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Buying and selling exchange goods: Outcome information, curiosity and the endowment effect

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Abstract

The endowment effect refers to the phenomenon that people demand more money to give up an object than they are willing to pay to receive the same object. Kahneman, Knetsch and Thaler (1991) [The endowment effect, loss aversion and status quo effect. *Journal of Economic Perspectives*, 5, 193–206] stated that this effect would not apply to exchange goods. Research by Van Dijk and Van Knippenberg (1996) [Buying and selling exchange goods: Loss aversion and the endowment effect. *Journal of Economic Psychology*, 17, 517–524] showed that the endowment effect does occur, but only for exchange goods of which the value is uncertain. The present research continues this exploration, and shows that curiosity contributes to the observed disparity between selling and buying prices for exchange goods with uncertain value. Furthermore, the findings suggest that in order to understand endowment effects, a closer study of the behavior of the non-owners may provide useful insights.

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1. Introduction

People generally demand more money as compensation for giving up an object than they are willing to pay in order to obtain the same object (Thaler, 1980). This finding has been termed the ‘endowment effect’. It is generally interpreted as a manifestation of loss aversion, the generalization that losses are weighted more heavily than gains (Kahneman & Tversky, 1979). Because giving up an object (selling) can be perceived as a loss, and obtaining an object (buying) can be perceived as a gain, loss aversion may indeed explain the disparity between too high selling prices and too low buying prices (Kahneman, Knetsch, & Thaler, 1990). Endowment effects have been demonstrated for a variety of objects, such as pens, coffee mugs, wines, and chocolate bars (see e.g., Kahneman et al., 1990; Van Dijk & Van Knippenberg, 1998).

Not all goods seem equally susceptible to the endowment effect, however. According to Kahneman (1992, p. 301) the endowment effect would not exist for goods which are held for exchange, because “loss aversion plays little role in routine economic transactions, in which Sellers and Buyers trade goods for money, both of which were held for that purpose”. Kahneman distinguished between three categories of exchange goods: (1) money held for spending; (2) goods held specifically for sale; and (3) goods that are only valued because they can be traded.

Van Dijk and Van Knippenberg (1996), nevertheless, obtained an endowment effect for exchange goods, but only when the value of the exchange good was uncertain. They used a research design in which Position (Buyer vs. Seller) and Uncertainty about the value of the exchange good (Fixed Exchange Value vs. Uncertain Exchange Value) were manipulated independently of each other. Half of their participants were endowed with a bargaining chip when they entered the laboratory, which could be exchanged for money at the end of the experiment. In the Fixed Exchange Value condition the participants learned that they could exchange the chip with the experimenter for Dfl. 3.50.¹ In the Uncertain Exchange Value condition the participants learned they could exchange the chip for an amount of money between Dfl. 1.75 and Dfl. 5.25, depending on a random chance procedure. Before exchanging the bargaining chip with the experimenter participants could trade the bargaining chips among themselves: the participants owning a chip (the Sellers) could sell this chip to the participants who did not own a chip (the Buyers). In the experiment, the Sellers indicated their minimum selling price (Willingness To Accept,

¹ At the time of the Van Dijk and Van Knippenberg (1996) study one Dutch Guilder was equivalent to \$0.55.

WTA) and the Buyers indicated their maximum buying price (Willingness To Pay, WTP). Van Dijk and Van Knippenberg's results revealed that in the Fixed Exchange Value condition no endowment effect occurred: the WTA of the Sellers was not significantly different from the WTP of the Buyers. This finding corroborated [Kahneman's \(1992\)](#) notion that exchange goods are not susceptible to the endowment effect. Interestingly, however, an endowment effect did emerge in the Uncertain Exchange Value condition. The WTA of the Sellers (Dfl. 3.97) differed significantly from the WTP of the Buyers (Dfl. 2.87).

[Van Dijk and Van Knippenberg \(1996\)](#) explained their findings by arguing that in the case of a Fixed Exchange Value, bargainers do not experience loss aversion because they can easily compute the net result of the trade. For example, when traders know that the exchange value is \$5, Sellers may instantly realize that any offer higher than \$5 yields them a net gain. Things are different, however, when the exchange value is uncertain. Then, it becomes more difficult to compute the net result of trade (what is the net result of selling your chip with an uncertain value for \$5?). Under these circumstances, Sellers may be susceptible to loss aversion, and thus to the endowment effect.

