current and prior ownership influences valuation.

Another avenue for future research would be to examine the role of duration of *exposure* in the duration-of-ownership effect. Longer ownership generally means more exposure and therefore more time for elaboration on the characteristics of the owned object. However, duration of ownership and duration of exposure need not always go hand in hand. For example, when a consumer orders and pays for an item either by mail or over the phone, that individual might wait quite some time before actually receiving the purchased item. Thus a consumer could experience a prolonged period of knowing that he owns a product before actually being physically exposed to it. It seems plausible that, if duration of ownership can measure increases in valuation, even in the absence of prolonged exposure, then in situations in which owners do not yet have goods that they purchased in their possession, psychological attachment to those goods could start developing immediately upon purchase.

The possible effect of duration of ownership without duration of exposure has interesting marketing implications. With the large number of direct marketing sales that occur each day, countless products are being ordered and paid for in advance, only to arrive days, weeks, even months after they have been paid for. Since consumers cannot return purchased goods until they possess them,

long wait periods will force consumers to delay the decision of whether or not to return an item. If future work finds that duration of ownership operates independently of duration of exposure, this would suggest that the longer a consumer waits for the delivery of a purchased item, the more reluctant he should be to part with it upon receipt. If so, it may be advantageous for marketers to charge an extra premium for speedy delivery, beyond what the delivery service charges.

Final Comments

The discovery of the endowment effect posed a significant challenge to standard theories of value by demonstrating that preferences fluctuate in response to individuals' immediate endowments. The current findings show that the effect of endowment goes beyond the immediate effect of current ownership and includes the duration of current and past ownership. These results suggest that people's physical endowments (what they currently possess) may not be the same as their mental endowments, which could include memories of what they owned in the past. The current research thus joins other recent work (Chapman and Johnson 1995; Loewenstein and Issacharoff 1994; Sayman 1996) in enumerating factors that moderate the effect of endowment and in enhancing our understanding of the diverse causes and consequences of the subjective sense of ownership.

APPENDIX

Stimuli for Study 1

For Subjects Who Ended Up with a Mug. "You now have the opportunity to trade your mug for some money. Below are a series of lines marked 'Keep mug/Trade it in for \$_____ amount.' On each line check whether you would prefer to keep the mug or trade it in for the amount of money written on the line. Check one or the other on every line.

"We have predetermined a money amount for the mugs. The amount is written on a slip of paper in the envelope (displayed in front of the subjects). When everyone has completed their forms, the amount will be revealed. If you specified below that you would prefer to trade the mug in for the money amount we reveal then you will give up the mug and we will give you the money. If you specified that you would prefer to keep the mug over the amount we reveal, then you will keep the mug. Note that your choices below will not affect the amount written in the envelope. Therefore, it is in your interest to indicate what the mug is truly worth to you. All trades will take place immediately." A series of 40 lines then followed, each containing a choice between keeping the mug or trading it in for a money amount that ranged from \$0.25 to \$10.00 in \$0.25 increments.

For Subjects Who Ended Up without a Mug. The instructions for those who ended up without a mug were

identical except that the first paragraph read: "You now have the opportunity to get a mug or get some money. Below are a series of lines marked 'Take the mug/Take \$_____ amount.' On each line check whether you would prefer to receive a mug or receive the amount of money written on the line. Check one or the other on every line." Forty choices then followed between taking the mug or the same money amounts as on the other form.

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