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INVESTIGATING THE ASSOCIATION AMONG EXTROVERSION, AROUSAL, ENGLISH LANGUAGE VERBAL ABILITY AND ANALYTICAL ABILITY

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ABSTRACT

The present study aims at finding the patterns and magnitude of association between Extroversion and Arousal as was claimed in Eysenck's (1967) theory that Introverted and extroverted personalities have different levels of cortical arousal. Furthermore, the study attempts to find out the relationship between extroversion and Verbal and Analytical abilities. For this purpose, 30 graduates preparing for NAT in Allama Iqbal College of Commerce Bahawalpur participated in the study. Data were collected through four standardized and two non-standardized tests and Descriptive and Pearson correlation analyses were employed. The results revealed that none of the variables is significantly correlated with each other, except that, moderate correlation was found between teacher-made non-standardized Verbal test and Standardized Verbal test. Non-standardized Verbal and Analytical tests were also correlated with each other. The findings of the study provide no support to Eysenck's theory of cortical arousal and that Extroversion has no significant impact on Verbal and Analytical abilities.

Key words: *Personality, extroversion, arousal, verbal ability, analytical ability, correlation.*

INTRODUCTION

The study aims at exploring the statistical correlation between two personality variables namely extroversion and Arousal, and two Proficiency variables namely Verbal ability and Analytical ability of graduate students in Pakistani pedagogical context.

Extroversion

Personality is a cumulative thing, composed of a number of dimensions. Personality represents the enduring character of an individual's experiences, and it is a wellspring from which flows the consistency of thoughts, feelings and behaviors. At a more humanistic level personality can be thought of as the mask we wear in social situations, as the core of our being, or a set of the process of actualizing our true potentials.

Although the study of personality originates from Galen, a Greek philosopher, and through Hippocrates it comes to Freud and Jung who introduced this term first in psychology. Galen presented the theory of temperament, and linked it with four elements which were considered at that time the types of matter on which the whole world was created.

One of the most important dimensions of personality is Extroversion-Introversion which is "unloved variable" in L2 studies (Dewaele & Furnham, 1999). Extroverts are the people who are above the mean on Extroversion scale and introvert are those people who are below the mean. People who tend towards extroversion are usually seen to be appearing relaxed, full of confidence and display vividness, when they are feeling bad or stressed, are likely to seek the company of others for relief. They seek their energy from the external world. They are considered social, friendly supportive and active while on the other hand introverts are usually reserved, reticent, shy and show less confidence (Johnston, 1999-2003).

Perceived Arousal

Eysenck (1967) suggested that temperamental differences, which have biological bases, determine threshold of ease that stimulates cerebral cortex to be aroused. Further he claims that

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some parts of the brain of the introverts are easily hyper stimulated, the extroverts on the other hand are under stimulated and their threshold of cortical arousal is more than their counterparts; resultantly, they seek social activities and adventures, and they can tolerate more stress level than introverts. Eysenck (1971) was of the view that extroverts and introverts have different reminiscence capabilities which was a direct function of cortical arousal. Gray (1981) criticized cortical arousal theory and claimed that extroverts have a strong nervous system than that of introverts. Geen (1984) refutes cortical arousal theory of Eysenk saying that introverts prefer low level of noise than extroverts and there is no difference in arousal and performance when the noise level is set according to both types of personality.

Verbal Ability

This is meant usually bilingual ability involving grammar, spellings, reading comprehension, understanding words' meanings, understanding words relationship and interpreting detailed written information in Target Language. Verbal Ability tests are frequently used by employers to diagnose aptitude and promise of prospectus candidates. They are supposed to assess overall hodgepodge of skills and abilities in second or foreign languages. They report general aptitude of the candidates and are not intended to distinguish the subjects' skill-wise or component-wise ability. In the present study verbal ability represents only that of English language.

Analytical Ability

Analytical ability is referred to the competency of looking at, figuring out, and solving problems by drawing conclusions out of given information and data. It involves logical thinking to the solutions of the problems. In this regard Richard and Heuer (1999) say that, "thinking analytically is a skill like carpentry or driving a car. It can be taught, it can be learned, and it can improve with practice. But like many other skills, such as riding a bike, it is not learned by sitting in a classroom and being told how to do it".

