

## Investigating The Mediating Role of Financial Literacy on The Relationship Between Women Entrepreneurs' Behavioral Biases and Investment Decision Making

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**Abstract:** This study investigates the theoretical link between heuristic behavioral factors and the investment decision-making of women entrepreneurs, focusing on the importance of financial literacy as a potential mediator shaping prudent decision-making. We argue that women's financial literacy is an efficient way to apply behavioral considerations in wise decision making. Using the proportionate stratified sampling method, we collected data from women entrepreneurs who were formally registered in Punjab Province, Pakistan. Owing to the complex model and small sample size, the smart PLS method was applied to analyze the structural relationship between the measured and latent constructs. The results show that overconfidence and availability heuristics have a significant positive impact on investment decisions, while financial literacy plays an essential intervening role between the overconfidence heuristic, availability heuristic, and investment decision-making. Our results support the execution of financial literacy awareness among women entrepreneurs to stimulate their financial decision control and give them the independence to make prudent financial decisions.

**Keywords:** heuristic, financial literacy, women entrepreneurs, investment decision

**JEL Classification:** G40, G41

## Introduction

Women entrepreneurs' investment decisions have become more difficult due to the prevalence of irrational behavior in recent decades (Iram, Bilal, Ahmad & Latif, 2022a; Salim & Khan, 2020). Many investors are particularly concerned about their investment decisions since every entrepreneur expects to earn more profits, based on their decisions (Dang et al., 2019; and Ghaeli, 2019). In this regard, Salim (2015) argues that a wide range of benefits is enclosed within rational investment decisions. Financial behavior researchers Iram, Bilal & Latif (2021) indicate that the vitality of women entrepreneurs' investment decisions and heuristic behavioral skills are shortcuts for individuals in their daily lives to make investment decisions. Similarly, Sharma (2018) endorsed that women's entrepreneurship has received greater recognition, in terms of economic progress, job creation prospects, and poverty alleviation (Iram, Parveen, Ahmad & Bilal, 2022; Rashid, & Ratten, 2020; Castellanza, 2020). Numerous researchers (Shakeel, Yaokuang, & Gohar, 2020; Roomi & Parrott, 2008) specified that women entrepreneurs' financial investment decisions substantially impact the economy of under-developed economies like Pakistan. It is a matter of acknowledgment that women entrepreneurs contribute to stable business development and poverty reduction (Iqbal, Rajput and Qadeer 2011; Bouzekraoui & Ferhane, 2017). An economic downturn can expose women entrepreneurs' vulnerability and cause them to strive harder for profitable business ventures (Zeb, Amin, Kakakhel & Ihsan, 2020). Women entrepreneurs secure their confidence and empowerment from moral and financial support during business startups (Iram, Bilal, Ahmad & Latif, 2022a; Iqbal et al., 2013). The scholar Bhavani (2020) reveals that women entrepreneurs are not encouraged and considered to be undervalued for investment decisions, compared to men, due to the women's social responsibilities. The identical stance was agreed by Khan et al. (2019) who pointed out that women entrepreneurs have to accomplish societal, familial, and religious obligations. In addition, women entrepreneurs' investment decisions bring more challenges in developing countries like Pakistan (Iram, Bilal, Ahmad & Latif, 2022b; Iram, Bilal & Latif, 2021). More prominent challenges are the lack of family support, social injustice, gender-dominating norms (Iram, Bilal, Parveen & Ahmad, 2019; Hasan, 2020), and gender discrimination (Sadaqat, 2011). In comparison, Shah & Saurabh (2015) claim that female investors display irrational behavior due to a lack of family support, despite the investment pattern being small, medium, or large. Thus, women's investment decisions still need to be addressed (Kappal & Rastogi, 2020).

Investment decisions are closely linked with the literacy level of individuals. Likewise, handling financial matters and making effective business decisions are mainly dependent on the women entrepreneur's financial literacy level (Vanjikodi, 2019; Iram et al., 2022a). However, heuristic behavior is also strongly correlated with investment decision-making, for example overconfident entrepreneurs may make better decisions through the utilization of financial literacy (Hayat & Anwar, 2016). Each person's cognitive skills urge him or her to take better decisions regarding investment plans. Financial literacy is an individual's capability to make rational financial assessments. In addition, prior knowl-

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edge of the financial instrument, markets, and investment opportunities is a prerequisite to expose more growth and build a competitive advantage (Baporikar & Akino, 2020). In contrast, women entrepreneurs residing in developing countries like Pakistan are less likely to be financially literate. Thus, the lack of financial literacy restricts their easy access to finance (Iram et al., 2021; Younas & Rafay, 2020), entrepreneurial ideas and skills (Baporikar & Akino, 2020), business growth, and capital gains (Yasin, Mahmud & Diniyya, 2020). In this perspective, the dynamic economic conditions of the developing countries, including individuals' financial instability, inflated poverty, unemployment and the greater probability of business start-up failures in the last 10 years has provoked the need to be acquainted with financial literacy; while consistent failure may affect business growth in terms of sustainable profitability (Smith, Richards & Shelton, 2016). The issue of women's financial literacy is also highlighted by Roomi & Parrot (2008) and also duly and repeatedly validated by the Federal Bureau of Statistics (in 2015, 2018, and 2019) indicating that less than 15% of women are enrolled in business or entrepreneurship-related courses, thus proving a dearth of financial literacy among women entrepreneurs in a developing country like Pakistan (Rasool & Ullah, 2020). In addition, gender inequality, and the irrational investment status quo urges the need for women's financial literacy prevalence and prudent decision-making (Kappal & Rastogi, 2020). This is why studying financial literacy has gained massive importance, especially in the context of women (Goyal & Kumar, 2020).

