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The effect of investor bias on gender: Causal role of Overconfidence and Loss aversion in financial decision making.

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Abstract
The present study took into account the effect of gender on risk taking ability of the investors in their financial decisions through overconfidence and loss aversion biases. A total of 128 investors (70 Males, 58 Females) of age groups 22 to 60 were taken into the study. The objective of the study was achieved by administering a well-structured questionnaire and collecting empirical evidence on investor's own perceptions of bias. An Average Bias Score (ABS) was calculated and analyzed in SPSS. The results revealed that male and female investors have different awareness for different biases. Overconfidence was found to be prevalent in males than females and loss aversion was found to be more in females than males. These biases are present in varying degrees among us and this paper made an attempt to highlight the same.
Keywords Gender, Loss aversion, Overconfidence, behavioral finance

Introduction

In a developing country like India, there is strong growth and economic prosperity all over. This implies that there is a huge investible fund available in the economy. Most of the people desire to invest their hard-earned money in the most secure avenues available. It has a greater influence on individual's future well-being. There are many sources available for the people to invest their money in, which includes secured and unsecured assets. The investment route chosen by an individual depends upon factors like risk and returns which needs to have a tradeoff. The personal financial goal of investors influences their decision-making but their financial goals differ as their life stage changes. The investors do not change their decision because of the age factor only but there are other set of factors associated too like income level category, occupation, gender, greed, fear and psychology. Babajide and Adetiloye (2012) and Bashir et al.,(2013). The above studies stressed upon the fact that the anomalies exhibited by the stock markets are a result of the irrational behavior shown by investors. The changing of decision and the anomalous behavior of the investors both owe their explanation to a new emerging area of finance known as behavioral finance. The behavioral finance takes into consideration how various psychological factors affect investors, analysts and policy makers.

The traditional finance theory bases its belief on the fact that the prices of securities align as per the new information available in an efficient market. As a result, the current price of securities reflects all the

information. The efficiency of capital markets is however more often than not a subject of controversy in the field of finance. The initial phase work on efficient markets had a foundation on random walk hypothesis which believed that a change in the stock price was a random phenomenon. This work was based more on the extensive analysis and less on the theory supporting it. The theories like arbitrage theory, capital asset pricing theory, the option pricing theory of Black, Scholes and Merton and Modigliani Miller is the fulcrum of traditional finance. These theories believe markets and agents in market are efficient or to say systematic. The basic standard finance theory which is the efficient market hypothesis(EMH) follows the norm that all the available information is incorporated in an efficient market when the prices of financial assets are estimated. The basis of EMH is the rationality belief of investors in financial markets. The investors have to single out an alternative among many when faced with uncertainty. The investors while making a decision tend to behave rationally on the basis of expected utility theory (EUT) by evaluating all the options and alternatives based on the utility and the associated risk . There were inconsistencies found though with EMH and EUT by Kahneman and Tversky(1979) post energy crisis of 1970's. Behavioral finance came out as a new concept in 1980's compounding behavioral and psychological aspects in financial decision making. The field of behavioral finance offered a challenge to efficient market hypothesis and facilitated in comprehending the way in which investors behaved while investing in financial assets. The decision making under uncertain conditions was explained by prospect theory given by Kahneman and Tversky (1971) which was an alternative to expected utility theory (EUT). The decision making process in investments as per behavioral finance is influenced by various behavioral biases which urge investors to make irrational decisions. There have only been a very few studies on systematic and comprehensive review of behavioral biases in which various biases have been analyzed in a single study. This paper makes an attempt to synthesize comprehensive review of the behavioral biases in investment decision making keeping in view the feeble systematic literature available on behavioral bias. The biases which an investor is exposed to are very large in number to be included in a single study as a result following biases have been chosen with reference to gender:

1) Overconfidence.
2) Loss aversion.

Overconfidence

Overconfidence is often regarded as the most prevalent judgment bias. Overconfidence affects decision-making, both in the corporate world and individual investments. According to Shefrin(2007) overconfidence "pertains to how well people understand their own abilities and the limits of their knowledge". In general, people tend to overestimate their ability to perform well. This, in turn, leads to impulsive decisionsas managers who think they know more than they really do are overly confident in their own abilities. Therefore, they search for less help and direction in making major decisions. Puri and Robinson (2005) link optimism to major economic choices and found out that optimists are more likely to believe that future economic conditions will improve. David, Graham, and Harvey (2006) test whether managerial

overconfidence is associated with corporate policies and found that firms with overconfident CFOs invest more, pay out fewer dividends, maintain long-term debt, exhibit higher investment- cash flow sensitivity, repurchase more equity as a response to low returns but issue less equity following high returns, and tilt executive compensation towards performance.

