

# ***The Impact of Loss Aversion and Endowment Effect on Self, Gender and Children's Identity***

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**Abstract:** This paper will be examining the effect of endowment effect and loss aversion on individuals through the lenses of self, gender and age, i.e. children, respectively. When examining the endowment effect on self-enhancing by an example of shopping, loss aversion and the endowment effect is found to be more intense to an individual when one is more conscious of “self-threat” (i.e. when prices are higher). Through the lenses of gender, there is a lack of evidence of whether loss aversion is more effective to one gender. However, there are quite a few studies that point to the fact that loss aversion has a relatively more negative impact on female, vice versa, ceteris paribus. In the situation of children, quite a lot studies have proved that endowment effect will not work on children unless someone lead them to focus on themselves, however, children will be obviously affected by loss aversion.

**Keywords:** endowment effect, loss aversion, identity, behavioral economics, age, children, gender, self

## **1. Introduction**

Loss aversion is a well-known behavioral bias that is widely used in the economic field as well as various other fields of study. It is known as the phenomenon that “the response to losses is stronger than the response to corresponding gains” [1]. It was then discovered in further studies that the loss experienced by an individual of a loss is two times more immense than an equivalent gain. In addition, the emotional bias of loss aversion is now defined as the endowment effect.

This paper focuses on the examination of the influence of loss aversion and the endowment effect on self (namely self-enhancing), the two physical genders (i.e. male and female) as well as children. In a 2013 study led by Dr. Promthesh Chatterjee, loss aversion was examined with a specific focus on self-enhancement. The concept of self-enhancing was identified with the two key concepts of self-affirmation and self-threat. As price rose, self-threat rises consequently and so does the endowment effect and thus consumers or individuals will have to use various other methods to establish self-affirmation [2]. For gender-based research on loss aversion, three studies were given special attention to in this paper. The first is about a pure model-based study on loss aversion where the loss aversion of male and female was compared by creating models of four different definitions of loss aversion

[3]. The second is an experiment designed to examine the impact of loss aversion and endowment effect on the gain of profit of male and female [4]. The third is a real-life study of a new grading system implanted in the University of Kentucky where instead of earning points, all students are ranked with full marks at the start of the semester and lost points as the tests were done [5]. This design of ranking allowed a clear indication of the effect of loss aversion on male and female students. For age based (namely children) research on loss aversion and the endowment effect, we selected three research that are representative. The first is an experiment aimed to test in which kind of situation children can be affected by the endowment effect by letting them ranking objects and designing picture of a farm in three different visions [6]. The second one is a experiment about making college students and children choose a few kinds of equally value objects and ask them if they want to change for another object by using object they have [7]. The third one is a real-life study of comparing children's reaction when they were given two options at the beginning and when they were first given an option but force them to change the option to another one.

## 2. Literature Review

In 1979, Kahneman and Tversky came upon the discovery of loss aversion which is the tendency of people to value asymmetrical loss considerably more (approximately two times more) than gain. This was first observed by creating a model of decision making under risk where values are assigned to gains and losses and probabilities are replaced by decision weights [8]. This research soon led to an evolution of various fields of study. To be specific, in 2019, Alesina and Francesco collaborated on research investigating on how loss aversion can influence canonical spatial voting models, deviating results significantly from the “standard” [9]. In another case, Humphreys and Pérez analysed the effect of loss aversion on the decision of consumers to watch sporting events, with the sample being the TV viewing audience size of La Liga, a top Spanish football league [10]. In addition, Takeuchi's team examined the reasons and results of pathological gambling (PG) (which is the behaviour of continuous gambling despite of consistently losing) in terms of loss aversion, suggesting that it is a heterogeneous disorder [11]. It is clear from these studies that loss aversion spreads around quite a few fields of academics. However, the flourishing of the loss aversion bias is most noticeable in the economics and financial field of knowledge. Earlier on than most other fields of studies, in 1993, a study done by Johnson and Simon explores how the brand choice is influenced by a reference point of the brands' position with the additional application of loss aversion [12]. In 2008, Freund and Caglar analysed a model of a government that maximized welfare, investigating the influence of loss aversion on trade policy [13]. More recently, a study done by Yang in 2019 aids the understanding of the financial market through the lenses of loss aversion [14]. Loss aversion can also be found commonly in everyday life: when given a 30-day free trial for the VIP of YouTube, loss aversion will encourage people to keep with the reference point of maintaining the VIP; when asked to trade an object for another, people tend to stick with what they initially have since loss is valued more than gain; when buying stocks, one is less likely to choose a stock that is high in risk even though the potential reward may be high since they cannot afford the thought of losing money. With all this said, loss aversion has been a prevalent bias no matter how one approaches it. However, most studies have examined this bias as a whole (i.e. in general), neglecting the fact that identity may also affect the way loss aversion influences individuals. There have been multiple, individual studies on how gender, self, race and other identities may influence an individual in terms of loss aversion. However, this paper seeks to examine these differences all together, comparing them with each other and hopefully providing a new perspective of perceiving the loss aversion bias.

