

Similarity and Reluctance to Trade

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ABSTRACT

Previous research has shown that after decision makers are endowed with an object, they are reluctant to trade it for an alternative item. This endowment effect can be explained by loss aversion, the tendency to weight losses more heavily than gains. Consequently, there is no reluctance to trade when no true loss is involved. Four studies investigated whether reluctance to trade declines when the trade involves less of a loss — specifically, when one item is traded for another very similar item. Three experiments did not reveal a relation between willingness to trade and the similarity between the two items being traded. A fourth experiment, however, indicated that subjects were quite willing to trade for an identical item, less willing to trade for a similar item, and even less willing to trade for a dissimilar item. Thus, reluctance to trade decreased as the similarity between the endowment and the alternative increased. This result suggests that loss aversion is a function not only of the item being lost but also of the trade itself — that is, of the relation between the two items being traded. © 1998 John Wiley & Sons, Ltd.

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Kahneman, Knetsch, and Thaler (1990) report a well-known experiment (Knetsch, 1989) in which half of a group of subjects were given coffee mugs. Each of the remaining subjects received a large Toblerone chocolate bar. When subjects were given the opportunity to exchange the item with which they had been endowed for the other type of item, very few preferred to do so. This reluctance to trade phenomenon has also been called the endowment effect (Thaler, 1980) or the status quo bias (Samuelson and Zeckhauser, 1988). Subjects placed a higher value on an object with which they had been endowed moments before than they did on an alternative object.

The endowment effect or reluctance to trade phenomenon has been demonstrated in a number of other studies (Knetsch, 1989; Loewenstein and Issacharoff, 1994; Ortona and Scacciati, 1992). Additional studies have demonstrated a related phenomenon: the minimum price that one demands in exchange for an endowed item is considerably larger than the maximum price one is willing to pay to gain the item (Casey, 1994; Coursey, Hovis, and Schulze, 1987; Kahneman *et al.*, 1990; Knetsch and

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Sinden, 1984). This disparity between minimum selling price and maximum buying price is analogous to reluctance to trade because a trade will not take place if the minimum price the seller will accept exceeds the maximum price that the buyer is willing to pay.

A psychological mechanism that can explain reluctance to trade is loss aversion, the tendency for decision makers to weigh losses more heavily than corresponding gains (Kahneman and Tversky, 1979; Tversky and Kahneman, 1991). For example, when endowed with a coffee mug and asked to exchange it for a chocolate bar, subjects view the forfeiture of the mug as a loss, which is weighted very heavily. The corresponding gain of the chocolate bar does not compensate for the heavily weighted loss. Likewise, subjects endowed with a chocolate bar view it as a loss and the alternative coffee mug as a gain. Consequently, subjects are reluctant to trade.

As evidence for the loss aversion explanation of reluctance to trade, a number of studies have shown that decision makers are not reluctant to trade when no real loss is involved. For example, Kahneman *et al.* (1990) showed that subjects were not reluctant to trade tokens for cash when those tokens could be exchanged for a known amount of cash at the end of the experiment. These trades were essentially exchanging cash for cash, involving no loss.

In a recent paper, Bar-Hillel and Neter (1996) similarly showed reluctance to trade only when a loss was involved. Extending a previous finding by Langer (1975) they found that when endowed with one randomly selected lottery ticket, subjects were reluctant to trade their ticket for an equivalent ticket. Bar-Hillel and Neter surmised that subjects were concerned that if they exchanged the ticket, they might face a situation in which the new ticket did not win but the old ticket might have won. The old potentially winning ticket was framed as a loss, and this loss could not be balanced by the potential for winning offered by the new ticket, which was framed as a gain.

To back up this explanation, Bar-Hillel and Neter found two situations where subjects were quite willing to trade. One was a case where each ticket had a number, and the winner was determined by picking a number. Subjects were asked to trade their old ticket for a new ticket that had the same number. Thus, the new ticket would win if and only if the old ticket would have won. In this situation no loss was involved and subjects were quite willing to exchange lottery tickets. The second case was one where subjects were endowed with a pen and then asked if they would exchange it for an identical pen. The loss of the endowed pen was not framed as a loss because it was replaced with a perfect substitute: an identical pen. Again, subjects were quite willing to exchange pens.

These results indicate that reluctance to trade occurs only when forfeiture of the endowed item is viewed as a loss. Giving up the endowment is not viewed as a loss if it is replaced with a perfect substitute. In contrast, giving up the endowment is viewed as a loss if it is exchanged for a different item, for example, trading a chocolate bar for a mug. This finding raises the question of whether decision makers would be less reluctant than usual to trade if the endowment was exchanged for an item that served as a good but not perfect substitute.

