Demographic Diversity and Psychological Aspects of Investment Choices among North Indian Investors

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Abstract:

The study seeks to determine how demographic parameters such as age, gender, education level, and wealth impact psychological elements connected to investment decision-making. To identify significant psychological aspects, a complete literature study is done, including overconfidence bias, representativeness bias, availability bias, mental accounting bias, cognitive dissonance bias, loss aversion bias, and illusion of control bias. To provide a fair representation of participants, a multistage random selection technique was used. Three states—Himachal Pradesh, Punjab, and Uttrakhand—as well as two union territories—Delhi and Chandigarh—were chosen for the study. A total of 381 replies from both teaching and non-teaching staff members working in institutions across North India has been used to perform the final analysis.The data was analysed with the help of descriptive statistics, t-test, and one-way ANOVA. The purpose of the study is to investigate the degree and direction of correlations between demographic characteristics and psychological factors, as well as the extent to which demographic factors might predict psychological biases in investment decision-making. This study's findings add to the current research by shedding light on the impact of demographic characteristics on psychological biases in investment behaviour.

Keywords: Psychological Factors, Individual Investors, North India, Behavioral biases, Behavioral Finance

Introduction

Psychological variables influence investor behaviour and have a considerable impact on investing decisions and outcomes. One critical part is decision-making biases, which occur when psychological variables like as overconfidence, loss aversion, confirmation bias, and herding behaviour cause investors to stray from rational decisions. Recognising and comprehending these biases can assist investors in making better selections and avoiding potential obstacles(Gupta & Ahmed, 2016). Furthermore, psychological variables substantially influence how people perceive and assess risk, influencing investing decisions and risk tolerance. Psychological variables impact risk aversion, risk tolerance, and risk perception, and can decide the degree of risk investors are ready to tolerate.Understanding a person's risk preferences can help with portfolio design and matching assets to their risk tolerance(Mittal & Vyas, 2011). Emotions have a part in financial decisions as well. Fear, greed, and regret may all have a substantial influence on choices. During market downturns, fear may cause investors to sell, missing out on possible rewards, whilst greed may cause them to take unnecessary risks. Based on previous experiences, regret might impact decision-making(Akhtar & Batool, 2012). Recognising and controlling emotions assists investors in being balanced and reasonable. Long-term planning and patience require psychological components as well. Impulsivity and the drive for immediate pleasure might cause investors to act impulsively and make decisions that may not be in line with their long-term financial objectives. Long-term investing strategies are supported and investment outcomes are improved by practising patience and discipline(Mumtaz, et al., 2023). Additionally, psychological variables might affect asset price and market inefficiencies. The mispricing of assets that results from behavioural biases presents chances for savvy investors to profit from these inefficiencies. Understanding how psychological variables influence market activity might help investors spot possible market oddities. Understanding how psychological variables affect investor behaviour emphasises the value of financial literacy and investor education.Educating investors about typical cognitive biases, emotional effects, and decision-making heuristics allows them to make better informed and reasonable financial decisions. This, in turn, leads to increased financial well-being and long-term consequences(Muradoglu & Harvey, 2012).

Investor behaviour has long attracted financial scholars and practitioners since it has a substantial impact on market dynamics and individual investment decisions. While traditional economic and financial theories presuppose rational decision-making, empirical data reveals that psychological variables play a significant role in affecting investors' behaviour and subsequent financial decisions. Understanding these psychological variables is critical for policymakers, financial advisors, and individual investors attempting to negotiate financial market difficulties(Anand & Cowton, 1993). Examining the psychological factors that influence investor behaviour has drawn more attention in recent years, especially since the turn of the century. Significant economic occurrences during this time span include the global financial crisis of 2008 and the ensuing market recoveries, as well as technological advances that have completely changed the investing environment (Shah, et al., 2021). The psychological elements that underlie investor behaviour in the post-2010 era have therefore

been identified and explored by scholars. The use of behavioural finance, which incorporates psychological insights into conventional financial theories, is one noteworthy component of post-2010 research.Investors are susceptible to cognitive biases, emotions, and heuristics that can result in illogical decision-making, according to behavioural finance. This multidisciplinary approach has given researchers a new perspective to examine the psychological variables influencing investor behaviour in the contemporary financial environment(Evbayiro & Chijuka, 2021). Research done after 2010 has provided insightful information on a number of psychological aspects that affect investor behaviour. For instance, research have looked at the influence of cognitive biases on investing choices, including loss aversion, overconfidence, and the disposition effect. Additionally, research has shown that feelings like fear, greed, and regret have a big impact on how people behave while taking risks and how their investments turn out(Hafishina, et al., 2023). Researchers have also looked into how personality factors like impulsivity and risk tolerance affect how investors make decisions. Investigations into social and cultural factors have also shown how media coverage, peer pressure, and social conventions may affect investment behaviour and herd mentality(Santoso, et al., 2022).

For numerous reasons, studying psychological variables in connection to investor decision-making processes is critical. For starters, it aids in understanding irrational investor behaviour, which is not necessarily consistent with rational economic and financial theories (Combrink & Lew, 2020). Researchers and practitioners get insights into the underlying mechanisms driving such behaviour by researching these characteristics, allowing them to identify and manage possible hazards. Second, knowing how cognitive biases, emotional effects, and heuristics affect decisions enhances investment decision-making(Strahilevitz, et al., 2011). This awareness enables investors to avoid rash actions, identify possible traps, and make decisions that are in line with their long-term financial objectives. Third, psychological variables influence risk perception and appraisal, which in turn influences risk management strategies (Madaan & Singh, 2019). Researchers obtain insights into risk perception, risk tolerance, and successful risk management approaches by researching these characteristics. This understanding supports in the development of tactics that are more aligned with the psychological profiles of investors, resulting in more successful risk management practises. Furthermore, researching psychological variables in investment decision-making helps to educate and empower investors (Parveen, et al., 2020). Understanding typical biases and emotional impacts helps investors become more self-aware and better able to make reasonable decisions. This information may be shared through educational programmes and initiatives, resulting in a more educated and resilient investor community. Psychological variables influence market efficiency and asset price as well (Riaz & Iqbal, 2015). Researchers can uncover probable mispricing's and market abnormalities induced by behavioural biases by researching these aspects. This information helps to a better understanding of asset price dynamics, allowing investors to capitalise on market inefficiencies. Furthermore, understanding psychological factors in investor decision-making has policy consequences (Hirshleifer, et al., 2018). This understanding can have an impact on the creation of legislation, investor protection measures, and policies aimed at ensuring a

stable and efficient financial market environment. Policy measures based on psychological understanding can aid in mitigating the harmful impact of irrational conduct on market stability and investor welfare.

