

## Impact of Heuristics on Perceived Investment Performance and Financial Satisfaction of Individual Investors

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**[Abstract]** Heuristics allow people to make quick and optimal decisions within a short period, but they can also lead to severe cognitive errors in decision-making. The purpose of the research is to analyze the impact of heuristics on the perceived investment performance and financial satisfaction of Indian individual investors. Convenience and snowball sampling techniques were used to collect data from 200 respondents, out of which 184 responses were found suitable for further analysis. Confirmatory factor analysis (CFA) and structural equation modeling (SEM) using AMOS 21 were employed to test hypotheses in the research model. The findings suggest that among the heuristics, representativeness, and anchoring were positively associated with perceived investment performance across the sample, while availability bias was significantly associated with the financial satisfaction of individual investors. The study has several implications for academicians, financial advisors, and educators, as it helps them understand the psychology of Indian retail investors.

**[Keywords]** overconfidence, representativeness, availability, anchoring, financial satisfaction

### Introduction

Financial decision-making is a complex process that has several dimensions, making financial decisions in the stock market requires individual investors to knowingly or unknowingly make use of various heuristics and biases that help them make better financial choices. Kahneman et al. (1982) suggested that heuristics are mental shortcuts that people employ to facilitate decision-making in uncertain situations. The employment of these heuristics is quite useful, but sometimes they can lead to severe systematic errors. The study incorporates three heuristics (representativeness, anchoring, and availability) introduced by Tversky and Kahneman (1974), and one heuristic (overconfidence) suggested by Waweru et al. (2008). Heuristics-induced behaviors have a direct or indirect impact on the natural outcomes of financial decisions (Chen & Koufaris, 2015) and two such outcomes are perceived investment performance and financial satisfaction. Investors' inclination toward heuristics and biases while making financial decisions (Daniel et al., 1998) and the difficulty of eradicating these psychological problems (Kahneman & Riepe, 1998) make it important for us to understand their role in financial decisions.

Previous researchers have long recognized the associations between heuristics and various demographic and socioeconomic variables in India. However, very scant literature exists that explores the relationship of heuristics with perceived investment performance and financial satisfaction of Indian retail investors (Sahi, 2017). Therefore, the purpose of the study is to identify the impact of heuristics on perceived investment performance and financial satisfaction of Indian individual investors. We test our theoretical model using structural equation modeling on the primary data collected from 184 individual investors in the Indian stock market. The research findings suggest that among the heuristics, representativeness and anchoring were positively associated with perceived investment performance across the sample, while availability bias was significantly associated with the financial satisfaction of individual investors. Hence, the results of the study empirically prove that people tend towards certain heuristics-driven biases, which, in turn, can impact the levels of their performance and satisfaction.

### Review of Literature and Hypotheses Development

Behavioral biases have been thoroughly investigated in the literature. This section offers a limited review of prior studies regarding heuristics (overconfidence, representativeness, availability, and anchoring), perceived investment performance, and the financial satisfaction of individual investors. The relationships between the variables have been explored to develop hypotheses and the conceptual model for the study.

**Overconfidence** is the most researched cognitive bias in the theory of behavioral finance. According to Odean (1998), overconfident investors overestimate the precision of their knowledge about the value of a financial security. Isidore and Christie (2018) have defined overconfidence as the bias that causes investors to be overconfident about their stock picking ability, about their knowledge, about their information processing capability, and about their skill set. Severson (1981) and Glaser and Weber (2007) measured overconfidence in terms of “better than average effect.” Langer (1975) and Moore and Healy (2008) identified that overconfident individuals think that they have more control over purely uncontrollable events. Self-attribution is also identified as an important aspect of overconfidence (Bradley, 1978; Zuckerman, 1979; Hirshleifer & Luo, 2001; Daniel et al., 1998; Gervais & Odean, 2001).