Such a result was demonstrated by Ortona and Scacciati (1992), who found a large endowment effect in a study where subjects were asked to trade money for leisure time. They found a much smaller endowment effect in a second study where students were asked to trade money for book store certificates. Because these students needed to buy course books, the certificates were a good substitute for cash. This similarity between the items to be traded could explain the small endowment effect. In contrast, money may not be a good substitute for leisure time, explaining the large endowment effect in the first study.

These results suggest that Kahneman *et al.*'s (1990) subjects would have been more willing to trade a chocolate bar for a chocolate truffle than for a coffee mug. Similarly, they would have been more willing to trade a coffee mug for a drinking glass than for a chocolate bar. Trading for a similar item seems to provide an intermediate case between exchanging identical items (e.g. a pen for an identical pen) and trading different items (e.g. mugs for chocolate bars). Exchanging a chocolate bar for a

chocolate truffle still comprises a loss because the chocolate bar is not replaced; however, the loss is not as severe, because the replacement item is similar to, or a good substitute for, the endowed item. Consequently, one might expect subjects to be less reluctant to trade for similar alternatives than for dissimilar alternatives. This prediction was tested in the present experiments.

An effect of similarity on willingness to trade would be important for two reasons. First, it could provide an explanation for why loss aversion is not constant. Although numerous studies have demonstrated an endowment effect, the size of this effect differs substantially across studies. Some pricing studies provide a measure of loss aversion by comparing selling and buying prices. For example, Kahneman *et al.* (1990, Experiments 1 and 2) found that selling prices for mugs were approximately twice as large as buying prices. In contrast, Thaler (1980) found that selling prices for possible exposure to a deadly disease were fifty times higher than buying prices. A similarity effect could provide an account of why the magnitude of loss aversion varies considerably across studies. Because money is a better substitute for commodities such as mugs than for health outcomes, decision makers may be more willing to trade money for coffee mugs than for health risks, indicating more loss aversion in the latter case.

A second reason why a similarity effect would be important is that it would help to distinguish between two possible views of loss aversion, each of which can account for the fact that loss aversion is not constant. One view, which might be called attribute-loss aversion, is that loss aversion is a characteristic of a single item or attribute. Decision makers may have more loss aversion for one dimension than another. For example, suppose that the disutility of losing one chocolate bar is three times greater than the utility of gaining one chocolate bar but that the disutility of losing one coffee mug is only twice as great as the utility of gaining one mug. We would conclude that there was more loss aversion for the chocolate dimension than for the mug dimension. If loss aversion is a property of the dimension or item, chocolate bars would exhibit the same amount of loss aversion when traded for coffee mugs as they would when traded for money or for chocolate truffles. Thus, this view can explain why the magnitude of loss aversion varies across situations, but it would not posit a role for similarity between the two items traded.

A second view of loss aversion, which might be called trade-loss aversion, is that loss aversion is a characteristic of the exchange, not of an individual dimension or item. According to this view a decision maker does not have a fixed amount of loss aversion for, say, chocolate bars than is invariant across situations. Instead, the decision maker shows loss aversion for a particular trade, say, trading chocolate bars for coffee mugs. One determinant of loss aversion for the trade is the similarity between the two items. Thus, the decision maker may show very little loss aversion when trading chocolate bars for chocolate truffles, but show extreme loss aversion when trading chocolate bars for coffee mugs. Furthermore, the extreme loss aversion in the latter trade is not due to high attribute-loss aversion for mugs, because the mugs would exhibit very low loss aversion when traded for drinking glasses. This view can explain why loss aversion varies in magnitude, and it also posits a role for similarity. Thus, results in the current experiments showing that reluctance to trade is influenced by similarity would support the concept of trade-loss aversion.

EXPERIMENTS 1, 2, AND 3

In each of three studies, subjects were endowed with one of four items and asked if they would like to trade for one of the other items. The four items were selected such that two items were similar to each other but different from the other two (which in turn were similar to one another). Subjects were asked whether they were willing to trade the endowment for the similar item or for one of the dissimilar items. It was predicted that subjects would be more willing to trade in the similar condition. The three

Exhibit 1. Items used in Experiments 1–4

	Pair 1	Pair 2
Experiment 1	One Reese's peanut butter cup One Kit-Kat bar	Pack of Dentyne gum Pack of Pep-O-Mint Lifesavers
Experiment 2	Box of 16 crayons, assorted colors Pack of 10 fine-line water color markers	2.10 oz can of 6 feet of 'Bubble Tape' grape bubble gum 2.10 oz bag of 'Big League Chew' original shredded bubble gum
Experiment 3	Pack of 12 colored pencils Pack of 10 colored markers	Bag of potato chips Bag of Doritos
Experiment 4	One Reese's peanut butter cup One Kit-Kat bar	Pack of cinnamon gum Pack of spearmint gum

experiments followed the same procedure, except that they employed different items (see Exhibit 1). In addition, Experiment 2 included some additional manipulation-check questions.

