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Original Article

The Impact of Stake Size on Loss Aversion: An Empirical Study in Bengaluru, India

Shraavyaa S Thalur

Trio World Academy, Bangalore, Karnataka, India.

Corresponding Author : thalurshraavyaa@gmail.com

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Abstract - *The loss aversion bias was first coined in the paper on Prospect Theory by renowned behavioral economists Daniel Kahneman and Amos Tversky [1]. Since then, understanding this bias, as well as its causes and factors influencing it, has been a topic of interest within the same field. This study aims to add to this existing literature with regard to loss aversion in gambling, risky choice situations, with regard to an increased wager amount at stake, and differences of the bias in terms of demographic variables. This study aims to observe the effects of this bias within an Indian socio-cultural context, based primarily in Bengaluru, Karnataka, while addressing differences in findings of past literature with respect to the relationship between the bias and specific demographic factors. To address this aim, this study employed a quantitative research methodology to measure 153 participants' loss aversion in making decisions for risky coin-toss scenarios. The study defined a measure to calculate loss aversion with regard to participants accepting or rejecting a wager coin-toss scenario. Through statistical analysis of the sample's measured loss aversion, it was found that loss aversion increases with an increase in the amount at stake and that loss aversion increases with an increase in an individual's household income. Further, loss aversion is found to be significantly more for older individuals only when the amount at stake is high. This study and its findings add to the existing inconsistent literature on the understanding of the influence of demographic variables on loss aversion, showing that loss aversion may not be as affected by inherent traits as suggested before.*

Keywords - *Loss aversion, Risk aversion, Coin-toss test, Prospect theory, Behavioural economics.*

1. Introduction

Loss aversion (LA) is a cognitive bias that was coined by Kahneman and Tversky (1979) [1]. This paper proposed the Prospect Theory as an alternative to the established Utility theory to explain decisions made under risk. The quote characterizes loss aversion: "Losses loom more than gains", i.e., individuals are intrinsically more aversive and responsive to losses, as compared to gains. This suggests that individuals are likely to feel more pain at losing Rs. 100 (approx. $1.20) than winning Rs. 100. Loss aversion can be observed in everyday situations, such as a student studying for an exam to avoid 'losing' a good grade and being disappointed than for the gain of knowledge as such, or even in an investment scenario, wherein a person may not sell their loss-making stock in hopes of getting a better price later on. A hypothetical value function in the Prospect theory consists of a 'reference point' that serves as a baseline for the evaluation of gains and losses. The 'losses' curve is steeper than the 'gains' curve, indicating that for the same value from the reference point, the pain of loss is more than the pleasure of gain. Kahneman and Tversky argued that losses can occur in both risky and riskless situations [1]. A situation with a riskless component refers to the 'minimum gain or loss which is certain to be obtained or paid', such as situations of trade, and the risky component refers to 'the additional gain or loss which is actually at stake', where a gamble could be involved. Current research has observed loss aversion in decision-making under risky situations in different conditions and a number of different participants to observe the extent of application of this phenomenon in different contexts, showing that some individuals may be more loss averse than others. A growing body of research has dived into loss aversion in different genders, ages, and even in video games. For instance, research has shown that gender (women are more likely to be loss averse than men), age (loss aversion increases with age), and personality (With reference to the Big 5 personality test, research has shown that higher levels of conscientiousness and agreeableness are associated with reduced risk-taking behaviors, whereas higher levels of extraversion, openness and neuroticism are associated with increased risk-taking) can lead to differences in loss aversion [2] [3] [4]. While there is reason to believe that loss aversion may occur in video-gaming contexts, the extent of this conclusion has been put into question due to factors such as ecological validity. A study from the University of Saskatchewan, Canada, illustrated loss aversion under risk with an adventure video game and

simulated the occurrence of loss aversion in virtual settings [5]. This study presented a situation where participants chose whether or not they would take a wager based on the amount of 'treasure' (coins) they had and the amount at stake. Participants were seen to accept wagers when the win: loss ratios were favorable to them and also were more likely to accept wagers at low amounts than at high amounts, indicating sensitivity when high amounts are at stake (more loss aversion when more money is at stake). However, the study showed that there was no significant difference in the loss aversion observed among different ages, genders, player types, or gambling risks. This is in contrast to existing research that states otherwise.

