

MULTIPLE INTELLIGENCE AND PERSONALITY TRAITS OF COLLEGE TEACHERS ON THEIR BIASES IN FINANCIAL DECISIONS

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Abstract

The study concentrated on the relationship between intelligence, personality and biases in financial decisions. Among the Intelligence theories, multiple intelligence, which consists of nine types of intelligences, has been taken for study. From different Personality theories, big five personality theories have taken. The descriptive research design was used for analysis with samples from college teachers in Kerala. Multiple intelligence inventory, personality inventory and biases scales were used for data collection. Canonical correlation technique used to study relationship as intelligence has nine and personality has five dimensions. The study results indicate only Extroversion and Verbal intelligence only varies according to gender, and Openness only differs among different age groups. Biases are studied using multiple regression and simple linear regression techniques. Personality traits and intelligence have a significant influence on biases in financial decisions. The study concluded that cognitive and behavioural factors are affected in biases in the financial decisions.

Keywords: Multiple intelligences, Personality traits, Biases in Financial decision, College Teachers, Kerala.

Intelligence and personality are two inner characteristics or original magnitudes that describe most of the variances that occur between people in behaviour, development and life outcomes. Intelligence is considered to be at the pinnacle of a more specific range of skills, all of which are interconnected. Personality can be described on three different levels, including: characteristics, traits and life stories. Psychologists study individual differences through different ages. Most researchers consider intelligence and personality in different domains, the cognitive and behavioural domains. Several studies are conducted that enhance the association or relationship between them. There are some psychological studies combining intelligence and personality and majority are reported the association between these variables like Von Strum S. (2017). In the current study, investigators try to check the relationship between intelligence and personality of college teachers and study their biases in financial decisions in related to these variables.

Intelligence is the capacity of an individual to do purposeful actions and logical thinking. There are several ideas related to Intelligence. In the present study, multiple Intelligence has been taken for analysis. Howard Gardner forwarded multiple Intelligence in his book Frames of Mind (1983). This theory gained universal acceptance and several discussions are reviewed related to the theory. Gardner himself studied the theory and updated it several

times. He included nine types of Intelligence in an individual's cognitive system: linguistic, logical, musical, spatial, kinaesthetic, intrapersonal, interpersonal, naturalistic and existential Intelligence. Thus, Intelligence and domains are getting confused with each other. But Gardener differentiates these like the domain of music can involve any number of Intelligence and include musical Intelligence and linguistic, naturalistic, etc. Thus, he asserts that Intelligence is a bio-psychological construct while the domain is sociological. He had developed tests for each Intelligence and demonstrated their psychometric independence.

Verbal Intelligence

Verbal Intelligence is the cognitive ability to learn languages, interpret words and signs, and use words that lead towards specific goals. A person with verbal Intelligence can understand and use complex phrases or learn more than one language. They have highly developed auditory skills and marvel at the use of language. The professions they prefer are creative writing, public speaking and journalism.

Logical Intelligence

Logical Intelligence can analyse information or problems logically and investigate issues scientifically. The person who possesses logical Intelligence thinks conceptually in analytical and numerical patterns making a connection between the bits of data, and are curious about the universe. They are interested in experiments and posing questions, and the preferred profession are scientists, statisticians, mathematicians or detectives.

Musical Intelligence

Musical Intelligence is the ability to identify different sounds distinguish between specific pitches, tones and rhythms. The person who possesses musical Intelligence is highly sensitive to environmental sounds and immediately respond to the sounds they hear. They are often sensitive listeners and can reflect or reproduce music quite accurately. This is related to other Intelligence like verbal, mathematical and kinaesthetic Intelligence. They are successful in the professions like musicians, composers, vocalists, drummers etc.

Spatial Intelligence

Spatial or Visual Intelligence is the capacity to visualise, recognise and manipulate patterns of vast space. This ability includes manipulating images, graphic skills and spatial reasoning. The visually intelligent person tends to think in pictures and need to develop visions for processing and retaining information. This Intelligence is essential to sculptors, surgeons, engineers and navigators.

Kinaesthetic Intelligence

Kinaesthetic or bodily Intelligence is the ability to manipulate both body and object with a keen sense of timing. This is the ability to control own body movements and handle things skilfully by eye-hand coordination. The people with kinaesthetic Intelligence may see success as dancers, magicians, athletes, sportspeople and builders.