Methods

Subjects

Subjects in Experiment 1 were 60 undergraduate students in introductory business or psychology classes who participated in class experiments. Subjects in Experiments 2 and 3 were 48 and 16 college students, respectively, who responded to posted notices. All studies were administered in several group sessions.

Procedure

Each subject received a sealed envelope that contained a questionnaire and one item that had been randomly selected from a set of four items. The item sets used in each experiment are listed in Exhibit 1. Each set consisted of two pairs of similar items. All four items within each set had almost identical market prices.

The instructions on the questionnaire informed subjects that they had received an item that was theirs to keep. Subjects were informed that they would be asked two questions about their preference to keep or trade the item. Afterward, a coin would be flipped to decide which of the two questions would actually be played out. They were further informed that at the end of the experiment, all subjects would need to turn in their questionnaire and tell the experimenter whether they were keeping or trading their item. This last instruction was included to minimize the transaction costs associated with trading (although transaction costs could not be eliminated). The time required to turn in the questionnaire was no longer if one were exchanging an item than if one were keeping the original item.

The questionnaire presented two questions. One asked if the subject would like to trade the endowed item for the similar item. The other asked if the subject would like to trade the endowed item for one of the dissimilar items. Different forms of the questionnaire counterbalanced which of the two dissimilar items was specified and which of the four items was endowed. The order of the two questions was also counterbalanced across subjects, forming 16 counterbalance conditions.

For each of the questions, subjects circled one option to indicate their preference for the endowed item or the alternative item. Then they specified the smallest amount of money they would have to be paid to accept the non-preferred option. Responses to the pricing questions had no real consequences.

After all subjects had completed the questionnaire, the experimenter flipped a coin to determine which of the two questions would be enacted. Subjects then came to the front of the room to turn in their questionnaires, and the experimenter made any necessary exchanges.

In Experiment 2, subjects were also asked several manipulation-check questions. They rated the similarity of each item to each other item on a 5-point scale (six similarity ratings). They also divided the four items into two pairs such that the items within each pair were, in their opinion, very similar to each other, and items in one pair were different from the items in the other pair. These similarity judgments confirmed the hypothesized similarity structure of the items.

Results and discussion

One subject in Experiment 1 and one subject in Experiment 3 did not answer both the similar and dissimilar questions. They were not included in analyses, leaving 122 observations overall.

Exhibit 2. Number (%) of subjects willing to trade in Experiments 1, 2, and 3

	<i>N</i>	Similar	Dissimilar	McNemar's χ^2 (1)
Experiment 1	59	22 (37%)	19 (32%)	0.47
Experiment 2	48	17 (35%)	14 (29%)	0.69
Experiment 3	15	7 (47%)	5 (33%)	0.67
Overall	122	46 (38%)	38 (31%)	1.68

Choice data

Exhibit 2 presents the percentage of subjects who chose to trade their endowed items for an alternative item. Over all three studies, 31% traded for a dissimilar item and 38% traded for a similar item. Although the frequency of trades is slightly higher in the similar condition, this difference is not significant, McNemar's $\chi^2(1, N = 122) = 1.68, p > 0.15$. The difference in percentages represents a small effect size (Cohen's $w = 0.12$, Cohen, 1988). Thus, no relation between reluctance to trade and similarity was revealed. In both conditions, however, the frequency of trades was significantly less than 50%, $Zs > 2.6, N = 122, ps < 0.01$. Given that the four items were randomly distributed to the subjects, in the absence of an endowment effect one would expect 50% trades between any two items. Thus, the low exchange rates indicate an endowment effect.

It is of interest to note that the overall frequency of trades (roughly 35%) was considerably higher than that found in Kahneman *et al.*'s (1990) study. They found that only about 10% of subjects were willing to trade a chocolate bar for a mug or vice versa. This disparity may be due to the fact that in the present studies the trades involved lower transaction costs. All subjects were required to come to the front of the room to turn in their questionnaire, whether or not they wished to trade. A second difference between the two studies is that in the Kahneman *et al.* study all the students in one classroom were endowed with the same type of item. (A second classroom of students was given the other type of item.) In the present studies the different items were distributed across subjects in the same room. It is possible that the resulting social comparison could have increased the number of trades. A final possibility is that decision makers are more loss averse for the items used by Kahneman *et al.* than for the items used in the present studies (which were less valuable).