A recent Indian study measured loss aversion in Indian investors using a questionnaire instrument and found that loss aversion bias was evident in investors. However, female investors were more loss-averse than their male counterparts [6]. Nonetheless, it is essential to note that these findings are likely a result of acquired experiences instead of innate characteristics. Another study from the United Kingdom measured loss aversion under both risky and riskless conditions, using a lottery choice task from Fehr and Goette (2007) for the risky condition [7]. This study, too, illustrated that women are more loss-averse than men; loss aversion increases with age and higher income but decreases with higher education. Additionally, the study showed that individuals are more loss-averse in riskless conditions (82%) than in risky conditions (71%). A study conducted in India showed that the greater the amount at stake, the greater will be the loss aversion exhibited by an individual. However, if the amount is small and the reference point is bigger, loss aversion is less strongly exhibited [8]. Adding on to this, more research has shown that gains loom greater than losses for smaller amounts [9]. Studies have observed the effects of loss aversion on entrepreneurs. For instance, a study using the loss aversion scale in Southern Nigeria highlighted that loss aversion tendencies were present in young entrepreneurs and that this bias was cross-cultural in its occurrence [10]. A 2018 study from Indonesia found that loss aversion negatively influenced entrepreneurial intentions (motivation, desire, and aim to engage in entrepreneurial activities and manage an enterprise) through an experimental game [11]. Some studies have shown that entrepreneurs are less risk-averse [12]. Additionally, another study has established some findings: loss aversion is higher for an individual who is older, holds more education, and has a higher income, but is lower for occupational factors, given that managers and entrepreneurs have lower loss aversion than employees, farmers and students [13]. The majority of the research on loss aversion has been based in Western contexts, leaving a gap in the number of studies within the socio-cultural context of India and how this phenomenon may be exhibited in an Indian cultural setting, specific to southern India. Past literature has been contentious, so this paper aims to reach a verdict regarding loss aversion with different demographics in the socio-cultural setting of the Indian working population.,. Understanding the different demographic factors that affect loss aversion will provide insight into whether loss aversion is determined by innate characteristics or developed by external factors, along with the context in which loss aversion is likely to occur. Furthermore, this will add to the knowledge of financial decision-making and the extent to which cognitive biases have a hold on them. This paper addresses loss aversion in decision-making with risky choices in the Indian context, observing differences in age groups, genders, occupations (entrepreneur and non-entrepreneur), investor or not, and household incomes through a set of decision-making questions under risk. Furthermore, the variance of aversion to losses based on the amount of money at stake is also measured. The methodology employed in this paper uses the simple lottery choice task template framed by Fehr and Goette (2007) [14], which has been customized to adhere to this paper's research objectives and behaves as a microcosm to understand financial decision-making in individuals.

2. Methodology

2.1. Research Objectives

This paper aims to measure the differences in the loss aversion with respect to higher and lower wager amounts at stake in decision-making with risky choices, in Bengaluru, Karnataka, India. Further, the effects of different demographic variables, such as age, gender, household income, occupation (non-entrepreneurs or entrepreneurs), and whether the participant invests in the stock market on loss aversion are explored. The following are the specific objectives of the study:

- To examine whether there is a significant difference in loss aversion for individuals when presented with higher versus lower wagers.
- To investigate whether loss aversion varies across different demographic categories when considering various wager amounts.
- To analyze the impact of income levels on loss aversion, individuals with higher incomes should be compared to those with lower incomes.
- To assess whether there is a significant difference in loss aversion between males and females.
- To determine if age influences loss aversion, younger individuals and older individuals were compared.
- To explore the difference in loss aversion between entrepreneurs and employed individuals.
- To evaluate whether stock market investors and non-investors exhibit different levels of loss aversion.

In addition to these objectives, the study observes the sample's overall loss aversion, understanding in what scenarios the bias affects a greater proportion of participants. Finally, participants' self-reports on their level of concern for specific scenarios observe whether participants' claims about themselves align with the objective results of their loss aversion.