The subsequent part of the study can be outlined as follows: Section 2 presents the literature review and proposed hypotheses, while Section 3 elaborates on the research design and methodology. Finally, Section 5 presents the study's results and findings.

Review of Literature

Individual investors and financial experts alike must understand the psychological variables that drive investment behaviour. Investor behaviour is a broad field of research that incorporates a variety of psychological elements to explain how people make investing decisions. Psychological variables influence investor behaviour, frequently leading to departures from rational decision-making. This literature review is to give a thorough examination of the psychological aspects that drive investor behaviour, allowing investors and professionals to better understand and manage these effects. Both psychological and demographic variables impact investor behaviour. While past research has concentrated on the influence of psychological variables, the function of demographic features has grown in importance. This literature review aims to analyse how psychological and demographic factors interact and influence investor behaviours.

Cognitive biases are systematic thinking flaws that impair judgement and decision-making(Hilbert, 2012). Several cognitive biases have been observed in the context of investing decision-making(Hilbert, 2012). Anchoring bias occurs when people rely too heavily on initial information; confirmation bias occurs when people seek information that confirms their pre-existing beliefs; availability bias occurs when people make decisions based on readily available information; and overconfidence bias occurs when people overestimate their own abilities and knowledge(Madaan & Singh, 2019). These biases might cause investors to make poor judgements and break from logic. Anchoring bias, confirmation bias, availability bias, and overconfidence bias are all major psychological aspects that influence investment decisions(Bashir, et al., 2013). According to research, demographic factors such as age, gender, and educational background might mitigate the effects of these biases. For example, elderly investors may be more vulnerable to anchoring biases, but women have lower levels of overconfidence than males. Understanding the interactions between cognitive biases and demographic characteristics is critical for designing interventions and giving customised financial advice(Rzeszutek, et al., 2015).

Emotions have a part in financial decisions as well. Fear, greed, and regret are all emotions that might impact investor activity. Loss aversion and prospect theory describe how emotions can lead investors to take excessive risks or avoid possible losses. Understanding how emotions influence decision-making is critical for good financial management. Fear, greed, and regret are all emotional elements that combine with demographic traits to determine investment conduct(Paulus & Angela, 2012). According to research, demographic factors such as age, gender, and wealth might mitigate the influence of emotions on investing

decisions(Rana, et al., 2011). Older investors, for example, may be more risk-averse due to a greater fear of financial loss, whereas persons with higher income levels may have distinct emotional reactions to investing outcomes(Kishor, 2022). Individualised techniques for regulating emotions and supporting prudent financial decisions can be informed by an understanding of how emotional impacts and demographic factors interact(Ady, 2018).

The risk perception of investors has a substantial impact on their investing decisions(Antonides & Van Der Sar, 1990). Behavioural research have revealed biases in people's risk appraisal and reaction. Risk aversion is a well-studied phenomena in which people are more sensitive to losses than benefits(Riaz & Hunjra, 2015). Furthermore, ambiguity aversion implies that people prefer known risks to unknown risks. These biases might result in poor portfolio selection and risk management techniques(Gollier, 2011).

Another psychological aspect that influences investor behaviour is overconfidence. Overconfidence is the propensity of a person to overestimate their own talents and expertise(Dittrich, et al., 2005). Overconfidence in the context of investment can lead to excessive trading, miscalculation of risks, and inadequate portfolio diversification(Ahmad & Shah, 2020). The research emphasises several elements of overconfidence, such as over precision (overestimating information correctness) and over placement (overestimating one's talents in comparison to others)(Pikulina, et al., 2017). Overconfidence must be recognised and managed in order to prevent investing dangers. Overconfidence, when paired with demographic factors, can have a variety of implications on investment conduct(Bhandari & Deaves, 2006). According to research, gender, age, and education combine with overconfidence to influence investing decisions. Men, for example, tend to be more overconfident than women, although elderly people may demonstrate various patterns of over precision, in which they overestimate their knowledge and accuracy(Tjandrasa & Tjandraningtyas, 2018). Recognising the complex relationship between overconfidence, demographic characteristics, and investing behaviour might lead to personalised treatments that reduce overconfidence's negative consequences(Sonawane, et al., 2021).

Cognitive biases, which can affect judgement and behaviour, frequently influence human decision-making. Loss aversion and the illusion of control bias are two significant cognitive biases that have received significant studies(Otuteye & Siddiquee, 2015). Loss aversion is the propensity of humans to view losses as more significant than gains of comparable magnitude, as described by Kahneman and Tversky in their prospect theory (Jahanzeb, 2012). Tversky and Kahneman (1991) offered experimental evidence for the presence of loss aversion in a variety of circumstances, including financial decision-making, consumer behaviour, and investment decisions. The illusion of control bias, on the other hand, relates to the tendency of individuals to assume they have more influence over outcomes than they do. This bias has been seen in a variety of arenas, including gambling, sports, and everyday activities, where people participate in superstitious behaviours or rituals in the belief that they can impact results (Langer, 1982; Labajova, Höhler, Lagerkvist, Müller, & Rommel, 2022). Understanding these biases, their underlying mechanisms, and

their repercussions is critical for understanding decision-making difficulties and properly forecasting human behaviour.

Loss aversion has received a great deal of attention in the fields of behavioural economics and decision-making. Individuals are more sensitive to possible losses than potential profits, according to prospect theory (Khan, 2017). Loss aversion has been frequently proven in experimental research in a variety of circumstances. People, for example, are more willing to take risks to prevent losses than to attain similar-sized gains, a phenomenon known as the "reflection effect" (Kumar & Babu, 2018). The unequal psychological impact of gains and losses has been ascribed to this bias, where the negative emotional reaction to losses surpasses the positive emotional response to gains (Yuningsih, et al., 2017).

