Original Article

The Mediating Role of Affect in the Relationship between the Big Five Factor Personality and Risk Aversion: A Structural Model

Mohammad Reza Mehregan[1], Mahnaz Hosseinzadeh[2], Mohammad Mehdi Emadi[3*]

[1] *Professor of Industrial Management, University of Tehran, Tehran, Iran.*
[2] *Assistant Professor of Industrial Management, University of Tehran, Tehran, Iran.*
[3] *PhD Candidate, Operations Research, Kish International Campus, University of Tehran, Kish, Iran.*
(*Corresponding author: Mohammad Mehdi Emadi, Email: emadi@ut.ac.ir)

Abstract

*Introduction***:** The purpose of this study was to analyze the relationship between the personality characteristics and their effects on risk aversion by the intermediary role of affect. The study suggests that positive and negative affect in individuals can play an intermediary role in the relationship between personality characteristics,risk aversion, and decision making.

*Methods***:** 265 undergraduate and postgraduate students completed the Ten-Item Personality Inventory and the Positive and Negative Affect Schedule (PANAS. Data were analyzed using structural equations modeling.

*Results***:** Findings showed that the increase in extroversion characteristic was negatively and significantly associated with risk aversion; it was also found out that there was a negative and significant relationship between openness to experience and risk aversion. Furthermore, the relationship between adaptability and risk aversion in the presence of affect as the intermediary factor was not statistically significant.

*Conclusion***:** Risk aversion is closely interlaced and undeniably associated with the personality and mentality of the individuals. But, it has to be noted that the sciences related to the intended subjects are substantially new in this regard hence many of the intended topic's angles are recognized and are worthy of discussion and study.

Declaration of Interest: None.

Key words: Risk Aversion, Big five factor personality, Affect, Decision making.

Introduction

Among different factors that influence people's decision making process, the willingness to take risks is one of the crucial factors that affects the person's overt behavior in risky situations (1). Risk and risk aversion have been recognized and included in the scientific discussion of decision making under uncertainty for hundreds of years (2). Risk aversion is the behavior of humans who, when exposed to uncertainty, attempt to lower that uncertainty (3).

There is much proof of a correlation between personality and major economic decisions that have marked the character either by the big five personality factors or Sensation Seeking Scale (4). The relationship between personality traits and risk aversion in individuals have been explored by so many studies (5, 6). These studies have frequently narrowed the personality role, in information gathering, during decision-making, pointing out that the decision-maker character traits may provoke

various priors (optimistic or pessimistic) of the individual concerning the uncertainty he faces. This is what impacts information seeking by the individual. Moreover, the need of a person to assure his/her choice may lead to a deviation in the information search (7). On the other hand, different people apply different heuristics in their decision-making that itself, in turn, influences how they collect data and solve the problem (8).

Fréchette and Schotter proposed that in uncertain environments, where decision makers are able to acquire information about the unknown probability distributions they face, personality variables influence the type of information they acquire, which then influences their choice (4). T has been shown the impact of personality traits on people's decision-making process and the degree of risk-taking in individuals and noted how the individuals' personality traits, such as the capacity of self-confidence, impose a solid and significant connection on the degree of the person's risk-taking (9). It has been pointed out that personality traits are one of the powerful determinants in the investors' performance and their eagerness to either risk-taking or not (10). Additional studies have denoted the weight of the five-factor model of personality in distinguishing risky behaviors (11) through which the main features of the personality are given. Five factors that have frequently addressed in the research are emotional stability, extroversion, openness to experience, agreeableness, and conscientiousness (12).

The recent researche in decision making and behavioral economics have pointed to the potential effect of affect (mood) on decision outcomes (13-16). In this sense, individual affect often determines the effectiveness of the individual's behavior on the achievement of goals. (17). According to the two-factor model of affect, affect consists of two dimensions, positive and negative (18). In accordance with decision making in risky situations, researchers have shown that the individual's emotional moods activate the information related to the similar emotional meaning in his/her memory. This mechanism allows a person to retrieve the related information from his/her memory for decision making in a short time which leads to a bias in memory recovery and the deviation of cognitive processes during judgment (19). It can be said that in problems including risk, people judge not only based on thinking, but also according to their own feelings. If they have desirable feeling about that problem, they will consider lower risk level and higher interests in their judgement; otherwise, they act in an opposite manner (16). There are two opposing theories to explain the relationship between the affect and risk preferences in people: the mood-maintenance hypothesis (MMH) and affect infusion model (AIM). MMH suggests that the positive affect leads to risk averse behavior and negative affect leads to risk-seeking behavior, while AIM points out to this fact that the affect will influence risk preferences exactly opposed to MMH model (20).