2.2. Sampling and Sample Characteristics

This paper adopted a mixed approach to sampling, incorporating two techniques, namely convenience and judgment sampling. This was administered in English via a Google Forms Survey. Participants were also encouraged simultaneously to share the survey link with other prospective participants, thereby also adopting the snowball sampling technique. The sample consisted of 153 participants, who were predominantly based in Bengaluru, Karnataka, but also from different regions of India, such as the northern states and rural areas of Karnataka, above the age of 16 years. As mentioned in the introduction, the study aims to reach a consensus on the effect of loss aversion in the Indian context and evaluate whether Western studies on this subject can be generalized to the Indian socio-cultural context. The following are the characteristics or breakdown of our sample. 153 respondents participated in the study by responding to the survey questions. Out of these, the sample included 7.2% of participants between 16-18 years, 2.6% of participants between 19-25 years, 12.4% of participants between 26-35 years, 32.7% of participants between 36-45 years, and 45.1% of participants between 46-65 years. The male-to-female respondents' ratio was approximately 60:40. For household income, participants were in the category below Rs. 5,00,000 (8.5%), between Rs. 5,00,000 to Rs. 20,00,000 (33.3%), or above Rs. 20,00,000 (58.2%). Given the difference in the number of participants in each category, and owing to simplify this category, the sample was divided into an income of less than or greater than 20,00,000 INR p.a., allowing for the analysis of the effect of a relatively higher or lower income p.a. on loss aversive tendencies. The paper also looked at the variable of occupation, with data collected in the form of the number of employed (66.7%), entrepreneurs (22.2%), and unemployed (11.1%). Lastly, the sample was divided based on whether individuals invest in the stock market or not, with 54.9% of participants being investors and 45.1% not being investors.

2.3. Research Design

The study employed quantitative research methodology, utilizing a survey instrument for data collection. The experiment involved 12 coin-toss choice questions with varying monetary stakes in Rupees, drawing inspiration from the work of Fehr and Goette (2007) [14]. While the lottery choice framework influenced the survey design in its question structure, it differed in several aspects: the currency used (Rupees), the three wager amounts involved (Rs. 50, Rs. 10,000 and Rs. 25,00,000), and the sequence of the questions. Respondents were presented with 4 loss win scenarios for each wager amount. These were 2, 1, 0.67 and 0.5. The questions were framed in the following manner: "If the coin turns up heads, you lose Rs. 50; if the coin turns up tails, you win Rs. 25," and participants were required to choose either "I will toss the coin" or "I will not toss the coin." Additionally, the survey included self-report questions to gauge participants' levels of concern regarding the lottery-choice scenarios, measured on a 5-point Likert scale. These self-report questions were strategically placed after the 4th, 5th, and 10th questions, serving as breaks to prevent respondents from becoming accustomed to the question pattern. These breaks were intended to ensure that participants viewed each question independently rather than as part of a continuous sequence.

2.3.1. Calculation of Loss Aversion (LA)

To calculate the loss aversion, the scenarios were first categorized based on whether the respondent wanted to toss the coin or not. In scenarios where the coin was tossed, the perceived loss was consistently zero, as the individual chose to engage in the gamble regardless of the outcome. As a result, the loss aversion for these scenarios was considered to be nil. Conversely, for scenarios where the coin was not tossed, the loss aversion was calculated using the ratio of perceived loss to perceived gain. The sum of these ratios was then computed to determine the overall loss aversion for the 12 scenarios in consideration, referred to as LA12 in the subsequent sections. Similarly, the loss aversion for specific scenarios, such as those with Rs. 50 at stake (LA1), Rs. 10,000 at stake (LA2), and Rs. 25,00,000 at stake (LA3) were also calculated. Furthermore, the 12 scenarios also consist of two categories: 3 Negative scenarios and 9 non-negative scenarios, based on the favorability of the outcomes. The negative scenarios are those with a loss: gain ratio of 2, where winning the coin toss results in a gain that is half the wagered amount. These scenarios include the loss-gain pairs (in Rs.) of 50-25, 10,000-5,000, and 25,00,000-12,50,000. The remaining 9 scenarios, with loss: gain ratios of 1, 0.67, and 0.5, are categorized as non-negative because the wagered amount is less than or equal to the potential gain from winning the toss. The study hypothesized that participants would exhibit greater loss aversion in the negative scenarios due to the unfavourable loss: gain ratio. This categorization enabled the calculation of participants' Acceptance-Rejection Behaviors, providing insights into the sample's overall propensity to avoid losses.

2.4. Statistical Techniques

The study uses two statistical methods of analysis: paired t-test and t-test for independent samples. An online statistics calculator, Datatab, was used. Paired t-test analysis was used to compare the differences in LA within each demographic variable, the difference between the categories within the demographic variable, and the differences in LA for different wagers. T-tests for independent samples were used to establish whether different categories within each demographic variable had significantly different LA from one another.

