

# Attachment or Ownership: Reference Point Shifts and an Experimental Test of Attachment\*

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## Abstract

This paper suggests a hypothesis that feelings of attachment change subjective valuation through reference point shifts. This attachment hypothesis can explain seemingly contradictory results of recent experiments concerning what are called endowment effects, in which there exists disparities of valuation between owners and nonowners. That is, individuals who are attached to a good value it highly. We propose a model of value function that illustrates the attachment hypothesis. In this model, feelings of attachment shift the reference point. In addition, we test the effect of attachment on subjective valuation by experimentally controlling attachment, using a psychological method called priming manipulation.

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Knetsch (1989) discovered the phenomenon, which he named the endowment effect, in which individuals who own a good tend to value the good at a higher price than individuals who do not own the good. This effect has been interpreted as the endowment effect created by loss aversion, a core ingredient of prospect theory (Kahneman and Tversky, 1979). Plott and Zeiler (2005, 2007), however, argued that the endowment effect is not appropriate for this phenomenon. That is, ownership does not moderate the endowment effect. They tested this with experiments using modified procedures to remove factors irrelevant to ownership, and concluded that they had to reject the explanation.

This paper suggests that the change of subjective value is created by attachment regardless of ownership. For example, Shimojo et al. (2003)

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identified a phenomenon, known as gazing bias, that if people looked at a person for a while, they tended to prefer that person. The result could be summarized as “the more they look at someone, the more they are attached to that person.” Thus, in the same way, the subjective value of a good is likely to change as attachment changes. If so, the endowment effect can be explained by this increase in the attachment of owners because they are attached to their goods by ownership. This attachment hypothesis can explain most of the recent findings that traditional endowment effect theory cannot explain (Plott and Zeiler, 2007; Knetsch and Wong, 2009).

An advantage of using the attachment hypothesis, in which people’s estimation of an object is moderated by attachment, is that this interpretation accounts for the puzzle, found by Isoni et al. (2011), that people have different attitudes towards goods and money. They observed that there exists an endowment effect for lotteries for money, but not for goods like a pen. The attachment hypothesis is likely to explain this difference. If people are instantly attached to lotteries for money at the moment they buy the lottery ticket, but are not attached to mugs, there exists an endowment effect only for lotteries for money.

I propose a value function model to express the attachment hypothesis. The standard model, in which the reference point shifts with ownership, cannot explain the recent findings. However, the model with the reference point shift depending on attachment can explain these findings. Although Plott and Zeiler (2007) rejected the explanation of loss aversion, this modified value function model based on loss aversion does work.

We tested the attachment hypothesis by an experiment that manipulated feelings of attachment. The experiment hypothesizes human nature: when we focus on negative characteristics of a good, our attachment to it would decrease. For example, consider your favorite item of clothing that has some stains. Usually you do not care about the stains but once you focus on them, your attachment would decrease. In the present study, the experiment focused subjects on negative characteristics of their goods to control attachment, and the result was consistent with the hypothesis.

The experiment used a psychological method called priming manipulation that stimulates subjects and controls what they focused on. Priming manipulation is widely used in psychological studies, but is rarely used in economics. Our paper is one of a few studies using this method in economics (Benjamin et al., 2010; Vohs et al., 2006).

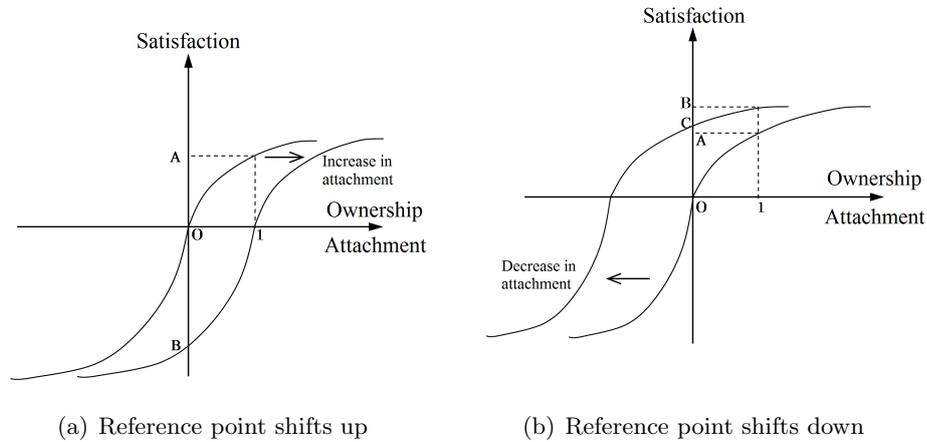


Figure 1: Reference point shifts with attachment

## 1 Reference point shift depending on attachment

Numerous studies have considered that reference point shifts with ownership. However, this cannot explain some research findings, for example, those of Knetsch and Wong (2009) in which changes of goods' location influenced subjective value. To interpret these findings, we must modify endowment effect theory by attachment. That is, an increase (decrease) in attachment makes the reference point shift up (down). The model shows that the higher the attachment is, the larger is the subjective valuation.