For the section that evaluates the role of endowment in self-enhancing, by conducting experiment studies, Chatterjee has suggested the connection between self-enhancing and the valuation of objects, which illustrated the role of the endowment effect and loss aversion in the market valuations [2].

Furthermore, the role of self-integrity and the defending actions under the self-threat was suggested through empirical studies of experiments by Sherman and Lin et al. (Sherman et al.2006; Lin et al. 2005).

Following that, when analysing the effect of loss aversion on gender, four definitions of loss aversion were examined via modelling, attaining a range of different results of the effect of loss aversion for male versus female [3]. In addition, an experiment base on a designed stock market involving risky stocks was applied to examine the reaction of loss aversion on different genders [4]. Last but not least, a real-life based experiment was done in the University of Kentucky where students of different gender were analysed on their reaction of the endowment effect when a different grading system is implanted [5].

In the fall and winter of 1998, 163 participants from New Mexico participated in experiments by Harbaugh, W. T., Krause, & Vesterlund to see whether the endowment effect would diminish with age. Their research has provided other economists with a different perspective on the endowment effect on ages. They collected data at a public elementary school on 125 students from kindergarten, third, and fifth grade classrooms as well as 38 undergraduates in introductory economics classes from the University of New Mexico. In order to further explore the endowment effect on children, Hood, B., Weltzien, S., Marsh, & Kanngiesser, P. conducted research in 2016. There were 20 British children in each condition. The second co-pilot author's experiments in Norway as part of a class project to develop the liking-scale approach served as the foundation for this sample size. A significant impact size ( $d = 0.852$ ) was seen when comparing the change in value of a toy given to the child in the self-focus condition with the other condition.

### 3. Endowment Effect on Children's Identity

It is believed that the experience of shopping accumulated by an adult is more reliable than the experience accumulated by children, and it works the same on the part of the endowment effect and loss aversion. However, it is proved that it is only a kind of stereotype. It is proved that the influence factor of the endowment is not the age or the experience you have. The endowment effect appears to be a 'real' part of preferences rather than a mistake that diminishes with experience and learning. The first research selected 163 people as sample, included 38 undergraduates in introductory economics classes at the University of New Mexico and 125 students from kindergarten, third grade, and fifth grade. Each person is given a kind of object and is asked if him want to change his good to another one, and this game has been repeated three times. The goods are Key chain with a toy alien attached, Small irregularly shaped super ball, Mechanical pencil, Highlighter marker, Six-function electronic calculator, Box of eight colored 'overwriting' markers, Chocolate bars x2, and Coffee mug. Although students in third and fifth grades have much more experience in buying, selecting, and abandoning goods compared with students in the kindergarten, they showed no less affected by the endowment effect. When it comes to the undergraduates, though they have exponential experiences than students in kindergarten, the result is still the same [7]. This experiment showed age is not a factor that can less the endowment effect. Another experiment showed that if we lead children to focus on the independent consciousness, they will be affected by the endowment effect, and show strongly loss aversion. At the beginning of the experiment, they taught all the children in the sample to use different stickers to express their feelings towards the object in front of them. When they feel interested of the object, they will use a smiling sticker. When they dislike the object, they will use a sad sticker. The stickers have five levels. Then the children were asked to mark five objects, i.e., a piece of paper, two identical spin-top toys, one control toy, and a toy that attract children the most among other four objects. The control toy is a plastic boy and has already been proved that attract children the same as the spin-top toys. The spin-top toys are used for testing the endowment effect. The researchers gave one of the spin-top to a child, and then put another spin-top and the control toy to a table that the child