2.5. Ethics and Informed Consent

To abide by the ethical standards of conducting research, this paper took several measures. Participants were briefed about the aim and objective of the study when the survey link was shared with them (both as a message and in the Google Forms survey). In the description of the survey, it was clearly stated that participants agreed to give their consent if they continued with the survey. Participants were ensured

confidentiality and that their information would be used solely for research purposes. Furthermore, participants were informed of their rights to withdraw their participation at any given point of time in the study.

3. Results And Discussion

3.1. Acceptance-Rejection Behaviors

As mentioned in the methodology, the overall loss aversion of the sample was given clarity through the calculation of their Acceptance-Rejection Behaviors of the Negative and Non-negative scenarios. The following are the results for each criterion.

Table 1. Acceptance - Rejection Behaviors of the sample (N=153)

Category	%
The proportion of respondents who	
Reject all coin-toss scenarios	7.2
Accept all coin toss scenarios	5.88
Reject all negative scenarios	51.63
Reject all negative and accept all non-negative	3.27
Accept all non-negative	14.38
Probability of	
Accepting non-negative scenario	53.7
Accepting negative scenario	25.05

Table 1 shows that 7.2% of participants are highly loss-averse, rejecting all coin-toss scenarios, indicating that losses loom larger than gains for them. Conversely, 5.88% accepted all scenarios, showing extreme tolerance for losses. The slight 1.32% difference suggests more participants are loss averse than loss tolerant. The majority of the participants (51.63%) rejected all negative scenarios, aligning with expectations due to their unfavorable nature. In contrast, 14.38% accepted all non-negative scenarios, indicating that gains outweigh losses when outcomes are more favorable. Only 3.27% rejected all negative but accepted all non-negative scenarios, showing a more strategic approach, balancing loss aversion with rational decision-making. The probability of accepting negative scenarios is found to be 25.05%, while for non-negative scenarios, it is significantly higher at 53.7%, indicating greater loss aversion in unfavorable situations. This suggests that the favorability of a ratio influences whether rational decision-making is impacted by loss aversion.

3.2. Self-Report Questions - SRQ

Self-report questions were incorporated after the 4th, 5th, and 10th questions to gauge participants' emotional responses to varying wager scenarios (LA1, LA2, and LA3). The results provide insights into the participants' concern levels in relation to the stakes involved. For the 4th question, where the wager was Rs. 50 with a favorable loss-gain ratio of 0.5, 52.9% of participants reported being "neutral." Only 2.6% were "very concerned," and 19.6% were "moderately concerned." The low level of concern likely reflects the minimal financial risk and favorable odds, explaining why a majority of participants felt neutral about this scenario. The 5th question, involving a wager of Rs. 10,000 with an unfavorable loss-gain ratio of 2, showed a marked shift in concern levels. Here, 24.2% of participants were "very concerned," and 41.8% were "moderately concerned," indicating heightened anxiety due to the significant increase in the wager and unfavorable odds. The jump from a two-digit to a five-digit amount also contributed to this heightened concern, with 101 participants expressing concern and only a small minority remaining "unconcerned." The 10th question presented a neutral wager scenario, where participants stood to lose or gain Rs. 25,00,000, resulting in a loss-gain ratio of 1. In this case, 51% of participants were "very concerned," while 22.9% were "moderately concerned." The substantial increase in the wager from Rs. 10,000 to Rs. 25,00,000 likely amplified the participants' anxiety despite the neutral odds, as reflected in the higher percentage of "very concerned" responses. Overall, the self-report data suggests that participants were able to imagine the scenarios and their financial implications vividly. The rising concern levels across the scenarios indicate an increasing loss aversion as the stakes grew, aligning with the quantitative findings presented below.

3.3. Impact of Increasing Wager Amounts on Loss Aversion

Table 2 reveals a significant difference in loss aversion across the various wager amounts, with the order being LA1 < LA2 < LA3. This indicates that loss aversion increases as the wager amount increases, suggesting a direct correlation between higher wages and greater loss aversion. The table also shows that loss aversion is significantly more pronounced at Rs. 25 lakhs compared to Rs. 10,000, even though both are substantial amounts. This implies that participants perceive these two wagers as distinctly different, with a higher wager intensifying the loss aversion bias. This finding is consistent with recent research by Bleichrodt and L'Haridon (2023), which asserts that "loss aversion is robust to stake size" [15]. Another study demonstrated that the effect of loss aversion may be reversed for smaller amounts, where gains tend to loom larger than losses [9]. This reversal helps explain why, at higher amounts, losses have a more substantial impact than gains, thereby intensifying loss aversion. The study also noted that with larger negative outcomes, individuals are likely to overestimate the negative emotions they might experience, thus increasing their loss aversion in such scenarios. The heightened sensitivity to decisions involving significant amounts of money can be attributed to the potential for high wagers to affect an individual's financial situation drastically. In contrast, smaller sums do not exert the same degree of influence. Another study further observed that small losses occur more frequently than large ones, and individuals are more experienced in coping with them, which diminishes their impact compared to the greater significance attached to substantial losses [16]. Moreover, it can be inferred that the wager amount plays a more critical role in determining loss aversion than the loss-gain ratios across different situations. Participants exhibited higher levels of loss aversion when facing larger wagers, even though all three wagers had identical loss-gain ratios.