Price data

In addition to indicating their willingness to trade, subjects also specified the smallest amount of cash they would have to receive to agree to receive the less preferred item. That is, subjects who preferred the

alternative item indicated the amount of money they would have to receive in order to agree to keep the endowed item. Subjects who preferred the endowed item indicated how much they would have to be paid to accept the alternative instead. If a subject preferred the endowed item, price was coded as a positive amount; if the subject preferred the alternative item, the price was coded as negative. By this algebraic coding, the prices provided a continuous measure of preference for the endowed item such that higher positive prices indicated a stronger preference for the endowment.

The average prices for each experiment are shown in Exhibit 3. If similarity reduces reluctance to trade, the prices in the dissimilar condition should be more highly positive than those in the similar condition. Overall, the price demanded was slightly higher in the dissimilar condition, but this difference was not significant, $t(121) = 1.28$, $SEM = 0.35$, $p > 0.2$, Cohen's $d = 0.12$. Thus, as with the dichotomous choice data, the continuous price data did not reveal a relation between similarity and the endowment effect.

Exhibit 3. Mean price (SEM) demanded to trade in Experiments 1, 2, and 3

	<i>N</i>	Similar	Dissimilar	Paired <i>t</i>
Experiment 1	59	\$0.46 (0.21)	\$0.34 (0.23)	0.53
Experiment 2	48	\$0.25 (0.57)	\$0.92 (0.59)	0.90
Experiment 3	15	−\$0.54 (0.78)	\$1.44 (0.81)	1.59 ^a
Overall	122	\$0.26 (0.35)	\$0.71 (0.28)	1.28

^a $p < 0.15$.

Interestingly, the mean overall price (\$0.48) was significantly positive, $t(121) = 2.35$, $SEM = 0.21$, $p < 0.05$. Positive prices indicate a preference for the endowed item (requiring a positive amount of money to switch from the endowment to the alternative), and negative prices indicate a preference for the alternative. Thus, the average positive price indicates an endowment effect. As with the choice data, the price data indicate an endowment effect but not a relation with similarity.

Similarity ratings

A final analysis of the relation between similarity and reluctance to trade was conducted using Experiment 2 only. In this experiment, subjects rated the similarity of each item to each other item on a 5-point scale. For each subject, the rated similarity between the endowment and the dissimilar alternative was subtracted from the rated similarity between the endowment and the similar alternative. The mean rating difference was 2.75 (s.d. 1.44, $N = 48$), which was significantly greater than zero, $t(47) = 13.25$, $SEM = 0.21$, $p < 0.0001$. High positive values of this rating difference indicate that subjects viewed the similarity relations as intended. Subjects with high rating differences should be especially likely to show more reluctance to trade in the dissimilar condition relative to the similar condition.

To test this prediction, subjects were divided into three groups: (1) those who traded for the similar alternative but not for the dissimilar alternative (the predicted pattern), (2) those who traded for the dissimilar alternative but not for the similar alternative (the counter-predicted pattern), and (3) those who made the same choice in both conditions. A one-way ANOVA was used to compare the rating difference of these three groups. If similarity is related to reluctance to trade, then group 1 should show a larger rating difference compared to groups 2 and 3. The ANOVA showed no group difference, $F(1, 45) = 1.28$, $p > 0.2$. Group 1 showed a rating difference (mean 2.38, s.d. 2.2, $N = 8$) that was not different from group 2 (mean 2.00, s.d. 2.1, $N = 5$) or group 3 (mean 2.94, s.d. 1.1, $N = 35$). A similar analysis using the price data also showed no relation between similarity and reluctance to trade.

EXPERIMENT 4

Experiments 1, 2, and 3 did not reveal a relation between similarity and reluctance to trade. This result could imply that similarity is in fact unrelated to loss aversion. Alternatively, shortcomings in the design of the previous experiments may have concealed a relation between reluctance to trade and similarity. The insignificant trends seen in the first three studies suggest that this may be the case. Experiment 4 addressed several possible shortcomings of the previous experiments. First, the previous experiments did not contain a condition where subjects were asked to trade the endowed item for an identical item, as Bar-Hillel and Neter (1996) used. The fact that subjects in the current studies were just as reluctant to trade in the similar condition as they were in the dissimilar condition may indicate that they would be reluctant to trade in any situation, even for an identical item. Experiment 4 checked this possibility by including such a condition.

