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**Endowed with Awareness: The Effect of Information on Appearance of Endowment Effect**

**Introduction**

Economists have found evidence for an ‘Endowment Effect’ by which people ascribe value to things merely because they own them (Thaler, 1980). This effect is extremely broad, having been found even among Capuchin monkey populations (Lakshminaryanan et al. 2008). Our experiment tests whether telling participants about this phenomenon would have an effect on its manifestation by replicating Knetsch’s (1989) two-good endowment effect experiment with an additional ‘information’ treatment. We hypothesize that knowledge of the endowment effect will reduce its appearance in participant behavior. In reality, we did not find an endowment effect, nor a significant change in actions due to this new information. This type of experiment has broad implications, as it can help to understand the mutability of irrationality and the effect of expert subject pools.

**Literature Review**

The endowment effect has long been of interest to economists due to its far-reaching implications for behavior in markets. Previous experiments have found significant evidence for its presence among different subject pools. Kahneman, Knetsch and Thaler (1991) in their experiment at Cornell University show that, compared to induced value tokens, the volume of trades of consumer goods like mugs and pens is significantly lower. In another paper by these authors published in 1990, evidence is provided for a notable disparity between Willingness to Pay (WTP) and Willingness to Accept (WTA), indicating that people do exhibit an endowment effect. Knetsch (1989) explores the endowment effect as it manifests when people are given a choice between two consumer goods rather than an item in exchange for monetary compensation. Out of the abundance of literature on the endowment effect and loss aversion, we chose to replicate Test 1 conducted by Knetsch to show the effect of having information about the endowment effect on its manifestation. This simple comparison of the preferences of two goods shows clearly the endowment effect outside of a buyer-seller context.

Kahneman et al. (1990) posited that the endowment effect occurs as a result of innate human preferences, including loss aversion. Huck, Kirchsteiger and Oechssler (2005) suggest that the endowment effect is caused by a genetic predisposition since in an evolutionary environment people are better off with such a cognitive process. They describe the endowment effect as a utility maximizing construct, considering that bilateral bargaining has always been a feature of human existence. Novemsky and Kahneman (2005) stress the role of anticipated emotional responses to loss and intentions to exchange the good in their discussion of the endowment effect. They also consider the phenomenon a result of differences in cognitive focus when endowed with a good and when not. Being endowed with a good causes a person to focus on the good when evaluating a possible exchange for money whereas not being endowed leads to a focus on money. Induced emotions are thus given precedence.

One subject of interest across the discipline of experimental economics is the external validity of experiments conducted using the popular subject pool of economics students. The central question here is one of external validity: does the subject pool employed by experimenters provide results that are indicative of the population as a whole, and in a non-lab setting? Carter and Irons (1991) conducted a $10 ultimatum game to test whether economists behave differently than non-economists, and found that economists yielded results that were significantly closer to the Nash equilibrium predictions than non-economists. They also found strong evidence to support Marwell and Ames’ (1981) selection hypothesis, the idea that this observed difference in behavior stems from people who are motivated by financial incentives self-selecting into economics. Economists do not make perfect Nash-compatible choices, however; Carter and Irons (1981) observed an average ‘accept’ minimum five standard deviations above the Nash prediction among economists. Bauer and Schmidt (2008) note results which suggest that economics students have both a significantly lower WTP and WTA compared to other respondents, indicating that existing studies on efficiency loss and the endowment effect that rely on data from economics students may be biased.

Sapienza and Zingales (2013) examined the difference between the thoughts of economists and ‘average Americans’ on policy through various surveys. They found a vast discrepancy. Conversely, when examining age, Harbaugh, Krause, and Vesterlund (2001) observe that large increases in age do not reduce the endowment effect, supporting the hypothesis that people have reference-dependent preferences which are not changed by repeated experience getting and giving up goods. This difference, along with the various other experiments mention, call into question the effects of experts and extra knowledge in subject pools. By explicitly making a treatment group “experts” by informing them about the endowment effect, we will see whether aspects of experimentation such as using economic students and experience in experiments should merit concern.

**Procedure**

The experiment was conducted at Carleton College and its participants, 49 in total, were all Carleton students. Our experiment was conducted in three treatments, one of which was our control, with two groups in each treatment. Subjects were randomly selected to participate in one of the three treatments.