First, consider an increase in level of attachment. Figure 1a<sup>1</sup> shows that the reference point shifts up when individuals become attached. For buyers, when they buy an object the satisfaction depends on their level of attachment. If they are not attached, the reference point does not shift and the satisfactions are  $OA$ . If they are attached, the reference point shifts up and the level of satisfaction is  $OB$ . Owners' loss of satisfaction when they sell an object is  $OA$  if they are not attached, and  $OB$  if they are attached. Therefore, whether or not they own the object, if individuals are attached, WTA or WTP will be  $OB$  and if they are not attached, WTA or WTP will be  $OA$ . Due to loss aversion,  $OB$  is larger than  $OA$ .

Next, consider a decrease in attachment. Figure 1b shows the case of a decrease in attachment with the reference point shifting down. When the

<sup>1</sup>The figures refers to Strahilevitz and Loewenstein (1998).

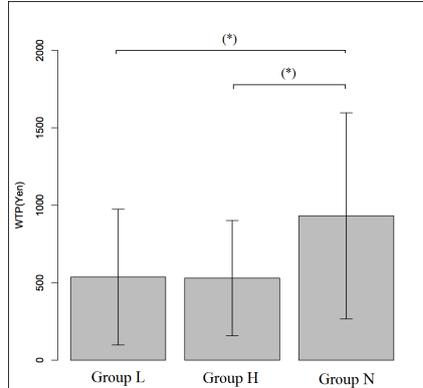


Figure 2: Results

reference point is at the origin, the satisfaction of buying and the loss of satisfaction of selling an object are both  $OA$  (i.e.,  $WTA$  and  $WTP$  are  $OA$ ). The satisfaction of buying and the loss of satisfaction of selling are both  $BC$  if they are disgusted by an object and the reference point shifts down. It is clear that  $BC$  is smaller than  $OA$  due to concavity of the function.

## 2 Experiment and Results

Methodology we employed was priming manipulation, a psychological technique, which control subjects' focus. In our case, we made subjects focus on weight. The experiment used a heavier pen than one people ordinarily use. Generally, this characteristic was negative due to its awkwardness. Our prediction was that their  $WTP$ s for the pen would fall because their attachment decreased due to mind control, and compared that with the neutral situation without priming manipulation.

The method of priming manipulation we used was the unscrambling task. Our unscrambling task<sup>2</sup> asked subjects to form a complete sentence using five words from a set of six by removing one irrelevant word. To turn their focus to weight, they solved an unscrambling task about weight.

After completing the task, they were asked their  $WTP$ , feelings of weight and usefulness.

As a result, first, subjects tended to feel uncomfortable with the heavy pen. Negative weight perception was significantly inversely correlated with

<sup>2</sup>One of the studies that used an unscrambling task is Vohs, Mead, and Goode (2006).

perceived usefulness ( $F(1,48)=5.168, p<0.03$ ). This indicates that weight was a negative characteristic for pens. Next, differences between distributions of each group's WTP were examined. Our null hypothesis was that each group had the same mean; the alternative hypothesis was that they had different means. WTP for group N was higher than that for group L ( $t(33)=-2.0724, p<0.05$ ; Mean(N)=931.6, SD=664.99; Mean(L)=546.3, SD=424.95), WTP for group N was also higher than for group H ( $t(32)=-2.196, p<0.04$ ; Mean(H)=539.3, SD=360.00), but there was no significant difference between the WTPs of groups L and H ( $p<1$ ).

Similarly, differences between how strongly they perceived weight were examined but there were no significant differences between groups (Mean(L)=7.71, SD=1.54; Mean(H)=6.82, SD=1.48; Mean(N)=7.28, SD=1.69).

Furthermore, there were no differences between their perceptions of usefulness (Mean(L)=3.65, SD=2.84; Mean(H)=4.54, SD=1.95; Mean(N)=5.08, SD=2.15).

### 3 Conclusions

Our study investigates whether the endowment effect is generated by the disparity of feelings of attachment to an object among individuals. Earlier research had revealed some phenomena that endowment effect theory, in which reference point shifts are hypothesized to depend on actual ownership, cannot explain (Plott and Zeiler, 2007; Knetsch and Wong, 2009). Our hypothesis, that the reference point depends on feelings of attachment, can resolve these anomalies.

In model section, we showed that prospect theory still works if the function is modified by the addition of attachment. A value function model, in which reference point shifts depend on attachment, is an appropriate to the hypothesis.

To test this assumption, an experiment was conducted in which subjects did not differ in ownership. Subjects were controlled only by their attachment and were asked to reveal their WTP. Subjects were administered priming manipulation to control what subjects focused on. This procedure hypothesized that people's attachment decreases when they unconsciously focus on negative characteristics. Our results confirmed that subjects with decreased attachment put a lower value on the object.

We suggest that further investigation of the factors that change attachment to goods is needed. This paper lacks detailed reasons for variation of attachment. To solidify the hypothesis, we need to reveal how object

attachment is generated.

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