Due to the reliance on the significant role of financial literacy in investment decision-making, researchers argue about investigating if heuristics influence women entrepreneurs' decision making; however, women entrepreneurs' decision making may be improved through increments in financial literacy. This study contributes to the literature by investigating the direct effect between heuristics and women entrepreneurs' decision making. Moreover, this study induces an intervening mechanism of financial literacy between heuristics and women entrepreneurs' decision making. Furthermore, this study focuses on the developing country context where the financial literacy rate is low, which hinders women's entrepreneurial development. Lastly, this study contributes by bringing up the robustness of women while making financial decisions to participate socially and economically in Pakistan.

This study is divided into six sections. The first section consists of an introduction, the second section discusses the literature review, and the third section provides insights into the methodology. The fourth section describes the results and findings, while the last section offers a discussion, research limitations, and implications.

## **Literature Review and Hypotheses Development**

Very little of the available literature indicates the importance of women entrepreneurs' financial behavior regarding the accuracy of investment decisions. The literature indicates almost no investigation of the influence of women entrepreneurs' behavior toward investment decisions. But a need arises to investigate how this relationship can be more predictive through the mediating mechanism of financial literacy (Shah, Ahmad &

Mahmood, 2018; Zahera & Bansal, 2018; Akinkoye & Bankole, 2020). Thus, this study induces a mediating mechanism (financial literacy) to contribute to the existing literature on how women entrepreneurs' financial decision-making can be more rational through the provision of financial literacy. Part of this literature firstly explains the conceptual model of this study through the heuristic behavioral theory and later emphasizes the development of the hypothesis.

### *Heuristic Behavioral Theory*

The heuristic theory is a model developed by Shelly Chaiken (1987) to explain how people receive and process persuasive information. The heuristic theory's lens further helps to explain how an individual's investment decisions are influenced, under uncertain conditions, by a lack of knowledge and bias belief. This theory apprehends behavioral finance and supports the relationship between human financial behavior and investment decision-making in the financial system. Furthermore, Shim and Siegel (1991) support the heuristic theory and highlight that an investor's behavior is a strong predictor of success or failure in managing his/her finances (i.e., investment decision). The scholars Gitman, Joehnk, Smart & Juchau (2014) explain that financial behavior instigates the investors to attain the necessary knowledge (i.e., financial literacy) to allocate the funds, determine the working capital and manage the financial retirement plans. In addition, Renkl, Hilbert, & Schworm (2009) argue that heuristics help individuals to manage their savings through knowledge of managing the expenses related to savings. He further elaborated, through the lens of the heuristic theory, that individuals who can manage their finances may have regular savings or emergency funds. An individual having healthy financial behavior demonstrates his/her ability to manage and control financial investments—an individual's wisdom to make an investment decision is dependent on his/her ability and financial literacy concepts. Thus, an individual's financial behavior in updating his/her financial knowledge contributes to rational investment.

### *Overconfident Heuristic and Investment Decisions*

An individual's overestimation of his/her skills, excessive experimental outcome anticipation, information preciseness, and predictive abilities conceptualize overconfidence heuristics (Porto & Xiao, 2016). The financial behavior literature indicates various investing styles like risk tolerance, growth vs. value, and market capitalization (Pak & Mahmood, 2015). Fundamentally, investor decision-making has two choices: To under-react or over-react to market information (Durand, Newby, Tant & Trepongkaruna, 2013). The investor who shows optimistic behavior with the market's upward trend and pessimistic behavior with the market's downward trend represents the bullish and bearish investment trends prevailing in the market. Likewise, an overconfident and a financially literate woman entrepreneur make accurate investment decisions. Thus, the proposed hypothesis is,

**H1:** Overconfidence bias has a significant impact on investment decisions

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### *Overconfidence and Financial Literacy*

An overconfident investor is seen to be strong and up-to-date in his/her financial calculations and knowledge (Xia, Wang & Li, 2014). More specifically, overconfident investors seek less professional financial advice regarding investment, debt counseling, and tax planning (Porto & Xiao, 2016). Moreover, a retrospective review of the prior studies has shown that overconfidence improves the intention to access investment capital, investor preferences, networking, intangible assets' management, correspondence to the risk, and cognitive anticipation to calculate the risks' intensity (Ahmad & Shah, 2020). On the other hand, more overconfident investors are less likely to utilize their financial knowledge, which may adversely affect their investment plans (Zwaan, Lee, Liu & Chardon, 2017). Therefore, overconfident entrepreneurs may make better decisions through the utilization of financial literacy (Hayat & Anwar, 2016). Furthermore, overconfident women entrepreneurs may make their investment decisions more accurately through their financial literacy (Iram, Iqbal, Qazi, Saleem, 2021). Therefore, it can be inferred that overconfident investors need more financial literacy to be successful entrepreneurs by making wise decisions.

**H2:** Overconfidence bias has a significant impact on financial literacy

### *Representativeness Heuristic and Investment Decision*

Making choices is the most difficult part of entrepreneurship. Each person's cognitive approach or cognitive skills constantly push them to make decisions. Psychologists are more knowledgeable about the psychology of human behavior and the perception of possessing a kind, judgmental attitude (Einhorn & Hogarth, 1981). Heuristics are often guided by psychologists based on their critical skills. Other than business decisions, heuristic skills are shortcuts for individuals in their daily lives. The essence of a shortcut varies depending on the individual. Every person has their shortcuts, and the representativeness heuristic is one of the most popular shortcuts mentioned by Tversky and Kahneman (1981) in their article. They reveal that the representativeness heuristic individuals are more reliant on the outcome of their investment decisions. Likewise, women entrepreneurs having representativeness heuristics may be concerned for their investment decisions. Thus, the proposed hypothesis is:

**H3:** Representativeness heuristic has a significant impact on investment decisions

### *Representativeness and Financial Literacy*

Most investment decisions are based on numerical or calculation-based data that depict a particular event or the likelihood of the occurrence or non-occurrence of an event (Kahneman & Tversky, 1972). For instance, what are the chances of event A and B, or how is event A affected by event B? (Kahneman, Slovic, Slovic & Tversky, 1982). Thus, an investor having the ability to comprehend past numerical records is most likely to have financial knowledge. On the other hand, scholars Novianggie & Asandimitra (2019) highlight that individuals with a high degree of representative bias are less likely to have strong

financial skills. So, it can be inferred that women entrepreneurs' representativeness heuristics are less likely to urge them to attain financial knowledge. Thus, it is vital to investigate the influence of representative heuristics on financial literacy. So, the proposed hypothesis is:

**H4:** Representativeness heuristics have a significant impact on financial literacy

#### *Anchoring Heuristic and Investment Decision*

Anchoring bias is a widespread phenomenon that affects all aspects of life (de Wilde, Ten Velden, & De Dreu, 2018). The term "anchoring bias" was identified by researchers using various lenses. For example, Meub, Proeger, and Bizer (2013) argue that an investor's propensity to invest in the stock market, based solely on any available information is anchored. Wilczek (2016) points out that individuals avoid attaining updated information and rely on their existing knowledge to make investment decisions. The researchers' Din, Mehmood, Arfan Shahzad, Davidyants, and Abu-Rumman (2020) agree that humans rely on the first piece of knowledge or evidence (anchor) to make investment decisions in a business. Similarly, women entrepreneurs may become victims of anchoring bias and make investment decisions during their entrepreneurial activities. So, it can be deduced that women entrepreneurs' anchoring heuristics influence their investment decision-making. Thus, the proposed hypothesis is:

**H5:** Anchoring bias has a significant impact on investment decisions

#### *Anchoring Heuristic and Financial Literacy*

The anchoring heuristics influence informational significance and financial experience (Pena & Gómez-Meja, 2019). The researchers English, Mussweiler, and Strack (2006) have suggested that irrelevant data may have a variety of effects on an expert's decision-making. Investors with previous transactional experience can forecast investment outcomes (Sharpe & Campbell, 2007), but their ability to invest could be influenced by anchoring bias. Esubalew & Raghurama (2020) point out that an investor with low anchoring bias has less interest in financial decisions. In addition, owners anticipating the anchoring bias tend to be aware of market dynamics and the economy. The researchers Kaustia, Alho, & Puttonen, (2008) claim that investors prone to having high anchoring bias are more likely to have the latest financial awareness and experience. Surprisingly, Abreu and Mendes (2010) discovered that females with anchoring biases are less likely to be financially literate, influencing their decisions. So, this inconsistent relationship between anchoring bias and financial literacy needs further investigation. Thus, the researchers decided to look into the connection between women entrepreneurs' anchoring bias and financial literacy. The following hypothesis is proposed:

**H6:** Anchoring bias has a significant association with financial literacy

#### *Availability Heuristic*

Availability heuristics permit individuals to figure out an opportunity while eval-

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uating a specific topic, concept, or method (Pompian, 2011). The literature indicates that availability heuristics can be considered as being useful for the dynamic moral procedure or the advancement of the ethic (Hayibor and Wasieleski, 2009). In addition, Kliger and Kudryavtsev (2010) argue that upward trends in stock values in a positive financial exchange might result in a more grounded investment decision. Individuals rely on the available stock to invest in developing countries with poor financial infrastructure (Anwar, Khan & Rehman, 2017). In Pakistan, women entrepreneurs rely on the available information and make investment decisions. So, the proposed hypothesis is:

**H7:** Availability bias has a significant impact on investment decisions

### *Availability Heuristic and Financial Literacy*

An individual having an immediate and massive amount of information cannot assume that he/she is literate, and thus can safeguard the stock (Barber & Odean, 2008). A person reliant on the available data may not be considered to have intellectual accessibility. An investor avoiding availability biases must attain proper financial knowledge and ensure its reliability and his/her access to the data (Ramalho & Forte, 2019). It can be deduced that women entrepreneurs having high availability heuristics are less prone to attaining financial knowledge for investment purposes. Koech (2021) argues that availability heuristics have an impact on financial knowledge's attainment. Thus, availability heuristics and financial literacy may uncover an important relationship that could result in greater financial performance. Thus, the deduced hypothesis is:

**H8:** Availability has a significant impact on financial literacy

### *Financial Literacy as a Mediator*

A person's ability to manage financial matters can be hampered if his/her cognitive ability deteriorates. Financial literacy broadens the rational and realistic investment choices (Tuffour, Amoako & Amartey, 2020). Investors like to show interest in risky decisions, and through financial literacy, positive investing habits enhance investment decisions dramatically (Iqbal and Iqbal 2015; Asaad, 2015). Investors who are financially savvy and willing are more likely to invest in stocks (Chu, Wang, Xiao & Zhang, 2017). In addition, Ahmad and Shah (2020) point out that overconfidence heuristics can lead to irrational investment decisions; however, financial literacy can help investors make better decisions. Someone who is overconfident but does not own the financial knowledge often makes unreasonable decisions. Thus, the proposed hypothesis is:

**H9:** Financial literacy mediates between overconfidence and investment decisions

Scholars have established that financial literacy is a global issue but bad financial conduct can have fatal implications at both the individual and global economic levels. When it comes to money or finance management, an individual is presumed to have a personal financial attitude. Women entrepreneurs are more likely to be biased than men regarding investment decisions, but greater financial literacy decreases this bias (Noviang-

gie & Asandimitra, 2019). Since the representativeness heuristic often relies on previously collected data, it is critical to be financially literate to comprehend the data and make sound investment decisions (Huhmann, 2017). So the inferred hypothesis is:

**H10:** Financial literacy mediates between representativeness and investment decisions

Cognitive operations generate the need for financial literacy, and they allow one to make sound investment decisions. The investor's anchoring conduct can influence the investment decision differently, due to varying levels of individuals' financial literacy (Baker, Kumar, Goyal & Gaur, 2019; Goyal & Kumar, 2021). Financial decisions can be strengthened by reducing the anchoring bias and also by presenting relevant financial information and expertise (Altman, 2012). Anchoring bias is more prevalent in women than men (Rekik & Boujelbene, 2013) in investment decision-making. However, financial literacy may play a role in improving the decision making (Sheeraz et al., 2016). Therefore, it can be deduced that women entrepreneurs' financial literacy may contribute to improving the investment decision-making of anchoring biased women.