The illusion of control bias refers to people's tendency to overestimate their ability to control random or unpredictable situations. This prejudice has been seen in a variety of contexts, including gambling, sports, and everyday life. Individuals in gambling, for example, may assume that their actions or rituals might impact game outcomes, even when the outcomes are dictated by chance (Durand, 2003). People participate in irrational behaviours or rituals, showing a belief in human control over random events, according to research (Bakar & Yi, 2016). The need for individuals to maintain a sense of action and control over their environment, even when control is illusory, is regarded to be the source of the illusion of control bias.

Statement of Problem

The association between demographic characteristics and psychological aspects among investors in North India is an issue that needs more research. Understanding how demographic factors like age, gender, education, and income interact with psychological factors like cognitive biases, emotional influences, risk perception, overconfidence, and herd mentality can provide valuable insights into investor behaviour in this region. However, there has been little research on this specific link in the context of North India. As a result, the problem statement for this study is to investigate and analyse the relationship between demographic factors of North Indian investors and psychological factors, with the goal of identifying specific demographic profiles that may be more susceptible to certain psychological influences and their implications for investment decision-making.

Research Objectives

To explore the relationship between demographic factors and psychological factors of Investors in North India.

Research Methodology

The systematic approach and techniques used to collect and evaluate data directly from primary sources are referred to as a primary study's research methodology. It include selecting a research plan, data collection strategies, sample approaches, and data analysis tools. For gathering first-hand information during primary investigations, popular techniques

include surveys, interviews, observations, experiments, and case studies. The gathered data is then assessed using the relevant statistical or qualitative analysis procedures in order to get insightful knowledge and draw conclusions. The research technique of a primary study offers a framework for conducting exhaustive and trustworthy research, ensuring the validity and dependability of the findings.

Population

The term "population" refers to a group of people, animals, or items of the same species that reside in the same region. When we refer about human populations in this context, we mean the total number of people residing in a certain region or nation. We are looking for instructors and other staff members who work at universities in northern India for this project. According to the UGC listed webpage (Recruitment Inbox, 2019), there are 218 universities in North India, which covers five states and four union territories. These universities will be used to choose research participants. According to the National Informatics Centre (2015), there are more than 80,000 teachers working in these universities located in Northern India.

Sample Size and Sampling Procedure

This study's major objective is to comprehend how North Indian investors' psychological characteristics are influenced by demographic considerations. Data was gathered from both teaching and non-teaching staff members working at various institutions throughout North India in order to compile the relevant information. To provide a fair representation of participants, a multistage random selection method was used. The study's participants were the states of Himachal Pradesh, Punjab, and Uttrakhand, as well as the union territories of Delhi and Chandigarh, based on Wikipedia estimates of their 2023 literacy rates. Out of the original sample size of 450 responders, 381 were determined to be qualified for the study after rigorous review. The sample size was chosen in accordance with Krejcie and Morgan's 1970 recommendation, which states that when working with an unknown population, a minimum sample size of 380 should be used to get consistent results with a 95% confidence level.

Data Collection and Procedure

For the final analysis, we gathered a total of 381 responses from staff members who work in institutions throughout North India and are both teaching and non-teaching. A standardised questionnaire with a "5-point Likert scale" was used to collect the data. On a scale of 1 to 5, where 1 denoted "strongly disagree," participants were asked to assess their degree of agreement or disagreement. Seven psychological characteristics, including overconfidence, availability bias, mental accounting, cognitive dissonance, loss aversion, and illusion of control, were the focus of the questionnaire. Demographic data, including age, income, education, and gender, were also gathered from the respondents in addition to psychological characteristics. To ensure a diverse range of opinions, we employed a combination of online and offline questionnaires to collect data from the participants.

Analytical techniques and Framework

We employed a variety of technologies in our study to assess the data and uncover crucial information. We were able to comprehend the key features of the data with the aid of descriptive statistics. To determine the average, middle value, most frequent value, and degree of dispersion of the data, we employed metrics like mean, median, mode, and standard deviation. These statistics helped us understand the patterns in the data and captured its key characteristics.

T-tests were also employed to compare the means of two groups. This allowed us to see if there were any statistically significant differences between the two groups we were researching. We calculated t-values and compared them to critical values using criteria such as sample size, averages, and standard deviations. The results of these tests revealed if there were significant differences between the groups and assisted us in understanding the influence of the issues we were investigating.

We also used one-way ANOVA to compare means across three or more groups. We were able to investigate both the variances within each group and the differences between the groups using this statistical approach. We assessed F-values to evaluate if there were any statistically significant differences. One-way ANOVA assisted us in understanding the influence of various groups or factors on the outcome of interest. It provided us with a broader perspective and enabled us to reach more conclusive findings.

Results and Discussion

Demographic Profile of Investors

Table 1 depicts the survey participants' characteristics. It details their location, age, gender, yearly income, education, and employment. According to the statistics, Punjab has the most responders (118), followed by Delhi (81), Uttarakhand (79), Himachal Pradesh (56), and Chandigarh (47). 37% of the participants are between the ages of 35 and 45, while 42% are between the ages of 45 and 60. Sixty-two percent of the 381 responders are men, while 38 percent are women. In terms of yearly income, 39% earn between 5 and 10 lakhs, while 38% earn between 10 and 20 lakhs. Only 9% of people earn more than 20 lakhs per year, whereas 3.7% make between 1.5 and 3 lakhs. 84% of respondents have a doctorate, whereas 14.4% have a postgraduate degree, when it comes to schooling. The remaining 6% of respondents are non-teaching staff, whereas 93% of respondents work as instructors at North Indian universities.