Table 3 observes the difference in loss aversion for different wager pairs (LA1- LA2 and LA2- LA3) in different demographics to estimate whether loss aversion increases with increasing wagers within different demographic categories as well. The table suggests that there is a significant difference in the loss aversion felt by all demographics for different wager pairs, with greater mean values for LA3 and LA2, as compared to LA1, with $p<0.001$. This suggests that irrespective of one's inherent characteristics or traits, loss aversion increases with increasing wagers.

Table 2. Paired t-test analysis of loss aversion in different wager scenarios (N=153)

	Wager Scenario	N	Mean	SD	t	p
LA_1-LA_2	LA_1	153	1.67	1.47	-7.82	<0.001***
	LA_2	153	2.69	1.48		
LA_1-LA_3	LA_1	153	1.67	1.47	-11.23	<0.001***
	LA_3	153	3.28	1.32		
LA_2-LA_3	LA_2	153	2.69	1.48	-5.88	<0.001***
	LA_3	153	3.28	1.32		

Note: *p<0.10, **p<0.05, ***p<0.01

Table 3. Paired t-test Analysis of loss aversion in a wager pair scenario for different demographic indicators

Demographic Variable	Category		Wager Scenario	N	Mean	SD	t	p
Household Income	**Over Rs.20L p.a**	**LA_1-LA_2**	LA_1	89	1.95	1.44	-6.27	<0.001***
			LA_2	89	2.95	1.34		
		LA_2-LA_3	LA_2	89	2.95	1.34	-4.35	<0.001***
			LA_3	89	3.49	1.21		
	Below Rs.20L p.a	**LA_1-LA_2**	LA_1	64	1.28	1.43	-4.75	<0.001***
			LA_2	64	2.32	1.61		
		LA_2-LA_3	LA_2	64	2.32	1.61	-3.94	<0.001***
			LA_3	64	2.99	1.43		
Gender	**Female**	**LA_1-LA_2**	LA_1	61	1.53	1.38	-5.45	<0.001***
			LA_2	61	2.7	1.55		
		LA_2-LA_3	LA_2	61	2.7	1.55	-2.77	<0.007***
			LA_3	61	3.08	1.5		
	Male	**LA_1-LA_2**	LA_1	92	1.77	1.53	-5.62	<0.001***
			LA_2	92	2.68	1.45		
		LA_2-LA_3	LA_2	92	2.68	1.45	-5.62	<0.001***
			LA_3	92	3.42	1.18		
Age	**26-45**	**LA_1-LA_2**	LA_1	69	1.53	1.43	-5.14	<0.001***
			LA_2	69	2.51	1.43		
		LA_2-LA_3	LA_2	69	2.51	1.43	-4.2	<0.001***
			LA_3	69	3.06	1.39		
	46-55	**LA_1-LA_2**	LA_1	69	1.7	1.59	-4.69	<0.001***
			LA_2	69	2.65	1.6		
		LA_2-LA_3	LA_2	69	2.65	1.6	-4.93	<0.001***
			LA_3	69	3.49	1.25		
Occupation	**Employed**	**LA_1-LA_2**	LA_1	40	1.59	1.43	-4.13	<0.001***
			LA_2	40	2.63	1.39		
		LA_2-LA_3	LA_2	40	2.63	1.39	-4.00	<0.001***
			LA_3	40	3.32	1.29		
	Entrepreneur	**LA_1-LA_2**	LA_1	34	1.71	1.58	-3.21	<0.003***
			LA_2	34	2.53	1.56		
		LA_2-LA_3	LA_2	34	2.53	1.56	-3.21	<0.003***
			LA_3	34	3.35	1.29		
Investing Habits	**Non-investor**	**LA_1-LA_2**	LA_1	69	1.64	1.39	-6.19	<0.001***
			LA_2	69	2.84	1.48		
		LA_2-LA_3	LA_2	69	2.84	1.48	-3.13	<0.003***
			LA_3	69	3.34	1.26		
	Investor	**LA_1-LA_2**	LA_1	84	1.7	1.55	-4.96	<0.001***
			LA_2	84	2.56	1.48		
		LA_2-LA_3	LA_2	84	2.56	1.48	-5.18	<0.001***
			LA_3	84	3.24	1.38		