Barber and Odean (2001) did work on gender. They have summarized psychological studies that find a higher degree of overconfidence among men than among women. Consequently, they partition their data set, a sample of U.S. online broker investors, on gender. They found that men trade more than women which are consistent with overconfidence models. In itself, overconfidence can generally be viewed as a positive trait as it leads to survival both in short and long run. The negativity of the bias presents itself in those situations when individuals don't recognize their limitations and therefore, make faulty decisions based on erroneous premises.

Loss Aversion

(Kahneman & Tversky (1979) while elaborating on loss aversion stated that it results from an anticipation that losses will have a greater effect on feelings than equivalent gains. Loss aversion or "prospect theory" is related to individual's stronger desire to avoid losses than experience comparable gains ,Tversky and Kahneman,(1979).

First positively demonstrated by Tversky and Kahneman, the theory of risk aversion stipulates that losses are emotionally felt twice as strongly by people compared to comparable gains. There have been some studies which suggest that losses can be as much as twice as psychologically powerful as gains. The aversion to loss is so great with most investors that the thought of selling a stock when one is down (showing a paper loss) is truly abhorrent and too painful to face. Many investors hang on to losing stocks in the hope that one day, the stock will come good. They do so even when there is no information to suggest this recovery will occur. In other words, their distaste for losses renders them unable to make a sound investment decision when losing money and they start to gamble. But refusing to sell a stock when it is down (unless there is a good reason to hold) is akin to a failure to acknowledge reality. Many investors continue to hold loss-making stocks in the hope they will one day recover.

Research has shown that people tend to evaluate outcomes not in terms of their impact on an individual's resulting state of wealth, but in terms of changes from a reference state (e.g., Kahneman & Tversky, 1979). Moreover, evidence has been interpreted to imply that people are loss averse: negative changes (i.e., losses) from a reference state are thought to loom larger than positive changes (i.e., gains) of equivalent magnitude (e.g Kahneman & Tversky, 1979; Tversky & Kahneman, 1991). This principle, named Loss Aversion, is commonly considered the most robust and important finding of behavioral decision theory and cited as a "seemingly ubiquitous phenomenon" (Novemsky & Kahneman, 2005).

This theory of loss aversion is present both in business and in everyday life. A study that looked at the concessions made in negotiation when the framing was alternatively posed in positive and negative frames, concluded that "a loss frame produced fewer concessions than a gain frame", proving again that individuals are less willing to negotiate when there is a potential of a loss because they are not predisposed to encounter that loss (Carnevale, 2008). Previous studies have shown that biases, heuristics, and framing effects have a negative impact on decision making and result in loss of productivity and value maximization; but do students display the same amount of bias in everyday life when it comes to investment decisions. The paper will also explore this question

Background of the study

Parikh,(2009) in his book Value Investing And Behavioral Finance has identified smart and successful way of investing calls for a thorough understanding of behavioral finance not just market sentiments, crowd behavior or company performance. This book studies investing and behavioral trends in Indian capital markets, and shows the follies of collective behavioral biases and their impact on investor decisions and returns. It makes nice reading because the examples are from the Indian markets so familiarity is high.

Maheran and Muhammad, **(**2009) compared Behavioral finance and traditional finance. Chira and Thornton (2008) did work on Behavioral Bias within the decision making process. Chandra, (2008) worked on Decision Making in the Stock Market: Incorporating Psychology with Finance. Pompian, (2006) did extensive research on Behavioral Finance. In his book Behavioral Finance and Wealth Management, financial expert Michael Pompian shows investors and financial advisors how to make better investment decisions by employing behavioral finance research.

A large body of psychological literature suggests that females tend to be more risk averse than males (see Byrnes, Miller, & Schafer, 1999,). This finding has been relatively robust across a wide variety of domains and using a wide variety of definitions of risk. Wilson and Daly (1985) suggest that risk taking in males has evolved due to the adaptive mating advantage conferred on males willing to take risks to accumulate mates and resources that may attract mates.

