

Understanding Loss Aversion: An Experimental Study on Decision Making

(A case study of Economics and Management Students at University of Malakand)

Dr. Faiza Hassan (Corresponding Author)

Lecturer, Department of Economics, University of Malakand

Email: faizahassan@uom.edu.pk

Ziaullah Khan

BS(Economics), Department of economics, University of Malakand

Email: ziaullahk738@gmail.com

Muhammad Yaseen

BS(Economics), Department of economics, University of Malakand

Email: ecoyaseen@gmail.com

Abstract

Loss aversion is a cognitive bias in behavioral economics explaining deviations from traditional rational choice theory. The current study aims to precisely examine the degree of loss aversion and associated qualitative factors such as reasons for keeping the endowed item or opting for risky options, self-reported confidence of respondents and their familiarity with behavioral economics. It addresses a notable gap in existing literature of studying this phenomena in the South Asian context. Empirical evidence of loss aversion is provided by employing a unified experimental design with 112 undergraduate students in four equal subsets of 28 from the Departments of Economics, Commerce, and Management at the University of Malakand. In a meticulously designed risk task, participants consistently preferred their endowed item over the alternative of exchanging it for mystery boxes with potential monetary gain. The statistical analysis mainly based on Chi-Square (χ^2) tests, supported these results. Most of the participants irrespective of whether they showed loss averse or risk taking behavior reported higher level of confidence in their decision making. The participants selected attachment to the endowed item and fear of losing it, as two major reasons for not exchanging it with mystery boxes. The major reason for the decision of taking risk was to avail the opportunity to have greater monetary reward. The study provides significant insights into loss aversion in the South Asian context and have implications for effective educational and policy interventions.

Keywords: Behavioural Economics, Experimental Economics, Loss Aversion, Endowed items, Mystery Boxes, Risk taking

JEL Classification: D90, D91, C90, C91, C92

Funding Statement:

The project funds are provided by ORIC, University of Malakand.

1. Introduction

The emergence of behavioral economics has challenged the classical assumption of rationality in economic decision making. Behavioral Economics is the field that links economics and psychology, by identifying systematic cognitive biases that influence decision-making. One of them is the loss aversion which is the basis of a prospect theory, established by Kahneman and Tversky (1979). Loss aversion is one of the most robust and powerful phenomena and is vital for understanding deviations from traditional rational choice theory.

Loss aversion is the behavior whereby people tend to give more weight to a loss of a same value than gaining it. Pain of a loss of something is psychologically more influential than pleasure of receiving a gain. Such inherent bias often causes people to make choices that are different from what classical economic models show. Loss aversion in economic decision-making acts as a primary driver behind risk-taking or risk-averse behaviors, it shapes investment strategies, and controls responses to perceived threats. A deep understanding of loss aversion is therefore essential, as it clarifies why individuals might adhere to depreciating assets, resist advantageous changes if these involve perceived sacrifices, or opt for choices that appear suboptimal from a purely logical perspective.

Seminal studies by Kahneman and Tversky (1979, 1992) presented the theoretical foundation for understanding loss aversion within their broader framework of Prospect Theory. Following their groundbreaking article, a lot of research has been done which explored the manifestations of this bias across a diverse range of contexts including consumer behavior and financial markets to organizational decision-making.

While loss aversion has been consistently and robustly demonstrated, particularly within Western laboratory settings, the present study distinguishes itself through its unique experimental design. It specifically aims to analyze loss aversion by presenting participants with choices that contrast a certain outcome (retaining an item they own) against a risky exchange involving uncertain monetary outcomes but the situation doesn't involve complete losses as the mystery boxes have two outcomes Rs100 or 400. Furthermore, this research investigates whether the inherent nature of the endowed item (an academic book versus a utilitarian mug) influences how loss aversion manifests. Crucially, this study holds distinct importance by examining loss aversion within a South Asian context, specifically among undergraduate students in Pakistan, a demographic and cultural setting that remains largely underexplored. This provides helpful cross-cultural insights into the phenomenon. Additionally, the study evaluates the role that participants' prior knowledge of behavioral economics concepts plays in influencing loss aversion.

The primary aim of this research is to clarify the mechanisms underlying risk

preferences and decision-making under conditions of uncertainty, employing a unified experimental design with undergraduate students from the Departments of Economics, Commerce, and Management at the University of Malakand. The central objective is to precisely examine the degree of loss aversion present among these students. Other objectives of the study include analyzing qualitative factors associated with loss aversion, like reasons for keeping the endowed item or opting for risky options, self-reported confidence of respondents and their familiarity with behavioral economics. The main hypothesis tested is:

- **H1:** Participants will demonstrate a preference for retaining their endowed item rather than risking it for a monetary amount in the designated Risk Task.