Note: *p<0.10, **p<0.05, ***p<0.01

3.4. Differences in Loss Aversion based on Household Income

While Tables 2 and 3 indicated that there is higher loss aversion for higher wagers, Table 3 suggests that an individual's household income can influence their loss aversion at different wager amounts. As seen from Table 3, there is an overall significant difference in the loss aversion between individuals with an income over Rs. 20 lakhs p.a. (M=2.8, SD=1.04) and below Rs. 20 lakhs p.a. (M=2.2, SD=1.12), t(151)=3.4, p<0.01. Further, with a greater mean value, individuals with an income over Rs. 20L p.a. were significantly more loss averse for all loss aversion scenarios as compared to individuals with an income below Rs. 20L p.a. This finding aligns with prior research that has found), that higher income is associated with greater loss aversion [13] [3] [17] [18]. A plausible explanation is the endowment effect, as highlighted in a study where individuals with higher incomes value their assets more and, therefore, take fewer risks [7]. This is evident in the greater loss aversion observed in the Over Rs. 20L group (mean value of 3.49) compared to the Below Rs. 20L group (mean value of 2.99). A study suggested that those above a subsistence minimum tend to be more risk-averse, fearing a fall below this threshold [19]. Conversely, the lower loss aversion in the Below Rs. 20L group may reflect a stronger motivation for gains, as less wealthy individuals are more inclined to take risks, such as purchasing lottery tickets [20]. Thus, the study reinforces the notion that higher household income correlates with higher loss aversion, regardless of the wager amount.

3.5. Differences in Loss Aversion based on Gender

The study assumes a binary gender demographic of male and female. Contrary to the existing literature, Table 5 reveals no statistically significant differences in loss aversion between males and females across the three wager scenarios (LA1, LA2, LA3; p>0.05). Previous studies have consistently found that women are generally more loss and risk-averse than men [20][22][23][24]. Similarly, Indian research supported the notion that women exhibit higher loss aversion than men [25] [26]. However, the unexpected findings of this study align with a similar study that also reported no significant gender-based differences in loss aversion [7]. This result may be influenced by factors such as education, as prior research has found that higher education levels are associated with reduced loss aversion [27].

This could explain the absence of gender differences in loss aversion in the present study, suggesting that education may play a more critical role than gender in this context. Additionally, shifting socio-cultural trends in India, where approximately 47% of women are making independent financial decisions, may also contribute to this outcome [28]. These findings indicate that gender is not a definitive determinant of loss aversion, especially when considering other influencing factors such as education. The literacy rates in Karnataka and Bengaluru, where the study's participants resided, further contextualize this result. As of 2024, male literacy in Karnataka stands at 82.47%, while female literacy is 68.08%. In Bengaluru, the 2011 census reported male and female literacy rates of 91.01% and 84.01%, respectively [29] [30]. Although a gap exists, the relatively close literacy rates may account for the observed lack of significant gender differences in loss aversion. Overall, this finding suggests that gender is becoming less of a barrier in decision-making scenarios, demonstrating that an individual's gender may not significantly influence their loss aversion.

Table 4. Independent t-test analysis of loss aversion in household income p.a (N=153)

Wager scenarios	Category	N	Mean	SD	t	p
$LA_{Overall}$	Over Rs.20L p.a	89	2.8	1.04	3.4	0.001***
	Below Rs. 20L p.a	64	2.2	1.12		
LA_1	Over Rs.20L p.a	89	1.95	1.44	2.83	0.005***
	Below Rs. 20L p.a	64	1.28	1.43		
LA_2	Over Rs. 20L p.a	89	2.95	1.34	2.62	0.01***
	Below Rs. 20L p.a	64	2.32	1.61		
LA_3	Over Rs. 20L p.a	89	3.49	1.21	2.33	0.021**
	Below Rs. 20L p.a	64	2.99	1.43		

Note: *p<0.10, **p<0.05, ***p<0.01

Table 5. Independent t-test analysis of loss aversion in gender (N=153)