**Representativeness** is the tendency of individuals to classify things or events into discrete groups based only on some noticeable visible characteristics and includes overreliance on stereotypes. Tversky and Kahneman (1974) in their seminal work have shown many ways in which representativeness can cause investors to diverge from rational thinking. First is failure to consider base rate probabilities or representativeness, second is failure to consider sample size, and third is the misconception of chance (gambler’s fallacy).

**Availability** is defined as a heuristic in which people assess the frequency of an event by the ease with which the instance came to mind (Tversky & Kahneman, 1974). It is a bias in which the decision-makers rely on readily available information and makes investors avoid laborious fact-checking and detailed analysis of information which increases the chance of the decision being flawed. Availability bias emerges because of the **retrievability** and **exposure effect** of an event.

**Anchoring bias** refers to the human tendency to rely too heavily on the “anchor” while making judgments for which the answer is ambiguous. An anchor generally refers to one characteristic or piece of information about an event or initial value of an estimate easily available to them (Tversky & Kahneman, 1974). Following Kahneman and Tversky (1974) many studies have demonstrated the prevalence of anchoring in various judgemental domains, including general knowledge (Mussweiler & Strack, 1999; Jacowitz & Kahneman, 1995), probability estimates (Plous, 1989; Chapman & Johnson, 1994), legal judgment (Markovsky, 1988; Chapman & Bornstein, 1996) and financial markets. In the financial domain George and Hwang (2004), Li and Yu (2012), and Park (2010) showed that a 52-week high price is taken as an anchor by many stock market participants.

**Perceived Investment Performance** is the self-analysis of the returns on stock investment by individual investors (Javed et al., 2017). It is the subjective assessment of returns that is made by asking investors to compare their current real returns with their expected returns. An element of satisfaction levels from investment decisions is also included in the scale to measure perceived investment performance, as there can be many investors whose returns are not high, but the investors are still satisfied with their investments (Luong & Thi Thu Ha, 2011).

**Financial Satisfaction** is defined as “the subjective assessment of satisfaction with one’s present financial situation” (Joo & Grable, 2004). Financial satisfaction is an important sub-construct of financial well-being (Campbell, 1981; Sahi, 2017). To date, there is no consensus on the best way to measure financial satisfaction, but, generally, it is measured by the perceived satisfaction of individuals with their present levels of income, savings, ability to meet financial emergencies, and ability to meet future needs of life (Saurabh & Nandan, 2019).

#### **Heuristics and Perceived Investment Performance**

A vast amount of literature has attempted to establish direct or indirect links between various heuristics and investment performance of individuals from time to time. Odean (1998) developed a model in which overconfident investors trade excessively and have lower expected utilities. Odean (1999) found out that

trading profits of overconfident discount brokerage customers are not even sufficient to cover transaction costs. Barber and Odean (2000), provided empirical evidence for the fact that overconfident investors pay a tremendous performance penalty in the form of lower annual returns when compared to market returns and average investor returns. Oberlechner and Osler (2008) pointed out that overconfidence is necessary for survival in the market, and the illusion of success keeps currency dealers motivated and enhances their self-esteem. De Long et al. (1991) examine overconfident traders as the ones who underestimate their risk and, consequently, hold more risky assets and earn higher expected returns in comparison to rational traders. Hirshleifer and Luo (2001) offer additional reasons as to why overconfident investors survive in the long run. As they trade more aggressively based on some valid information, they are better able to exploit risky profit opportunities and, in turn, earn higher expected profits as compared to rational and noise traders.