Second, Experiment 4 also followed Bar-Hillel and Neter's procedure more closely on another point. In their studies, Bar-Hillel and Neter offered subjects a small financial incentive for trading (1 NS). This incentive served to counteract any transaction costs associated with the trade. Thus, subjects endowed with a pen and asked to trade for an identical pen were offered 1 NS if they traded. As expected, over 90% of subjects agreed to this trade. In contrast, 1 NS was not sufficient incentive to entice subjects to trade a lottery ticket for another lottery ticket. Thus, in the current Experiment 4, subjects were offered a small amount of cash for trading (in this case, a nickel). This procedure addresses the possibility that subjects in Experiment 1–3 may have been reluctant to trade not because they preferred their endowed item but because they were truly indifferent between the two items and trading involved transaction costs. Specifically, subjects may have refused to trade in the similar condition because of indifference and refused to trade in the dissimilar condition because of loss aversion. Thus, the two conditions may have showed similar results for different reasons. By offering a small amount of cash for trading, subjects who were indifferent would have an incentive to trade, while those who strongly preferred the endowed item would still refuse to trade.

Finally, Experiment 4 did not contain pricing questions, as the previous questionnaires had. In the previous studies, the choice questions had real outcomes (for one of the two questions), but the pricing questions did not. This design may have led to confusion among some subjects, adding noise which concealed differences between the similar and dissimilar conditions. Experiment 4 contained only 3 choice questions, one of which (randomly selected) had real outcomes.

Methods*Subjects*

Ninety-six subjects participated in this experiment. Of these, 23 were students who participated in a classroom session. The remaining 73 were community members recruited at a local mall who participated in individually-administered sessions.

Procedure

The procedure was similar to that used in Experiments 1, 2, and 3. Each subject received a sealed envelope that contained a questionnaire and one item that had been randomly selected from a set of four items shown in Exhibit 1. The instructions on the questionnaire informed subjects that they had received an item that was theirs to keep and that they would be asked three questions about their preference to keep or trade the item. Afterward, the roll of a die would decide which of the questions would actually be played out.

The questionnaire presented three questions. One asked if the subject would like to trade the endowed item for another identical item plus 5 cents. A second asked if the subject would trade for the similar item plus five cents. The third asked about trading the endowed item for one of the dissimilar items plus five cents. Different forms of the questionnaire counterbalanced which of the four items was endowed and which of the two dissimilar items was specified. The order of the three questions was also counterbalanced across subjects, forming 24 counterbalance conditions with 4 subjects in each.

For each of the questions, subjects circled one option to indicate their preference for the endowed item or the alternative item. After all of the 23 student subjects had completed the questionnaire, the experimenter rolled a die to determine which of the questions would be enacted. Because 73 community member subjects were run individually, the die was rolled after each subject completed the questionnaire.

Results and discussion

Exhibit 4 shows the number of subjects willing to trade in each condition. Seventy-nine percent of the subjects were willing to trade for an identical item. This percentage is much higher than the trading rates seen in the previous experiments, reflecting the fact that an identical trade involves no real loss. It is somewhat surprising, however, that 21% of the subjects did not trade for an identical item. In Bar-Hillel and Neter's study, less than 10% of subjects refused the identical trade. These subjects were violating the principle of dominance, since an item identical to the endowment plus five cents dominates the endowed item. This result could reflect the fact that five cents was not enough to overcome the transaction costs of turning in the endowed item for an identical item. Alternatively, it could reflect that some subjects did not understand or were not paying attention to the experimental task or that they were suspicious of an experimenter offering a nickel to encourage an identical trade. Because of these possibilities, an analysis was conducted for only those subjects who agreed to the identical trade, in addition to an analysis of the results for all subjects combined (see Exhibit 4).

Exhibit 4. Number (%) of subjects willing to trade in Experiment 4

	<i>N</i>	Identical	Similar	Dissimilar
All subjects	96	76 (79%)	52 (54%)	40 (42%)
Identical traders only	76	76 (100%)	45 (59%)	31 (41%)

Note: Comparisons of the similar and dissimilar conditions were computed for all subjects and also for those subjects who agreed to the identical trade (Identical traders only).