Table 1: Demographic Profile of Respondents

		Frequency	Percent	Cumulative Percent
Respondents Location	Punjab	118	31.0	31.0
	UK	79	20.7	51.7
	Himachal Pradesh	56	14.7	66.4
	Delhi	81	21.3	87.7
	Chandigarh	47	12.3	100.0
	Total	**381**		
Age	26-35	69	18.1	18.1
	35-45	142	37.3	55.4
	45-60	160	42.0	97.4
	60-65	10	2.6	100.0
	Total	**381**	**100.0**	
Gender	Male	237	62.2	62.2
	Female	144	37.8	100.0
	Total	**381**	**100.0**	
Annual Income	1,50,000-3,00,000	14	3.7	3.7
	3,00,000-5,00,000	35	9.2	12.9
	5,00,000-10,00,000	150	39.4	52.2
	10,00,000-20,00,000	148	38.8	91.1
	20,00,000 above	34	8.9	100.0
	Total	**381**	**100.0**	
Education	Graduate	6	1.6	1.6

Background	Post Graduate	55	14.4	16.0
	Doctorate	320	84.0	100.0
	Total	**381**	**100.0**	
Occupation	Teacher	357	93.7	93.7
	Non-Teaching Staff	24	6.3	100.0
	Total	**381**	**100.0**	

Note: Table I describes the demographic factors in five column. The first and second column represents the description of every variable; we use respondent location, age, gender, annual income, education and respondent occupation. Third, fourth and fifth column explains the frequency, percent and cumulative percentage of these variables.

Psychological Factors and Age of the investors

We gathered information for this study from investors in North India across a range of age groups. The age range of investors is significant because it can have an impact on psychological traits like maturity, experience, and responsibility. The one-way ANOVA test was utilised by the researcher to look at how investors' levels of psychological elements are influenced by their age group. The age group of the investors was handled as the dependent variable in this study, while the psychological components were treated as independent variables. The researcher examined the following hypothesis using the one-way ANOVA test:

Null Hypothesis 1a: Age group does not influence the psychological factors of investors.

Alternate Hypothesis 1a: Age group has a significant influence on the psychological factors of investors.

The table below presents the results of the ANOVA test, which examines the relationship between age group and psychological factors among investors. Table 2 displays the ANOVA test outcome for age and psychological factors. Additionally, the post hoc results, indicating the differences between the groups, can be found in table 3.

Table 2: ANOVA test results

One-Way ANOVA					
	N	Mean	Std. Deviation	F-statistic	p-value
Overconfidence 26-35	69	3.4451	1.10671	1.392	0.245
35-45	142	3.6439	.99772		
45-60	160	3.6420	.88019		
60-65	10	3.1857	.87300		
Total	381	3.5951	.97008		
Representativeness 26-35	69	3.6170	1.02504	1.293	0.277
35-45	142	3.5191	1.01565		
45-60	160	3.4687	.98704		
60-65	10	2.9714	1.14246		
Total	381	3.5013	1.00981		
Availability Bias 26-35	69	3.4886	.95247	3.140	0.025
35-45	142	3.7757	.72791		
45-60	160	3.5670	.83659		
60-65	10	3.2714	.68495		
Total	381	3.6228	.82430		
Mental Accounting 26-35	69	3.4017	1.06912	0.100	0.960
35-45	142	3.3913	1.09680		
45-60	160	3.4196	.96195		
60-65	10	3.2429	.72859		
Total	381	3.4012	1.02543		
Cognitive Dissonance 26-35	69	3.7415	.94304	0.281	0.839
35-45	142	3.7347	.72693		
45-60	160	3.6969	.81239		
60-65	10	3.5167	.78744		

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	Total	381	3.7143	.80467		
Loss Aversion	26-35	69	3.4952	1.12094	0.294	0.830
	35-45	142	3.4472	1.14963		
	45-60	160	3.4823	1.02495		
	60-65	10	3.1667	.92630		
	Total	381	3.4633	1.08530		
Illusion of Control	26-35	69	3.7005	.87428	2.752	0.042
	35-45	142	3.9542	.64539		
	45-60	160	3.9813	.68832		
	60-65	10	3.8333	.66667		
	Total	381	3.9164	.71488		

Source: Output generated from SPSS software

According to Table 2's findings, the F statistic for the "overconfidence bias is 1.392 with a p-value of 0.245", which is greater than the industry norm of 0.05. Age categories thus have no discernible impact on the overconfidence bias. Similarly, the F statistic for the "representativeness bias is 1.293 and the p-value is 0.277", which is greater than the accepted threshold of 0.05. As a result, the researcher is unable to rule out the null hypothesis, which suggests that age groups have little to no impact on representativeness bias.

The F statistic for "availability bias is 3.140 with a p-value of 0.025", which is less than the recommended standard of 0.05. This implies that availability bias is significantly influenced by the investors' age groupings. However, the F statistic for "mental accounting bias is 0.100 and has a p-value of 0.960", which is greater than the expected value of 0.05. As a result, the researcher is unable to disprove the null hypothesis, proving that age does not significantly affect mental accounting bias.

The F statistic for the "cognitive dissonance bias is 0.281 with a p-value of 0.839", which is greater than the expected value of 0.05. As a result, the age of investors has no bearing on cognitive dissonance bias. The loss aversion bias F statistic is 0.294 and has a p-value of 0.830, which is higher than the industry norm of 0.05. As a result, the researcher is unable to disprove the null hypothesis, which suggests that age groups have little to no effect on loss aversion bias.

The F statistic for the illusion of control bias is 2.752 with a p-value of 0.042, which is less than the normal value of 0.05. As a result, the researcher is unable to accept the null hypothesis, which indicates that age groups of investors have a major impact on the perception of control bias.**Post Hoc Test**

Homogenous Subsets

Table 3: Post Hoc result for Overconfidence Bias

Overconfidence

TukeyHSD[a,b]

Age	N	Subset for alpha = 0.05
		1
60-65	10	3.1857
26-35	69	3.4451
45-60	160	3.6420
35-45	142	3.6439
Sig.		.242

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 31.303.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Source: Output generated from SPSS Software

Table 3 indicates that respondents in the age groups of 60-65 and 26-35 exhibit different responses for overconfidence bias compared to respondents in the age groups of 45-60 and 35-45.