In the current article, we examine the possibility that an additional variable may contribute to the endowment effect, namely the curiosity regarding the uncertain exchange value. To understand why curiosity may affect the endowment effect for exchange goods with an uncertain value, it is instructive to take a closer look at the experimental set-up used by [Van Dijk and Van Knippenberg \(1996\)](#). In their Uncertain Exchange Value condition, participants not only learned that the exchange value was uncertain, but also that only the participants who were in possession of a bargaining chip at the end of the experiment (after the possible trade between participants) would learn what the eventual exchange value was. Recall that the exchange value is the amount of money that the bargaining chip is worth, when you exchange it with the experimenter. This implies that Sellers who would decide to sell the chip would not only lose their chip, but also the outcome information of the eventual exchange value. Put differently, if they were to sell the chip, they could not anymore satisfy the curiosity they might have regarding the exchange value. Of course the same goes for the Buyers: if they would not buy the chip they would not get the chip and their possible curiosity would not be satisfied. In the current article, we argue, however, that ownership may affect curiosity. As [Loewenstein \(1994\)](#) noted, curiosity can also be characterized as a loss-aversion phenomenon: a situation in which one loses the opportunity to obtain information is considered to be worse than a situation in which one merely not acquires the same information. If losses also loom larger than gains when information is concerned, this suggests that there may be an additional consideration for Sellers to hold on to their chip: Sellers may be curious to know the exchange value of the chip because if they were to sell the chip they would lose the possibility to know the outcome. Buyers may be less curious because buying the chips puts them in the gain domain. As a consequence, one might expect that Sellers would be more motivated to learn the exchange value of the chips bargaining chip. That is, one might expect that Sellers would be more curious to know the exchange value than Buyers.

The implication of this is that in addition to the loss aversion regarding the bargaining chips itself, loss aversion regarding the possibility to satisfy curiosity towards the eventual exchange value may add to the endowment effect for exchange goods with uncertain values. In order to explore the possible effects that curiosity may have on the endowment effect, we conducted two experimental studies.

2. Experiment 1

To provide a first test of our idea that curiosity may contribute to the endowment effect, we presented our participants a scenario of a trade of a lottery ticket. In this study, we not only assessed buying and selling prices, but also how curious (potential) Sellers and Buyers were regarding the lottery ticket. Our first prediction was that Sellers would ask a higher price (WTA) than Buyers would like to pay (WTP), replicating the endowment effect. Our second and more interesting prediction was that Sellers would be more curious than Buyers.

2.1. Method

A total of 43 participants at Tilburg university (29 females, 14 males, $M_{\text{age}} = 22$) were randomly assigned to each of the two experimental conditions: Seller vs. Buyer. The Seller scenario asked participants to imagine being endowed with a lottery ticket that could be worth any possible value in the range of €1 to €10. They were asked to rate their curiosity for the outcome value on a 7-point scale (1 = not curious at all, 7 = to very curious). Further, we asked the Sellers to indicate their minimum selling price for the lottery ticket. The Buyer scenario was similar. Participants read that a friend owned a lottery ticket and he was willing to sell it to them. The Buyers were also asked to indicate how curious they were towards the value of the ticket and they indicated their maximum buying price.

2.2. Results and discussion

The results of this experiment are shown in Table 1. We found the predicted endowment effect. Sellers indeed asked significantly more money to give up a lottery ticket ($M_{\text{WTA}} = €5.58$) compared to the price Buyers were willing to pay for it ($M_{\text{WTP}} = €1.91$). Remember that the more interesting part of the present study was to investigate if owners would be more curious about the true value of a

Table 1
Mean curiosity and Willingness to Pay (WTP)/Willingness to Accept (WTA) for Buyers and Sellers in Experiment 1 (standard deviation between parentheses)

	Buyer $n = 23$	Seller $n = 20$	$t(41)$	$p <$
Curiosity	3.26 (1.82)	5.20 (1.64)	3.65	0.001
WTP/WTA	€1.91 (1.86)	€5.58 (2.25)	5.84	0.001

exchange good (in this case a lottery ticket) than non-owners. A comparison of the levels of curiosity between Sellers and Buyers yielded a significant effect for ownership. The Sellers ($M = 5.20$) were more curious for the outcome compared to the Buyers ($M = 3.26$). Finally, consistent with our reasoning, we found a significant positive correlation between curiosity and buying or selling prices, $r = 0.45$, $p < 0.002$. Together, these findings provide a first indication that buying and selling prices for exchange goods with uncertain exchange values can be related to curiosity.