Fifty-four percent of all subjects agreed to the similar trade, compared to 42% for the dissimilar trade. The number of similar trades (54%) was significantly less than the number of identical trades (79%), $\chi^2(1, N = 96) = 15.16, p < 0.001$, indicating loss aversion. (The number of dissimilar trades, 42%, was also less than the number of identical trades, 79%.) The number of dissimilar trades, however, was only marginally lower than the number of similar trades, $\chi^2(1, N = 96) = 3.60, p = 0.06$. This effect size was somewhat larger than in the previous experiments (Cohen's $w = 0.19$).

I then examined the 76 subjects who had agreed to the identical trade. Approximately equal numbers of them (range 17 to 21) were in each of the four endowment conditions, so examination of this subgroup did not alter the experimental design substantially. Of these 76 subjects, 59% agreed to the similar trade, but only 41% agreed to the dissimilar trade, $\chi^2(1, N = 76) = 5.76, p < 0.02$. This effect size was considerably larger than that seen in Experiments 1–3 (Cohen's $w = 0.28$). (Of the 20 subjects who did not agree to the identical trade, 35% agreed to the similar trade and 45% agreed to the

dissimilar trade.) Thus, a reliable difference between similar and dissimilar trades was revealed in this comparison.

These results introduce the question of why the difference between similar and dissimilar trades was revealed in this last comparison but not in previous studies. A number of factors could have contributed to the increased sensitivity of this comparison. The overall results of Experiment 4 led to a larger effect size ($w = 0.19$) than the combined results from Experiments 1–3 ($w = 0.12$). Experiment 4 did not contain the hypothetical pricing task, which might have confused some subjects and resulted in noisier data. In addition, Experiment 4 included a large number of subjects ($N = 96$) with the same experimental stimuli, whereas Experiments 1–3 used three different sets of stimuli, another possible contributor of noise. Experiment 4 included a small financial incentive (5 cents) for trading. This change increased the overall rate of trading relative to earlier experiments. More importantly, it meant that subjects who were truly indifferent between the endowment and the alternative would be more likely to trade. Thus, the low rate of trading in the similar and dissimilar conditions is less likely to be due to transaction costs rather than to loss aversion. Finally, Experiment 4 included an identical trade condition, similar to that used by Bar-Hillel and Neter (1996).

Inclusion of this condition had several consequences. It provided a benchmark with which to compare the similar and dissimilar conditions. The fact that the number of trades was lower in the latter two conditions compared to the former indicates loss aversion. This difference cannot be attributed to transaction costs, because the transaction costs are the same in all three conditions. In addition, the presence of the identical condition may have focused subjects' attention on the continuum from identical to similar and dissimilar. They may have realized that there were some conditions (identical) where they were quite willing to trade (because no real loss was involved) and may consequently have seen the similar condition as somewhat analogous to the identical condition.

A final consequence of the identical condition is that it provided a screen to identify subjects who did not understand or attend to the experimental task or for whom five cents did not balance the transaction costs of trading. Subjects who refused the identical trade technically violated the principle of dominance and their data on the remaining two questions may therefore be suspect. Even subjects who had rational reasons for refusing the identical trade (e.g. transaction costs) may still be appropriately screened out. As discussed earlier, if transaction costs are not overcome, subjects may refuse both similar and dissimilar trades but for different reasons. This possible confound is avoided by using only subjects who agreed to the identical trade.

For these reasons, a secondary analysis was conducted using only subjects who agreed to the identical trade. This analysis resulted in an effect size ($w = 0.28$) that was larger than that seen in the overall analysis ($w = 0.19$) and twice as large as that seen in Experiments 1–3 ($w = 0.12$). Thus, an important reason that the first three experiments failed to show a difference between the similar and dissimilar conditions may have been the inclusion of a subset of subjects who were not attending to the task (e.g. choosing randomly) or for whom transaction costs were high. The use of experimental prizes with small market prices (about 25 cents) and a very small incentive to trade (5 cents) may have contributed to poor attention to the experimental task and transaction costs that were high relative to the prizes. Future studies with more weighty outcomes may show stronger effects.

GENERAL DISCUSSION

Both the choice and price data indicated an endowment effect. Subjects preferred an item with which they had been randomly endowed only minutes previously to an alternative item. In addition, they were much more likely to trade the endowment for an identical item than for another type of item. This result replicates numerous previous demonstrations of the endowment effect or status quo bias

(Bar-Hillel and Neter, 1996; Knetsch, 1989; Loewenstein and Issacharoff, 1994; Ortona and Scacciati, 1992; Samuelson and Zeckhauser, 1988; Thaler, 1980).