Wager scenarios	Category	N	Mean	SD	t	p
$LA_{Overall}$	Female	61	2.43	1.16	-1.05	0.295
	Male	92	2.62	1.07		
LA_1	Female	61	1.53	1.38	-1.01	0.313
	Male	92	1.77	1.53		
LA_2	Female	61	2.7	1.55	0.07	0.947
	Male	92	2.68	1.45		
LA_3	Female	61	3.08	1.5	-1.59	0.113
	Male	92	3.42	1.18		

Note: *p<0.10, **p<0.05, ***p<0.01

3.6. Differences in Loss Aversion based on Age

An individual's age can also be linked to their level of loss aversion. In this study, participants were divided into two age categories: 26-45 years (referred to as the younger age group) and 46-65 years (referred to as the older age group). Table 6 indicates that there is no statistically significant difference in overall loss aversion between the age groups 26-45 years (M=2.37, SD=1.11) and 46-65 years (M=2.61, SD=1.15) across all wager scenarios, t(136)=-1.26, p>0.05. Additionally, no significant differences were found between the two age categories for the lower-stakes scenarios, LA1 and LA2. However, a significant difference was observed in the highest-stakes scenario, LA3, where the older group (M=3.49, SD=1.25) exhibited greater loss aversion than the younger group (M=3.06, SD=1.39), t(136)=-1.88, p<0.10. This suggests that while both age groups perceive lower wagers (Rs. 50 and Rs. 10,000), similarly, the older group is more loss-averse when faced with the highest wager of Rs. 25,00,000.

A possible explanation for this difference is that older individuals may be more cautious with higher wagers due to their shorter time horizon to recover from losses [26]. Additionally, older participants may be more focused on saving for retirement, family obligations, or insurance, leading to increased loss aversion in high-stakes situations. The endowment effect, which suggests that people value what they own more as they age, may also contribute to this heightened loss aversion, as older individuals typically accumulate more wealth and, therefore, have more to lose. This is supported by a study that found a stronger endowment effect with increasing age [13]. Another Indian study found similar results with the age groups of 41-55 years and 25-40 years [26].

In summary, the study demonstrates a difference in loss aversion between younger and older individuals, but only in the highest-stakes scenario (LA3). This suggests that the magnitude of the wager is a key factor in determining loss aversion across age groups.

Table 6. Independent t-test Analysis of loss aversion in Age (N=138)

Wager scenarios	Category	N	Mean	SD	t	p
$LA_{Overall}$	26-45 years old	69	2.37	1.11	-1.26	0.209
	46-65 years old	69	2.61	1.15		
LA_1	26-45 years old	69	1.53	1.43	-0.64	0.523
	46-65 years old	69	1.7	1.59		
LA_2	26-45 years old	69	2.51	1.43	-0.54	0.587
	46-65 years old	69	2.61	1.6		
LA_3	26-45 years old	69	3.06	1.39	-1.88	0.062*
	46-65 years old	69	3.49	1.25		

Note: *p<0.10, **p<0.05, ***p<0.01

Table 7. Independent t-test Analysis of loss aversion based on Occupation (N=74)

Wager scenarios	Category	N	Mean	SD	t	p
$LA_{Overall}$	Employed	40	2.51	1.05	-0.05	0.963
	Entrepreneur	34	2.53	1.15		
LA_1	Employed	40	1.59	1.43	-0.33	0.745
	Entrepreneur	34	1.71	1.58		
LA_2	Employed	40	2.63	1.39	0.31	0.761
	Entrepreneur	34	2.53	1.56		
LA_3	Employed	40	3.32	1.29	-0.09	0.93
	Entrepreneur	34	3.35	1.29		

Note: *p<0.10, **p<0.05, ***p<0.01

3.7. Differences in Loss Aversion based on Occupation

This study also observed whether the occupation of an individual can influence their loss aversion. For the independent t-test analysis with different wager scenarios, Employed (Wage/Salaried) individuals and Entrepreneurs (Self-employed) were taken into account. Table 7 illustrates that for all three wager scenarios, there is no statistically significant difference in loss aversion between employed individuals and entrepreneurs, with p>0.05, for all scenarios. Except for LA2, however, all the other wager scenarios have greater mean values for Entrepreneurs than Employed, suggesting that the former are more loss-averse. Nonetheless, the difference is not statistically supported. This lack of statistical significance contrasts with existing literature, which states that entrepreneurs are less loss-averse than other individuals [31][13]. A likely reason for this is that entrepreneurs are more likely to have to deal with decision-making situations with money: being accustomed to such scenarios helps them be more rational than being susceptible to bias. This reason is also explained by Novemsky and Kahneman (2005b), who argued that experience with losses may decrease the impact bias, which is the overestimation of the duration and intensity of reactions to negative outcomes [32][33]. The contrasting results in this study may be attributed