Although personal characteristics and traits are considered as potential drivers for risk aversion in individuals (4-6, 11, 21), the results of personality traits alone cannot predict the behavior of individuals in the real world whereas the issue of the possible impact of mediator variables on the relationship between two or more variables is of interest to researchers (5, 11, 22) .

This study seeks to investigate the structural relationship between personality traits and risk aversion behavior in people through their affect. It suggests that positive and negative affect of individuals can play as a mediator in the relationship between personality traits and the rate of risk aversion of individuals in decision making.

Determinants of risk attitudes of individuals are of great interest in the growing area of behavioral economics that focuses on the individual attributes, psychological or otherwise, that shape common financial and investment practices. Given the importance of risk aversion and its consequences for the business world in terms of choosing portfolios, assessing the insurance behavior or employee salaries, these research findings can help to better understanding of the individual's behavior in dealing with issues that require the risk of individuals in the situation.

Method

Descriptive correlational research design was utilized in this study. A survey method and questionnaire tools were used to collect the initial data and measure the theoretical model indices. The questionnaire was provided online and 265 people completed the questionnaire.

Sample individuals in the first section completed their personal information, which included questions about age, gender, education level, and participants' income.

In the next section, a ten-item Personality Inventory (TIPI) containing 10 sentences with five subscales of extraversion, emotional stability, openness to experience, agreeableness, and conscientiousness (23) was presented that the score of each expression was between "I quite disagree" and "I completely agree". Ehrhart et al. demonstrated (24) the reliability coefficient of this scale providing correlations between the scale scores and latent factors, and compare each measure's pattern of correlations with measures of other individual difference constructs. Results were favorable in terms of the factor structure and convergent validity of the TIPI. In Iran PoorYasin and Yusefi have been reported accepted reliability coefficients of tool by using Cronbach's alpha for the whole scale (25).

In the third section, individuals responded to the questionnaire of Positive-Negative Affective Scale (PANAS). This scale was developed and validated by Watson et al. in 1988 (26). This 20 questions scale has two sub-scales of positive and negative, each of which contains 10 questions. The Cronbach's alpha coefficient for positive and negative affective has been reported in the range of 0.83 to 0.91 (27).

In order to assess the risk aversion of the participants, Behavioral Measure of Risk Aversion: The Safe Asset Versus Risky (SAVR) Task was used (28). This measure has already been mentioned in previous studies (29). Participants were promised a guaranteed payment. They were offered the option of receiving their guaranteed payment or allocating some or all of it to a risky ''investment'' that would either increase or decrease their payment. Data were analyzed using structural equations modeling. To accurately mimic financial risk, where accepting risk leads to higher payoffs on average, the potential gains exceeded the potential losses. The proportion of each payment that participants allocated to the safe investment was used as measure of their financial risk aversion at that time.

Results

There were 265 participants in this study, of which 131 (49.4%) were male and 134 (50.6%) were female. The average age of the whole sample is 29.5 years. The descriptive information of the sample is presented in Table 1.

Table 1. Demographic characteristics of the samples in terms of gender and education

Gender	Male		Female		Total	
Education	N	Percent	N	Percent	N	Percent
College	55	70.5	23	29.5	7	29.4
Graduate	68	42.5	92	57.5	160	60.3
PhD	8	29.6	19	70.3	27	10.1
Total	131	49.4	134	50.6	265	100

Cronbach's alpha and reliability tests were used to measure the reliability of the questionnaire. Table 2 shows the value of statistics associated with each of the latent variables in the questionnaire. Given the values obtained for each of the latent variables in this table, it can be concluded that the questions designed to evaluate each of the latent variables have a high reliability.