Javed et al. (2017) found a positive and significant association between representativeness and perceived investment performance. Alrabadi et al. (2018) surveyed a sample of 242 investors on the Amman Stock Exchange and found out that Vietnam and concluded that heuristics have a positive influence on investment performance. Kengatharan and Kengatharan (2014), in their study on Sri-Lankan investors, concluded that overconfidence has a negative effect, while anchoring has a positive influence on the investment performance of individuals. Cen et al. (2013) and Birz et al. (2022) explored how anchoring-induced forecasts are related to stock prices and found that there is a strong statistically significant correlation between measures of anchoring and stock returns. So, the past literature provides both views regarding the impact of heuristics on perceived investment performance, but the majority of results emphasize that heuristics are not always bad, and they help investors perform better in the market. Therefore, we form the following hypotheses:

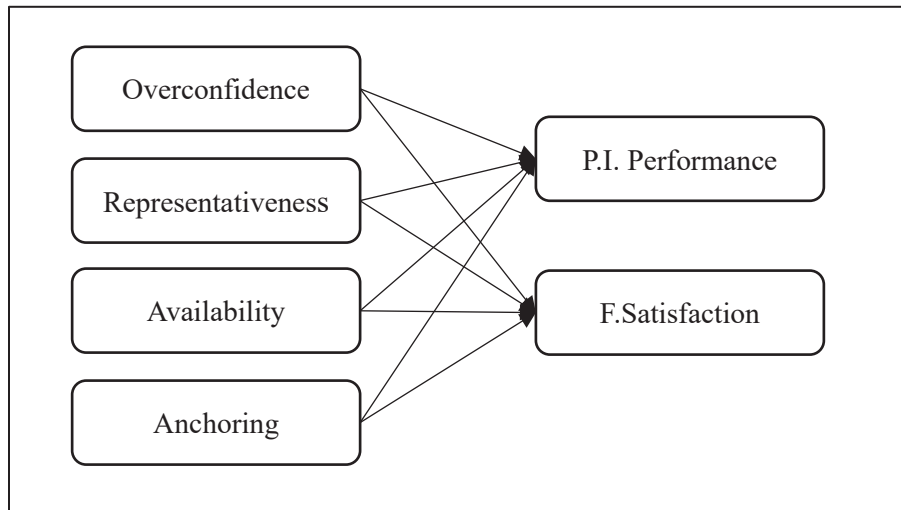
- H1: Overconfidence has a positive significant impact on perceived investment performance.
- H2: Representativeness has a positive significant impact on perceived investment performance.
- H3: Availability has a positive significant impact on perceived investment performance.
- H4: Anchoring has a positive significant impact on perceived investment performance.

Representativeness, availability, and overconfidence have a significant impact on the investment performance of individuals. Le Luong and Thi Thu Ha (2011) identified the impact of behavioral factors on investment decisions and the investment performance of individual investors at HOSE

### ***Heuristics and Financial Satisfaction***

Heuristics and their impact on financial satisfaction have been little researched, not just in the Indian context, but also across the world. Chen and Koufaris (2014) took satisfaction as the causal outcome of the decision-making process and confirm the hypothesis that subjects who exhibit a higher level of overconfidence also exhibit a higher level of satisfaction with the decision-making process. Asif (2016) confirms the prevalence of behavioral biases among the small investors of the Lahore stock exchange and found out that overtrading has a negative and significant impact on the satisfaction of investors, while anchoring did not yield a significant relationship in this regard. In the Indian context Sahi (2017) has tried to find out the association between heuristics and the financial satisfaction of individual investors. *“The past decisions made by the individual investor based on the heuristics and biases lead to outcomes that, when evaluated by the individual based on their internal standards, impact their financial satisfaction levels”* (Sahi, 2017, P. 4.) The study found that overconfidence, self-control, and budgeting tendency have a positive and significant association with financial satisfaction. Pandey and Jessica (2018) explained the relationship between behavioral biases and investment satisfaction in the Indian real estate market, the study believes heuristics can assist individuals in selecting the top course of action and allow them to go for less costly mistakes, thereby helping in achieving satisfying behavior. Therefore, we form the following hypotheses:

- H5: Overconfidence has a positive and significant impact on financial satisfaction.
- H6: Representativeness has a positive and significant impact on financial satisfaction.
- H7: Availability has a positive and significant impact on financial satisfaction.
- H8: Anchoring has a positive and significant impact on financial satisfaction.