Previous studies (Bar-Hillel and Neter, 1996; Kahneman *et al.*, 1990) have suggested that reluctance to trade is caused by loss aversion. Giving up the endowment is viewed as a loss, whereas receiving an alternative item is viewed as a gain. Because losses are weighted more heavily than gains, the gain cannot compensate for the loss, and decision makers prefer to retain the endowment. In contrast, they are quite willing to trade when no real loss is incurred. For example, they will happily trade one pen for an identical pen (Bar-Hillel and Neter, 1996).

This result led to the prediction that losing the endowed item would be less painful if, instead of receiving a completely different item in return, one received a similar item that served as a good substitute for the endowed item. Such an exchange may be viewed as involving less of a loss, resulting in less loss aversion and consequently less reluctance to trade. Thus, it was surprising that the first three experiments presented here did not show that reluctance to trade was related to the similarity between the endowment and the alternative item. As discussed above, this failure to find an effect may have resulted from transaction costs or from subjects failing to attend to the task. Experiment 4 did reveal a clear relation between similarity and reluctance to trade, especially after screening out subjects who violated dominance.

Several other studies have also found an effect of similarity between the attributes being exchanged. Chapman and Johnson (1995) found that willingness to trade health and consumer items for money or life expectancy depended on the similarity between the two dimensions being traded. Subjects demanded more money for commodities than for health items, but they demanded more additional life expectancy for health items than for commodities. Beattie and Baron (1995) found that subjects assigned higher litigation penalties when the penalty was paid in a currency different from that of the damage caused (out-of-kind penalties) than when the penalty was paid in a similar currency (in-kind penalties). Neither of these studies examined loss aversion, however.

Like the present results, Ortona and Scacciati's (1992) results showed a larger endowment effect for dissimilar trades. They found a larger endowment effect when subjects traded money for leisure time (a dissimilar trade) than when they traded money for bookstore certificates (a similar trade). Ortona and Scacciati, however, suggest an alternative explanation for their results. In their first experiment, subjects made hypothetical choices about trading money for leisure time. In their second experiment, students made real choices about trading substantial amounts of money for bookstore certificates. Ortona and Scacciati argue that the endowment effect may decrease when decisions are made about real, high stakes consequences. Thus, their results may not indicate a relation between similarity and the endowment effect. No analogous explanation can account for the effect of similarity in the current study because the stakes were equally low in both the similar and dissimilar conditions.

What do the present results indicate about reluctance to trade and loss aversion? The fact that reluctance to trade is caused by loss aversion and is mitigated by similarity indicates that loss aversion is in part determined by the relation between the two items being traded. As discussed in the Introduction, the present results support the concept of trade-loss aversion over attribute-loss aversion. The attribute-loss aversion view may be able to account for these results, however, by positing that each of the experimental items consisted of multiple attributes (Houston and Sherman, 1995). For example, all the items shared the dimension of sweetness. The peanut butter cup and Kit-Kat bar also shared a chocolate dimension, while the cinnamon and spearmint gum shared the breath-freshening attribute. Within each pair, the items differed on additional attributes. For example, the peanut butter cup and Kit-Kat bars differed on the peanut butter and crunchiness attributes.

When trading a peanut butter cup for a Kit-Kat bar, there is no loss on the sweetness or chocolate attributes, but there is a loss on the peanut butter dimension (with a corresponding gain on the crunchiness dimension). When trading a peanut butter cup for a pack of spearmint gum, in contrast,

there are losses on more dimensions (both the chocolate and peanut butter attributes) and corresponding gains on more dimensions (both the breath-freshening and spearmint flavor dimensions). Thus, the similar trades may result in less reluctance to trade because they involve losses on fewer attributes. Note that this account could explain the similarity effect even if all attributes had the same amount of loss aversion. Willingness to trade would depend only on the number of attributes that involved a loss. This attribute-loss aversion account may be difficult to disentangle from trade-loss aversion. Future research is needed using items with clearly defined attributes and independent measures of the loss aversion associated with each dimension.

Although the present research did indicate that reluctance to trade is moderated by similarity, this effect was moderate in size. The first three studies failed to reveal any effect at all. Even in the fourth study, the difference between the identical and similar conditions was much larger than the difference between the similar and different conditions. What does this moderate but significant effect indicate about the nature of loss aversion? One might conjecture that loss aversion constitutes a continuum such that exchanges that involve no loss lead to no loss aversion, transactions that lead to some loss lead to some loss aversion (weighting losses moderately more than gains), and trades that involve a definite loss lead to extreme loss aversion (weighting losses much more than gains). An alternative characterization is that loss aversion is not a continuum but a dichotomy. Outcomes are either framed as gains or as losses, and those framed as losses are overweighted. The present results clearly argue against the dichotomy view. The small similarity effect, however, may indicate that the continuum is not very smooth. Transactions that involve no loss may be viewed as importantly different from those that involve even somewhat of a loss, whereas transactions that lead to some loss are seen as only mildly different from those that involve a definite loss. This uneven continuum might explain the weak relation between similarity ratings and reluctance to trade in Experiment 2. The present experiments used only three levels of similarity (identical, similar, and dissimilar). Future research using a broader range of similarity, from identical items to very different items, could provide additional evidence about the shape of the continuum relating similarity and loss aversion.