3. Experiment 2

In Experiment 1, we assessed curiosity ratings for bargaining chips with uncertain exchange values, and provided first support for our reasoning that curiosity may play a role in setting buying and selling prices. It may be noted, however, that although these findings are in accordance with our reasoning they do provide only preliminary evidence because we did not yet manipulate curiosity, and we did not include a condition with fixed exchange values. Moreover, we explicitly asked our participants to indicate how curious they were about the value of the lottery ticket, which may have induced the effect that we are interested in. Finally, the experiment was a scenario study, and hence did not involve real trade.

In our second experiment we remedied these shortcomings. For this purpose, we extended the original experiment of Van Dijk and Van Knippenberg (1996). As Van Dijk and Van Knippenberg, we included a condition in which the exchange value was fixed (the *Fixed Value* condition), and an Uncertain Exchange Value condition in which only participants that would end up with the chip would receive the outcome information of the exchange value (hereafter referred to as the *Uncertain with Information to Owner* condition). To these two conditions, we added a condition in which all participants (including the participants who sold or did not buy a bargaining chip from others) received the outcome information of the exchange value in the end (the *Uncertain with Information to All* condition).

We expected the minimum selling price of the Sellers to be lower in the Uncertain with Information to All condition than in the Uncertain with Information to Owner condition. This is because in the Uncertain with Information to All condition potential traders do not need the bargaining chip in order to satisfy curiosity about the exchange value: even if one decides to sell the chip or not to buy it, one will know the exchange value of the chip. In the Uncertain with Information to Owner condition only the eventual owner will learn the exchange value. As a consequence, loss aversion regarding the knowledge of the value of the bargaining chip may add to the endowment effect in the latter condition.

In a similar vein, one might predict that the Information manipulation affects buying prices because the curiosity premium for Buyers that is present in the Uncertain with Information to Owner condition is absent in the Information to All conditions. However, based on the results of our Experiment 1 and loss aversion interpretation of curiosity (Loewenstein, 1994) we predict that this effect will be less

pronounced for Buyers than for Sellers. The prospect of not satisfying the curiosity is assumed to weigh heavier for the Sellers than for the Buyers.

3.1. Method

3.1.1. Participants and design

Students at Tilburg University (45 females, 44 males, $M_{\text{age}} = 22$) participated in a series of studies of which the present experiment was the first. They were paid €5 (€1 \approx \$1.25) for their participation in the whole session. Participants were randomly assigned to one of the six condition of the 2 (Position: Buyer vs. Seller) \times 3 (Value: Fixed, vs. Uncertain with Information to Owner, vs. Uncertain with Information to All) design.

3.1.2. Procedure

Participants entered the laboratory in groups with a maximum of 12 people. Upon entrance half of the participants were endowed with a bargaining chip. The chip represented money because it could be exchanged for money at the end of the experiment. In the Fixed Value condition participants learned that the exchange value for the bargaining chip was always €1.80. In both Uncertain Value conditions the participants learned that the exchange value of the bargaining chip could be any amount of money between €0.90 and €2.70, depending on a random chance procedure. In the Uncertain Value conditions half of the participants learned that they would only receive the outcome information of the exchange value when they owned a bargaining chip at the end of the experiment (Uncertain with Information to Owner) and the other participants learned they would always receive the outcome information of the exchange value, irrespective of ownership (Uncertain with Information to All). The Fixed Value condition and the Uncertain with Information to Owner conditions are conceptual replications of the conditions used in [Van Dijk and Van Knippenberg \(1996\)](#).