**Figure 1***Proposed Conceptual Model*

## Research Design and Methodology

### *Sampling and Data Collection*

The target population for the study consists of individual investors in the Indian stock market. A cross-sectional research design is employed using a self-administered questionnaire as a tool for data collection. Convenience and snowball sampling techniques are used for the study. A total of 200 respondents returned questionnaires, out of which 184 responses were found suitable for further analysis.

### *Measuring Instrument*

A structured questionnaire was constructed and used as the main survey instrument. It consists of 35 questions, which were broadly divided into three sections. Section 1 is based on demographic and socioeconomic variables (8 items), the second section is composed of 17 questions measuring four heuristics as an independent variable in the study, and the third section contained 10 items measuring investment performance and financial satisfaction of individual investors as dependent variables in the study. Responses were sought on a seven-point Likert scale with anchors ranging from 1 (strongly disagree) to 7 (strongly agree).

**Overconfidence:** To measure overconfidence, the six-item scale from Kansal and Singh (2018) has been adopted.

**Representativeness:** To measure the representativeness heuristic, a three-item scale was constructed, which consist of 2 items from Waweru et al. (2008) and 1 item from Rasheed et al. (2018)

**Anchoring:** Anchoring was also measured using a four-item scale that was taken from Jain et al. (2020) and Baker et al. (2019).

**Availability:** To measure availability, 2 items were taken from Le Luong and Thi Thu Ha (2011), and 2 items were taken from Kudryavtsev et al. (2013).

**Financial Satisfaction:** To measure the financial satisfaction of individuals, 6 items from a 7-item scale from Joo and Grable (2004) and Sahi (2017) were adopted.

**Perceived Investment Performance:** A 4-item scale to measure perceived investment performance was taken from Le Luong and Thi Thu Ha (2011) and Sato et al. (2011).

## Data Analysis and Interpretation

### *Respondents Profile*

The sample consists of 184 respondents out of which 79.60 percent are males and 19.90 percent are females. The number of female investors is quite low because of the patriarchal nature of Indian society. The respondents are categorized into age groups of 18-30 years, 31-40 years, and above 40 years. A major chunk of our respondents is highly educated and falls within the age group of 18-30 years. Regarding their educational background, almost 53 percent of the sample participants are postgraduates. Concerning investment experience, we have categorized them into two categories: less than 3 years of experience (73.30%) and more than 3 years of experience (26.70%). The majority of the respondents (65.45%) have an annual income of less than 5 lakh rupees.

### *Confirmatory Factor Analysis*

First, we used confirmatory factor analysis (CFA) to determine the quality of the measurement model by evaluating the reliability of all reflective scales, followed by the discriminant and convergent validity of each construct. We used six concepts that are overconfidence, representativeness, anchoring, availability, perceived investment performance, and financial satisfaction. CFA on the hypothesized model was performed using SEM. Values of CMIN/df, comparative fit index (CFI), the goodness of fit index (GFI), adjusted goodness of fit index (AGFI), p-values, and root mean square error of approximation (RMSEA) were used to evaluate the fit of the model.

### *Reliability and Validity of the Model*

Internal consistency of the scale is measured with the help of Cronbach's alpha i.e.  $\{CA(\alpha)\}$  and is shown in Table 1. Some of the items were negative in sense and, therefore, they were reverse coded. For each construct, the values of Cronbach's  $\alpha$  and CR are more than the floor level of 0.70 and are acceptable for basic research (Nunnally & Bernstein, 1967; Fornell & Larcker, 1981).