The paper is organized in several sections. Section 1 introduces the aim of the study and its broader significance. Section 2 reviews literature. Section 3 consists of the conceptual framework, research design and research methodology. Section 4 reports the results and discussion in detail. Section 5 is about conclusion, recommendations and limitations of the study.

2. Literature Review

Loss aversion was formally established in prospect theory by Kahneman and Tversky (1979), and was further refined in cumulative prospect theory (Tversky & Kahneman, 1992). This theoretical framework fundamentally demonstrates that individuals experience losses more intensely than equivalent gains, typically weighing them approximately twice as heavily. For example, the emotional distress associated with losing PKR 500 is typically more profound than the satisfaction derived from gaining the same PKR 500. In practical scenarios, loss aversion explains various human behaviors, such as the disposition effect, where investors are unwilling to sell assets that have decreased in value. It also explains resistance to changes from the status quo and the rejection of gambles that have a positive expected value. This principle is a key underlying factor in numerous observed anomalies within consumer behavior and financial decision-making processes.

Daniel Kahneman, in his seminal book *Thinking, Fast and Slow* (2011), further elaborated on the cognitive foundations of Prospect Theory and popularized the concept of loss aversion for a broader audience. Daniel Kahneman explained how human decision-making is shaped by two distinct cognitive systems: System 1, characterized by its intuitive, rapid, and emotionally driven nature, and System 2, which is more deliberate, slower, and logical. Loss aversion primarily operates through System 1, causing individuals to automatically overemphasize potential losses compared to equivalent gains. This dual-system framework provides a compelling psychological explanation for why individuals that might behave irrationally in economic contexts, even resisting advantageous changes when they are

presented as losses. This conceptual model is particularly relevant for understanding economic behavior in real-world scenarios, including investment strategies, consumer choices, and public policy acceptance, all of which are influenced by how outcomes are cognitively processed.

The phenomenon of loss aversion is closely linked with other established behavioral biases. It is widely regarded as a key driver of the endowment effect (Thaler, 1980; Kahneman et al., 1991), where the act of giving up an owned item is psychologically perceived as a loss, a loss that appears more significant than the potential benefit of acquiring an equivalent item. Furthermore, mental accounting (Thaler, 2019) and status quo bias (Samuelson & Zeckhauser, 1988), are related to loss aversion; the manner in which an outcome is categorized within an individual's mental frameworks, or the default option presented, can profoundly influence its perceived value and the associated emotional burden of a loss. Beyond individual choices, loss aversion can also manifest in how individuals evaluate their well-being relative to others. Gebhardt (2011) explored loss aversion over relative consumption, highlighting the social dimension of this bias, demonstrating that individuals experience greater disutility from falling behind their peers in consumption than utility from surpassing them. Wilson et al. (2008) highlighted motivational biases, showing that subjective losses incurred personally outweigh the equivalent losses suffered by others.

The universal influence of loss aversion, across various domains, is consistently supported by empirical research. In consumer behavior, studies like that by Boyce et al. (2013) have demonstrated that negative impacts on well-being from income losses are more significant than the positive effects of equivalent income gains. Marketers frequently use this insight by framing offers in terms of avoiding losses rather than gaining benefits, evident in strategies such as money-back guarantees, limited-time promotions, and the exploitation of sunk cost fallacies. In financial decision-making, Thaler and Johnson (1990) observed that previous financial outcomes significantly shape subsequent risk preferences. Individuals who have recently gained money tend to be more risk taking (often called the house money effect) and individuals who have recently lost may either become overprotective of risk or irrationally seek it to recover their losses. In the context of real estate, Leung and Tsang (2013) found evidence of both the anchoring effect and loss aversion influencing transaction behavior in Hong Kong's real estate market, where sellers particularly exhibit an aversion to selling at a price below their perceived reference point, even if market conditions suggest otherwise. Vu Thuy Mai Uyen (2023) further investigated the interplay of loss aversion and investor overconfidence on market performance, specifically providing evidence from the London Stock Exchange, suggesting that these behavioral biases can jointly influence market dynamics. Saltik et al. (2023) utilized machine learning techniques on

experimental data to determine demographic factors and psychological traits that predict individual differences in loss aversion.