Before exchanging the bargaining chip with the experimenter participants could trade the bargaining chips among themselves: the Sellers (who owned a chip) could sell this chip to the Buyers, who did not own a chip. The dependent variable for the Sellers was their minimum selling price (WTA), for the Buyers it was their maximum buying price (WTP). The procedure for indicating the buying and selling prices was modeled after the procedure used by [Van Dijk and Van Knippenberg \(1996\)](#) and [Kahneman et al. \(1990\)](#). On a separate form, prices were listed from €0.10 to €3.50 (with €0.10 intervals). Sellers were requested to indicate for each price whether or not they would sell at that price. Buyers indicated on their forms for each price whether or not they would buy at that price. The buying or selling prices obtained through this procedure were the dependent variables in our experiment.

After the WTA and WTP were indicated, the experimenter would randomly select a price on a separate form in the range of €0.10 to €3.50, thereby establishing the ‘market price’ for the chip. If Sellers had indicated they wanted to sell for the selected ‘market price’ and there were also Buyers who wanted to buy for that price, the experimenter saw to it that the chip was sold between the participants. It was stressed

from the outset that if they were willing to buy/sell at this randomly selected ‘market price’, the prices they indicated on the form were binding. With this procedure we diminished the possible effects of demand characteristics, which may affect choice behavior in experimental markets. This procedure was intended to prevent participants from misstating their true values. All Buyers had enough money for buying a bargaining chip, because all participants were paid €5 for participating in the larger experimental session. The participants who (after a possible trade between participants) possessed a chip exchanged their chip with the experimenter and they were paid the exchange value over and above the €5 participation fee which all participants received. In the Uncertain Value with Information to All conditions, all participants were given the outcome information of the exchange value. Subsequently, all participants were debriefed.

3.2. Results and discussion

The buying and selling prices were analyzed by means of a 2 (Position: Buyer vs. Seller) \times 3 (Value: Fixed, vs. Uncertain with Information to Owner, vs. Uncertain with Information to All) design ANOVA. An overview of the averages per condition can be found in Table 2. This analysis revealed a main effect for Position, $F(1, 88) = 25.66, p < 0.01$. This represents the endowment effect, indicating an overall difference between Sellers ($M_{WTA} = €1.89$) and Buyers ($M_{WTP} = €1.61$). Further, a Position \times Value interaction effect, $F(2, 88) = 3.81, p < 0.05$, was observed. Inspection of the relevant means in Table 2 reveals that the current findings replicate the findings of Van Dijk and Van Knippenberg (1996) that the endowment effect does occur for exchange goods, but only if the exchange value is uncertain. For the Fixed Value the mean for the Sellers did not differ significantly from the mean of the Buyers, $F(1, 83) = 0.83, ns$. Both of the uncertain value conditions show an endowment effect: for Uncertain with Information to Owner, $F(1, 83) = 23.94, p < 0.01$; for Uncertain with Information to All, $F(1, 83) = 9.22, p < 0.01$.

In order to further explore the behavioral effects of curiosity it is important to test for differences between the information manipulations within the uncertain value conditions. The predicted difference between the minimum selling price of the Sellers in the Uncertain with Information to Owner ($M_{WTA} = €1.97$) and the Uncertain with Information to All ($M_{WTA} = €1.85$) conditions was indeed significant, Tukey test, $p < 0.05$, one-way. This supports our theorizing on the possible effect of curiosity

Table 2

Mean buying and selling prices (standard deviation between parentheses) per condition in Experiment 2, in euros

	Fixed Value	Uncertain with Information to Owner	Uncertain with Information to All
Seller (WTA)	1.86 _a (0.07)	1.97 _b (0.18)	1.85 _a (0.17)
Buyer (WTP)	1.78 _a (0.22)	1.51 _c (0.39)	1.58 _c (0.32)

Note: Means with a different subscript differ significantly ($p < 0.05$). $N = 89$, per cell there were between 12 and 17 participants.

on the endowment effect. The introduction of outcome information for participants not owning a bargaining chip appeared to induce the Sellers to lower their minimum-selling price, towards the same price for which Sellers in the Fixed Exchange Value condition were willing to sell their bargaining chip. In agreement with our predictions, the information manipulation did not significantly affect the behavior of the Buyers in the uncertain value conditions.