*Convergent Validity* is the extent to which scale correlates positively with other measures of the same construct (Malhotra & Dash, 2017). Measures, namely CR (composite reliability) and AVE (average variance explained) have been used to establish the Convergent validity of the measurement model. The CR values of all six constructs are more than 0.7, and AVE values are more than 0.5, respectively (Table 1). Thus all conditions for ensuring the convergent validity of the measurement model have been satisfied. (Hair et al., 2006)

Discriminant validity is the extent to which a measure does not correlate with other constructs from which it is supposed to differ. (Malhotra & Dash, 2017). Discriminant validity of the measurement model is confirmed if MSV (maximum shared variance) < AVE. (Hair et al., 2006) and if the square root of the AVE of each variable is greater than the correlation values of all other constructs (Fornell & Larcker, 1981). Table 1 shows that the square roots of the AVE of all variables in the diagonal element were greater than the bivariate correlation of other variables. Therefore, the discriminant validity of our research model was acceptable. In the present study, the validity toolkit provided by Professor Gakingston is used to determine the validity of the measurement model.

**Table 1**  
*Reliability and Validity of the Constructs*

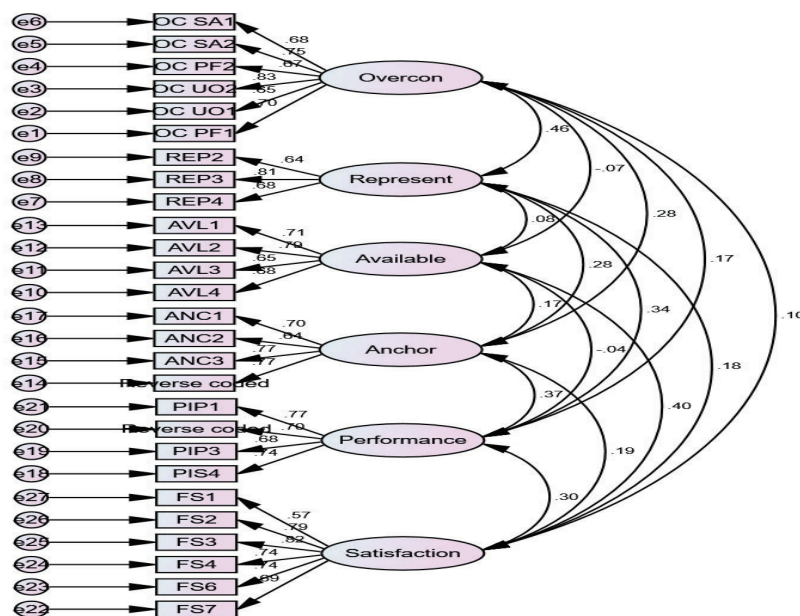
	CR	AVE	MSV	Max R(H)	ANC	OC	REP	AVL	PIP	FS
ANC	0.813	0.522	0.118	0.821	<b>0.722</b>					
OC	0.863	0.515	0.207	0.874	0.277	<b>0.717</b>				
REP	0.757	0.512	0.207	0.779	0.282	0.455	<b>0.715</b>			
AVL	0.801	0.503	0.161	0.809	0.172	-0.069	0.084	<b>0.709</b>		
PIP	0.815	0.524	0.132	0.818	0.368	0.175	0.342	-0.042	<b>0.724</b>	
FS	0.875	0.541	0.157	0.883	0.198	0.096	0.178	0.401	0.332	<b>0.728</b>

Source(s): Gakingston statistical toolkit output

Note(s): ANC = Anchoring, OC = Overconfidence, REP = Representativeness, AVL = Availability, PIP = Perceived investment performance, FS = Financial satisfaction

The CFA model to test the conceptual model is depicted in Figure 2. The measurement model is estimated using the maximum likelihood estimation method in AMOS 21, which is a commonly used approach in SEM. The CFA model produced acceptable results according to statistical fit indices. Threshold values of good fit indices defined in the studies of Hair et al. (2010), Tucker and Lewis (1973), and Bentler (1990) are in an acceptable range. **CMIN/ df = 1.286, GFI = 0.90, AGFI = 0.850, TLI = .947, CFI = 0.953 and RMSEA = 0.40**; therefore, the model is a good fit.