Empirical investigation of gender differences in risk taking do point in the direction of less risk taking by women than by men (Eckel and Grossman, 2002 and Croson and Gneezy, 2004). Research in the domain of investing has also found consistent support for this basic gender difference. For example, non-professional women investors have been found to allocate less of their portfolios to volatile assets (Barber & Odean, 2000; Bernasek & Shwiff, 2001; Chow & Riley, 1992; Cohn, Lewellen, Lease, & Schlarbaum; 1975; Jianakoplos & Bernasek, 1998; Sunden & Surette, 1998). This risk aversion on the part of women has also been demonstrated in professional financial analysts. Olsen and Cox (2001) found that female professional investors are more focused on the chance of loss in determining their portfolio makeup than male investors.

Studies have found that men tend to be more risk tolerant on average than women (Byrnes, Miller, and Schafer, 1999). This gender difference carries over into personal investment decisions. Men tend to allocate more wealth to risky assets than do women (Jianakoplos & Bernasek, 1998) and are 45% more active in trading common stock than women (Barber & Odean, 2001).

Gender-stereotyped beliefs exist within the business realm. For example, a study conducted by Williams, Paluck, and Spencer-Rodgers (2010) revealed that both university students and working adults provided higher salary estimates for men than women to neutral job titles in both white- and blue-collar professions. Moreover, they also believed that men should earn more than women. Such findings are consistent with the proposed "male-wealth stereotype" where masculinity, more than femininity, is associated with wealth. In financial investment decisions, women are typically perceived to be more risk averse than men.

Most studies have found that men and women do respond to risk differently, with men taking more risks than women; For example, Eckel & Grossman (2002) found women are more risk averse on average than men in gamble choices: they are more than four times as likely as men to choose the risk-free gamble and only one-third as likely to choose the highest-risk gamble, although men and women did not significantly differ in estimated loss aversion. However, not every study has found significant gender differences in risk aversion or risk taking. In a recent study by Feng and Seaholes (2008), no gender differences were obtained in terms of portfolio return and trading activity for individual Chinese investors in China.

Finally, a few papers have studied the issue of whether men and women stereotype similarly or differently. Siegrist, Cvetkovich, and Gutscher (2002) found that women tended to overestimate the risk seeking tendency of men but accurately estimated the risk seeking tendency of women. However, Eckel and Grossman (2002) found a consistent pattern in both men and women underestimated the risk seeking tendency of both genders. They also found that men tend to underestimate women's risk seeking tendency more than women themselves.

Rationale of the Study

From the above discussion, it is clear that investors are prone to behavioral biases and their role in decision making cannot be undermined. Rather, we attempt to study the most prevalent of these biases, i.e., Overconfidence and Loss Aversion (Regret Aversion) in the state of Jammu and Kashmir. We are studying only Overconfidence and loss aversion because these are the most common among the biases to which people are prone to not only in business decisions but also in day-to-day activities. For this, we have taken people who are actively investing in the stock market. It is clear from review studies that the state of Jammu and Kashmir is more of an agri-economic state where we do not have stock exchanges and financials which other states have access to as a result do not have much knowledge and expertise about the behavioral biases and hence are more prone to them. Further, we have not only identified these biases among the investors, we have also classified the biases on the basis of gender, i.e. intensity of Overconfidence and Loss Aversion is different in males and females investors.

So, the objectives of this study are:

- To give an overview of the two biases of our study
  - ✓ Overconfidence
  - ✓ Loss aversion (Regret Aversion)
- To find out the differences in male and female investors in terms of biases.i.e. Overconfidence and Loss aversion.

Research Methodology

For testing Over confidence and loss aversion with respect to gender we designed a questionnaire where in the questions relating to both was mixed. The questionnaire was prepared using Google documents and was sent to participants through e- mail. Participants comprised of various categories of people namely – students, working professionals, professional investors and amateur investors. E-mails were sent out to more than 200 people, almost half of them women since this is a gender- based study.

We received 135 responses, out of which 61 were female and 74 were male. Three responses for women were deleted due to incomplete information, making a total of 58 responses for consideration. Out of 74 responses received for males we considered only 70 and four of them were rejected due to incomplete information. Thus, the final set of responses was 128, of which 58 were from women and 70 were from men.

Reliability of the Instrument:

From the questionnaire, question numbers 1,3,5,6,9 were asked to measure Over Confidence and the remaining questions i.e. 2,4,7,8,10 were used to measure Loss Aversion. The questionnaire was designed on a 5-point Likert scale and an internal consistency check was done by calculating Cronbach Alpha for both set of questionnaires.

The Questionnaire pertaining to Over Confidence the responses yielded a Cronbach Alpha score of 0.752 and for that of Loss Aversion the Cronbach Alpha was 0.751.