cannot reach. The child then is asked to create a picture of farm in three different visions. Self, others, and common. In the self-vision, the child is led to draw a picture of him own and pick clothes, hair, and organs that are similar to his in order to better concentrate his attention on him own. When all the pictures of farm are finished creating, the children are asked to rate again. Finally, children are questioned if they want to change the toys on the table with the toy they already have. The result is most of the children are unwilling to change after they focused their attention on their own. That has proved if children has focused their attention on their own, they will be affected by the endowment effect [6]. We also did a simple case study. When we first tell a child who is not allowed to play video games usually that he can play video games for one hour tomorrow, he will be happy. However, if we tell him he cannot play game tomorrow but replace it with two hours the day after tomorrow, he will show strongly resist and loathness. That happens even if we promise him three hours instead of two. What interesting is, if we give the two options to him directly at the beginning, he will choose to wait for one day and play two hours without any hesitation. Those examples showed children may not be affected by endowment effect when they are not being led to focus on themselves, but they will be affected by loss aversion most of the time

#### 4. Endowment Effect on Gender Identity

Loss aversion has been studied and explored by various researchers in the past. It has been shown that on the level of pure modelling that according to different definitions, a range of different answers to the effect of loss aversion can be generated for the two genders. To elaborate, when using the definition of Cumulative Prospect Theory (CPT) which is a well-recognized definition that allows a differ in gain and loss, women are as loss averse as men. When using the Original Prospect Theory (OPT) definition which fixes the drawback of CPT and cancels the weight of decision in calculation, women are found to be less loss averse than men; the same result was attained when using the Markowitz-Expected Utility (MEU) definition which was defined before the discovery of the prospect theory and thus it defines loss aversion as unrelated to the prospect theory. When using the Gain-Loss Ratio (GLR), which is a measure of “behavioral loss aversion”, women are discovered to be more loss averse than men [3].

In the experimental field, an experimental design of the stock market was created and subjects were given the portfolio choices of 6 high-risk assets. As a result of analysis, women were shown to be more risk averse since they bought less stock on average. This shows the underlying psychology of women to be more reluctant of capital loss. However, since the overall profit of male and female were similar on average, the experiment doesn't prove women to be more suitable for the stock market, it only shows the disposition effect of women to be higher than men (Figure 1) [4].

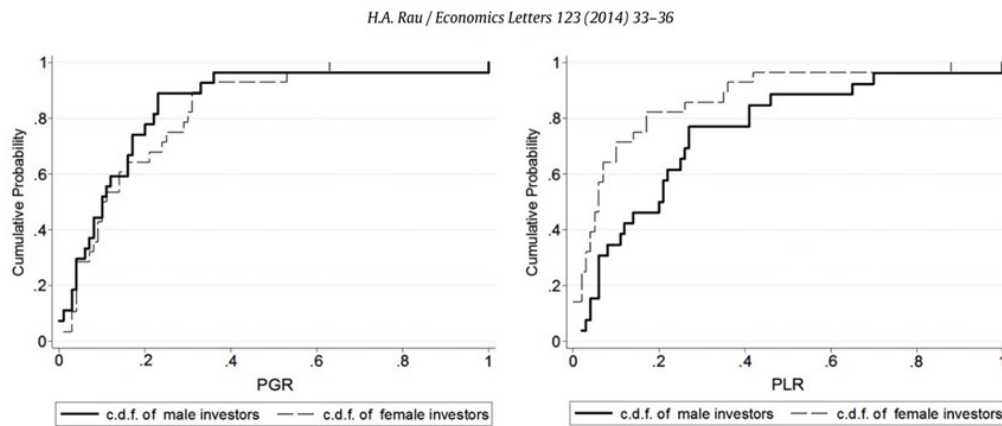


Figure 1: The proportion of gain realized (PGR)(left) and proportion of loss realized (PLR) (right) of male and female.