**H11:** Financial literacy mediates between anchoring and investment decisions

Availability heuristics are a mental state that depicts shortcuts based on previously available information. However, information sharing and high communication skills may urge investors to attain the latest information for their investment decisions. Financial literacy is debated as a skill, and an inadequate grip on this skill can cause irrational investment decisions (Tuffour, Amoako & Amartey, 2020). Availability heuristics often rely on unfamiliar information; it is critical to be financially literate to properly rely on that information and make rational investment decisions (Khattak et al., 2013; Huhmann, 2017).

**H12:** Financial literacy mediates the relationship between availability and investment decisions.

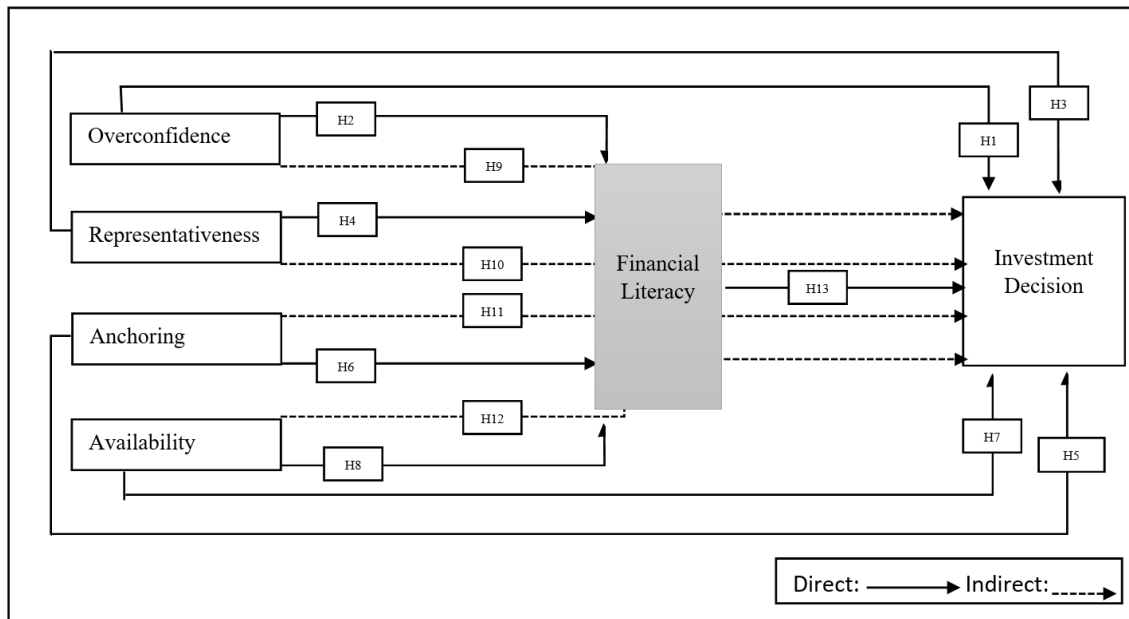
### *Financial Literacy and Investment Decision*

A financially literate person can make rational financial decisions and remains updated on the financial markets (Eniola & Entebang, 2017). Relying upon financial literacy, Atkinson & Messy (2012) claim that basic financial concepts are useless unless reflected in financial behavior. However, financial awareness is debatable if it is an important measure of investment decisions. Financially literate individuals have two distinct cognitive types (cognition and intuition) that influence their financial decision-making (Christopher, 2010). Since financial literacy increases the perception of financial risks and opportunities, it can help people make better financial decisions (Atkinson & Messy, 2012). In addition, financial literacy promotes rational investment decisions, which increase business efficiency (Tuffour, Amoako & Amartey, 2020). Finally, greater financial literacy's prevalence can have a significant effect on investors' investment decisions. Thus, the proposed hypothesis is:



**H13:** Financial literacy is significantly associated with investment decisions

### Proposed Conceptual Model



**Figure 01.** Model of Influencing Voluntary Disclosure

### Methodology

The population in this study represented women entrepreneurs operating small and medium enterprises (SMEs) in the most populous province of Pakistan, “Punjab.” This study investigated their long-term and day to day investment decision-making while handling the affairs of their businesses. The fact is, vigilant decision-making enhances the SME’s profitability and performance while poor decision-making results in losses and failure. Women entrepreneurs registered in the women’s chamber of commerce and industry (WCCI) were targeted to collect the primary data. Contact details provided by the WCCI were used to distribute a close-ended questionnaire through the most convenient means of communication i.e., WhatsApp media. The questionnaire was developed using Google Forms. The privacy of the respondents’ information and data security were strictly observed through due process. The proportionate stratified sampling technique was used to collect the data. The population was divided into two strata for proportionate stratified sampling, based on two women’s chambers of commerce operating in Faisalabad and Multan, Pakistan, namely the Multan Women’s Chamber of Commerce and Industry and the Faisalabad Women’s Chamber of Commerce and Industry. For the selection of the sample’s size, the formula by Ruane, (2005) was used. If the population was less than 500, consider using 50% of the total population for the study (Ruane, 2005). The sample size for this analysis was greater than the minimum threshold set by Ruane, (2005). The overall sample size was calculated (Ruane 2005) to provide an accurate representation of the population. The questionnaire consisted of two parts. The demographic characteristics

of women entrepreneurs, including their age, were addressed in the first segment of the survey. Overconfidence, representativeness, anchoring, availability, financial literacy, and investment decisions were all discussed in the second section.