Evidence of loss aversion extends beyond consumer and financial settings into organizational and experimental contexts. Post et al. (2008) illustrated how reference points and prior outcomes intensely influence risk-taking behavior among participants in game shows. Gächter et al. (2022) identified considerable individual variability in the degree of loss aversion, attributing these differences to a combination of psychological and demographic factors. Although loss aversion is considered a common human trait the degree of its nature might differ between various cultures. According to the findings of the research conducted by Maddux et al. (2010), self-enhancement motives are usually more definite in Western societies, and this factor might reinforce the outcomes of the loss aversion. On the other hand, the Eastern cultures (which Pakistan also happens to be a part of) tend to focus more on the group dynamics or contextual thinking. It follows that this cultural orientation might shape the cognition of people in such societies to regard risk and attribute a value to potential loss possibilities in a rather subtle way since compared to their Western counterparts, manifestations of the loss aversion will be subtle. Even though an impressive volume of literature exists in the field, significant gaps in the literature body related to loss aversion can be identified, especially when it comes to the contextual validity across diverse populations. Most of the already existent research has focused on societies characterized as Western, Industrialized and rich countries. This requires dedicated research in distinct cultural and educational settings, such as Pakistan, to thoroughly assess the generalizability and potential cultural modulation of this bias. Moreover, substantial research needs to be performed in order to examine the degree to which the characteristic of given items (e.g., utilitarian vs academic items) influence the degree of loss aversion.

The present research aims to address these identified gaps by employing a unified experimental framework administered to undergraduate students specializing in Economics and Management at the University of Malakand, Pakistan. This study integrates a dedicated "Risk Task" specifically designed to quantify loss aversion, utilizing items with distinct characteristics, and exploring prior knowledge. The anticipated findings will contribute to refining theoretical models and guiding the development of personalized interventions in both educational and policy contexts, thereby expanding our understanding beyond conventional research settings.

3. Conceptual Framework and Research Design

3.1 Conceptual Framework

The conceptual framework guiding this study is grounded in the principles of behavioral economics, particularly from Kahneman and Tversky's Prospect Theory (1979, 1992). This framework explores the complex relationship between situational factors manipulated within the experiment,

the psychological processes experienced by participants, and the resulting behavioral outcomes related to risk preferences, with focus on loss aversion. The loss aversion experiment in the current study has the following design. Participants were randomly assigned to be physically endowed with either an Academic Book or a Ceramic Mug; this initial endowment establishes the reference point for the item that could potentially be "lost" in the subsequent risky choice scenario. Loss Aversion which represents the central phenomenon of interest and is measured by participants' choices in the Risk Task. More precisely, it is quantified by their expressed preference and decision to keep the endowed item versus a choice of selecting a box from two opaque mystery boxes and foregoing their endowed item as a result. The two opaque boxes were exactly similar with two different labels like Δ and δ . One of them had PKR 100 while the other guarantees PKR 400 upon selection. Both boxes have equal probabilities. PKR 100 was the lowest value a person will get in the worst situation, Mug was of PKR 160, book was of worth PKR360 and highest reward was PKR 400. A higher proportion of participants consistently choosing the certain option is indicative of a greater degree of loss aversion, as it suggests they prioritize avoiding the potential loss of their endowed item over the possibility of a larger monetary gain.

Several mediating and moderating variables are also fundamental to this framework. Emotional Attachment, defined as participants' self-reported emotional connection to their endowed item, is hypothesized to mediate the relationship between initial ownership and the observed loss aversion, as a stronger emotional bond might intensify the perceived pain of losing the item. Decision Confidence, representing participants' self-reported certainty in their choice during the Risk Task, is expected to moderate the manifestation of loss aversion. Prior Knowledge of Behavioral Economics Principles, indicated by the self-report of the participants about their knowledge of behavioral biases like loss aversion, is predicted to moderate the size of the bias. Finally, Item Type, referring to the inherent characteristics and perceived relevance of the endowed item (Academic Book versus Ceramic Mug), is expected to moderate the strength of loss aversion due to potential differences in utility or symbolic meaning.

The model posits that the initial endowment of the items and their prices will influence the intensity of the emotional attachment and the subjective view of ownership. This variable is hypothesized to influence participants' risk preferences in a manner consistent with loss aversion. Moderating variables, including, item type, decision confidence and prior knowledge, are expected to influence the strength of these relationships and the overall manifestation of the bias.

