

# **The Endowment Effect in the Future: How Time Shapes Buying and Selling Prices**

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## **Abstract**

Little is known about the sellers' and buyer's valuations for transactions that will happen in the future although these situations are common in real life. Do the endowment effect become stronger or weaker the further in the future they are? We found that the endowment effect is strengthened in time in the first four studies. The results show that the timing of transaction systematically affects the endowment effect, making sellers' and buyers' evaluations more different the further away in the future they exchange goods. The first three studies indicate that the discounting of money is not the fundamental source of the increasing disparity, and the pattern is seen with three dissimilar items. The fourth lab-in-the-field study confirms the stronger endowment effect in the future by the evaluations from actual users on online flea market service. The fifth study uncovers the mechanism of the finding. The results suggest that sellers do not predict the duration-of-current-ownership effect and do not discount the future value of the item either, while buyers do discount the future value of the item.

Keywords: Endowment effect, Loss aversion, Time preferences, Sign effect

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## Introduction

It has been shown that people give a higher value to an object just because they own it. This pattern is called the endowment effect (Thaler, 1980). Much paper has investigated its mechanism, but the loss aversion is a leading explanation of this effect (Kahneman et al, 1991). However, little is known about the endowment effect for transactions that will happen in the future even though these situations are common in daily life (e.g., Booking hotels, Amazon market place, online flea market services and eBay). If gains are discounted in time more than losses (Frederick et al, 2002), which has been called the sign effect, then the endowment effect should be strengthened in the future. However, no study has tested the sign effect in the context of the evaluation of objects. We conducted five studies to investigate the endowment effect in the future and its mechanism.

## 2. Study 1-4

The first study was designed to test how the endowment effect changes at different points in time in the common situation where the transaction of the item and the money happen at the same time. The aim of Study 2 was to uncover if the discounting of the money solely explains the stronger endowment effect in the future or not. In Study 3, we replicated Study 2 with three dissimilar items which are expected to produce different degrees of attachment to investigate if the results of Study 2 are robust across different items. Study 4 tested the results of Study 1 in a real setting. Users on Wallapop, which is the most popular online flea market web service in Spain, were recruited, and we elicited sellers' willingness to accept (WTA) on their own items and buyers' willingness to pay (WTP) on items being sold on Wallapop with an incentivized experiment.

### 2.1. Method

In Study 1, 2 and 3, we conducted an experiment with hypothetical setup on Amazon Mechanical Turk in which 800 subjects in total. The study approximately took 7 minutes on average, and subjects received around \$0.5 for their participation. The subjects were randomly assigned to a buyer or a seller condition. The subjects in the seller condition were asked to imagine that they received an item as a gift; the subjects in the buyer condition were asked to imagine that they had the opportunity to buy the same item. The subjects then evaluated the item in the present and in different future moments. The buyers were asked to answer the maximum price that they would be willing to pay at time  $t_{money}$  to receive an item at time  $t_{item}$ ; the sellers were asked to answer the minimum price that they would require at time  $t_{money}$  to give up an item at time  $t_{item}$ .  $t_{money}$  and  $t_{item}$  have four scenarios ({today,

tomorrow, 1 month, 1 year}<sup>1</sup>). In Study 1,  $t_{money}$  is always equal to  $t_{item}$ . In Studies 2 and 3,  $t_{money}$  is always fixed to today in order to control the discounting of the money. The item used in Study 1 and 2 was a Game of Thrones poster. Two more items were used in Study 3: an autographed CD by their favorite artist or band and an ordinary mug. This allows us to detect if there is anything special about the poster in terms of attachment. Table 1 summarizes the studies.

In Study 4, the authors asked a web service called TurkPrime to recruit 130 Wallapop sellers who at least have one or more items on sale before the date of this study<sup>2</sup>. These subjects received the reward set by TurkPrime. This study employed two within-subject factors: role (seller and buyer conditions) and time scenario (tomorrow and one month), and the orders of the conditions and time scenarios were randomized. First of all, the subjects in the seller condition were asked to provide their URL of the webpage where their items were posted; subjects in the buyer condition were asked to choose the item which they like the most from the five items (smartwatch, wireless speaker, backpack, electric blush, and ukulele)<sup>3</sup>. Next, the subjects in both conditions evaluated the item if the transaction happens at different points of time. As with Study 1,  $t_{money}$  is always equal to  $t_{item}$ . (Tomorrow/In one month) scenario, the buyers were asked to answer the maximum price that they would be willing to give up to receive the chosen item (tomorrow/in one month); the sellers were asked to answer the minimum price that they would require to give up an item (tomorrow/in one month). This study was incentivized by BDM method (Becker et al., 1964). The randomly selected buyers had chances to receive the chosen item either tomorrow or in one month (also randomly determined) if their declared price was higher or equal to a random number generated by a computer, otherwise receive money equal to the amount generated by the computer<sup>4</sup>. The selected sellers had chances to sell their items either tomorrow or in 1 month if their declared price was smaller or equal to a random number generated by a computer.