Questionnaire	Cronbach alpha
Over Confidence	0.752
Loss Aversion	0.751

Hypothesis

Over Confidence and Loss Aversion are the two main common behavioral biases among investors and are present in varying degrees in both men and women. This study is an attempt to identify whether there is a significant difference of these behavioral biases in Indian men and women. We propose to analyze the

following hypothesis:

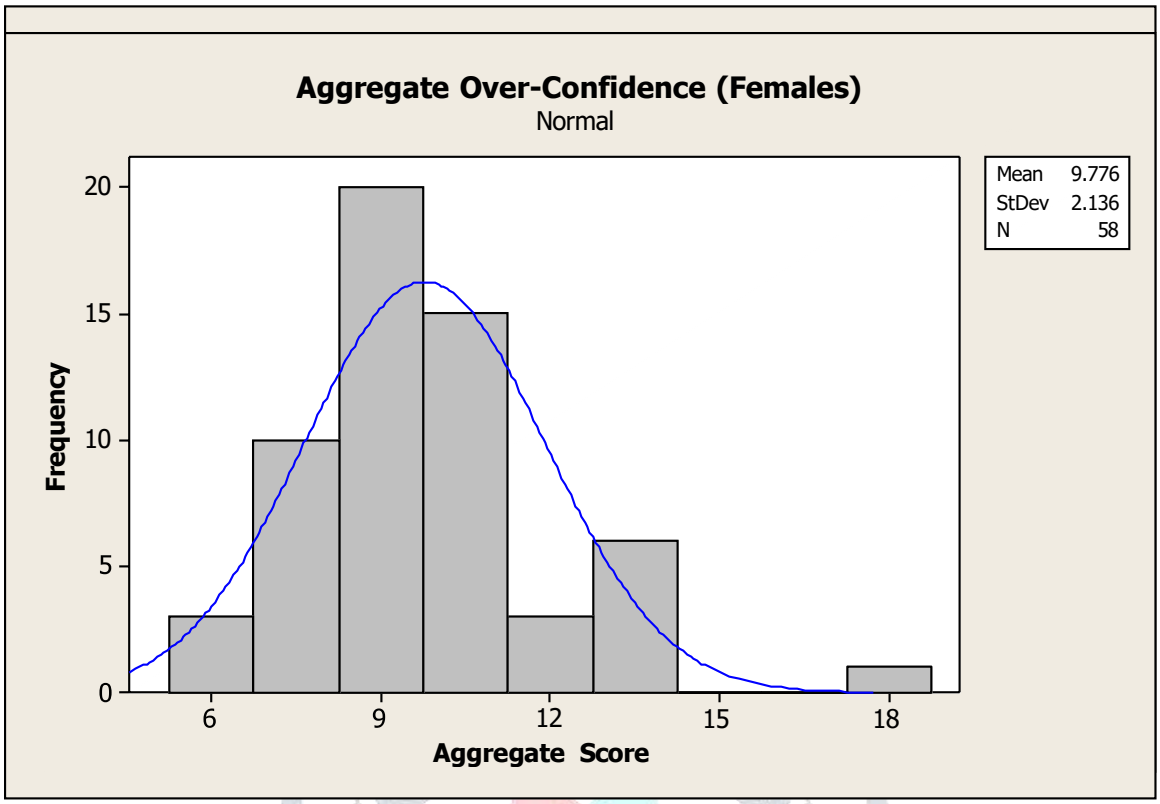
H1: There is no difference between the Over-Confidence exhibited by males and females. H2: Both males and females display loss aversion to the same degree.