**Table 01.** Proportionate Stratified Sampling

PUNJAB Stratum	Women Entrepreneurs		Proportionate stratified sample	
	Frequency	%age	Frequency	%age
FSD CC	103	50%	51	50%
Multan CC	283	50%	142	50%
<b>Total</b>	403	50%	193	50%

(Source: Ruane, 2005)

Questionnaires were sent via WhatsApp to the 210 registered entrepreneurs, and 99 questionnaires were received within the three-month time frame. After scrutinizing the collected data, the response rate was around 43%. Samples were drawn in proportion of the total population of the two WCCI in Punjab, which can be seen in Table#01

### Measurement

The questionnaire used in this study was adapted from published and reliable articles in which well-calibrated items were used that related to four heuristic dimensions i.e., overconfidence, representativeness, anchoring, and availability. The scale items of the measured variables, like overconfidence, representativeness, anchoring, and availability were adapted from studies by Babajide & Adetiloye, (2012), which had been further validated by Ul Abdin, Farooq, Sultana & Farooq (2017). The scale items of financial literacy were adapted from the study by Mandell & Klein (2007), which was further validated by Bongomin et al. (2018). Furthermore, the study of Waweru, Munyoki, & Uliana (2008) was used to adapt the scale items of investment decisions; this adapted scale had also been validated by Rasheed, Rafique, Zahid & Akhtar (2018). The complete adaption process followed the recommendation of Gujarati (2011), with necessary amendments made to the scale items.

### Data Analysis, Results, and Interpretation

Smart-PLS software was used to statistically analyze the data after handling the missing data's analysis. Smart-PLS software is best suited for high predictability in a small size data set (Ramayah, Cheah, Chuah, Ting & Memon, 2018). The researchers applied structural equation modelling (SEM) to investigate the proposed direct and mediating relationship. SEM is a multivariate statistical technique that incorporates both latent and observed variables to evaluate structural theories (Carvalho & Chima, 2014).

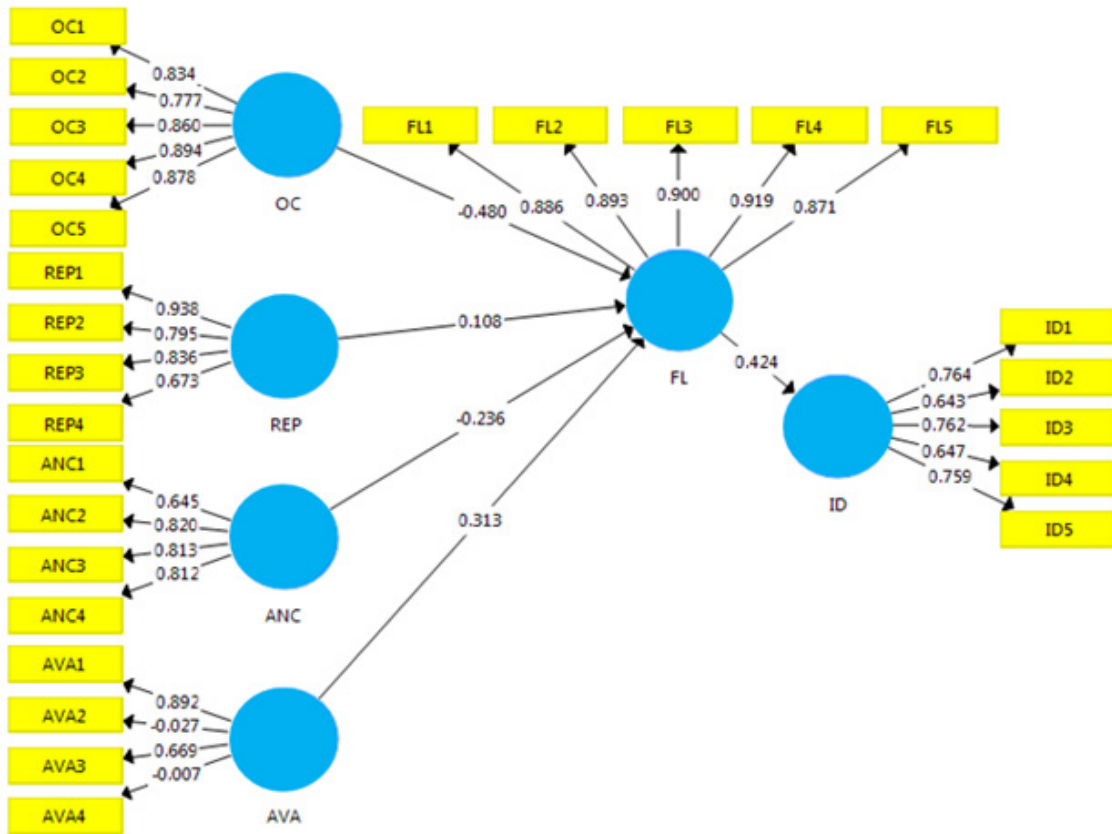


Figure 02. Structural Equation Model (PLS Algorithm)

Table 02. Reliability and validity

	Cronbach alpha	Composite reliability	Avg. Var. extracted
<b>Anchoring</b>	0.83	0.85	0.799
I rely on my previous experiences in the market for my next investment decision.			
I forecast the changes in the market based on recent investment decisions			
The high profitability ratio is considered to be the main motivational factor for investment as an entrepreneur in Pakistan			
A better return on investment urges me to invest more			
<b>Overconfidence</b>	0.90	0.92	0.722
I am an experienced entrepreneur			
When I decide to invest, I feel that my knowledge and actions affect the result			
I expect that my investment decisions are more prudent than others			

I feel more confident in my own investment decisions rather than those of analysts and advisors