The control group consisted of 12 participants, 6 of whom received information about the existence of the endowment effect, and 6 of whom did not. These two groups were brought into separate rooms, where a sheet of paper with instructions and a questionnaire for designating responses was distributed and all text on these sheets was read aloud to participants. Participants in the control group were asked to assign their true value, in dollars and cents, to an accordion folder and a wide-ruled composition notebook, both of which were purchased at Target for $1.00 each. The items were placed on the blackboard ledge in the classrooms in which we conducted the experiment, and were labeled according to the arbitrary letters we assigned them. After assigning a monetary value to the items, control group subjects were asked to write which item they would prefer to have. After completing these items on their provided instructions and form, the experimenters collected their responses and paid these participants a $1.00 show up fee before dismissing them.

After the control session, our first treatment (henceforth “Not Told”) was a replication of a standard endowment effect experiment using two goods. All subjects in this treatment were brought into one room, where a questionnaire with instructions was distributed to all participants. Two forms of the questionnaire--P and Q--were distributed to participants. All text on the instructions was read aloud to the participants. The letter on the questionnaire indicated to experimenters who would be endowed with which of the two goods--folder or notebook, which were then distributed to the participants according to the form of their questionnaire. Participants were informed that they would take home the item of their choosing. Participants were given a few minutes to examine the item given to them, and then were shown the item they were not given. As in the control group, participants were asked to indicate their true value, in dollars and cents, for both items. The last item on the questionnaire asked participants to indicate whether they would like to keep the item they were given or swap for the alternative item. One at a time, participants met with an experimenter in the hallway, where their questionnaire was collected and swaps for alternative items were conducted, if requested.

Our second treatment (“Told”) was conducted using the same procedure as the Not Told group, but participants in this treatment received information about the existence of the endowment effect on their instructions and response sheet. This information was displayed in bold text on the questionnaire and read aloud along with the rest of the instructions.

**Results**

In order to determine whether telling participants about the endowment effect had an impact on its appearance, we first need to confirm the existence of an endowment effect. We did this by following a technique outlined in Knetsch’s endowment effect experiment (1989) by which we created a table comparing preferences of one item over another.

**Table 1**

|  |  |  |  |
| --- | --- | --- | --- |
| Treatment 1: Not Told | Notebook over Folder | Folder over Notebook | Participants |
| Given Notebook | 33% | 67% | 9 |
| Given Folder | 33% | 67% | 9 |
| Control | 50% | 50% | 6 |

The table above shows the percent of participants from the Not Told treatment who preferred their given item versus the alternative item in the various groups. This table can be interpreted as followed: if an endowment effect is present, those given the notebook should show a higher preference for the notebook compared to those given the folder or to those in the control. For instance, Knetsch found 89% preference for mugs among those given mugs, while only a 10% among those given candy, and 56% preference for mugs in the control. Our results, however, do not suggest an endowment effect. While those given the folder do appear to prefer it slightly more than the control group, the fact that the notebook and folder group exhibit proportional preferences, regardless of which item initially given, implies that there is no endowment effect present. This data also calls into question the validity of our control, as the preferences expressed by the control do not seem to reflect those of the participants in Not Told treatment, despite no appearance of an endowment effect.

We analyzed the data from the told Treatment in a similar fashion. Below is the corresponding table:

**Table 2**

|  |  |  |  |
| --- | --- | --- | --- |
| Treatment 2: Told | Notebook over Folder | Folder over Notebook | participants |
| Given Notebook | 67% | 33% | 9 |
| Given Folder | 40% | 60% | 10 |
| Control | 83% | 17% | 6 |

At first glance, our results for the Told Treatment also seem to negate the existence of an endowment effect since those given the notebook prefer it less than those in the control, however, we must consider the possibility that this control is an outlier. The difference between the two control groups is too large to be explained purely by the difference in non-applicable information about the endowment effect (since the control group made their selections without being endowed with an item). If we consider the proportions of the notebook and folder group, standalone, we do see an endowment effect. Those given the notebook prefer the notebook at a 67% rate, while those given the folder prefer their own item more (with folder selection at 60%).