Intra-personal Intelligence

Intra-personal Intelligence is the capacity to be aware of their own emotions, needs, interests, confidence, feelings, motivation, attitude and personality. Intrapersonal intelligent persons tend to daydream, enjoy self-reflection and analysis, and assess themselves. They can understand the basis of their feelings, motivation and attitude. They may be philosophers, scientists, behavioural theorists, and writers.

Interpersonal Intelligence

Interpersonal Intelligence is the ability to communicate effectively with others verbally and non-verbally and accurately understand others' emotions and mental states. Persons who possess this type of Intelligence try to see things from others' points of view to know how they think and feel. They may be good managers, organisers, teachers, counsellors, and great leaders. This Intelligence may depend on verbal and visual Intelligence.

Naturalistic Intelligence

Naturalistic Intelligence is the ability to sensitise with the environment and distinguish and identify the living and non-living things with the specification. It involves expertise in the recognition and classification of species in the background. Individuals with this type of Intelligence are highly aware of even subtle changes in the environment. They may be interested in natural science and dislike studying topic which has no connection with the environment. The profession they prefer may be botanist, farmer, or meteorologist.

Existential Intelligence

Existential Intelligence is the ability to think about the meaning of life and human beings' existence and survival during unfavourable situations. The persons with this Intelligence are more futuristic and are sensitive but can take rational decisions in difficult situations.

Howard Gardner and his followers treated all these Intelligence as separate entities and related to the behaviour, attitude, personality, career preferences and success in different professions. This theory stresses the individualisation of Intelligence. Several studies on multiple Intelligence in the social sciences and education field were conducted. The studies related to multiple Intelligence have proven that multiple intelligences affect an individual's creativity, education and development.

Personality Traits

The personality is the sum of all the factors relating to an individual. It includes an individual's physical, psychological, and emotional adjustment to their environment. Personality traits are the stable features that describe an individual's behaviour. Psychologists have identified several traits and dimensions that differentiate individuals. There are trait theories that explain a different number of traits and dimensions of personality, like the sixteen-factor theory of Raymond Cattell and the five-factor theory of Robert McCrae and Paul Costa. Lewis Goldberg named the five-factor theory as Big Five personality. The personality traits are:

Openness

Openness is the response to the environmental and social background and changes. Otherwise, it is the response to experience and its link with intellectual activity. It is the ability to think out of the box and creative and artistic value and interest in learning new things. It tends to enjoy a unique experience and its influence on novel ideas, imagination and divergent thinking. High Openness indicates the person is curious and has a wide range of interests, and low Openness indicates one's preference in routine work and conventional style. Sub dimensions identified under this trait are Curiosity, Aesthetic, Ideas and Action.

Conscientiousness

Conscientiousness is the ability to control impulses, lead a disciplined life and fulfil goals within the limitations. The person who has this trait will be thoughtful and careful and have a deep sense of duty and orderliness. High conscientiousness indicates a hardworking and organised personality, while low conscientiousness indicates a careless and disorganised character. Sub dimensions identified under this trait are Competence, Deliberation, Order and Self-discipline.

Extroversion

Extroversion is a person's intensity or level of interaction with society and environment and a tendency to seek stimulation and company; make good relationships with society. It is the foundation of social, honest and emotional expression. High extraversion indicates external, warm, and disturbing, while low extraversion indicates quiet, reserved, and withdrawn. Sub dimensions identified under this trait are Excitement seeking, Assertiveness, Gregariousness and Warmth.

Agreeableness

Agreeableness is the tendency to keep the relationship and interaction with others. It is the willingness to accept others and cooperate with fellow mates. High agreeableness indicates an empathetic and trusty personality, and low agreeableness shows a critical suspicious personality. Sub dimensions identified under this trait are Modesty, Altruism, Straightforwardness and Trust.

Neuroticism

Neuroticism is the opposite of a stable personality and describes emotional stability and the ability to experience negativity. It is the tendency to experience and expect unpleasant emotions. High Neuroticism indicates an anxious and unpleasant personality, while low Neuroticism indicates a calm and even-tempered personality. Sub dimensions identified under this trait are Vulnerability, Self-consciousness, Depression and Anxiety.