## 2.2. Results

Consistent with previous findings on the endowment effect, the median WTA today was higher than the median WTP today in Studies 1, 2 and 3 (Mann-Whitney test:  $p < 0.01$ ). As Figure 1 suggests, in all of the Studies the endowment effect was significantly strengthened in

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1 We decided not to include the tomorrow scenario in Study 3 because the today and tomorrow's scenarios in Studies 1 and 2 are not statistically different.

2 From a URL provided by subjects, we could automatically check if the item was indeed posted on Wallapop at least one day before the experiment by web scraping. We excluded the subjects who did not meet these criteria.

3 This is to avoid for subjects giving price of 0. According to a pre-test, these five items were highly evaluated.

4 So, a buyer did not buy an item out of their pocket in order to avoid the income effect.

the future in the quantile regression analysis<sup>5</sup>. The regression of declared prices with the time scenario variable shows that medians of WTA were not different among time scenarios ( $p>0.1$ ), whereas medians of WTP decrease as transaction timing is delayed in the further future in all four Studies ( $p<0.05$ )<sup>6</sup>.

### 3. Study 5

The four Studies showed that the endowment effect was strengthened in time. However, the mechanism behind sellers' prices remains unclear. There are two broad causal mechanisms that could explain why sellers' prices did not change across the four scenarios in Studies 2 and 3. Strahilevitz and Loewenstein (1998) found that the value of objects increases with the duration of ownership, which is called the duration-of-current-ownership effect. If the sellers anticipated this effect while they discounted the future value of the item, both effects were canceled out. The other explanation is that the sellers neither expected the effect nor discounted the future value of the item. Therefore, Study 5 was conducted to investigate if participants anticipate the effect, which would shed light on the mechanism behind the patterns obtained in the studies.

#### 3.1. Method

200 people on Amazon Mechanical Turk participated in this study. The study took 9 minutes on average, and subjects received \$0.5 for their participation. Three items were used in this study as with Study 3. All subjects were given a question to elicit their valuation of the items. Specifically, the subjects were asked "how valuable you think the item would be to you after owning it for  $t$ " with scale from 0 (not valuable at all) to 10 (very valuable). Time  $t$  had three different values ( $t = \{\text{today, 1 month, 1 year}\}$ ), and the order was randomized across the subjects. After the main tasks, the subjects completed a demographic survey.

#### 3.2. Results

As can be seen in Figure 2, the CD was considered more valuable than poster (Mann-Whitney test:  $z=16.91$ ,  $p<0.01$ ), and the mug was considered less valuable than the poster for the subjects ( $z=7.62$ ,  $p<0.01$ ). The duration-of-current-ownership effect was not anticipated. According to quantile regressions, the valuations across the three scenarios are not significantly different among the three items ( $p>0.1$ ).