Table 2. Cronbach's Alpha for indicators

Latent variables	Cronbach's Alpha
Extraversion	0.833
Openness	0.933
Conscientiousness	0.796
Agreeableness	0.782
Emotional Stability	0.772
Positive Affec	0.868
Negative Affect	0.803

Considering the importance of the number of samples in the factor analysis and in order to get out of the problem of samples number or the ratio of variables to samples, KMO criterion was observed; Bartlett's test for sphericity was also used to measure the

adequacy and conformity of the data. The KMO value was 0.753 and the confidence level was calculated to be 95%. As such, it can be stated that as the KMO value is more than 0.6 and the result of the Bartlett's test has a confidence level higher than 95%, the number of the data is adequate (30).

To test the proposed model, after testing the assumptions of structural equation modeling such as independence of errors and multivariate normalization, the model was tested. The mean, standard deviation and

correlation coefficients of the proposed model components are reported in Table 3.

The pattern of scores given to the five personality traits indicates that an increase in extraversion decreases agreeableness and conscientiousness. Additionally, it was shown that emotional stability is not significantly correlated with extraversion and openness. Moreover as can be seen the positive and negative affect are strongly inversely correlated.

Table 3. Means, standard deviation and correlation matrix for variables

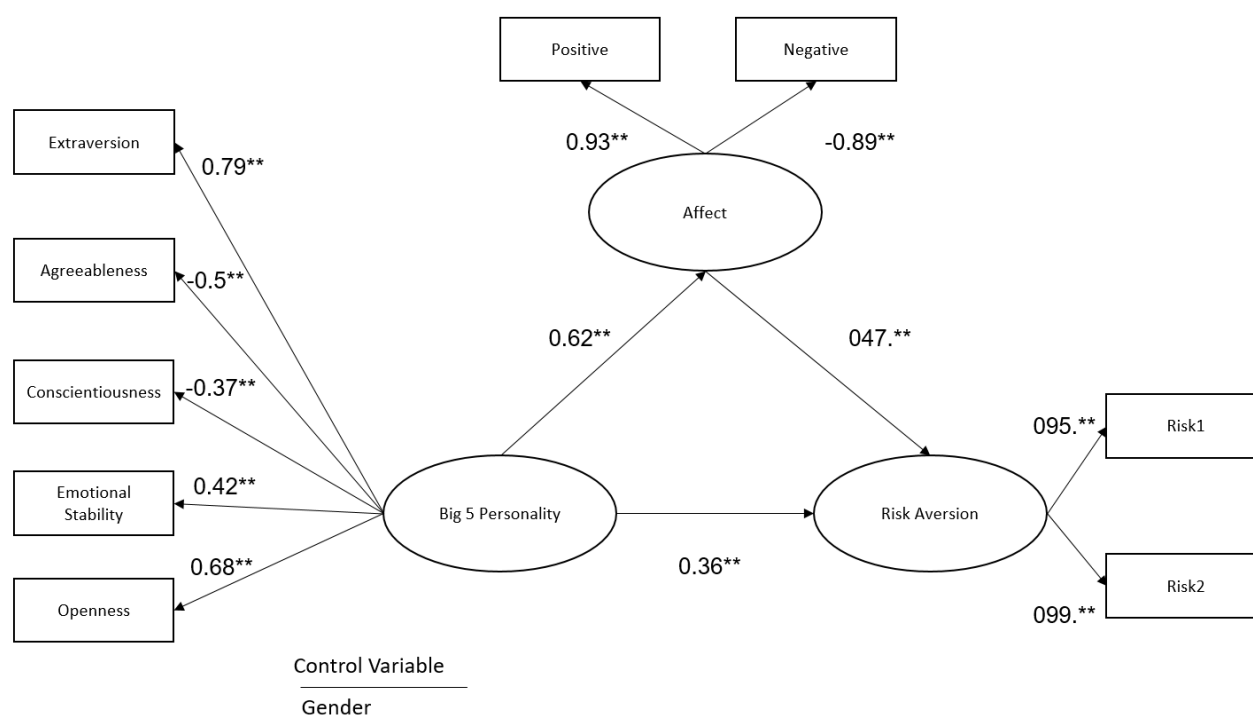|	**M**	**SD**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1. Extraversion	10.5	2.18	-							
2. Openness	10.9	2.31	0.795**	-						
3. Conscientiousness	10.8	2.26	-0.259**	-0.218**	-					
4. Agreeableness	9.59	2.37	-0.387**	0.293**	0.293**	-				
5. Emotional Stability	9.28	2.56	-0.11	-0.08	0.392**	0.207**	-			
6. Positive Affect	38.8	5.62	0.519**	0.361**	-0.185**	-0.301**	-0.318**	-		
7. Negative Affect	21.2	5.19	-0.520**	-0.421**	0.182**	0.229**	0.282**	-0.824**	-	
8. Risk Aversion	69.2	42.7	0.504**	0.428**	-0.265**	-0.344**	-0.350**	0.631**	-0.588**	-
*P < 0.05 **P < 0.01										