**Figure 2**  
*Measurement Model for Constructs*



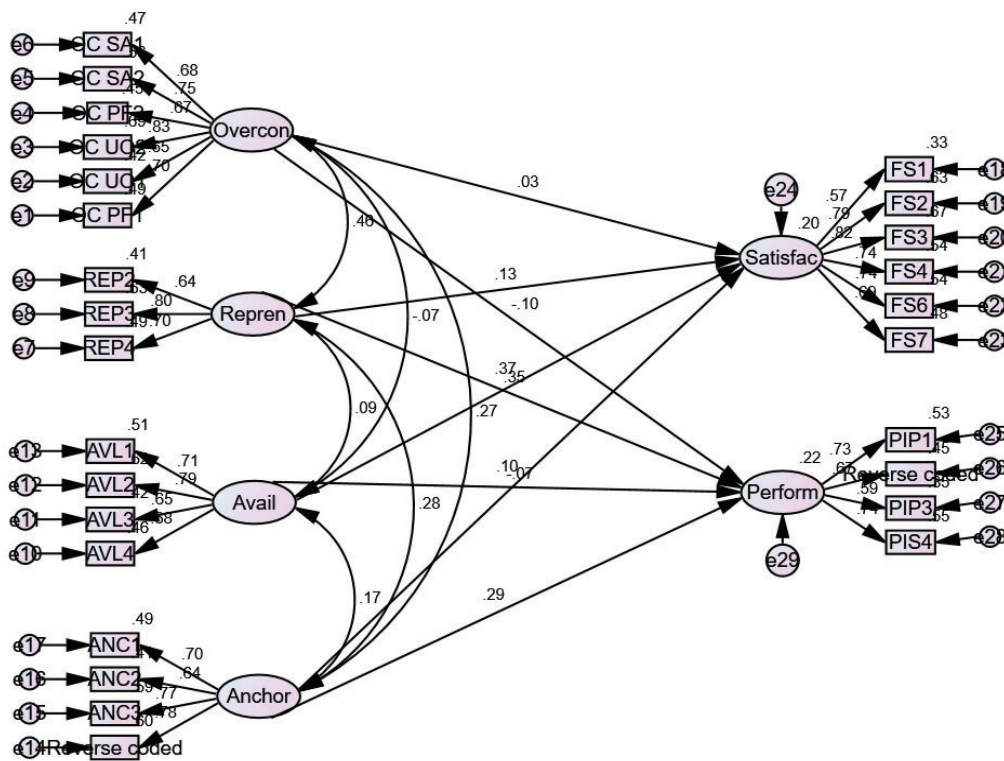
Source: IBM Amos output

**Structural Model Assessment**

A structural equation model generated through AMOS was used to test the relationships. A good fitting model is accepted if the value of the CMIN/df is < 5, the goodness of the fit (GFI) indices (Hair et al, 2010); the Tucker and Lewis (1973) index (TLI); the confirmatory fit Index (CFI) (Bentler, 1990) is > 0.90 (Hair et al., 2010). In addition, an adequate fitting model is accepted if the AMOS computed value and the standardized root mean square residual (RMR) is < 0.05 and the root mean square error approximation (RMSEA) is between 0.05 and 0.08 (Hair et al., 2010). The fit indices for the model shown in Table 2 fell within the acceptable range: **CMIN/df = 1.308, GFI = 0.869, TLI = 0.941, CFI = 0.948, SRMR = 0.076, and RMSEA = 0.041.**

The squared multiple correlation was 0.220 for perceived investment performance; this shows that overconfidence, representativeness, anchoring, and availability explain about 22% variance in perceived investment performance, and the squared multiple correlation for financial satisfaction was 0.24. This shows that a 24% variation in financial satisfaction is explained by heuristics in the present model.