Bias in financial decisions

Financial decision making is an essential factor in the economic well-being of an individual. Financial decision-making is the key to success in the individual's financial success, and here the irrational decision-making factors are treated as bias. Biases in financial decisions may

arise from the lack of financial knowledge, prejudices, personal values and beliefs, and misconception or influence of friends and relatives. Here the investigators try to study the relationship of bias with Intelligence and personality.

Review

Lounsbury, J.W., Sundstrom, E., Loveland, J. M. and Gibson L.W. (2003) have conducted a study on Intelligence, big five personality traits and work drive on the course grade. They performed hierarchical multiple regression analysis and found that general intelligence influence significantly in course grade. The big five personality traits and work drive are also significant in course grades. The study discussed the importance of specific features of personality in understanding the details of pedagogical training and the need for further research using different perspectives and basic comparisons.

Motah, M. (2008). Studied the Influence of Intelligence and Personality on the Use of Soft Skills in Research Projects among Final Year University Students. The researcher examined the influence of the big five model of personality, emotional Intelligence and multiple Intelligence on the use of soft skills among final year university students. This study provided information on how young students use interpersonal skills in their work and how multiple intelligence and their personalities influence the preparation and presentation of their final project.

Deary, I.J., Weiss, A., and Batty, G. D. (2010) studied illness and death and its association with Intelligence and personality. They tried to analyse the chronic disease epidemiology and collaborate it with differential psychology. They found that personality traits and intelligences are associated with health and illness.

Baptiste, A. A. M. B. (2018) studied authentic leadership and its relationship with big five personality traits. The results of the study show that only the conscientiousness of the Big Five personality traits is positively correlated with authentic leadership, and that the combination of conscientiousness and neuroticism is best paired with authentic leadership. Agreeableness was indirectly significant in a simple correlation analysis.

Neuroticism has a negative Correlation, and conscientiousness has a positive Correlation with authentic leadership, and thus they concluded Neuroticism and conscientiousness are combined predictor of authentic leadership.

Reviews of the other literature related to different areas of life are made for the study, taking personality traits and Intelligence as a variable for study.

Objectives of the study

- To study the relationship between the nine multiple intelligences with big five personality traits.
- To study if there are any differences in the personality traits and multiple intelligences of the teachers according to gender and age.

- To reduce the dimensions of multiple intelligence and personality traits using factor analysis
- To study if there are any significant influence for multiple intelligences on bias in financial decisions.
- To study if there are any significant influences for personality traits on bias in financial decisions.

Hypotheses

- H0: There is no significant relationship between the nine multiple intelligences with big five personality traits
- H0: There are no significant differences in the teachers' personality traits and multiple intelligences according to gender and age.
- H0: Multiple intelligences have no significant influence in bias in financial decisions.
- H0: Personality traits have no significant influence on bias in financial decisions.

Methodology used

The present study is descriptive in nature. The data were collected from a hundred college teachers using a questionnaire containing multiple intelligence inventory, personality traits scale, and financial bias scale. Data analysis was done with ANOVA, t-test, factor analysis, Canonical Correlation, Pearson's coefficient of Correlation and multiple regression analysis.

Results and discussion

Tables are numbered as A1 to A21

A1.

All the personality traits are above average mean values, and as the weighted score is five, the trait extroversion has less, and Openness has a high mean value.

A2.

The weighted score of each Intelligence is maximum five, and minimum one and the table exhibits that all the intelligences are above average score in individual mean.

Canonical Correlation

Canonical correlation analysis is used to identify components of multiple Intelligence that are most highly related linearly to the components of the big five personality traits. The logic of this analysis involves deviating the linear combination of variables from each of the two sets of variables so that the correlation between the two groups is maximized. Canonical Correlation follows the similar procedure of principal component analysis but tries to account for the maximum amount of Correlation between the two sets of variables rather than within a single set of variables.

A3.

The sum of the squared canonical correlations is called Pillai's trace, which can be found: $.65275^2 + .56364^2 + .55485^2 + .36114^2 + .28251^2 = 1.26185$. The Hotelling trace is very

similar to Pillai's trace and can be calculated as the sum of the values of (canonical correlation²/(1-canonical correlation²)). It can be calculated as: $.65275^2 / (1-.65275^2) + .56364^2 / (1-.56364^2) + .55485^2 / (1-.55485^2) + .36114^2 / (1-.36114^2) + .28251^2 / (1-.28251^2) = 1.889407$. The product of the values of (1-canonical correlation²) is called Wilks' lambda. Here, it is $(1-.65275^2) * (1-.56364^2) * (1-.55485^2) * (1-.36114^2) * (1-.28251^2) = .21688$. This is Roy's greatest root. It can be calculated from the largest eigenvalue: largest eigenvalue/(1 + largest eigenvalue).

$$.74240 / (1+.74240) = .42608$$

A4.