Figure 1. Final model

Structural equation modeling was used to investigate the role of the five big personality traits on risk aversion through the mediator variable of affect. The values of goodness of fit indices including CMIN/DF, goodness of fit index (GFI), Root Mean Square Error of Approximation (RMSEA) and fit index (CFI) were calculated to be 2.208, 0.964, 0.079 and 0.983 respectively. The results of this test showed that the proposed model has a good fit and the model was confirmed.

In the presentation of the model, as the results associated with risk aversion can be confused by the age of the individual (31), the age variable was statistically controlled.

The structural model of the test and the research measurement models are shown in Figure 1. The path coefficients in this figure suggests the significance of the direct paths related to the measurement models, indicating that all the subscales are representative of the related variable.

As can be observed, all the paths in the proposed model are significant. On the other hand, the direct effect of the personality variable on the affect variable is equal to 0.617 and on the risk aversion variable is equal to 0.358. The indirect effect of personality variable on risk aversion variable is 0.29. Hence, the total effect of the personality variable on risk aversion is equal to 0.648.

In the next step, for estimating and determining the significance of indirect paths between each of the five big personality traits and risk aversion through the mediating role of positive and negative affect, bootstrap command was performed (Table 3). As shown in Table 4, only two indirect paths of the model are significant. The direct paths of the relationship between extroversion and risk aversion and the direct path of this relationship with the mediating role of affect are positively significant. As such, there is limited mediation in this path. The relationship between emotional stability and risk aversion is significant only through the mediating role of affect and is a relationship with full mediation of affect. The findings also showed that the mediating role of affect is not significant in the relationship between personality trait of agreeableness and risk aversion. Moreover, there is no significant relationship in other paths.

Table 4. The results of Bootstrap test regarding the relationship between the five big personality traits and risk aversion through the mediating role of positive and negative affect

Path	Direct	Indirect	Result
Extraversion → Risk Aversion	-0.241***	-0.146**	Partial Mediation
Emotional Stability → Risk Aversion	0.29 (NS)	0.085**	Full Mediation
Agreeableness → Risk Aversion	0.237**	0.002 (ns)	No Mediation
**P < 0/001 NS= not significant			

Discussion

The purpose of this research was to study the mediation role of mood (affect) on the personality traits and risk aversion in individuals. The idea behind is that in addition to the link between personality traits and risk aversion (9, 21, 32), an individual's affect influences one's risk preferences (15). The findings showed that the personality traits, affect and risk aversion are correlated. Importantly, it also found that individuals' affect partially mediated the effect that personality traits had on children's individuals' risk aversion.

Extraversion was found to have the largest total effect on risk aversion among the five Big Five factors. The finding of a significant relationship between extraversion and risk aversion is consistent with existing studies (33, 34). Because extravert individuals are characterized as sensation seeking (demand stimulation and quest for excitement) (12), they are more comfortable engaging with the world around them and take risks (35). The findings also support theoretical formulation that extraverts are stimulation seekers relative to introverts (36). Furthermore, extraversion was found to have both a direct effect on risk

aversion and an indirect effect on risk aversion via affect. Extravert traits, especially assertiveness and sensation seeking, are related with the person's happiness causing him to be happy regarding or regardless of his affect, while positive affect boosts risk taking. This may be explained by the role of affect as partial mediator in the relation between extraversion and risk aversion.