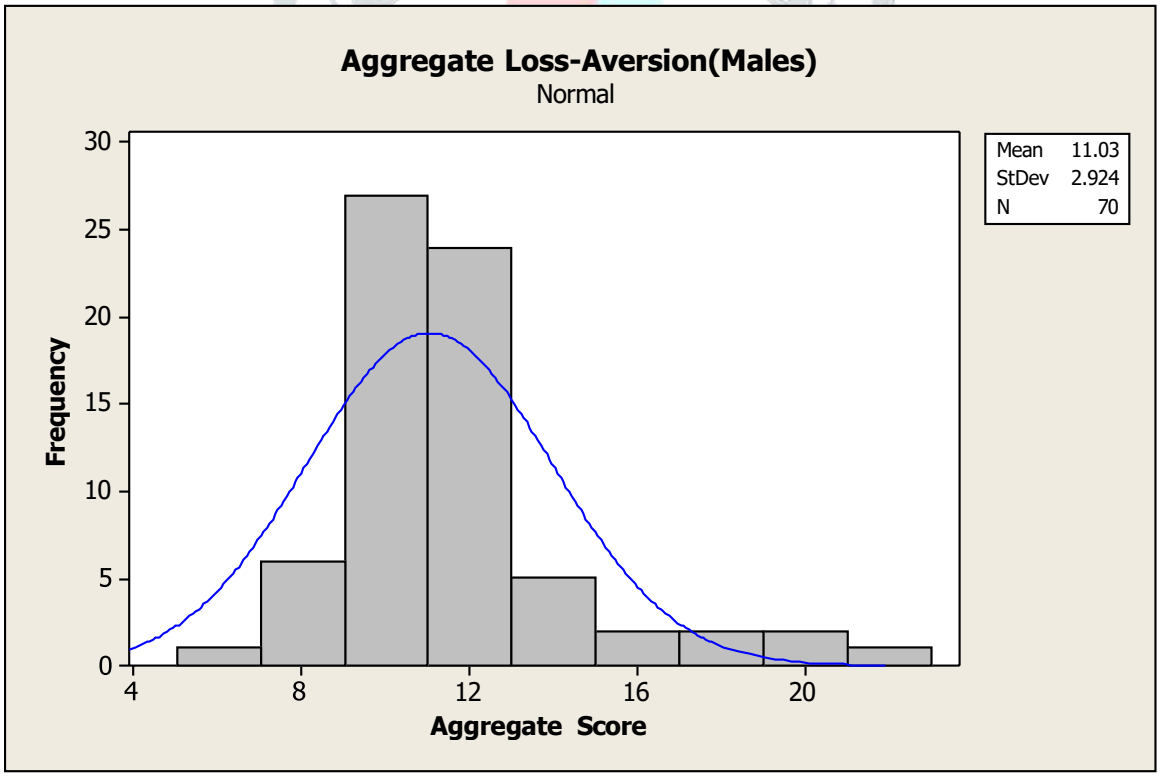
Analysis and Interpretation:

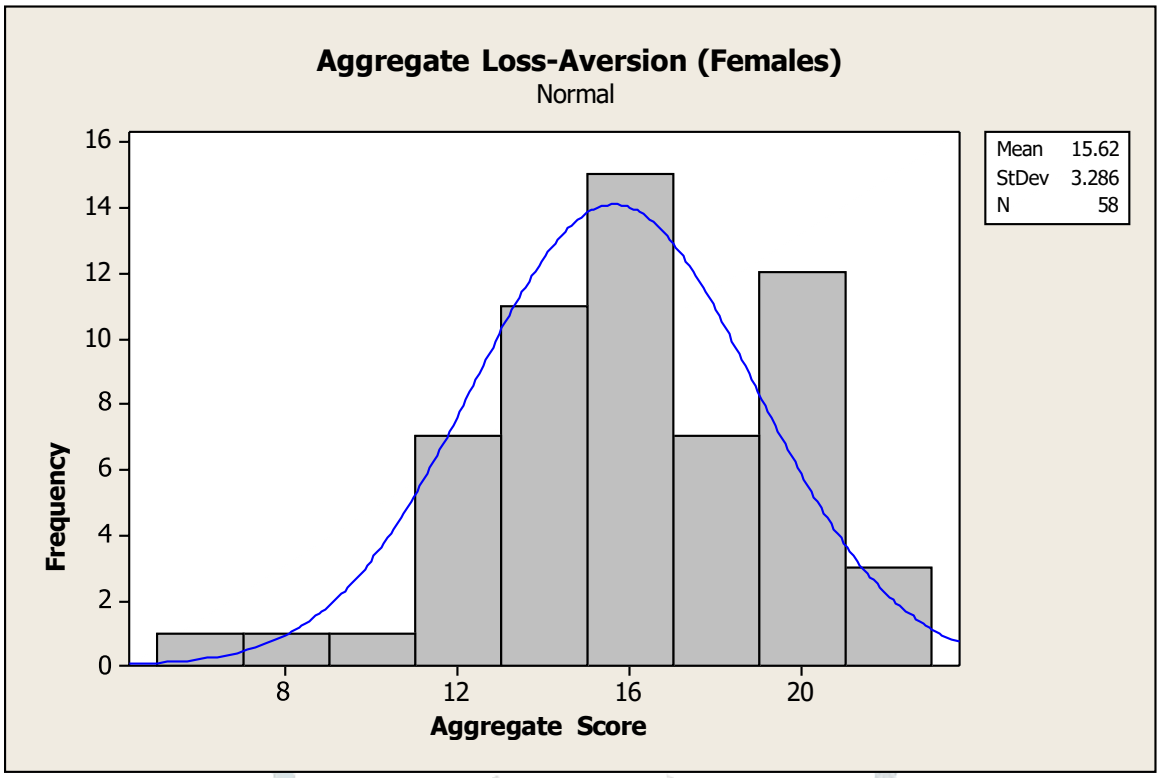
The data received from the questionnaire was further refined by separating the data from the two mixed questionnaires. Question numbers 1, 3,5,6,9 were on Over Confidence and the remaining questions i.e. 2, 4, 7,8,10 were used to measure Loss Aversion. Once we had data for the twodifferent questionnaires, both sets were further refined to extract responses for males and females. This was done using Microsoft Excel.