Since there are five dependent variables, five canonical functions are derived. The first three are statistically significant (dimension reduction analysis). The first function having a squared canonical correlation is 0.43, and the other four functions are 0.32, 0.31, 0.13 & 0.07 respectively. These values are interpreted like r^2 in multiple regression analysis. That is, 43% of the first function is influenced by the independent variables, and all others are 32%, 31%, 13% and 7%, respectively.

A5.

Wilk's lambda is a statistic for testing the statistical significance of canonical Correlation, and the lambda may range from a value of 0 to 1. The closer lambda is to 0, the more likely canonical Correlation. Here the first three functions are closer to 0, and the other two functions are not.

Structure correlation coefficients

A6.

A7.

A structure coefficient is a Correlation between the predictor or dependent variable composites and the variable used to create the composites. Structure coefficients help interpret Canonical results in each variable's contribution to the canonical solutions.

Here the squared structure correlation between Openness and the first canonical function is 0.15; conscientiousness is 0.63, Extroversion is 0.59; Agreeableness is 0.50; and Neuroticism is 0.10.

Agreeableness & Openness are more related to function 4. Extroversion is related to function 1, and Neuroticism is related to function 2. That means the first canonical function has more to do with conscientiousness and Extroversion. The fourth canonical function has more to do with agreeableness and Openness, and Function 2 is more related to Neuroticism. The same interpretation can be made upon examining covariates.

Variate Adequacy Coefficient

The average of all the squared structure coefficients for the variables in one set concerning one function is a canonical variate adequacy coefficient. This indicates how adequately a

given group of canonical variate scores perform with reference to represent every variance of the original unweighted variables in the group.

A8.

The first canonical function represents 20.62% of the variance in the dependent variable and 17.53% of the variance in the independent variable. The second function represents 13.89% of the dependent variable and 6.5% of the independent variable, and so on.

Redundancy Coefficient

The redundancy coefficient indicates the average proportion of variance in the variable in one set that is reproducible from the variable in another set. It is an evaluation of the capacity of prediction and not association because it is not entirely affected by all the intercorrelations of the variables. The redundancy coefficient equals 1.00 only when two variables share precisely 100% of their variance and a variate perfectly act for the original variables in its domain.

In this analysis, on average, 8.97% of the variance of the dependent variables is reproducible by the independent variables in the first function. 4.41%, 4.76%, 3.83% & 1.65% in case of second to fifth function respectively.

On the independent variables, only 7.47%, 2.08%, 4.01%, 2.07% and 0.75% of their variance can be reproducible by the first to fifth functions, respectively.

The pooled redundancy coefficients for a given set of variables equals the average multiple Correlation for the variables in the set when they are predicted by all the variables in the other set.

In this analysis => $8.79+4.41+4.76+3.83+1.65 = 23.44\%$ for the independent variables and $7.47+2.08+4.01+2.07+0.75 = 16.36\%$ for dependent variables.

A9.

R^2 for personality traits are: Openness 0.19, Conscientiousness 0.27, Extroversion 0.27, Agreeableness 0.24 and Neuroticism 0.19. All the regression coefficients are significant at 0.05 levels.

A10.

Among the personality traits, Extroversion significantly differs from male to female. All other traits do not differ significantly at 0.05 levels.

A11.

Among the multiple Intelligence, Verbal Intelligence significantly differs from male to female. All other intelligences do not differ significantly at 0.05 levels.

A12.

Among the personality traits, Openness significantly differs from different age groups. All other traits do not differ significantly at 0.05 levels.

A13.

A post hoc test in Tukey's HSD test which provides greater insight to get differences between different age groups was conducted. Multiple comparisons show that the Openness of the age group between thirty and forty are significantly different from that of the age groups forty to fifty and fifty to sixty.

A14.

Dimension reduction

For the analysis of multiple intelligence and personality traits with bias in financial decisions, the data and dimensions were reduced using factor analysis. The multiple intelligences have nine different intelligences, and personality consists of five different traits. The dimensions are reduced with principal component analysis and rotation using the varimax method. The eigenvalue greater than or equal to one has taken for the study.