I am likely to invest in things which I have confidence in

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<b>Representativeness</b>	0.89	0.88	0.849
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I try to avoid transactions that have performed poorly in the recent past

I use trending financial analysis of random transactions to make better investment decisions

I prefer transactions that represent desirable qualities

I only depend on selective informational sources while investing

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<b>Availability</b>	0.78	0.80	0.76
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I prefer to invest locally rather than internationally because the information on the local market is readily available

I consider the information which I receive from my close friends and relatives to be reliable for my investment decisions

I depend on the decisions of my social networks when lacking relevant information

While making investment decisions, I give sufficient weight to the experience and advice of others

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<b>Financial literacy</b>	0.93	0.95	0.757
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In my firm, financial staff are knowledgeable about financial risks

The financial staff in my firm have the ability to prepare a budget for the coming financial year

In my firm, the financial staff have the ability to decide what financial services the business needs

In my firm, the financial staff are capable of evaluating the weighted cost of different financial products and services

In my firm, the financial staff can easily compute the financial cost of invested capital

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<b>Investment decision</b>	0.77	0.84	0.515
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As a women entrepreneur, I prefer to invest in secure options

My investment decisions are optimized to generate interest payments and return margins

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I prefer to invest in lower or moderate risk options with better expected returns

I always avoid investing in high risk options even if they offer higher expected returns.

With some investment decisions, I received a better return on investment than I expected before making the investment

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### *Cronbach Alpha*

In the above Table 02, the value of Cronbach's alpha showed the reliability and internal consistency between the items of data, which had to be more than 0.7, while the excellent value for Cronbach alpha is from 0.8 to 1.0 (Hair, Anderson, Tatham, William & Black, 1998). The above values showed that the Cronbach's alpha values were more than 0.7, so the data were sufficiently reliable and consistent internally.

### *Composite Reliability*

Composite reliability is the preferred alternative to the use of Cronbach alpha; its value must be between 0.6 to 1.0 (Chin, 1998). For confirmatory research, a value for the composite reliability of more than 0.8 is considered acceptable (Daskalakis & Mantas, 2008). In the above cases, the composite reliability values ranged above the threshold.

### *The Average Variance Extracted (Ave)*

The table's validity can also be measured through AVE (average variance extracted); its value must be more than 0.5 (Chin, 1998). The values of all the constructs age hierarchy, anchoring; availability, overconfidence, representativeness; financial literacy, and investment decision were more than 0.5, ranging from 0.515 to 1.000

**Table 03.** Correlation matrix & Discriminant Validity

	OC	REP	ANC	AVA	FL	ID
OC	1					
REP	0.645**	1				
ANC	0.699**	0.874**	1			
AVA	0.494**	0.707**	0.719**	1		
FL	0.304**	0.622**	0.585**	0.707**	1	
ID	0.866**	0.544**	0.610**	0.387**	0.199**	1

\*\* Correlation is significant at the 0.01 level (2-tailed).

### *Correlation Matrix*

The correlations matrix reveals that the construct investment decision was positively correlated as the overconfidence heuristic was ( $r=0.866$ ), the representativeness

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heuristic was ( $r=0.544$ ), the anchoring heuristic was ( $r=0.610$ ), the availability heuristic was ( $r=0.387$ ) and financial literacy was ( $r=0.199$ ) at a significance level of 0.01

**Table 04.** Fitness of the Model

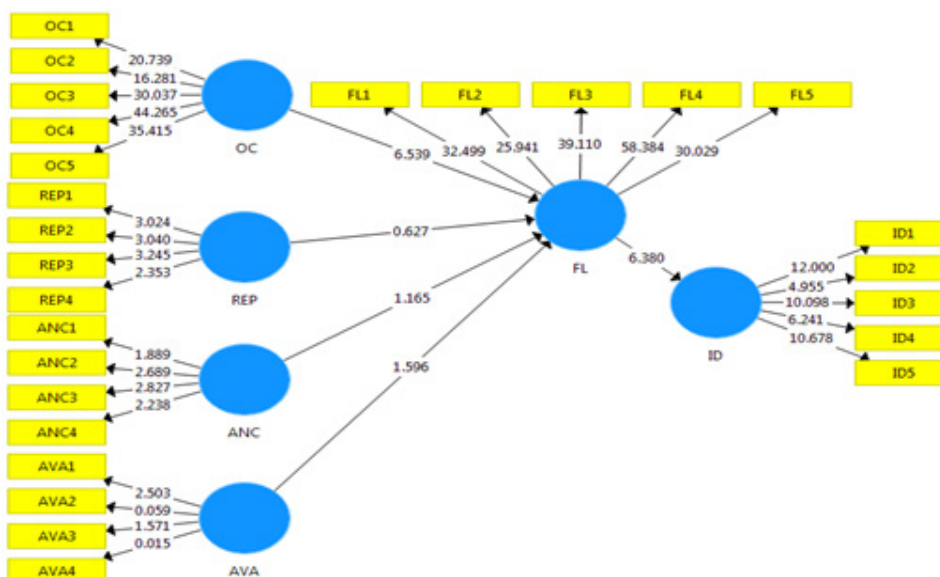
	R Square
Financial literacy	0.70
Investment decision	0.71

### R-Square

The R square's value must be above 0.6 and near to 0.9 for a good fit of the model (Chin, 2010). The values of financial literacy and investment decision were above 0.7, so the model was considered a good fit

### Structural Equation Modeling

To run the SEM in the SAMRT-PLS, a bootstrapping analysis was performed.