On the level of reality, Maria Apostolova-Mihaylova and others set up a new grading system in the economics class of the University of Kentucky where students were given full marks on all assessment grades and the points were deducted as students goes through tests throughout the semester. The subjects, sophomores and juniors from the economic class of the University of Kentucky, were set into groups so that they peer evaluate each other at the end of the semester on a various range of criteria which sums up to be the contribution of each subject to the group in terms of grade. By collecting data through a pre-course survey, a post-course survey, the registrar's office, and instructor records, the researchers obtained the control group of the ability of the subjects before the grading system was implanted. The students were then assessed through the means of quiz scores, project grades as well as three exam grades.

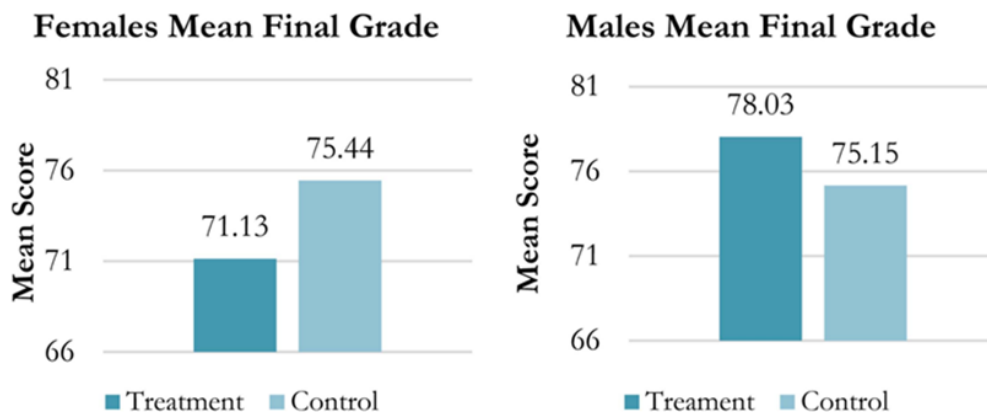


Figure 2: Mean Final Grade for Females and Males.

After analysing the results, researchers found out that students in all-male groups have a higher possibility of being motivated by the loss framing of the course grade set by the researchers while the opposite happens to students in all-female groups (Figure 2). Thus, when implanting such a rating system in any coeducational environments, the educator would face a challenge of balancing between the costs and benefits due to different reactions of different gender to the innovative grading structure [5].

## 5. Endowment Effect on Self-enhancing

Self-enhancement is referred to as a tendency to value the self when encountering a threat or under the fear of impoverishment [2]; the application of the endowment effect can be illustrated in the context of market valuations. The case study below gives a direct insight into the connections between the endowment effect and self-enhancement theory.

An application of the endowment effect can be examined through market valuations, where the performance under the consumer's identity of self-enhancement through object valuation can be illustrated in Figure 3.

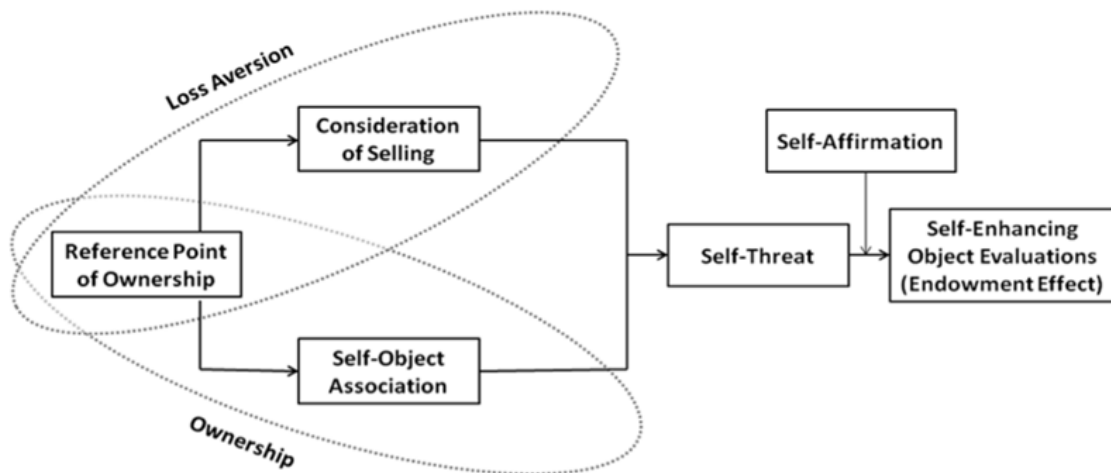


Figure 3: The relation between the self-system and the endowment effect.