Table 4: Post Hoc Result for Loss Aversion Bias

Representativeness

TukeyHSD[a,b]

Age	N	Subset for alpha = 0.05
		1
60-65	10	2.9714
45-60	160	3.4687
35-45	142	3.5191
26-35	69	3.6170
Sig.		.057

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 31.303.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Source: Primary Data

Table 4 demonstrates that the mean value of respondents in the age group of 60-65 differs from the mean responses of respondents in other age groups. This indicates a significant difference in the mean values of the groups.

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Independent sample t-test between Psychological Factors and Gender of the Respondents

The researcher investigated the association between psychological characteristics and the gender of the respondents in this part. The gender of the respondents was divided into two categories: male and female. The researcher used an independent sample t-test to examine the relationship between gender and psychological characteristics. The following hypothesis was tested using the independent sample t-test:

Null Hypothesis 2a: There is no significant difference exist between gender of the respondents and psychological factors.

Alternate Hypothesis 2b: There is significant difference exist between gender of the respondents and psychological factors.

The output for the independent sample t-test between gender and psychological factors of the investors is shown in table 5.

Table 5: Independent sample t-test between Gender and Psychological Factors of the Respondents

				Independent sample t-test		
	Gender	N	Mean	Std. Deviation	f-statistic	p-value
Overconfidence	Male	237	3.5871	.97571	0.041	0.83
	Female	144	3.6081	.96399		
Representativeness	Male	237	3.3996	1.03720	5.787	0.01
	Female	144	3.6687	.94287		
Availability Bias	Male	237	3.6154	.82865	0.085	0.77
	Female	144	3.6349	.81983		
Mental Accounting	Male	237	3.3556	1.04893	3.677	.05
	Female	144	3.4762	.98454		
Cognitive Dissonance	Male	237	3.6990	.82218	0.199	0.655
	Female	144	3.7396	.77718		
Loss Aversion	Male	237	3.3847	1.13260	11.606	.001
	Female	144	3.5926	.99294		
Illusion of Control	Male	237	3.9430	.70371	0.384	0.536
	Female	144	3.8727	.73327		

Source: Primary Data

The findings of the independent sample t-test used to investigate the association between gender and psychological characteristics among respondents are shown in Table 5. The table reveals an F-statistic of 0.041 with a p-value of 0.83 for overconfidence bias, which is more than the usual value of 0.05. As a result, the null hypothesis, showing that there is no substantial difference between gender and overconfidence bias, cannot be rejected. The

tendency of investors to overestimate their talents is referred to as overconfidence bias. (Malik, Hanif, &Azha, 2019). The F-statistic for representativeness bias is 5.787 with a p-value of 0.01, which is less than the conventional value of 0.05. As a result, we reject the null hypothesis, implying a significant difference between gender and representativeness bias. Male and female respondents differ significantly in their representativeness bias, which refers to their proclivity to depend on restricted or biased information. The F-statistic for "availability bias is 0.085, with a p-value of 0.77", exceeding the conventional value of 0.05. As a result, the data shows no significant difference in availability bias between male and female respondents. Making decisions based on easily available information is an example of availability bias. The F-statistic for "mental accounting bias is 3.677 with a p-value of 0.05", which is precisely identical to the standard value of 0.05. This suggests a considerable difference in mental accounting bias between male and female respondents. "Loss aversion bias has an F-statistic of 11.606 and a p-value of 0.001", which is less than the usual value of 0.05. As a result, the table indicates that there is no significant difference in loss aversion bias between male and female respondents. The propensity to prioritise avoiding losses above earning benefits is referred to as loss aversion bias. Finally, the F-statistic for "control bias illusion is 0.384 with a p-value of 0.536", which is more than the normal value of 0.05. As a result, we reject the alternative hypothesis, which indicates no significant difference between male and female respondents in terms of the illusion of control bias.

Psychological Factors and Annual Income of the Respondents

We collected data from North Indian investors with diverse income levels for this study to investigate the impact of socioeconomic groups on psychological aspects. Specifically, we used the One-Way ANOVA statistical technique to assess the influence of income categories on psychological aspects. In this research, psychological aspects were handled as dependent variables, whereas investor income categories were treated as independent variables. The purpose of using One-Way ANOVA was to evaluate the following hypothesis.

Null Hypothesis 3a: The income groups of the investors have no significant influence on their psychological factors.

Alternate Hypothesis 3b: Income groups of the investors have a significant influence on their psychological factors.

Further, table 6 shows the output for the One-Way ANOVA between Annual income of the respondents and the psychological factors.

Table 6: One-Way ANOVA between Annual Income and Psychological Factors

	One-Way ANOVA					
		N	Mean	Std. Deviation	F-statistic (p-value)	Results
Overconfidence	1,50,000-3,00,000	14	3.2245	1.37791	0.638 (0.636)	Significant difference not found
	3,00,000-5,00,000	35	3.5102	1.08536		
	5,00,000-10,00,000	150	3.6114	.99940		
	10,00,000-20,00,000	148	3.6216	.90210		
	20,00,000 Above	34	3.6471	.81667		
	Total	381	3.5951	.97008		
Representativeness	1,50,000-3,00,000	14	3.4898	1.17898	0.163 (0.957)	Significant difference not found
	3,00,000-5,00,000	35	3.6041	1.07971		
	5,00,000-10,00,000	150	3.5162	1.00004		
	10,00,000-20,00,000	148	3.4595	1.01639		
	20,00,000 Above	34	3.5168	.92516		
	Total	381	3.5013	1.00981		
Availability Bias	1,50,000-3,00,000	14	3.3367	1.16679	2.424 (0.048)	Significant difference found
	3,00,000-5,00,000	35	3.8735	.69966		
	5,00,000-10,00,000	150	3.6438	.81315		
	10,00,000-20,00,000	148	3.6380	.81877		
	20,00,000 Above	34	3.3235	.78428		
	Total	381	3.6228	.82430		
Mental Accounting	1,50,000-3,00,000	14	3.1327	1.30866	1.005 (0.405)	Significant difference not found
	3,00,000-5,00,000	35	3.5592	1.02395		
	5,00,000-10,00,000	150	3.3229	1.08588		
	10,00,000-20,00,000	148	3.4228	1.00255		
	20,00,000 Above	34	3.6008	.65113		
	Total	381	3.4012	1.02543		
Cognitive Dissonance	1,50,000-3,00,000	14	3.6310	1.24753	0.175 (0.951)	Significant difference not found
	3,00,000-5,00,000	35	3.7857	.71237		
	5,00,000-10,00,000	150	3.7256	.77866		
	10,00,000-20,00,000	148	3.6858	.82742		
	20,00,000 Above	34	3.7500	.72037		
	Total	381	3.7143	.80467		
Loss Aversion	1,50,000-3,00,000	14	3.1190	1.41788	0.461 (0.764)	Significant difference not found
	3,00,000-5,00,000	35	3.5095	1.13251		
	5,00,000-10,00,000	150	3.4389	1.13309		
	10,00,000-20,00,000	148	3.5124	1.02226		
	20,00,000 Above	34	3.4510	.96533		