It should be noted that this is contrary to our hypothesis that telling participants about the endowment effect will minimize it. If anything, we saw the formation of an endowment effect from the Not Told to the Told Treatments. To explore this further, we now consider the monetary values participants assigned to each item for a more nuanced look at their decision making. We examine the differences between the two items’ values across the treatments. Returning to our original hypothesis that there would be an endowment effect that would then diminish after telling participants about it, we would expect that the difference in values between the item given and the alternative item to decrease. Below is a table of differences across the two treatments:

**Table 3**

|  |  |
| --- | --- |
| Not Told | Told |
| -0.25 | 0 |
| 0.2 | 1.49 |
| 0.5 | 0.6 |
| 0.75 | -1.4 |
| -0.5 | 0.75 |
| 1.5 | 0 |
| 0.75 | 0 |
| -0.5 | -1 |
| 4 | -0.25 |
| -0.25 | 0 |
| 0.5 | -0.75 |
| -1.5 | 1 |
| 1 | 1.35 |
| -1.5 | 1 |
| -1.67 | 2 |
| 1.99 | -1.25 |
| -2.5 | 0 |
| 0 | 0 |
| -- | -0.5 |
| **0.14** | **0.16** |

We ran a two-tailed t-test for a comparison between two means, to test whether the difference in average means was significant. We found a p-value of .96, which indicates to us that there is no significant difference among means. This makes sense, given that the average difference actually increased instead of the gap narrowing as we would expect had the endowment effect declined with information given.

We then created a 2x2 contingency table to conduct a chi-squared Fisher’s test. The point of this test, as applied to our experiment, is to examine whether being told about the endowment effect created a significant change. We first examined those given the folder across both treatments and then those given the notebook to see if more people selected their given object instead of swapping. Given our previous results, we would expect to find no significant difference.

**Table 3 - Those given Folder in Treatment 1 and 2**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Folder | Notebook | Total |
| Treatment 1 (Not Told) | 6 | 3 | 9 |
| Treatment 2 (Told) | 6 | 4 | 10 |
| Total | 12 | 7 | 19 |

**Table 4 - Those given Notebook in Treatment 1 and 2**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Folder | Notebook | Total |
| Treatment 1 (Not Told) | 6 | 3 | 9 |
| Treatment 2 (Told) | 3 | 6 | 9 |
| Total | 9 | 9 | 18 |

The p-values for these tests were 1 and .35 respectively, neither of which are at the significant level, showing that telling people about the endowment effect had no notable impact.

**Conclusion**

To summarize our findings, we did not find an endowment effect in our Not Told treatment but in our Told treatment we found more evidence for an endowment effect, although not a statistically significant level. The lack of presence of an endowment effect contradicts previous findings in the the literature. Similarities between Told and Not Told treatment results prevents us from rejecting our null hypothesis that knowledge will not change participants’ behavior.

Perhaps the most striking element of our data is the anomaly of our control group. Consequently, how we define rationality is of interest to us in analyzing these results, as a portion of our control made decisions that may be construed as irrational. Four out of our 12 control participants failed to select the item to which they assigned a higher value. Sugden (1991) discusses rational choice, which, according to standard theory, requires a set of known preferences and that a person’s preferences meet standards of consistency, such as transitivity. If someone has incomplete preferences, they can be said to make decisions that are non-rational. It is shown that individuals who act as rational choice theory prescribes are not always as successful at obtaining their objectives as those who do not. Sugden concludes that the foundation of rational choice theory is less secure than it was once considered to be.

Our control group is clearly an instance of rational choice failing to materialize in the data set. One possible explanation for the control’s violation of rational choice theory is that participants may have interpreted the instructions incorrectly, responding with their perception of an item’s store value as opposed to what they would be willing to pay for the item--their true value. If this experiment were to be conducted again, we would suggest that experimenters take measures to clearly define true value in participants’ instructions.

An obvious difficulty of running experiments in economics at Carleton College is the small subject pool available to us. Tversky and Kahneman (1971) noted that psychologists frequently put faith in the law of small numbers, which, if believed by experimenters, leads to overconfidence in the robustness of results obtained from small sample sizes. With this in mind, we note that a larger subject pool may have yielded different results. An additional explanation for the absence of an endowment effect may be that the novelty of swapping overpowered participants’ attachments to their endowed item.