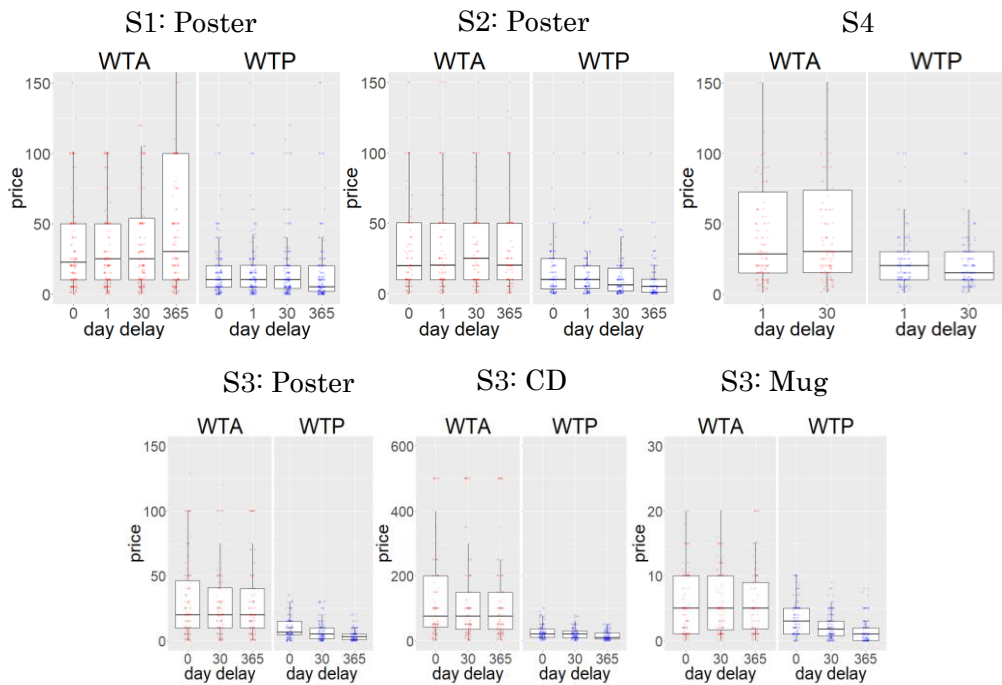
## 4. General discussion

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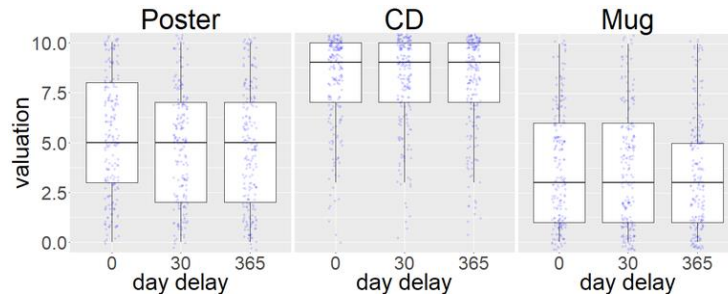
<sup>5</sup> They are median regressions. For all the Studies, both default standard errors and clustered standard errors are used, but results look very similar.

<sup>6</sup> On average, median of WTP decreases by €0.01 by additional day delay.

The paper presented here indicates that the endowment effect was strengthened in time. As the transaction is delayed in the further future, the gap between sellers' and buyers' prices became larger. Studies 1, 2 and 3 indicated that this pattern still remained in fixing the transaction timing for the money and hold among three quite different items. Furthermore, the stronger endowment effect in the future was also seen in Study 4 where actual Wallapop sellers and buyers evaluated items being currently sold. In Studies 2 and 3, sellers' prices remained constant across the different time scenarios. Interestingly, this is more pronounced pattern than what the sign effect suggests (Frederick et al, 2002), which future losses should be slightly discounted. The Study 5 shed light on the explanation for the stronger endowment effect in the future. Sellers do not predict the duration-of-current-ownership effect and do not discount the future value of the items either, while buyers do discount the future value of the items.



**Figure 1. The prices in different points in time by sellers and buyers: Study 1 (upper left), Study 2 (upper middle), Study 3 (bottom) and Study 4 (upper right)**  
**Each dot indicates one observation. The length of the box is the interquartile range of the sample. A line is drawn across the box at the sample median. The x-axis indicates the transaction timing of items in days.**



**Figure 2. Boxplot of the evaluation of three items in three scenarios: Study 5.** Each dot indicates one observation. The length of the box is the interquartile range of the sample. A line is drawn across the box at the sample median. The x-axis indicates the transaction timing of items in days.

**Table 1. The summary of the experimental design of the four studies**

	$t_{money}$	$t_{item}$	Item	Incentive	n
<b>S1</b>	Always equal to $t_{item}$	{0,1,30,365 days}	Poster	No	300
<b>S2</b>	Always today	{0,1,30,365 days}	Poster	No	200
<b>S3</b>	Always today	{0,30,365 days}	Poster, CD, Mug	No	300
<b>S4</b>	Always equal to $t_{item}$	{0,30 days}	Sellers: their items Buyers: 1 out of 5 items	Yes	130

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