3.2. Research Design

The current research used a quasi-experimental design to explore the behavioral economics concept of the loss aversion. The research design incorporated structured comparisons between groups of participants based on their academic department and initial item endowment. The design aimed to assess how the inherent nature of the item, the psychological impact of

ownership, and prior knowledge of behavioral economics affect risk preferences and decision-making under uncertainty. The core of the study involved participants completing a "Risk Task" specifically designed to quantify tendencies towards loss aversion in a context of uncertain outcomes. The quasi-experimental nature of the study arose from the utilization of pre-existing academic departments, while random assignment was employed for item endowment within each department.

3.2.1 Participants

The study included a total sample of 112 undergraduate students from three academic departments of the University of Malakand. Department of Economics students were further divided in two sets resulting in overall 4 sets; Management (BBA), Commerce, Economics-A, and Economics-B. The division of participants in 4 equal sets helped in conducting the experiment rigorously and systematically. The selected students were primarily from 8th semester and in case of absence 6th semester students were included. The details are given in the following table. Within each department, participants were randomly divided into two groups, to either receive an academic book (Book Owners, $n=14$ per department) or a ceramic mug (Mug Owners, $n=14$ per department).

Table 1: Distribution of Items Received by Department

Department	Book Owners	Mug Owners	Total Participants
Management	14	14	28
Commerce	14	14	28
Economics –A	14	14	28
Economics-B	14	14	28

3.2.2 Data Collection Instruments

Data collection was primarily conducted using tailored questionnaire, properly administered and supervised without influencing the participant's responses. The questionnaire was specifically designed to capture key measures related to risk preferences. The questionnaire designated as the "Risk Task," presented participants with two choices: retaining the item they possessed (representing a certain outcome), exchanging it with either of two mystery boxes; for Box δ (which contained either PKR 100 or PKR 400), or exchanging it for Box Δ (also containing either PKR 100 or PKR 400). Different set of symbols were used to label boxes for different sets of participants to avoid biases and information flow across different sets of participants. The other three set of symbols used were @#, $\rho\sigma$, and $\psi\phi$.

3.2.3 Procedure

The experiment was executed through a standardized three-phased process. To effectively prevent potential contamination or the diffusion of information regarding the tasks or items among participants, students from

each academic department completed the study independently, typically within a designated classroom setting under supervised conditions. The procedure involved the following steps:

1. **Participant Recruitment and Informed Consent:** Participants were approached and provided with a concise and clear overview of the study's general nature and purpose. The voluntary nature of their participation was explicitly emphasized and practiced.
2. **Item Endowment:** Upon expressing their agreement to participate, students were randomly divided into two groups, one of them receiving the academic book and the other ceramic mug. The participants were provided with enough time to get familiar with their items. This crucial step established the participants' ownership of an item, which was anticipated to influence their subsequent perception of potential loss.
3. **Risk Task Administration:** Following the setup, participants proceeded to the questionnaire, which presented the mystery box choice scenario. Participants were provided with choice either to be risk averse by keeping their endowed item or to forgo the endowed item and choose one from two mystery boxes. The mystery boxes were purposely kept identical in their looks in order to avoid any signaling effect. The two boxes had different labels (e.g. Box @ or Box #). Participants were informed that one of them contained PKR 100 and the other one PKR 400, and that their final monetary reward depends on their choice. Then they were given with time to take decision and register their choices in questionnaire. After this the box outcomes were revealed. Subsequent to their choice, they addressed a question regarding their prior familiarity with concepts from behavioral economics, confidence and other relevant questions.

The questionnaires were administered within a consistent, structured environment to ensure uniformity in the experimental conditions across all participants and departments. The purpose of study, the process and choices were well explained to the respondents. Researchers were also available to provide clarification on any instructions if participants had questions, but leading interaction during the tasks was knowingly avoided in fear of unintentionally influencing participants' responses or decisions.

3.2.4 Data Analysis

All statistical analyses were conducted using IBM SPSS Software. The collected data were meticulously tabulated and represented, allowing for the derivation of meaningful conclusions even prior to formal statistical analysis. Inferential statistics were subsequently applied to rigorously test the research hypotheses. The predetermined level of statistical significance for all inferential tests was set at $\alpha=0.05$.

To test Hypothesis H1 which states that participants will prefer to retain their endowed item rather than risk it for a monetary amount in the Risk Task, a Chi-Square test of independence was conducted. This test was appropriate

for examining the association between categorical variables. The chi-square statistic was calculated based on the observed and expected frequencies within a contingency table, allowing for a determination of whether observed deviations from expected frequencies are statistically significant.