**Figure 03.** Structural Equation Model (bootstrapping)

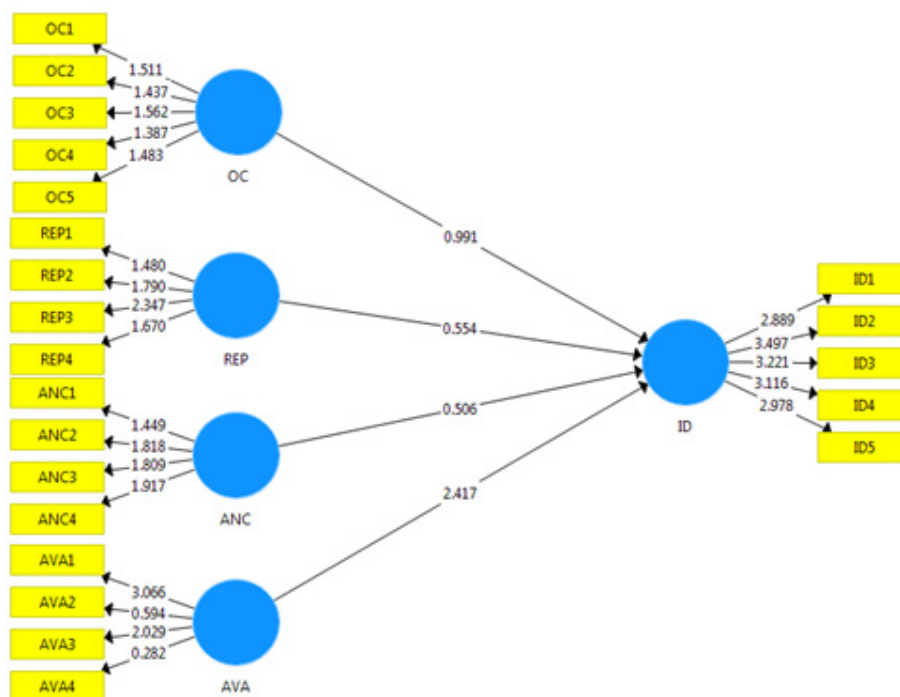
**Table 05.** Hypotheses testing through Path Coefficient

	Sample Mean (M)	T Statistics (O/STDEV)	P Values
ANC -> FL	0.202	1.165	0.24
AVL -> FL	0.196	1.596	0.11
FL -> ID	0.066	6.38	0.00
OC -> FL	0.073	6.53	0.00
REP -> FL	0.172	0.62	0.53

In the above Table 05, anchoring had an insignificant impact on financial litera-



cy with 0.245. Thus H6 was rejected. Similarly, overconfidence had a significant positive relationship with financial literacy, with a p-value of 0.000, which meant that with an increase in overconfidence, the financial literacy increased, and thus H2 was accepted. Furthermore, the availability and representativeness had an insignificant impact on financial literacy, with values of 0.11 and 0.53, which meant H8 and H4 were rejected. Thus, the increase in representativeness and availability bias had no link with the financial literacy of women entrepreneurs. Financial literacy had a significant relationship with the investment decision construct, at p-0.000; thus, H13 was accepted



**Figure 04.** Structural Equation Model (bootstrapping)

**Table 06.** Hypotheses testing through Path Coefficient

	Sample Mean (M)	T Statistics ( O/STDEV )	P Values
ANC -> ID	-0.234	0.506	0.613
AVL -> ID	0.352	2.416	0.016
OC -> ID	0.148	2.991	0.032
REP -> ID	0.075	0.554	0.580

Table 06 reveals that availability and overconfidence had a significant positive relationship with the investment decision construct, with p-values of 0.016 and 0.032, respectively, which supported H7 and H1. Furthermore, the anchoring and representative heuristics did not reveal a significant impact on investment decisions with p-values of 0.613 and 0.580, thus H5 and H3 were rejected.

**Mediation Analysis**  
**Table 06.** Indirect Effects

	<b>Sample Mean (M)</b>	<b>Standard Deviation (STDEV)</b>	<b>T Statistics (O/STDEV)</b>	<b>P Val- ues</b>
ANC->FL ->ID	-0.076	0.09	1.085	0.27
AVL -> FL->ID	0.098	0.09	2.46	0.04
OC -> FL ->ID	-0.205	0.04	4.7	0.00
REP -> FL -> ID	0.044	0.07	0.59	0.55

The mediating mechanism of financial literacy revealed that the relationship between the heuristics for anchoring and representativeness and investment decisions was not mediated significantly through women entrepreneur's financial literacy. Thus, hypotheses H10 and H11 were rejected. On the other hand, financial literacy mediated the relationship between the heuristics for over-confidence and availability and decision-making negatively and significantly. Thus, H9 and H12 were accepted. So, it could be deduced that an increase in the financial literacy of women entrepreneurs would decrease the overconfidence heuristics and subsequently increase the availability. Financial literacy played a partial mediating role between overconfidence; while no mediation was seen in the case of anchoring and representativeness. Furthermore, full mediation was seen in the case of availability heuristics

## Discussion of Results

In light of the findings, we propose that if financial literacy is enhanced, it can play an illuminating mediating role in the relationship between heuristic behavior and women's investment decisions. A scholar, Al Tamimi (2009), supported the idea that financial literacy has an enlightening impact on investment decisions and, through enhancing financial literacy, behavior biases can be controlled (Iram, Bilal & Latif, 2021; Iram, Bilal, Ahmad & Latif, 2022b). However, the literature indicates variability in the influence of behavioral heuristics on the investment decision. Hence, investment decisions become uncertain due to heuristic behavior. So, there arises a need to induce a mediating mechanism that explains the relationship between heuristic behavior and investment decisions, and this may mitigate the negative impact of heuristic behavior on the investment decisions of women entrepreneurs. Thus, this study considered the mediating mechanism of financial literacy between behavioral factors and investment decisions. Through our findings, this study reveals that enhanced financial literacy partially mediates the relationship between the heuristics for overconfidence and availability and investment decisions. More specifically, this study has a special focus on investigating the mediating mechanism of financial literacy among women entrepreneurs in developing countries like Pakistan, where women entrepreneurs face unique challenges when making investment decisions (Iram, Bilal, Latif, 2021).