The Aggregate score was calculated in excel and a Graphical analysis was done using Minitab software so as to generate the basic statistics of the Aggregate Score. Below are the 4 graphs revealing the descriptive statistics of the total aggregate score of the four categories – Aggregate data of Over-Confidence in males and females as well as Aggregate data of Loss-Aversion in males and females.

The final analysis on the refined data was done in SPSS.







The aggregate score for the respective questionnaires was then used to calculate the Average Bias Score (ABS) which was the arithmetic average of the aggregate score. This was done separately for males and females. Finally, t-tests were performed for identifying whether there is any significant difference between the Average Bias Score (ABS) for male and female responses for both the questionnaires respectively.

Over Confidence and Gender:

A significant number of review studies have shown that males tend to be more over confident than their female counterparts. To test this, we subjected the Average Bias Score (ABS) for Over-Confidence to an independent t-test, comparing the ABS for males and females respectively.

Hypothesis	t value	Sig. (2-tailed)	Result
H01	12.202	.000	Rejected

The Null hypothesis is Rejected, which means that there is difference between the over confidence displayed by males and females. The ABS for Over Confidence is higher for males suggesting that males are more over confident than females.

Loss Aversion and Gender:

Loss Aversion is another commonly occurring bias said to be found more in females than males. To test this, we again applied an independent t-test on the ABS for Loss Aversion on male and female data respectively.

Hypothesis	t value	Sig. (2-tailed)	Result
H02	-8.361	.000	Rejected

The Null hypothesis is Rejected, meaning that the means of the two populations are significantly different. The ABS score showed that females are more prone to Loss averse bias than their male counterparts.

Conclusion:

Behavioral biases such as overconfidence and loss aversion lead people to make mistakes and hence lose out more than people who judge correctly. This paper was an attempt to link the biases with gender and see whether there is any difference between the biases exhibited by males and females in the state of Jammu and Kashmir. Our study found that there is a clear difference between the levels of biases displayed between males and females. While males seem to be more over confident than females they are less likely to show loss averse behavior than females do.

Being aware of these facts is an advantage to both kinds of investors as these facts can act as yardsticks while investing. Also, an important implication is that mixed teams comprised of males and females can nullify these effects to a great extent. We have only studied the two most common occurring biases. However, further studies can be done to explore the relation of other behavioral biases with gender.

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Appendix:

Cronbach Alpha: Overconfidence Questionnaire

Case Processing Summary

		N	%
Cases	Valid	128	100.0
	Excluded[a]	0	.0
	Total	128	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.752	5

Loss Aversion Questionnaire Case

Processing Summary

		N	%
Cases	Valid	128	100.0
	Excluded[a]	0	.0
	Total	128	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.751	5

INDEPENDENT SAMPLES T-TEST FOR TESTING OVER-CONFIDENCE (RESULTS FROM SPSS)

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
ABS	Males	70	3.1000	.59927	.07163
	Females	58	1.9552	.42722	.05610

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
ABS	Equal variances assumed	11.511	.001	12.202	126	.000	1.14483	.09383	.95915	1.33051
	Equal variances not assumed			12.583	123.403	.000	1.14483	.09098	.96475	1.32491

INDEPENDENT SAMPLES T-TEST FOR TESTING LOSS AVERSION (RESULTS FROM SPSS)

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
ABS	Males	70	2.2057	.58480	.06990
	Females	58	3.1241	.65730	.08631

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
ABS	Equal variances assumed	3.754	.055	-8.361	126	.000	-.91842	.10985	-1.13581	-.70104
	Equal variances not assumed			-8.270	115.313	.000	-.91842	.11106	-1.13841	-.69844