Agreeableness was found to have a positive direct effect on risk aversion, but no indirect effect on risk aversion via affect. The finding of a non-significant indirect effect of Agreeableness on risk aversion via affect implies that Agreeableness is a stronger predictor of risk aversion than predictor of affect. However, this finding is inconsistent with previous studies that are found agreeableness is inversely associated with risk-taking (37, 38). The appearance of the personality trait of agreeableness in previous studies is associated with the expressions of altruism and sympathy with others (39) that would protect against the concern related to negative consequences of risk-taking (37). The HEXACO model of personality (40) offers a useful explanation for understanding the current findings. In the HEXACO model, agreeableness splits into two factors named honesty-humility (H) and agreeableness (A). People high in H are sincere and modest; people low in H are deceitful, pompous, and greedy. Consonant with this distinction, the findings in this research was more consistent with more people low in H.

This study also showed that emotional stability is the positive and significant predictor of risk aversion through the mediating role of affect. The finding is consistent with existing studies (34, 41). Emotional stability or neuroticism is a personality trait that includes low anxiety and high emotional stability on one end of its continuum and emotional instability and high anxiety on the other (12). Individuals who have a low score in this trait have dysfunctional emotions, are unable to control their impulsive behaviors and weak to cope with their problems. By contrast, those with high score in this trait are emotionally stable, usually calm, moderate and comfortable, and able to cope with stressful situations without

disturbance or anxiety. The findings also show that neuroticism predicted higher negative and lower positive affect and neurotics are more risk averse in negative mood. Neuroticism is associated with processing of negative emotional information and also reveals that current mood states moderate the judgments (42).

Moreover, it has been found that openness and conscientiousness predicted some of the variance in risk aversion. The lack of indirect relationship between individuals with the personality traits of conscientiousness, agreeableness and openness and risk aversion is not surprising as those responding to risk aversion scenarios did not include people with a strong emotional state or stress. When there is no compulsion, manipulation or social participation for people's response, the lack of relationship between some personality traits and risk aversion-related tests can be observed (43).

Consistent with previous studies (44, 45) it is found that positive and negative moods may affect the behavior of individuals when facing risky choices. On the other hand, the average rate of risk aversion was more than median. The research finding also implies that Individuals with positive affect showed more risk aversion than those with negative affect. It indicates the compliance of the research findings with previous studies (46, 47) and supports the theory of mood-maintenance hypothesis that according to this hypothesis, (20) individuals in a negative mood state tend to take greater risks than individuals in a neutral or positive mood state in order to improve their mood.

Two limitations should be acknowledged when interpreting the results of this study. First, the use of the TIPI instead of the Revised NEO Personality Inventory (NEO PI-R), TIPI was not designed to meet high standards of reliability or other psychometric properties, but rather to create a brief measure of the Five-Factor Model of personality without sacrificing validity (23). The reason that the TIPI was used in this study was that other personality inventories were lengthy and required several to be completed NEO Inventories new versions improved readability

and allowed the measure accessible to a wider portion of the population while it can to be used with younger populations and adults with lower educational levels (48). Another limitation of this study might be seen in measure of risk aversion. The SAVR Task test-re-test was used to measures of individual risk attitudes. But this task measure shows no strong construct validity (when related to personality). This finding is in line with results of other studies (49), which indicate the general risk factor derived from the questionnaire about individual risk attitudes has better construct validity (being correlated with an external predictor of risk-taking behavior, namely personality, almost exactly as expected) than choice task measure. As a result, we suggest that future studies should include a questionnaire measure of individual risk-attitudes along with choice tasks.

Although risk aversion is related to almost all human activities, there are still questions regarding the aspects and determinants thereof that have to be answered (50). Many of the questions in this regard pertain to the idea that whether risk aversion is a type of attitude in individuals or not and to what extent the individuals' inherent personality attitudes predict risk aversion. However, risk aversion levels of the various individuals and groups can be compared. But, due to its complexity and the involvement of various factors therein, it is not possible to measure it in exact terms. For a reason or another, risk aversion is closely interlaced and undeniably associated with the personality and mentality of the individuals. However, needless to say that the sciences related to the intended subjects, including behavioral study, personality study, psychology and others, are substantially new in this regard; hence, many of the intended topic's angles are recognized and are worthy of discussion and study.