Finally, this study is a step to support struggling women entrepreneurs to make accurate and rational investment decisions. Thus, women entrepreneurs may play their role in the economic and social prosperity of developing countries like Pakistan through enhanced financial literacy. This study reveals that financial literacy mediates insignificantly between the heuristics for anchoring and representativeness and investment decisions. Focusing more on enhanced financial literacy, the less literate individual investors, whether male or female, demonstrate irrational behavior compared to institutional investors (ul Abdin, Farooq, Sultana, & Farooq, 2017). Financially literate women are not overconfident and possess less representativeness bias when making financial decisions. Women prefer a slow start but wait until it is profitable; they rarely leave early, even if their investment initially loses money (Iram, Parveen, Ahmad & Bilal, 2022).

Women entrepreneurs who are engaged in the economic activities of Pakistan have the potential to alter world dynamics and contribute to poverty alleviation in volatile business environments (Castellanza, 2020; Rashid & Ratten, 2020; Iram, Bilal, Ahmad & Latif, 2022b). Women entrepreneurs, who are long-term investors and are prepared to take risks, rely on their financial literacy for a successful investment career. They would not be able to comprehend audits, correct accounting systems, make investments, and undertake fund-raising if they were less financially literate (Iram, Bilal, Latif, 2021). While previous research has argued about the effect of behavioral influences on investment decisions (Chaudhary, 2013), the findings of this study indicate that financial literacy is crucial for making rational investment decisions. Cognitive errors can lead to unreasonable decisions and mislead the entire investment process if they are not discovered or exhausted in time. Financial literacy has proven to be useful in preventing cognitive errors (Iram, Bilal, Latif, 2021). Even though there are many behavioral finance studies, and scholars have been researching women's entrepreneurship for about 25 years, there are still many unanswered questions (Greene, Hart, Gatewood, Brush & Carter, 2003). As a result, this is one of the first studies of Pakistani female investors' heuristic behavior, in terms of financial literacy, which fills a theoretical gap regarding financial literacy in the behavioral finance literature. Empirical results also indicate that investors' financial expertise is often valuable for obtaining accurate information about stock values, market research, patterns, and consumer moods, which assists entrepreneurs in making investment decisions and avoiding behavioral biases (Iram, Bilal, Latif, 2021; Iram, Bilal, Ahmad & Latif, 2022b).

**Table 07.** Acceptance / Rejection of Hypotheses

<b>Hypotheses</b>	<b>Accepted/Rejected</b>
<i>H1-Overconfidence has a significant impact on investment decisions</i>	<b>Accepted</b>
<i>H2-Overconfidence has a significant impact on financial literacy</i>	<b>Accepted</b>
<i>H3-Representativeness has a significant impact on investment decisions</i>	<b>Rejected</b>

<i>H4- Representativeness has a significant impact on financial literacy</i>	<b>Rejected</b>
<i>H5- Anchoring has a significant impact on investment decisions</i>	<b>Rejected</b>
<i>H6- Anchoring has a significant impact on financial literacy</i>	<b>Rejected</b>
<i>H7- Availability has a significant impact on investment decisions</i>	<b>Accepted</b>
<i>H8- Availability has a significant impact on financial literacy</i>	<b>Rejected</b>
<i>H9- Financial literacy mediates the relationship between overconfidence and investment decisions</i>	<b>Accepted</b>
<i>H10- Financial literacy mediates the relationship between representativeness and investment decisions</i>	<b>Rejected</b>
<i>H11- Financial literacy mediates the relationship between anchoring and investment decisions</i>	<b>Rejected</b>
<i>H12- Financial literacy mediates the relationship between availability and investment decisions</i>	<b>Accepted</b>
<i>H13- Financial literacy has a significant impact on investment decisions</i>	<b>Accepted</b>

## Conclusions, Implications, Limitations, and Future Directions

Thus, this study examines the impact of heuristic behavioral factors on women entrepreneurs' investment decisions registered in the WCCI, Punjab, Pakistan. Without in-depth business knowledge and high financial literacy, a woman may not make rational decisions to get a lucrative return on her investment. The above Table 07 shows that financial literacy plays a mediating role between overconfidence, availability, and investment decisions, supporting H9 and H12. In contrast, representativeness and anchoring heuristics have no impact on investment decisions through financial literacy. Thus it rejects H10 and H11. Moreover, overconfidence directly relates to financial literacy and investment decisions; therefore, it supports H1 and H2. On the other hand, representativeness and anchoring heuristics do not directly relate to financial literacy and investment decisions, thus rejecting H3, H4, H5, and H6. Moreover, availability heuristics are directly linked with investment decisions, while there is no direct relationship with financial literacy, thus it supports H7 and rejects H8. Finally, financial literacy shows a direct relationship with investment decisions, which supports H13.

In practice, this research will aid government authorities in developing policies that will reduce poverty by increasing female entrepreneurship through business management awareness initiatives. Additionally, the funding allocation method should be changed to support women entrepreneurs. The government can design women-related enterprise programs, loan schemes, and tax exemption programs by considering the investment psychology of women. This might be accomplished by providing women entrepreneurs with adequate financial education and training in areas such as taxation and auditing.

Only the women entrepreneurs from Punjab, Pakistan, were taken for this study.

Future research can be done by taking into account other behavioral factors' impacts on women entrepreneurs. Additionally, a comparative study could be conducted with male and female entrepreneurs. Future researchers can conduct surveys of other women in sophisticated economies to determine whether their decision making is impacted. Additionally, it would be prudent to do comparative research into Asian and European female entrepreneurs; this will best align the theoretical contributions and policy consequences. Similarly, we relied on cross-sectional data; future studies are encouraged to employ a qualitative strategy based on interviews in order to prevent common method bias.

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