4. Results and Discussion

Loss aversion serves as a fundamental concept in behavioral economics describing the phenomenon where the psychological impact of a loss outweighs the equivalent gain, significantly influencing decision-making in situations involving risk and uncertainty. This section presents the empirical results derived from the Risk Task, which assessed loss aversion by offering a choice between a certain outcome (retaining the endowed item) and a probabilistic exchange for potential monetary outcomes.

4.1 Choices in loss aversion experiment

The behavior and choice of participants across all departments in loss aversion experiment are concisely reported in Table 2. The results clearly indicate a strong preference among participants across all departments for retaining their endowed item, providing strong evidence for the presence of loss aversion. More specifically, Table 2 shows that in the first three subsets at least 78% (22 out of 28) of the participants decided to keep their endowed item while Economics-B showed somewhat different behavior where 57% of respondents decided to keep while the remaining 43% chose one of the two mystery boxes (labelled # or @; # contained PKR 100 while @ contained 400). However, most of the participants decided to keep their item and showed behavior in favor of loss aversion.

In order to test the existence of loss-averse behavior among the participants across departments, the Chi-Square (χ^2) test was employed. The null hypothesis in the test represents no significant difference among participants' behavior for keeping the endowed item versus the mystery box that is the participants are, on average, indifferent. The results for loss aversion test are reported in Table 3. The results show that the null

Table 2: Choices in loss aversion experiment, Keep Vs Boxes

What did you choose in the loss aversion experiment?				
Participants Decision	BBA	Commerce	Economics A	Economics B
keep your item	22	23	26	16
Exchange for box #	3	2	1	6
Exchange for @	3	3	1	6

hypothesis of no loss aversion behavior for BBA, Commerce and Economics-A is rejected with high level of significance as the p-values are well below 0.05. This signifies the loss-averse behavior for all these

departments. However, for subset Economics-B the null hypothesis cannot be rejected ($p=0.45$), same as the numbers in Table 2 suggested before that higher proportion of participants (43%) opted for mystery boxes in Economics-B, and difference in behavior is reported from other sub-groups. The reason might be that experiment with Economics-B was conducted at the end and the larger risk-taking behavior might be due to diffusion of information from first three groups to this last group. These results provide another dimension to the future research.

Table 3: Test of Loss Aversion, The Chi Square Test Keep Vs Mystery Box

Department	χ^2	p-value
BBA	9.413	0.002
Commerce	11.571	0.001
Economics A	20.571	0.000
Economics B	0.571	0.45

The behaviors of the participants based on item endowed are also analyzed and the results are summarized in Table 4. In contrast to a priori expectations, the mug owners showed higher loss aversion than the book owners. It was expected during design of the study that the mug owners would exchange their item more than the book owners because the book had higher market value of PKR340 than Mug that had value PKR 160. However, the results showed that book owners tend to exchange their items more than the mug owners. With the exception of the Department of commerce, in all other departments the exchange ratio was much higher for book owners as compared to mug owners and double in case of BBA and Economics-B.

Table 4: Choices in loss aversion experiment; Book owners Vs Mug owners

Item received	BBA		Commerce		Economics A		Economics B	
Decision	Keep	Exchange	Keep	Exchange	Keep	Exchange	Keep	Exchange
Books Owners	10	4	13	1	12	2	6	8
Mug owners	12	2	10	4	14	0	10	4

However, when Chi-Square test was applied to statistically test the claim that mug owners show more risk aversion than the book owners, the test didn't support the claim and the hypothesis that there is no significant difference in loss aversion on the basis of item received could not be rejected. The results are reported in Table 5. The Fischer's exact significance is also reported because of the cell count in most of cases were less than 5 while calculating Chi-Square. All the p-values (Exact significance) are calculated much greater than the significance level 0.05 and therefore the null hypothesis cannot be rejected.

Table 5: The Pearson Chi Square Test (Difference in loss-aversion Book Owners Vs Mug owners)

Department	χ^2	p-value	Fischer's Exact Significance Test (2- sided)
BBA	0.848	0.357	0.648
Commerce	2.191	0.139	0.326
Economics A	2.154	0.142	0.481
Economics B	2.333	0.127	0.252

4.2 Subjective Factors Associated with Loss Aversion

This section explores the qualitative factors associated with loss aversion behavior derived from the data gathered through subjective questions in questionnaire. The data were gathered about reasons for keeping the endowed item (loss aversion), the reason for opting for risky options, the self-reported confidence of the participants and their prior knowledge about behavioral economics. The findings are summarized in the following subsections.