References

1. Yuen KS, Lee TM. Could mood state affect risk-taking decisions?. J Affect Disord. 2003;75(1):11-8.
2. Machina M, Viscusi WK, editors. Handbook of the Economics of Risk and Uncertainty. Newnes; 2013.
3. Zhang R, Brennan TJ, Lo AW. The origin of risk aversion. Proceedings of the National Academy of Sciences. 2014;111(50):17777-82.
4. Fréchette GR, Schotter A, Trevino I. Personality, information acquisition, and choice under uncertainty: An experimental study. Economic Inquiry. 2017;55(3):1468-88.
5. Beyer AR, Fasolo B, De Graeff PA, Hillege HL. Risk attitudes and personality traits predict perceptions of benefits and risks for medicinal products: a field study of European medical assessors. Value in Health. 2015;18(1):91-9.
6. Baugh AT, Senft RA, Firke M, Lauder A, Schroeder J, Meddle SL, van Oers K, Hau M. Risk-averse personalities have a systemically potentiated neuroendocrine stress axis: A multilevel experiment in Parus major. Hormones and behavior. 2017;93:99-108.
7. Masatlioglu Y, Orhun AY, Raymond C. Intrinsic information preferences and skewness.
8. Brandstätter E, Gigerenzer G, Hertwig R. The priority heuristic: Making choices without trade-offs. Psychological review. 2006;113(2):409.
9. Bucciol A, Zarri L. Does Investors' Personality Influence their Portfolios?.
10. Statman M, Wood V. Investment temperament. *J Invest. Consult*. 2004;7(1):55-66.
11. Murugesan R, Jayavelu R. The influence of big five personality traits and self-efficacy on entrepreneurial intention: the role of gender. *J entrepreneursh. innov. emerg. econ*. 2017;3(1):41-61.
12. Costa PT, McCrae RR. The NEO personality inventory.
13. Lerner JS, Li Y, Valdesolo P, Kassam KS. Emotion and decision making. Annual review of psychology. 2015;66.
14. Bandyopadhyay D, Pammi VC, Srinivasan N. Role of affect in decision making. J InProgress brain res. 2013;202: 37-53.
15. Zinn JO. Risk, affect and emotion. InForum qualitative sozialforschung/forum: qualitative social research. 2006;7(1).
16. Slovic P, Peters E, Finucane ML, MacGregor DG. Affect, risk, and decision making. Health psychology. 2005;24(4S):S35.
17. Treffers T, Koellinger P, Picot AO. In the Mood for Risk? A Random-Assignment Experiment Addressing the Effects of Moods on Risk Preferences. 2012.
18. oyle GJ, Helmes E, Matthews G, Izard CE. Measures of affect dimensions. InMeasures of personality and social psychological constructs 2015;190-224.

19. Montibeller G, Von Winterfeldt D. Cognitive and motivational biases in decision and risk analysis. Risk Analysis. 2015;35(7):1230-51.

20. Grable JE, Roszkowski MJ The influence of mood on the willingness to take financial risks. *J Risk Res*. 2008;11(7):905-23.

21. Desmoulins-Lebeault F, Gajewski JF, Meunier L. Personality and Risk Aversion. Economics Bulletin. 2018;38(1):472-89.

22. Kusev P, Purser H, Heilman R, Cooke AJ, Van Schaik P, Baranova V, Martin R, Ayton P. Understanding risky behavior: the influence of cognitive, emotional and hormonal factors on decision-making under risk. Frontiers in psychology. 2017;8:102.

23. Gosling SD, Rentfrow PJ, Swann Jr WB. A very brief measure of the Big-Five personality domains. *J Res. Pers*. 2003;37(6):504-28.

24. Ehrhart MG, Ehrhart KH, Roesch SC, Chung-Herrera BG, Nadler K, Bradshaw K. Testing the latent factor structure and construct validity of the Ten-Item Personality Inventory. Personality and individual Differences. 2009;47(8):900-5.

25. PoorYasin Z, Yusefi F. Predict job satisfaction of teachers according to five factor model Personality and emotional intelligence. *J Res. Educ. Syst*. 2011;4(11):83-113. (Persian).