Reluctance to trade and the endowment effect appear to be very common phenomena (Bar-Hillel and Neter, 1996; Knetsch, 1989; Loewenstein and Issacharoff, 1994; Ortona and Scacciati, 1992; Samuelson and Zeckhauser, 1988; Thaler, 1980). The present results indicate that these effects are dependent on both items involved in the trade. This similarity effect has a number of potential applications. For example, tax payers may be much more willing to give up health benefits in exchange for improved highway safety than for a tax cut. However, they would be more willing to give up consumer protection regulations in exchange for a tax cut than for an increase in highway safety. Medical patients may be more willing to accept a reduced life expectancy in order to gain a better quality of life than to achieve financial savings, whereas they may be more willing to accept a limited physical ability to work in order to achieve financial gain. Employees may be more willing to give up the company car for a larger travel expense account than for additional vacation days; however, they may be more willing to work overtime in exchange for additional vacation days than for a larger travel expense account. During a negotiation when gains and losses may be experienced on a number of dimensions, losses can be made to appear more acceptable if they are paired with gains on similar dimensions.

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REFERENCES

- Bar-Hillel, M. and Neter, E. 'Why are people reluctant to exchange lottery tickets?' *Journal of Personality and Social Psychology*, **70** (1996), 17–27.
- Beattie, J. and Baron, J. 'In-kind and out-of-kind penalties: Preferences and valuation', *Journal of Experimental Psychology: Applied*, **1** (1995), 135–51.
- Casey, J. T. 'Buyers' pricing behavior for risky alternatives: Encoding processes and preference reversals' *Management Science*, **40** (1994), 730–49.
- Chapman, G. B. and Johnson, E. J. 'Preference reversals in monetary and life expectancy evaluations', *Organizational Behavior and Human Decision Processes*, **62** (1995), 300–17.
- Cohen, J. *Statistical Power Analysis for the Behavioral Sciences*, Hillsdale, NJ: Lawrence Erlbaum, 1988.
- Coursey, D. L., Hovis, J. L. and Schulze, W. D. 'The disparity between willingness to accept and willingness to pay measures of value', *Quarterly Journal of Economics*, **102** (1987), 679–90.
- Houston, D. A. and Sherman, S. J. 'Cancellation and focus: The role of shared and unique features in the choice process', *Journal of Experimental Social Psychology*, **31** (1995), 357–78.
- Kahneman, D., Knetsch, J. L. and Thaler, R. H. 'Experimental tests of the endowment effect and the Coase Theorem', *Journal of Political Economy*, **98**, (1990), 1325–48.
- Kahneman, D. and Tversky, A. 'Prospect theory: An analysis of choice under uncertainty', *Econometrica*, **47** (1979), 263–91.
- Knetsch, J. L. 'The endowment effect and evidence of nonreversible indifference curves', *American Economic Review*, **79** (1989), 1277–84.
- Knetsch, J. L. and Sinden, J. A. 'Willingness to pay and compensation demanded: Experimental evidence of an unexpected disparity in measure of value', *Quarterly Journal of Economics*, **99** (1984), 507–21.
- Langer, E. J. 'The illusion of control', *Journal of Personality and Social Psychology*, **32** (1975), 311–28.
- Loewenstein, G. and Issacharoff, S. 'Source dependence in the valuation of objects', *Journal of Behavioral Decision Making*, **7**(3) (1994), 157–68.
- Ortona, G. and Scacciati, F. 'New experiments on the endowment effect', *Journal of Economic Psychology*, **13**(2) (1992), 277–96.
- Samuelson, W. and Zeckhauser, R. 'Status quo bias in decision making', *Journal of Risk and Uncertainty*, **1** (1988), 7–59.
- Thaler, R. H. 'Toward a positive theory of consumer choice', *Journal of Economic Behavior and Organization*, **1** (1980), 39–60.
- Tversky, A. and Kahneman, D. 'Loss aversion in riskless choice: A reference-dependent model', *Quarterly Journal of Economics*, **106** (1991), 1039–61.

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