A15.

A16.

After the factor analysis, the dimensions of Multiple intelligences are reduced to three from nine. The three dimensions are decided as per the rotated component matrix.

A17.

There are three factors aroused from multiple intelligences, and they are treated as intrapersonal and related intelligences, interpersonal related intelligences and logic related intelligences. These three dimensions are compiled for further analysis of the research.

A18.

A19.

After factor analysis, only one factor is raised from five personality traits, and the five traits are compiled to a single score for the further analysis of data.

A20.

The R squared is 0.69, which is significant at 0.01 levels; it denotes that 69% of Biases in the financial decision are influenced by multiple intelligences. The general form of the equation to predict biases in the financial decision from multiple intelligences is predicted as: $0.634 + (0.74 * \text{Intra P Factors}) - (6.66 * \text{Inter P Factors}) + (4.1 * \text{Logical factors})$. The general form of equation to predict personality from multiple intelligences is predicted as: $5.935 + (0.57 * \text{Intra P Factors}) + (1.567 * \text{Inter P Factors}) - (0.977 * \text{Logical factors})$

A21.

The R squared is 0.077, which is significant at 0.05 level; it denotes that 7.7% of Biases in financial decisions are influenced by personality traits. The general form of the equation to predict biases in financial decisions from personality traits is predicted as: 2.984.

Conclusion

Multiple intelligences and big five personality traits of college teachers are studied with biases in financial decisions. All the personality traits are present in the college teacher community, and all the respondents have above average Intelligence also. The canonical Correlation on five dimensions of personality traits and nine dimensions of multiple intelligences have been studied, and there are five functions in canonical Correlation. Two personality traits are related to function four and one each with function one and two. In gender-wise analysis, Extroversion is the only personality trait and Verbal intelligence is the only intelligence that differ between males and females. In age-wise analysis, Openness is the only trait that differs between different age groups and no any dimension of intelligence differ according to age. Both multiple intelligences and personality traits are influenced significantly by biases in financial decisions.

College teachers are highly educated and highly paid category in the social strata of Kerala. The study helped to identify the personality traits and multiple intelligences of college teachers, and it analysed the biases which affect the financial decisions of the teachers. The study concludes that personality and Intelligence are combinedly influenced the biases in financial decisions. This study may throw light on this area of research and may lead the researchers to do a depth investigation in this direction.

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Conflict of interest statement

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. There was no external fund received for the study. There is no conflict of interest.

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Data Availability Statement

The authors confirm that the data supporting the findings of this study are available within the article and its supplementary materials.

A1.

Table 1 Descriptive statistic of Personality traits

Variables	M	S.D.
Openness	3.58	0.708
Conscientiousness	3.15	0.632
Extroversion	2.98	0.711
Agreeableness	3.28	0.655
Neuroticism	3.36	0.746

A2.

Table 2 Descriptive Statistics of Multiple Intelligence

Variables	M	S.D.
Verbal Intelligence	3.75	0.81
Logical Intelligence	3.61	0.89
Spatial Intelligence	3.32	0.90
Kinesthetic Intelligence	3.14	0.91
Musical Intelligence	3.18	1.01
Interpersonal Intelligence	3.77	0.87
Intrapersonal Intelligence	3.78	0.80
Naturalistic Intelligence	3.8	1.01
Existential Intelligence	3.22	0.99

A3.

Table 3 Test of significance of within cells of Regression of Personality traits and Multiple Intelligences

Test	Value	Approx. F	Sig. of F
Pillais	1.26185	3.37561	.000
Hotellings	1.88950	3.54387	.000
Wilks	.21688	3.51011	.000
Roys	.42608		

A4.

Table 4 Eigenvalues and Canonical Correlations of Personality traits and Multiple Intelligences

Rank of E.	E	Canon r.	Can r ²
1	.74	.653	.43
2	.47	.563	.32
3	.44	.553	.31
4	.15	.363	.131
5	.087	.28	.08

E. - Eigen Value

A5.

Table 5 Analysis for reducing dimensions

Rank of E.	Wilks L.	F(DF)	p
1 TO 5	.27**	3.51 (45)	.00
2 TO 5	.38**	3.04 (32)	.00
3 TO 5	.55**	2.76 (21)	.00
4 TO 5	.80	1.75 (12)	.06
5 TO 5	.92	1.56 (5)	.17

** P ≤ 0.01 E. - Eigen Value

A6.