26. Watson D, Clark LA, Tellegen A. Development and validation of brief measures of positive and negative affect: the PANAS scales. *J Pers. Soc. Psychol*. 1988;54(6):1063.

27. Watson D, Clark LA. The PANAS-X: Manual for the positive and negative affect schedule-expanded form. 1999.

28. Kramer LA, Weber JM. This is your portfolio on winter: Seasonal affective disorder and risk aversion in financial decision making. Social Psychological and Personality Science. 2012;3(2):193-9.

29. Itzhak V, editor. Behavioral Finance: Where Do Investors' Biases Come From?. World Scientific; 2016.

30. Howard MC. A review of exploratory factor analysis decisions and overview of current practices: What we are doing and how can we improve?. *J Hum.-Comput. Interact*. 2016;32(1):51-62.

31. Morin RA, Suarez AF. Risk aversion revisited. *J Finance*. 1983;38(4):1201-16.

32. Filbeck G, Hatfield P, Horvath P. Risk aversion and personality type. *J Behav. Finance*. 2005;6(4):170-80.

33. McGhee RL, Ehrler DJ, Buckhalt JA, Phillips C. The relation between five-factor personality traits and risk-taking behavior in preadolescents. Psychology. 2012;3(08):558.

34. Oehler A, Wedlich F. The relationship of extraversion and neuroticism with risk attitude, risk perception, and return expectations. *J Neurosci. Psychol. Econ*. 2018;11(2):63.

35. Contessa J, Suarez L, Kyriakides T, Nadzam G. The influence of surgeon personality factors on risk tolerance: a pilot study. *J surg. Educ*. 2013;70(6):806-12.

36. Vestewig RE. Extraversion and risk preference in portfolio theory. J Psychol. 1977;97(2):237-45.

37. Anic G. The association between personality and risk taking. 2007.

38. Spurk D, Abele AE. Who earns more and why? A multiple mediation model from personality to salary. *J Bus. Psychol*. 2011;26(1):87-103.

39. Costa Jr PT, McCrae RR. Four ways five factors are basic. Personality and individual differences. 1992;13(6):653-65.

40. Ashton MC, Lee K. The HEXACO model of personality structure and the importance of the H factor. Social and Personality Psychology Compass. 2008;2(5):1952-62.

41- Glöckner A, Hilbig BE. Risk is relative: Risk aversion yields cooperation rather than defection in cooperation-friendly environments. Psychonomic Bulletin & Review. 2012;19(3):546-53.

42- Rafienia P, Azadfallah P, Fathi-Ashtiani A, Rasoulzadeh-Tabatabaiei K. The role of extraversion, neuroticism and positive and negative mood in emotional information processing. J Pers. Individ. Differ. 2008;44(2):392-402.

43- McGhee RL, Ehrler DJ, Buckhalt JA, Phillips C. The relation between five-factor personality traits and risk-taking behavior in preadolescents. Psychology. 2012;3(08):558.

44- Colasante A, Marini M, Russo A. Incidental emotions and risk-taking: An experimental analysis. 2017.

45- Campos-Vazquez RM, Cuilty E. The role of emotions on risk aversion: a prospect theory experiment. J Behav. Exp. Econ. 2014;50:1-9.

46- Bernoulli D. Exposition of a new theory on the measurement of risk. InThe Kelly Capital Growth Investment Criterion: Theory and Practice 2011;11-24.

47- Eeckhoudt L, Gollier C, Schlesinger H. Economic and financial decisions under risk. Princeton University Press; 2005.

48- McCrae RR, Martin TA, Costa Jr PT. Age trends and age norms for the NEO Personality Inventory-3 in adolescents and adults. Assessment. 2005;12(4):363-73.

49- Lönnqvist JE, Verkasalo M, Walkowitz G, Wichardt PC. Measuring individual risk attitudes in the lab: Task or ask? An empirical comparison. *J Econ. Behav*. Organ. 2015;119:254-66.

50- Zaleskiewicz T. Beyond risk seeking and risk aversion: Personality and the dual nature of economic risk taking. *Eur. J Pers*. 2001;15(S1):105-22.