4. General discussion

The present research investigating the effects of curiosity on the endowment effect resulted in a number of interesting observations. Both experiments supported our ideas about the possible role of curiosity in causing the endowment effect. In Experiment 1 we found higher levels of curiosity for owners as compared to non-owners. In addition, we observed a positive correlation between curiosity and selling and buying prices. Experiment 2 showed that owners of an exchange good demand less money for their chip when they know that they will learn the exchange value even if they sell, compared to a situation in which they lose the opportunity of knowing the exchange value if they would sell.

These findings suggest that if curiosity can only be satisfied by holding on to the exchange good (if you currently own the good) or buying the exchange good (if you do not own the good), curiosity may also lead to disparities between buying and selling prices. At this point, it may also be worthwhile to consider the broader consequences of our findings. In the current study, we limited ourselves to an investigation of exchange goods. Curiosity is not necessarily restricted to exchange goods, however. For example, prior studies have also documented endowment effects for consumer goods such as wines (e.g., [Van Dijk & Van Knippenberg, 1998, 2005](#)). Again these findings have primarily been explained on the basis of loss aversion, by arguing that the disutility of losing a bottle of wine exceeds the utility of obtaining a bottle of wine. As in the current study, it is conceivable that wine-owners realize that by selling the wine they not only lose the bottle, but also the possibility to satisfy their curiosity (“What would it taste like?”). More general, we think that the curiosity effect may generalize to all goods that have an element of uncertainty associated with them. Examples are intangible goods such as experience goods or services. These goods may be hard to evaluate beforehand, and sometimes even in retrospect, because it is often unclear what exactly to expect and how to judge the final experience. This uncertainty and the accompanying expectations may evoke curiosity in the consumers that already purchased the good, but have not experienced it yet. It is appropriate to note that we believe that the endowment effect, like many other complex psychological phenomena, may be multi-determined in the sense that it may actually stem from a set of different mechanisms or processes that operate jointly and independently. These mechanisms or processes may each contribute to the endowment effect. What we have found in the present research is that curiosity may play a role in setting buying and selling prices and hence in causing the endowment effect.

A final observation has to do with what the endowment effect actually refers to. The endowment effect is usually attributed to the tendency of owners to hold on to what they have got. The data from both our experiments suggest that the endowment effect may in fact be strongly related to the behavior of the non-owners. In Experiment 1, the expected value of the lottery ticket is €5.50. Interestingly, the Buyers were willing to pay €1.91 and the Sellers would on average not accept offers below €5.58. A t -test on the absolute differences with the expected value shows a significant effect, $t(41) = 4.05$, $p < 0.001$. In our Experiment 2, the same effect was found. The expected and objective value of the bargaining chip was €1.80 (the average of €0.90 and €2.70). The Sellers (owners) in the Uncertain Value condition were willing to sell their bargaining chip for €1.91 (€0.11 above the expected value), while Buyers were willing to buy a chip for €1.54 (€0.26 below the expected value). Again a t -test on the absolute differences with the expected value shows that the Buyer's under pricing of the ticket is larger than the Seller's overpricing, $t(42) = 2.51$, $p < 0.05$. After re-examining other literature, we encountered this pattern of results more often. For example, the study by Van Dijk and Van Knippenberg (1996) also showed larger deviations of the expected value for Buyers than for Sellers. A similar pattern was present in an endowment study by Kahneman, Knetsch, and Thaler (1991, p. 196) in which they used mugs with a normal selling price of \$6.00, and observed that Buyers were only willing to pay \$2.87 while owners were asking \$7.12 to sell their mug. The possibility that the endowment effect may be attributed to the Buyers' behavior may provide new insights in the theory of the endowment effect. A further investigation of the behavior and motives of the Buyers may produce new insights into the causes and consequences of the endowment effect.

Taken together, the present research has further explored some factors that may contribute to the fact that owners generally demand more money in order to give up a possession than non-owners are willing to pay in order to obtain it. We found that owners tend to be curious with respect to the value of their possessions, when the exact value is yet unknown. We also found that this may result in higher selling prices when possession is the only way by which this ambiguity can be resolved. Although we realize that curiosity is not the sole driver of the behavior of Buyers and Sellers, we do believe that the current data add to the understanding of the psychology of the endowment effect.

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