**Figure 3**  
*Structural Model*



Source: IBM Amos output

The study assessed the impact of heuristics on perceived investment performance and the financial satisfaction of investors. The impact of overconfidence and availability on perceived investment performance is negative but insignificant (H1:  $b = -0.103$ ,  $t = -0.999$ ,  $p = .318$ ; H3:  $b = 0.067$ ,  $t = -0.746$ ,  $P = 0.456$ ), so H1 and H3 were not supported. Representativeness and anchoring have a positive and significant impact on the perceived investment performance of investors hence, so the data confirm H2 and H4 in the model (H2:  $b = 0.348$ ,  $t = 3.0.32$ ,  $P < 0.05$ ; H4:  $b = 0.289$ ,  $t = 2.925$ ,  $P < 0.05$ ). About the impact

of heuristics on the financial satisfaction of retail investors, H5, H6, and H8 were not supported by the results obtained from data analysis as  $P > 0.05$ . However, availability bias has a positive and significant impact on the financial satisfaction of investors (H7:  $b = 0.371$ ,  $t = 3.749$ ,  $P < 0.05$ ).

**Table 2**

*Model fit Indices about SEM and Hypotheses Results*

Hypothesized relationship	Standardized estimates	t-value	p-value	Decision
Overconfidence -> PIP	-0.103	-0.999	0.318	Reject
Representativeness -> PIP	0.348	3.032	< 0.05	Accept
Availability -> PIP	-0.067	-0.746	0.456	Reject
Anchoring -> PIP	0.289	2.925	< 0.05	Accept
Overconfidence -> FS	0.034	0.357	0.721	Reject
Representativeness -> FS	0.129	1.269	0.204	Reject
Availability -> FS	0.371	3.749	< 0.05	Accept
Anchoring -> FS	0.096	1.074	0.283	Reject
R-Square				
Perceived Investment Performance	0.22			
Financial Satisfaction	0.20			
CMIN/df = 1.308, GFI = 0.869, TLI = 0.941, CFI = 0.948, SRMR = 0.076, and RMSEA = 0.041.				

### Findings and Discussion

In this article, we set out to deepen our understanding of whether heuristics influence the perceived investment performance and financial satisfaction of individual investors in India. The data analysis revealed that representativeness and anchoring have a significant and positive impact on the perceived investment performance of individual investors, while availability bias has a significant and positive association with the financial satisfaction of retail investors. These findings are consistent with the results from Javed et al. (2017), Alrabadi et al. (2018), Kengatharan and Kengatharan (2014), Cen et al. (2013), Birz et al. (2022) and Pandey and Jessica (2018). This may be due to the fact, that representativeness, availability, and anchoring allow investors to select the best course of action that not only saves their time but also protects them from committing costly mistakes and thereby help them to achieve higher levels of perceived investment performance and financial satisfaction.

Overconfidence has a negative association with perceived investment performance and a positive association with financial satisfaction; however, this association is not significant in the context of this study. Still, a negative coefficient between overconfidence and PIP suggests that overconfident investors pay a performance penalty in terms of lower returns, as suggested by Odean (1998) and Barber and Odean (2000). This, observation is also interesting in the sense that regardless of whether investors gain or lose money from the decision they made, the extent of confidence they had in their initial investments had a positive effect on their satisfaction (Chen & Koufaris, 2014). Overconfidence and availability do not have any significant impact on investment performance, and links between overconfidence representativeness and anchoring with financial satisfaction are also insignificant in the present model.

The finding implies that individual investors, while making financial decisions, are prone to certain psychological errors, and they have a mixed effect on the natural outcome of financial decisions, such as investment performance and financial satisfaction.

### Limitations and Future Research

The study has a series of limitations in its conclusions and findings. First, the technique for model testing assumes that the latent variables possess linear relationships between them. Second, we used pre-defined scales to measure heuristic constructs; thus, our study has a measurement weakness. Third, the study has



been conducted on a small sample of investors in India. This study paves the way for various possibilities for further research in the domain of behavioral finance. Researchers and practitioners can explore other biases and their associations with investment performance and financial satisfaction. Moreover, researchers can also study the mediation effect of perceived investment performance between heuristics and financial satisfaction. Larger sample sizes can also be considered to improve the generalizability of results.

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