The self-enhancement indicated an implicit threat from the upcoming sale of the goods in the consuming process, which may prompt an instinctual defence response by boosting the threatened component of the self through a higher valuation of the product [2]. Furthermore, according to the self-affirmation theory, when the individual enhances threat, they might employ defending actions in order to reduce the threat as a measure to protect an image of their self-integrity [15]. Selling can be regarded as one of the self- threats of losing, which would trigger producers to raise the value of self-associated goods [16]. In this case, as the value of the object proceeds as “mine”, the sense of ownership has been taken into account, and the meaning of object owning creates a spontaneous linkage between the item and the self [17]. The pain of losing the endowed item is considered a self-threat to the producers, which leads them to take self-enhancing actions, such as raising the valuations of the good. The concept of the endowment effect and loss aversion is connected due to the dependency on ownership when setting the selling and buying prices.

An experiment was carried out by Dr. Promothesh Chatterjee and his colleagues at the University of South Carolina with 89 undergraduates, using the coffee mug as the stimulus. They were assigned into roles of seller and consumer in a transaction. As a cover narrative, participants had the signatures required to receive study credit for their involvement in the experiment. The experiment was conducted under the randomly chosen market prices, and it turns out that the analysis shows that when the status is under the seller's control (before signature), the seller remains with a price of around 4.3 US Dollars and sellers of about 2.2 US dollars [2]. After the condition was out of the seller's control (after signature and is under threat), the prices were raised to approximately 5 US dollars. At the same time, the buyers remained to offer relatively comparable prices. In this case, one can evaluate the role of the endowment effect and loss aversion. In this context, the sellers were



enhancing the value of their self-associated object, the coffee mug; the loss of their own object was thought of as a threat; due to the loss aversion, the loss is psychologically more severe than a gain [18]; the price was raised to 5 US dollars after the signature to reduce the threat. Furthermore, the endowment effect and loss aversion point out that individuals tend to have a higher valuation of their own objects than others [18]. Therefore, one can also evaluate the performance of buyers; since the object does not belong to the buyers, gaining the object does not seem to impact the consumers, as they are not losing their properties, and their prices remain relatively close.

To summarise, when sellers are compelled to offer reserving prices for the endowed item, the outcome indicates that implicit self-threat induces higher reserving prices until sellers can self-affirm through another way. Additionally, as self-threat increases, so does the endowment effect; the endowment effect arises from self-enhancement triggered by self-threat.

## 6. Conclusion

The first application is explained in two approaches—from experiment data and a case study. The first two studies proved that the endowment effect will not work on children most of the time (children are willing to exchange the objects they have already have with another object that does not belongs to them) unless they are asked to focus on themselves (focus on what they usually choose in daily life and how do they choose when meeting the same problem in the real life), which means, age is not a specific factor when it comes to the endowment effect. However, in the case study we gave two options that have the same benefit but only different in the time they need to wait (play video game for an hour on tomorrow and the day after tomorrow) straight in the beginning. This article also tried to give one option at first and replace it with another option later. The result is the children are deeply affected by the loss aversion (choose the option we gave at first even if we doubled and tripled the benefit of the option we gave later). It is still unclear about why children can be deeply affected by the loss aversion while the endowment effect is totally useless on them. Thus, there is a high potential of future experiments and case studies in this field of study.

The third application is explained in three approaches, i.e. from pure modelling, experimental data and a case study. Although all three studies were not successful in classifying whether female or male are more loss averse (feels stronger emotions when experiencing loss), it is not hard to see from both studies that has human involvement (experiment and case study) that females are behave more negatively towards loss averse scenarios (female are more afraid to lose capital in the stock experiment and attained lower scores in the new grading system indicating a negative incentive when losing points). In addition, these studies implicate a series of information that can be cultivated in the future. First, since the pure modelling study attained different results from different definitions, I believe that this indirectly proves the impreciseness this of the definitions of loss aversion. Thus, it is necessary to come to a conclusion or compromise of a more precise and more widely applicable definition of loss aversion. In addition, there is also a lack of information of experiments or real-life examples that can prove whether loss aversion has a stronger impact of male or female. Thus, there is a high potential of future experiments and case studies in this field of study.

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