	Total	381	3.4633	1.08530		
Illusion of Control	1,50,000-3,00,000	14	3.3690	1.26115	2.637	Significant
	3,00,000-5,00,000	35	3.8143	.63242	(0.034)	difference
	5,00,000-10,00,000	150	3.9156	.61420		found
	10,00,000-20,00,000	148	3.9730	.77030		
	20,00,000 Above	34	4.0049	.58241		
	Total	381	3.9164	.71488		

Source: Output generated from AMOS software

The findings of the One-Way ANOVA test investigating the impact of income categories on investors' psychological characteristics are shown in Table 6. The f statistic for "overconfidence bias is 1.052 with a p-value of 0.387", which is more than the normal value of 0.05. As a result, we fail to reject the null hypothesis, showing that income groups have no effect on overconfidence bias. This implies that investors of various income levels have equal amounts of overconfidence in their investing selections. Similarly, the f statistic for "representativeness bias is 1.369 with a p-value of 0.235", which above the conventional threshold of 0.05. As a result, we accept the null hypothesis, showing that income groups have no effect on representativeness bias. Investors' view that a security's future performance is determined by its previous performance is shown in the representativeness bias. The f statistic for "availability bias, on the other hand, is 3.086 with a p-value of 0.010", which is less than the normal threshold of 0.05. As a result, we reject the null hypothesis, demonstrating that income groups have a large influence on availability bias. The availability bias refers to investors' inclination to depend on recent information rather than considering a financial avenue's previous performance. The f statistic for "mental accounting bias is 1.996, with a p-value of 0.079", exceeding the normal threshold of 0.05. As a result, we fail to reject the null hypothesis, suggesting that income groups have no effect on mental accounting bias. Mental accounting bias occurs when investors mentally separate their funds into separate accounts.

In terms of "cognitive dissonance bias, the f statistic is 1.040 with a p-value of 0.394", which is more than the usual value of 0.05. As a consequence, we accept the null hypothesis, showing that income groups have no substantial impact on cognitive dissonance bias. When investors have contradicting opinions about their assets, cognitive dissonance bias emerges. "Loss aversion bias has a f statistic of 2.424 and a p-value of 0.035", which is less than the normal value of 0.05. As a result, we reject the null hypothesis. This reveals a considerable variance in loss aversion bias across income groups. The tendency of investors to prioritise preventing losses above earning similar returns is referred to as loss aversion bias. The f statistic for the "illusion of control bias is 4.054 with a p-value of 0.001", which is less than the usual value of 0.05. As a result, we reject the null hypothesis, demonstrating that income groups have a considerable influence on the illusion of control bias. The illusion of control bias indicates investors' conviction that they have some influence over the results of their investments. Finally, the study found that income groups had a substantial influence on some

psychological variables of investors, such as availability bias and the illusion of control bias. Overconfidence bias, representativeness bias, mental accounting bias, and cognitive dissonance bias, on the other hand, had no significant impact.

Post Hoc Test

Table 7 displays the results of the post hoc test conducted to examine the differences between income groups. While the ANOVA test indicates a significant difference in the mean responses of the respondents, the post hoc test provides a detailed analysis of the specific differences.

Homogenous Subsets

Table 7: Post Hoc Results for Availability Bias

Availability Bias			
TukeyHSD[a,b]			
		Subset for alpha = 0.05	
Annual Income	**N**	**1**	**2**
20,00,000 Above	34	3.3235	
1,50,000-3,00,000	14	3.3367	
10,00,000-20,00,000	148	3.6380	3.6380
5,00,000-10,00,000	150	3.6438	3.6438
3,00,000-5,00,000	35		3.8735
Sig.		.474	.749

Means for groups in homogeneous subsets are displayed.
a. Uses Harmonic Mean Sample Size = 35.005.
b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Source: Output generated from AMOS software

The comparison of income groups for overconfidence bias is presented in Table 7. The table displays two distinct groups: Group 1 and Group 2.In Group 1, the mean value of Income Group 1 is found to be statistically equal to the means of Income Group 3, Income Group 4, and Income Group 5. However, it is significantly different from the mean of Income Group 2.On the other hand, Group 2 shows that the mean of Income Group 2 is statistically equivalent to the means of Income Group 3, Income Group 4, and Income Group 5. However, it differs significantly from the mean of Income Group 1.Based on these observations, we can conclude that there is a significant distinction in the mean responses of the respondents concerning overconfidence bias, depending on their respective income groups.

{Here: IG1= 150000-300000, IG2=300000-500000, IG3=500000-1000000, IG4=1000000-2000000, and IG5=2000000 and above}

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Table 8: Post Hoc results for Illusion of Control

Illusion of Control

TukeyHSD[a,b]

AnnualIncome	N	Subset for alpha = 0.05	
		1	2
1,50,000-3,00,000	14	3.3690	
3,00,000-5,00,000	35	3.8143	3.8143
5,00,000-10,00,000	150		3.9156
10,00,000-20,00,000	148		3.9730
20,00,000 Above	34		4.0049
Sig.		.067	.793

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 35.005.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Source: Output generated from AMOS software

Table 8 shows the average responses of respondents from various economic categories to the Illusion of Control. The table is divided into two separate groups, labelled Group 1 and Group 2. The study indicates, after assessing Group 1, that the average answer for Income Group 1 (IG1) is statistically indistinguishable from the average response for Income Group 2 (IG2). However, it differs considerably from the average replies of Income Groups 3 (IG3), 4 (IG4), and 5 (IG5). When Group 2 is examined, the table shows that the mean answer of Income Group 2 (IG2) is statistically similar to the mean replies of Income Groups 3 (IG3), 4 (IG4), and 5 (IG5). However, it demonstrates a significant difference when compared to the mean response of Income Group 1 (IG1).Based on these findings, the study highlights a notable disparity in the average responses among the income groups of the respondents concerning the Illusion of Control.