Despite our initial hypothesis not proving true, there is literature to support our findings. Our results certainly speak to the persistence of irrationality. The statistical insignificance of telling people about the endowment effect seems to suggest that behaviors are fixed. In an experiment about social theories, participants were told false data about the correlation between firefighters’ risk taking and success rates (Anderson et al., 1980). Next, they were asked to rate their hypothesized success rates for various fictitious firefighters. Participants were then told that the correlation information was fictitious. Despite this knowledge, in a follow-up success rate ranking session, participants continued to evaluate firefighters along the rationale outlined by the correlation. This suggests people are not able to incorporate new information easily in their decision processes.

Likewise, in a study done by Lei et al. (2004) the researchers found inherent fixed irrationality. Unike Anderson et al., the experimenters removed the dimension of conveying new information. Rather, Lei et al. ran two market simulation games. In one, participants could resell stock, while in the other, the only reason to purchase stock was to receive dividends. The experimenters found that in both treatments, bubble emerged. This is fascinating as, in the treatment where resell was prohibited, it was as if participants were forced to believe speculative behavior was dumb since that option was removed, and yet bubbles still occurred. It appears that the fixedness of irrationality is not simply due to not accepting newly conveyed information; rather, it can be ingrained in people. With these two studies in mind, our results do not actually appear anomalous as the literature supports the idea that people fail to incorporate knowledge of irrationalities into their behavior.

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**Appendix**

The following instructions were used in our experiment:

**Group P Instructions**

You have been selected to participate in an economics experiment. Now that the experiment has begun, please refrain from talking. If you have a question, please raise your hand and an experimenter will come to assist you. You will shortly be given an item. This is yours to keep, unless you decide to exchange it for an alternative item. Please take the time to examine it and then write down your value (in dollars and cents) for the item. After this, we will show you Item Q. Please indicate on the given line your value for this item. After that, circle if you would like to keep your item or swap it for the alternative item. You will take home the item you choose.

Value for Item P \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Value for Item Q \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What would you like to do? Keep my Item Swap for the Other Item

**Group Q Instructions**

You have been selected to participate in an economics experiment. Now that the experiment has begun, please refrain from talking. If you have a question, please raise your hand and an experimenter will come to assist you. You will shortly be given an item. This is yours to keep, unless you decide to exchange it for an alternative item. Please take the time to examine it and then write down your value (in dollars and cents) for the item. After this, we will show you Item P. Please indicate on the given line your value for this item. After that, circle if you would like to keep your item or swap it for the alternative item. You will take home the item you choose.

Value for Item Q \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Value for Item P \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What would you like to do? Keep my Item Swap for the Other Item

**Group P Instructions**

You have been selected to participate in an economics experiment. Now that the experiment has begun, please refrain from talking. If you have a question, please raise your hand and an experimenter will come to assist you.

Please consider the following piece of information:

***Economists have found evidence for an ‘Endowment Effect’ by which people ascribe value to things merely because they own them*** (Thaler, 1980)*.*

In short, people tend to overvalue things in their possession.

You will shortly be given an item. This is yours to keep, unless you decide to exchange it for an alternative item. Please take the time to examine it and then write down your value (in dollars and cents) for the item. After this, we will show you Item Q. Please indicate on the given line your value for this item. After that, circle if you would like to keep your item or swap it for the alternative item. You will take home the item you choose.

Value for Item P \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Value for Item Q \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What would you like to do? Keep my Item Swap for the Other Item

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Value for Item Q \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Value for Item P \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What would you like to do? Keep my Item Swap for the Other Item

Instructions

You have been selected to participate in an economics experiment. Now that the experiment has begun, please refrain from talking. If you have a question, please raise your hand and an experimenter will come to assist you.

In this experiment, you will be asked to assign your value, in dollars, for two different goods.

Please write your value for object P on this line: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Please write your value for object Q on this line: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Please write which item you would prefer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Instructions

You have been selected to participate in an economics experiment. Now that the experiment has begun, please refrain from talking. If you have a question, please raise your hand and an experimenter will come to assist you.

Please consider the following piece of information:

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In this experiment, you will be asked to assign your value, in dollars, for two different goods.

Please write your value for object P on this line: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Please write your value for object Q on this line: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Please write which item you would prefer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_