Table 6 Correlation between dependent and canonical variables

Variable	Function No.1	Function No.2	Function No.3	Function No.4	Function No.5
Openness	-.15	.50	.31	.63	-.49
Conscientiousness	.63	.01	.49	.18	-.579
Extroversion	.59	-.101	.47	.62	.18
Agreeableness	.50	-.16	-.46	.629	-.348
Neuroticism	.10	-.64	.079	.51	-.568

A7.

Table 7 Correlation between covariates and canonical variables

Variable	CV.1	CV.2	CV.3	CV.4	CV.5
Verbal	.023	.002	-.67	-.11	-.28
Logical	-.16	-.08	-.19	.86	-.24
Spatial	.27	.206	.39	.59	-.29
Kinesthetic	.59	-.176	.50	.39	-.25
Musical	.23	-.16	-.16	-.04	-.58
Interpersonal	.28	-.65	-.03	.31	.12
Intrapersonal	.63	-.02	-.28	.27	.38
Naturalistic	-.13	.25	.38	.09	.24
Existential	.76	.01	.16	.08	.11

A8.

Table 8 Variance explained by canonical variables

CV	Dependent variables		Covariates	
	% of variance (dep.)	% of variance (cov.)	% of variance (dep.)	% of variance (cov.)
1	20.62	8.79	7.47	17.53
2	13.89	4.419	2.08	6.54
3	15.48	4.769	4.01	13.04
4	29.398	3.839	2.07	15.89
5	20.61	1.65	0.76	9.5

CV-Canonical variable dep -Dependent variable cov. – covariate

A9.

Table 9 Univariate F-tests - Regression F-tests with (9, 90) D. F.

Variable	R ²	Adj. R ²	Hypoth. MS	F	Sig. of F
O	.19	.11	1.04	2.31	.022
C	.27	.201	1.20	3.76	.000
E	.27	.201	1.52	3.77	.000
A	.24	.17	1.14	3.18	.002
N	.19	.11	1.20	2.43	.016

A10.

Table 10 Personality traits t test with equality of means between male and female

	Male		Female		t test
	M	SD	M	SD	
OPENNESS	3.54	0.595	3.63	0.850	-0.63
CONSCIENTIOUSNESS	3.19	0.603	3.09	0.675	0.78
EXTROVERSION	3.13	0.571	2.76	0.835	2.57*
AGREEABLENESS	3.30	0.662	3.26	0.653	0.3
NEUROTISM	3.47	0.681	3.19	0.812	1.87
N	59		41		

* $P \leq 0.05$

A11.

Table 11 multiple intelligence t test with equality of means between male and female

	Male		Female		t test
	M	SD	M	SD	
Verbal Intelligence	3.56	0.80	4.02	0.75	-2.870*
Logical Intelligence	3.72	0.86	3.46	0.92	1.460
Spatial Intelligence	3.31	0.75	3.33	1.08	-0.080
Kinesthetic Intelligence	3.22	0.88	3.03	0.94	1.000
Musical Intelligence	3.03	0.98	3.40	1.02	-1.820
Interpersonal Intelligence	3.81	0.82	3.71	0.93	0.570
Intrapersonal Intelligence	3.73	0.63	3.87	1.00	-0.850
Naturalistic Intelligence	3.66	0.94	4.01	1.09	-1.720
Existential Intelligence	3.25	0.92	3.18	1.09	0.310

* $P \leq 0.05$

A12.

Table 12 One-Way Analysis of Variance of Personality traits of College teachers by Age

Measures	20-30		30-40		40-50		50-60		F (3,96)
	M	SD	M	SD	M	SD	M	SD	
Openness	3.6	0.34	3.27	0.70	3.77	0.69	3.83	0.61	4.485*
Conscientiousness	2.95	0.33	3.01	0.68	3.23	0.58	3.33	0.66	1.46
Extroversion	3.2	0.54	2.78	0.71	3.02	0.67	3.28	0.77	2.28
Agreeableness	2.95	0.21	3.27	0.70	3.37	0.59	3.19	0.79	0.76
Neuroticism	3.3	0.41	3.33	0.86	3.35	0.74	3.44	0.58	0.09

* $p \leq 0.05$

A13.