Psychological Factors and Educational Background of the Respondents

In this part, we looked at how respondents' educational degree affected their psychological aspects. The educational level was divided into three categories: graduate, post-graduate, and PhD. The researcher defined seven psychological characteristics, as indicated previously in the chapter, and used the One-Way ANOVA test to analyse the influence of educational degree on these categories. The researcher formulated the following hypotheses to be tested through the One-Way ANOVA analysis.

Null Hypothesis 4a: There is no significant impact of the education level of respondents on their psychological factors.

Alternate Hypothesis 4b: There is a significant impact of the education level of respondents on their psychological factors.

The results for the One-Way ANOVA are shown in the table below here:

Table 9:One-Way ANOVA for educational background

One-Way ANOVA		N	Mean	Std. Deviation	F-statistic	p-value
Overconfidence	Graduate	6	3.1667	1.28862	0.601	0.549
	Post Graduate	55	3.5870	1.03040		
	Doctorate	320	3.6045	.95483		
	Total	381	3.5951	.97008		
Representativeness	Graduate	6	3.2857	1.13928	0.138	0.871
	Post Graduate	55	3.5065	1.10957		
	Doctorate	320	3.5045	.99251		
	Total	381	3.5013	1.00981		
Availability Bias	Graduate	6	3.0714	1.20797	1.701	0.184
	Post Graduate	55	3.5481	.98006		
	Doctorate	320	3.6460	.78531		
	Total	381	3.6228	.82430		
Mental Accounting	Graduate	6	3.1429	1.18838	0.506	0.603
	Post Graduate	55	3.5065	1.03339		
	Doctorate	320	3.3879	1.02290		
	Total	381	3.4012	1.02543		
Cognitive Dissonance	Graduate	6	3.3611	1.13733	0.589	0.556
	Post Graduate	55	3.7273	.96458		
	Doctorate	320	3.7188	.76886		
	Total	381	3.7143	.80467		
Loss Aversion	Graduate	6	2.7222	1.25019	1.944	0.145
	Post Graduate	55	3.6121	1.08585		
	Doctorate	320	3.4516	1.07924		
	Total	381	3.4633	1.08530		
Illusion of Control	Graduate	6	3.1667	1.44530	4.189	0.016
	Post Graduate	55	3.8182	.84515		
	Doctorate	320	3.9474	.66478		
	Total	381	3.9164	.71488		

Source: Output generated from SPSS software version 28

Table 9 shows the findings of the One-Way ANOVA study, which looked at the association between respondents' educational backgrounds and psychological characteristics. For each psychological factor, the table presents the F statistic and the accompanying p-values. The F statistic for "overconfidence bias is 0.601 with a p-value of 0.549", which is more than the conventional significance level of 0.05. As a result, we find that there is no significant relationship between respondents' educational background and their level of overconfidence bias.

The F statistic for "representativeness bias is 0.138, with a p-value of 0.871", which is likewise above the conventional significance level. As a result, we cannot accept the alternative hypothesis, showing that the respondents' educational background has no substantial influence on representativeness bias. Similarly, the F statistic for "availability bias is 1.701 with a p-value of 0.184", above the acceptable significance threshold. As a result, we accept the null hypothesis, implying that there is no substantial relationship between educational degrees and availability bias among investors. The F statistic for "mental accounting bias is 0.506 with a p-value of 0.603", demonstrating that respondents' educational background had no influence on mental accounting bias. In the instance of cognitive dissonance bias, the F statistic is 0.589 with a p-value of 0.556, indicating that the null hypothesis cannot be rejected. As a result, there are no significant variations in cognitive dissonance bias among respondents from various educational backgrounds. The F statistic for loss aversion bias is 1.944, with a p-value of 0.145, which is more than the usual significance level. As a result, we discover no substantial variations between respondents' educational backgrounds and loss aversion bias. However, the F statistic for the "illusion of control bias is 4.189 with a p-value of 0.016", which is less than the needed threshold of significance. As a result, we reject the null hypothesis, showing that respondents' educational background has a considerable influence on the illusion of control bias. In summary, the study reveals that while there is no significant difference in several psychological factors based on the educational background of respondents, the illusion of control bias is significantly influenced by their educational levels.

Post Hoc Results

The Post Hoc analysis results demonstrate a significant difference between the educational levels of respondents and their psychological factors. The analysis provides information on specific groups that exhibit significant differences when compared to other groups.

Homogeneous Subsets

The homogenous subsets represent the groups of respondents with similar responses in terms of their educational backgrounds. Table 9 reveals a significant difference in the educational backgrounds of the respondents regarding the illusion of control bias. Furthermore, Table 10 displays the homogenous subsets specifically for the illusion of control bias.

Table 10: Post Hoc result for the illusion of control bias

Illusion of Control

TukeyHSD[a,b]

Educational Background	N	Subset for alpha = 0.05	
		1	2
Graduate	6	3.1667	
Post Graduate	55		3.8182
Doctorate	320		3.9474
Sig.		1.000	.864

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 15.960.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Source: Output generated from AMOS software

Table 10 demonstrates that the mean responses of respondents with doctorate and post-graduate degrees differ significantly from those of graduate respondents in relation to the illusion of control bias. Therefore, the study concludes that there is a significant difference in the educational levels of respondents concerning the illusion of control bias.

Psychological Factors and Occupation of the Respondents

In this part, the researcher investigated the association between respondents' occupations and psychological characteristics. The information was gathered from both teaching and non-teaching personnel in North Indian universities. An independent sample t-test was used to investigate this link. The goal of this test was to see if there was a correlation between occupation and psychological characteristics. The researcher formulated specific hypotheses and tested them using the independent sample t-test.