4.2.1 Reason for keeping the endowed item and opting for Mystery box decision

The reasons reported by participants for keeping the endowed item are presented in Table 6. The reason "Felt attached to my item" was cited with high frequency across all departments, with a total of 51 responses. This finding indicates that the subjective value and emotional connection to the endowed item made parting with it feel like a significant loss. Additionally, the statement "Didn't want to risk getting less money" reported by 14 participants clearly reflects a direct aversion to potential financial loss. Furthermore, 9 of the participants reported that they didn't trust the process, pointing towards the existence of mistrust in the process by some participants.

Table 6: Reasons for keeping the Endowed Item

Reasons	BBA	Commerce	Economics A	Economics B	Total
Didn't want to risk getting less money	2	3	5	4	14
Felt attached	14	13	14	10	51
Didn't trust process	2	5	1	1	9
Other	4	1	6	1	12

Similarly, reasons for opting mystery boxes are summarized in Table 7. The primary stated motivation, "I wanted a chance to win Rs. 400" was reported by 14 out of 25 participants opting for mystery boxes. This indicates a preference for potential gain over the certainty of the endowed item, although this choice was made by a smaller proportion of the overall participants. The reason "I didn't care much about the item" was selected by

5 participants, suggests a lower perceived loss for these individuals, making the risky option more appealing.

Table 7: Reasons for Opting Mystery Boxes

Reasons	BBA	Commerce	Economics A	Economics B	Total
Chance for Rs. 400	3	2	0	9	14
Accepted risk of Rs. 100	1	0	0	1	2
Didn't care about the item	0	2	2	1	5
Other	2	1	0	1	4

4.2.2 Self-Reported Confidence Level of the Participants

The information about the respondents' self-reported confidence was also gathered through questionnaire using numeric rating scale ranging from 1 (not confident at all) to 10 (extremely confident). Table 8 summarizes the self-reported confidence level of respondents. Majority of the respondents reported a high level of confidence in their decision of keeping their endowed item or exchanging it for the mystery boxes. More specifically, a total of 75 respondents out of 112 reported the highest confidence level of 10. Of these 58 were the loss-averse individuals (decided to keep their item) and 17 out of 25 who opted for the mystery boxes. Another 14 respondents chose to report confidence level of 9 while 13 chose confidence level of 8. Adding up the respondents in confidence level 8 to 10 across departments sums up to 102 (75+ 14+13). The remaining 10 respondents stated the confidence level less than 8. Overall, most of the respondents found to be confident in their decisions irrespective of their decision to be loss-averse or the risk taking. It implies that for loss-averse individuals keeping their endowed item reflects a confident preference for avoiding potential losses. Similarly, participants who decided to take a risk also felt confident in their choice, and their confidence and hope of gain motivated them to take risk. However such individuals constituted a smaller portion of overall sample.

Table 8: Self- Reported Confidence of participants

Confidence	Confidence level 10					Confidence level 9					Confidence level 8				
Department	1	2	3	4	Total	1	2	3	4	Total	1	2	3	4	Total
Keep your item	1	1	1	1	58	5	4	3	1	13	2	3	5	1	11
Exchange for Box @	2	2	1	4	9	0	0	0	1	1	0	0	0	1	1
Exchange for Box #	2	1	1	4	8	0	0	0	0	0	1	0	0	0	1
Total					75					14					13

4.2.3 Prior knowledge of Behavioral economics

This section presents data on participants' self-reported familiarity with concepts from behavioral economics. The theoretical relevance of assessing prior knowledge is to explore whether explicit awareness of these biases influences their manifestation. If participants are already familiar with these concepts, their responses might be influenced by this knowledge, potentially mitigating the biases or, conversely, leading to demand effects. Participants' self-reported prior exposure to behavioral economics concepts, by department, is presented in Table 9. Overall out of 112 participants only 34 reported having studied behavioral economics concepts like loss aversion, while 53 had heard of these concepts and 25 were completely unfamiliar. It suggests that any observed loss aversion biases in this study are likely operating due to innate cognitive processes rather than being learned behaviors. The data on prior knowledge provides a baseline for understanding the level of prior exposure to these ideas within the sample and offers an initial indication that the observed biases are likely fundamental rather than learned. This finding supports their potential universality and provides crucial context for interpreting the results, and thereby contributing to understanding of the loss aversion in non-Western context.