Table 13 Multiple comparisons of Openness by age

(1) Age	(2) Age	Mean Difference (1)-(2)	Std. Error	Level of signi.
20-30	30-40	.33	.32	.73
	40-50	-.17	.32	.95
	50-60	-.23	.35	.91
30-40	20-30	-.330	.32	.732
	40-50	-.499*	.15	.008
	50-60	-.56*	.20	.032
40-50	20-30	.168	.32	.952
	30-40	.50*	.16	.008
	50-60	-.06	.19	.990
50-60	20-30	.23	.35	.911
	30-40	.56*	.20	.032
	40-50	.06	.19	.990

* $p \leq 0.05$

A14.

Table 14 One-Way Analysis of Variance of Multiple intelligence of College teachers by Age

Measures of Intelligence	20-30		30-40		40-50		50-60		F (3,96)
	M	SD	M	SD	M	SD	M	SD	
Verbal	3.8	0.69	3.98	0.76	3.6	0.88	3.58	0.68	1.81
Logical	2.85	1.23	3.51	0.99	3.79	0.74	3.64	0.81	1.97
Spatial	3.4	0.89	3.39	1.08	3.21	0.78	3.41	0.75	0.32
Kinesthetic	2.7	1.72	3.11	0.98	3.18	0.77	3.27	0.79	0.53
Musical	2.9	1.33	3.4	0.95	3.06	0.99	3.08	1.08	0.99
Interpersonal	3.3	1.08	4.01	0.78	3.58	0.92	3.84	0.73	2.28
Intrapersonal	3.45	0.89	4.05	0.76	3.65	0.83	3.59	0.63	2.53
Naturalistic	4.3	0.76	3.9	1.01	3.56	1.12	4.02	0.65	1.57
Existential	3.2	1.04	3.32	0.95	3.16	0.98	3.14	1.15	0.22

All the multiple intelligences do not differ significantly in different age groups.

A15.

Table 15 KMO test for dimension reduction for multiple intelligences using factor analysis

Measure of Sampling Adequacy		.66
Test of Sphericity	Approx. Chi-Square	249.59
	df	36
	Sig.	.000**

** $p \leq 0.01$

A16.

Table 16 Rotation component matrix in factor analysis (PCA)

	Component		
	1	2	3
Verbal Intelligence	.045	-.068	.865
Logical Intelligence	-.112	.698	.503
Spatial intelligence	.166	.847	-.034
Kinesthetic Intelligence	.355	.753	-.216
Musical intelligence	.417	.004	.595
Inter-personal Intelligence	.304	.282	.698
Intrapersonal Intelligence	.823	.041	.078
Naturalistic intelligence	.579	.073	-.186
Existential intelligence	.649	.369	-.113

A17.

Table 17 New dimensions for multiple intelligences after factor analysis

	Intrapersonal dimension	Interpersonal dimension	Logic dimension
Intelligence types	Musical Intelligence	Verbal Intelligence	Logical Intelligence
	Intrapersonal Intelligence	Interpersonal Intelligence	Spatial Intelligence
	Existential Intelligence		Kinesthetic Intelligence

A18.

Table 18 KMO test for dimension reduction for Personality traits using factor analysis

Measure of Sampling Adequacy		.716
Test of Sphericity	Approx. Chi-Square	154.61
	df	10
	Sig.	.000**

** $p \leq 0.01$

A19.

Table 19 Rotation component matrix in factor analysis (PCA)

Personality traits	Component
	1
Openness	.594
Conscientiousness	.821
Extroversion	.748
Agreeableness	.745
Neuroticism	.770

A20.

Table 20 Multiple Regression analysis of multiple intelligence with Biases in financial decision

Model summary		ANOVA		Coefficient	
				Constant	0.63
R	.83 ^a	F	71.56	Intrapersonal dimension	0.74
R Square	0.69	Sig.	.000 ^b	Interpersonal dimension	-6.66
Adjusted R²	0.68	df	3,96	Logical dimension in Intelligence	4.1

a – Independent variables - multiple intelligences b – Dependent variable – Biases in financial decision

A21.

Table 21 Regression analysis of Personality traits with Biases in financial decision

Model summary		ANOVA		Coefficient	
R	.278 ^a	F	8.183		B
R Square	0.077	Sig.	.005 ^b	Constant	2.984
Adjusted Square	R 0.068	df	1,98	Personality trait	0.225

Dependent Variable: Bias b. Predictors: (Constant), Personality traits