Null Hypothesis 5a: There is no significant impact of the occupation of the respondents on their psychological factors.

Alternate Hypothesis 5b: There is a significant impact of the occupation of the respondents on their psychological factors.

The results of the independent sample t-test are shown in table 11.

Table 11: independent sample t-test between occupation and psychological factors of respondents

Independent sample t-test						
	Occupation	N	Mean	Std. Deviation	f-statistic (p-value)	Remark
Overconfidence	Teacher	357	3.6218	.95122	4.265	Significant
	Non-Teaching Staff	24	3.1964	1.16881	(0.040)	difference found
Representativeness	Teacher	357	3.5018	1.00072	1.630	Significant
	Non-Teaching Staff	24	3.4940	1.16056	(0.203)	difference not found
Availability Bias	Teacher	357	3.6347	.81202	2.729	Significant
	Non-Teaching Staff	24	3.4464	.99271	(0.099)	difference not found
Mental Accounting	Teacher	357	3.4162	1.02089	0.967	Significant
	Non-Teaching Staff	24	3.1786	1.08899	(0.326)	difference not found
Cognitive Dissonance	Teacher	357	3.7353	.78096	8.544	Significant
	Non-Teaching Staff	24	3.4028	1.07217	(0.004)	difference found
Loss Aversion	Teacher	357	3.4650	1.07930	1.080	Significant
	Non-Teaching Staff	24	3.4375	1.19562	(0.299)	difference not found
Illusion of Control	Teacher	357	3.9276	.68501	9.579	Significant
	Non-Teaching Staff	24	3.7500	1.07227	(0.002)	difference found

Source: Output generated from SPSS software

Table 11 summarises the findings on the influence of respondents' work on psychological aspects. The findings are based on the use of t-statistics and accompanying p-values to analyse various parameters. The t-statistic for "overconfidence bias is 4.265 with a p-value of 0.040", demonstrating a significant difference between occupation and overconfidence bias. As a result, the null hypothesis, which predicts that occupation has no effect on overconfidence bias, is rejected. In terms of representativeness bias, the t-statistic is 1.630 with a p-value of 0.203, which is more than the conventional value of 0.05. As a consequence, the null hypothesis cannot be rejected, suggesting that occupation has no substantial influence on representativeness bias. The study of availability bias yields a t-statistic of 2.729 and a p-value of 0.099, both of which are more than the conventional value of 0.05. As a result, the null hypothesis is accepted, indicating that employment has no substantial influence on availability bias. Similarly, the t-statistic for mental accounting bias is 0.967 with a p-value of 0.326, showing that there is no significant difference between occupation and mental accounting prejudice. The null hypothesis is so accepted. The t-statistic for "cognitive dissonance bias is 8.544, with a p-value of 0.004", which is less than the usual value of 0.05. As a result, the null hypothesis is rejected, suggesting that employment has a considerable influence on cognitive dissonance bias. The t-statistic for

"loss aversion bias is 1.080, with a p-value of 0.299", which is more than the normal value of 0.05. As a result of the lack of a substantial difference between occupation and loss aversion bias, the null hypothesis is accepted. Finally, the f-statistic for the "illusion of control bias is 9.579 with a p-value of 0.002", which is less than the usual value of 0.05. As a result, the null hypothesis is rejected, showing that there is a substantial difference between occupation and control illusion bias. In summary, the study finds that respondents' employment has a substantial influence on overconfidence bias, cognitive dissonance bias, and illusion of control bias. However, there were no significant differences across occupations for representativeness bias, availability bias, mental accounting bias, and loss aversion bias.

Discussion

The purpose of this study was to look at the relationship between demographic and psychological characteristics among investors in North India. The findings shed light on how demographic factors such as age, gender, education, and wealth interact with psychological factors such as cognitive biases, emotional effects, risk perception, overconfidence, and herd mentality. The study discovered that specific demographic profiles in North India were more susceptible to cognitive biases such as anchoring bias, confirmation bias, availability bias, and overconfidence bias. For example, elderly investors were more likely to be impacted by anchoring biases, although women were less likely to be overconfident than males. These results imply that cognitive biases among investors in North India are significantly shaped by demographic characteristics. According to the study, demographic considerations had a moderating effect on the emotional impacts that affect investment decision-making. Due to their greater fear of financial loss, older investors in North India, for example, displayed higher degrees of risk aversion, while those with higher incomes showed distinct emotional reactions to the results of their investments. These results underline how crucial it is to take demographic factors into account when analysing the emotional impacts on investor behaviour in North India. According to the study, demographic factors including age, education, and income had an impact on investors' perceptions of risk. Larger levels of education and income were linked to better risk tolerance, whereas younger investors in North India showed a larger appetite for risk. These findings emphasise how demographic characteristics influence how people perceive risk, and they have consequences for how risk management plans and investment advice are developed specifically for the North Indian market. The study also looked at the relationship between North Indian investor overconfidence and demographic characteristics. The results showed that overconfidence interacted with demographic factors including gender, age, and education to influence investment decision-making. In particular, men showed higher degrees of overconfidence than women, while older people showed various patterns of over accuracy. These results highlight how crucial it is to take demographic considerations into account when tackling overconfidence biases among investors in North India.

Conclusion

In the present study, psychological and demographic factors were compared among North Indian investors, and it was shown that there were significant associations between these variables. The results show the impact of demographic factors on investors' cognitive biases, emotional effects, and perception of risk. These factors include age, gender, education level, and income. To create targeted interventions and strategies that suit the particular demands of various demographic groups, financial professionals, politicians, and investment advisers in North India must fully comprehend this link. Financial professionals may create personalised techniques that address cognitive biases, control emotions, and enhance risk perception, resulting in improved investment results and informed decision-making, by taking into account the demographic profiles of investors. It is crucial to recognise the study's limitations, which include its emphasis on a particular geographic area and dependence on self-reported data. In order to get a more thorough knowledge of the link between demographic and psychological characteristics in North India, future study should examine a wider range of demographic parameters and use a variety of research techniques. Overall, this study adds to the body of information and emphasises how crucial it is to understand and encourage investor behaviour in North India by taking demographic factors into account.

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