Table 9: Prior knowledge of Behavioral economics

Prior knowledge	BBA	Commerce	Economics A	Economics B	Total
Yes, I have studied them	15	5	7	7	34
I have heard of them	10	11	18	14	53
No, I am unfamiliar	3	12	3	7	25

5. Conclusions, Limitations and Recommendations

The findings of this study significantly contribute empirical evidence from a non-Western population, directly addressing a notable gap in the existing behavioral economics literature. The observed presence of loss aversion in this specific population context, the undergraduate students from departments of Economics, Commerce, and Management of University of Malakand, suggests that this cognitive bias may indeed be more widespread and potentially universal. In the meticulously designed risk-task, participants consistently preferred the certain outcome of retaining their endowed item over the uncertain alternative of exchanging it for mystery boxes with potential monetary gain. This pronounced tendency directly aligns with the fundamental principle of loss aversion, as theorized by Prospect Theory, which postulates that the psychological impact of facing a loss is perceived with greater intensity than the psychological satisfaction associated with an equivalent gain. The stated reasons provided by participants for their choices, such as avoiding the risk of receiving less money or stating a feeling

of attachment to the item, further validated this interpretation of a strong preference for avoiding potential loss. Moreover, survey data collected on participants' self-reported confidence levels in their choices in the risk task provided insights into the emotional and cognitive processes underpinning these risk preferences. These patterns indicated potential associations between the degree of confidence individuals felt about their decisions and their observed risk preferences.

The findings concerning loss aversion provide valuable insights into how individuals within this population might approach situations involving risk and uncertainty. This is highly relevant for understanding real-world financial behavior, investment decisions, responses to perceived risks, and how individuals make choices across various domains having uncertain outcomes. The observed low level of prior knowledge about behavioral economics among the majority of participants further supports the argument for the fundamental nature of loss aversion, suggesting it is an inherent cognitive bias rather than a learned response.

Despite the valuable insights gathered, it is crucial to acknowledge that the study sample consists solely of undergraduate students enrolled at a single university in Pakistan. This specific demographic and geographic limitation inherently constrains the generalizability of the findings to the broader Pakistani population, to individuals in different cultural or socioeconomic contexts within Pakistan, or to populations in other non-Western countries. Moreover, the findings related to the influence of item type are based on the use of only two specific items: an academic book and a ceramic mug. The results observed for these particular items may be specific to their unique characteristics, perceived utility, or cultural meaning and therefore may not generalize to other types of goods, services, or assets with different attributes.

The potential presence of loss aversion among the studied population suggests several appropriate considerations for both educational practices and the formulation of public policy. Recognizing that this cognitive bias operates within this population, even among university students, signifies the necessity to integrate some of the aspects of behavioral economics, including discussions of biases like loss aversion, into educational curricula. Specifically, within fields of study such as business, psychology, economics, and even general education curricula, providing individuals with knowledge about these systematic variations from purely reasonable decision-making could empower them to comprehend and potentially mitigate the influence of these biases on their professional and personal decision-making. From a policy standpoint, insights gained from understanding loss aversion exhibited in this population can be highly appropriate for policymakers when formulating and implementing public policies, especially those that establish default options or involve choices under uncertainty. For instance, considering loss aversion can greatly affect policy effectiveness; framing

options to highlight potential losses from inaction, rather than correspondent gains from desired behaviors, might more effectively motivate public involvement in critical areas such as participation in savings schemes, environmental conservation initiatives, or health preventative measures. This delicate understanding has the potential for more effective policy outcomes. Finally, integrating the concept of loss aversion into financial literacy programs, especially designed for this demographic population, could significantly help individuals to understand their inherent biases and risk preferences while making decisions about investing, saving, managing debt, and borrowing. This could potentially enable them to avoid suboptimal choices driven by an inflated fear of loss. Addressing these biases through targeted educational and policy interventions can contribute to more informed and, ultimately, more rational decision-making.