to the difference between the nature of risks entrepreneurs typically take and the risky-choice scenarios presented in this research. Entrepreneurs are generally known for their willingness to take risks and for being less loss-averse in their professional endeavors. However, it is important to recognize that the risks they take are typically informed and calculated. In contrast, this study involved a coin-toss scenario, where the probability of winning or losing was 50%, offering no opportunity for calculated decision-making. This pure gambling scenario did not allow entrepreneurs to leverage their experience in handling decision-making situations.

Given this factor, the study found no significant difference in loss aversion between employed individuals and entrepreneurs, as the coin-toss scenario lacked any differentiating elements related to their occupations. These results suggest that an individual's occupation does not significantly influence their loss aversion in situations involving pure chance, such as the one presented in this study.

3.8. Differences in Loss Aversion based on Investment Habits

The study examined whether being an investor influences loss aversion. Participants were classified as either "Investors" (those who invest in the stock market) or "non-investors" (those who do not). As seen in Table 8, there is no statistically significant difference in loss aversion between Investors and Non-investors across the three wager scenarios ($p>0.05$). The findings suggest that being an investor does not influence an individual's loss aversion. This contrasts with other research that Haigh & List (2005) observed that experienced stock and options traders exhibit higher loss aversion compared to novices [21].

Novemsky and Kahneman theorize that experience with losses might reduce impact bias, which should theoretically apply to both investors and non-investors [32]. The discrepancy may arise because long-term investors typically make informed decisions based on detailed analysis, whereas this study used coin-toss scenarios reliant purely on chance. Thus, investors' decision-making skills were not applicable in this context. This indicates that the influence of investing experience on loss aversion may be more relevant in scenarios involving financial planning and analysis rather than simple games of chance. Overall, the study demonstrates that loss aversion is more strongly associated with the magnitude of the stakes rather than individual characteristics like investment experience.

Table 8. Independent t-test Analysis of loss aversion based on Investing Habits (N=153)

Wager scenarios	Category	N	Mean	SD	t	p
$LA_{Overall}$	Non-investor	69	2.6	1.03	0.58	0.566
	Investor	84	2.5	1.17		
LA_1	Non-investor	69	1.64	1.39	-0.28	0.779
	Investor	84	1.7	1.55		
LA_2	Non-investor	69	2.84	1.48	1.17	0.245
	Investor	84	2.56	1.48		
LA_3	Non-investor	69	3.34	1.26	0.45	0.651
	Investor	84	3.24	1.38		

Note: *p<0.10, **p<0.05, ***p<0.01

4. Conclusion

This study aimed to explore whether loss aversion, with a focus on the Indian socio-cultural context, is influenced by demographic variables such as household income, age, gender, occupation, and investment habits in risky decision-making scenarios. Additionally, the study examined whether loss aversion increases with the amount at stake and how it varies with different loss-to-gain ratios. The findings indicate that loss aversion intensifies with larger wager amounts, suggesting that individuals are more loss-averse when facing higher stakes. This effect is consistent across various demographic groups, with higher loss aversion observed in individuals with higher household income and increased age, particularly when the amount at stake is substantial. The implications of these findings are significant. In the realm of behavioral economics, the study suggests that while demographic factors are influential, the magnitude of potential losses plays a more prominent role in determining loss aversion. This indicates that future models should emphasize stake size as a primary factor. Furthermore, businesses and financial institutions can leverage these insights to develop more effective marketing strategies and risk communication approaches. Recognizing that higher stakes amplify loss aversion allows organizations to craft messages that better align with consumer risk perceptions.

Future research should address additional characteristics and socio-cultural contexts, such as personality traits, health conditions, and emotional intelligence, to gain a more comprehensive understanding of loss aversion. Experimental or observational studies with higher ecological validity are needed to determine whether survey-based findings reflect real-world decision-making. Expanding the sample size and geographical diversity will also enhance the generalizability of the results. Overall, the study reveals that while demographic factors do influence loss aversion, the amount at stake remains a dominant factor, providing valuable insights for financial decision-making and behavioral economic theories.

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