References

- Boyce, C. J., Wood, A. M., Banks, J., Clark, A. E., & Brown, G. D. A. (2013). Money, well-being, and loss aversion: Does an income loss have a greater effect on well-being than an equivalent income gain? *Psychological Science*, 24(12), 2557–2562.
- Gächter, S., Johnson, E. J., & Herrmann, A. (2022). Individual-level loss aversion in riskless and risky choices. *Theory and Decision*, 92(3-4), 599–624.
- Gebhardt, G. (2011). Investment decisions with loss aversion over relative consumption. *Journal of Economic Behavior & Organization*, 80(1), 68–73.
- Holden, S. T., & Tilahun, M. (2020). *Endowment effects and loss aversion in the risky investment game* (Centre for Land Tenure Studies Working Paper No. 01/20). Norwegian University of Life Sciences (NMBU), Centre for Land Tenure Studies.
- Kahneman, D. (2011). *Thinking, fast and slow*. Penguin Books.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, 47(2), 263–292.
- Kahneman, D., Knetsch, J. L., & Thaler, R. H. (1991). The endowment effect, loss aversion, and status quo bias. *Journal of Economic Perspectives*, 5(1), 193–206.
- Leung, T. C., & Tsang, K. P. (2013). Anchoring and loss aversion in the housing market: Implications on price dynamics. *China Economic Review*, 24, 42–54.
- Maddux, W. W., Yang, H., Falk, C., Adam, H., Adair, W., Endo, Y., Carmon, Z., & Heine, S. J. (2010). For whom is parting with possessions more painful? Cultural differences in the endowment effect. *Psychological Science*, 21(12), 1910–1917.
- Post, T., van den Assem, M. J., Baltussen, G., & Thaler, R. H. (2008). Deal or no deal? Decision making under risk in a large-payoff game show. *American Economic Review*, 98(1), 38–71.

- Saltık, Ö., Rehman, W. U., Söyü, R., Değirmen, S., & Şengönül, A. (2023). Predicting loss aversion behavior with machine-learning methods. *Humanities and Social Sciences Communications*, 10, 183.
- Samuelson, W., & Zeckhauser, R. (1988). Status quo bias in decision making. *Journal of Risk and Uncertainty*, 1(1), 7–59.
- Smitizsky, G., Liu, W., & Gneezy, U. (2021). The endowment effect: Loss aversion or a buy-sell discrepancy? *Journal of Experimental Psychology: General*, 150(2), 1–11.
- Thaler, R. (1980). Toward a positive theory of consumer choice. *Journal of Economic Behavior & Organization*, 1(1), 39–60.
- Thaler, R. H. (2019). Mental accounting matters. In D. Kahneman & A. Tversky (Eds.), *Choices, values, and frames* (pp. 241–268). Cambridge University Press.
- Thaler, R. H., & Johnson, E. J. (1990). Gambling with the house money and trying to break even: The effects of prior outcomes on risky choice. *Management Science*, 36(6), 643–660.
- Tversky, A., & Kahneman, D. (1992). Advances in prospect theory: Cumulative representation of uncertainty. *Journal of Risk and Uncertainty*, 5(4), 297–323.
- Uyen, V. T. M. (2024). Loss aversion, overconfidence of investors and their impact on market performance: Evidence from the London Stock Exchange (FTSE100). *International Journal of Social Science and Economic Research*, 9(8), 2941–2964.
- Wilson, R. S., Arvai, J. L., & Arkes, H. R. (2008). My loss is your loss... sometimes: Loss aversion and the effect of motivational biases. *Risk Analysis*, 28(4), 929–938.

Appendix: Questionnaire**Loss Aversion Experiment****Demographics:**

- **Gender:** ☐ Male ☐ Female
- **Department:** ☐ Economics ☐ Management ☐ Commerce
- **Which item did you receive?**

☐ Book ☐ Mug

1. You now have three options:

- ☐ Keep your item.
☐ Exchange it for Box @ (Rs. 100, or Rs. 400).
☐ Exchange it for Box # (Rs. 100, or Rs. 400).

2. If you chose to keep your item, why? (Mark all that apply.)

- ☐ I didn't want to risk getting less money.
☐ I felt attached to my item.
☐ I didn't trust the option selection process.
☐ Other: _____

3. If you chose box @ or #, why? (Mark all that apply.)

- ☐ I wanted a chance to win Rs. 400.
☐ I was okay with the risk of receiving Rs. 100 PKR
☐ I did not care about the item (Book or Mug).
☐ Other: _____

4. On a scale of 1-10, how confident were you in your decision (to choose box) (1 = Not confident at all, 10 = Extremely confident)

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10

5. Did you have any prior knowledge of behavioral economics like the endowment affect or risk aversion?

- ☐ Yes, I have studied them.
☐ I have heard of them but don't know much
☐ No, I am unfamiliar with them.

Name: _____

Signature: _____