It involves a methodical step-by-step approach to thinking that allows you to break down complex problems into single and manageable components.

To my knowledge, no study has been conducted so far which embodies all these four variables (Extroversion, Arousal, Verbal ability and Analytical Ability) in order to explore the relationship between/among them and to explore what is the impact of Extroversion or Arousal level on Verbal and/or Analytical ability. Review of the past literature reveals that certain aspects of the study were investigated in different social contexts, for example, Rossier (1976) reported a positive correlation between extroversion and oral fluency, finding that extroverted learners were more proficient than introverted ones, but no study has adopted integrating approach in respect with above-mentioned variables.

RESEARCH METHODOLOGY

Participants

The sample of the study contained 30 graduates both male and female who were preparing for NAT (National Aptitude Test) which was to be conducted next month, and that was a prerequisite for the candidacy for admission in postgraduate classes. All the participants were enrolled in coaching classes managed in Allama Iqbal College of Commerce Bahawalpur Pakistan for the duration of one month, where the researcher along with other colleagues was coaching them for Verbal and Analytical sections of the test.

Research Instruments

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Six types of research instruments were utilized to collect the required data. They are described in detail below.

1. **Extroversion Test**

A paper-and-pencil, 10-item, five-point Likert scale, Extroversion test- in abridged form was used to assess the level of extroversion of the participants. The items for the test were adapted from International Personality Item Pool (IPIP) available at http://ipip.ori.org/ which is items bank for personality researchers, substantially validated by psychometric experts. Alpha reliability .86 was reported on the website. For this purpose, ten-item short version of the test was selected. The test items are easy to understand and obviously closely related to the construct of extroversion. The test has also five reverse scored items (- keyed) to enhance the validity.

The items are like:

1. I make friends easily. (+ keyed)
2. I keep in the background. (- Keyed)

2. **Perceived Arousal Test**

In order to measure the degree of Perceived Arousal, the test was conducted immediately after the students had taken NAT (National Aptitude Test) conducted by NTS (National Testing Service). The current version of the scale has 24 items, some of which are reverse scored. The Author of the test, Anderson (1995) reports that they have successfully used both 5-point as well as 7-point scales. Perceived Arousal Scale was used by Anderson, Deuser, and DeNeve (1995), in a study on heat effects on affect, cognition, and arousal. They have used the scale several times since then, including in the Anderson, Anderson, and Deuser (1996).

3. **Verbal Ability Tests**

Two types of Verbal Ability tests were used: one that was prepared by teachers and it was administered in the classroom as a pretest for the final test which was going to be held two days after this rehearsal type test and in the study it is named as Verbal ability test 1, the second Verbal Ability test was conducted by NTS as the first part of NAT. This test is claimed to be reliable and validated by NTS psychometric experts. The test is used nationwide on thousands of candidates seeking admissions in master classes every year. Nearly one week after taking the test the participants received their marks sheets. Their score in verbal section was used in the study for further analysis with the title of Verbal Ability test 2.

4. **Analytical Ability Tests**

Like Verbal Ability tests, two types of Analytical Ability tests were conducted: first Analytical Ability Test 1, which was teacher-made non-standardized was conducted in the classroom in the same way as Verbal ability test was administered. The second Analytical Ability test (here named as Analytical Ability test 2) was also conducted by NTS as the second section of NAT. Like Verbal Ability test 2, it is claimed to be reliable and validated by NTS psychometric experts as well. This test is used nationwide on thousands of candidates seeking admissions in master classes every year. All tests are administered by NTS staff. The contents of the tests are kept confidential beyond the access of local market, and reliability or validity statistics are not available to the public or even to researchers. They are also kept confidential. So, reliability and validity statistics could not be provided here.

RESULTS AND DISCUSSION

Data analysis of the research is as under:

The data were analyzed through SPSS ver. 16.0. First Reliability Statistics of the Extroversion Scale were requested. The results revealed that Extroversion Test is moderately reliable,

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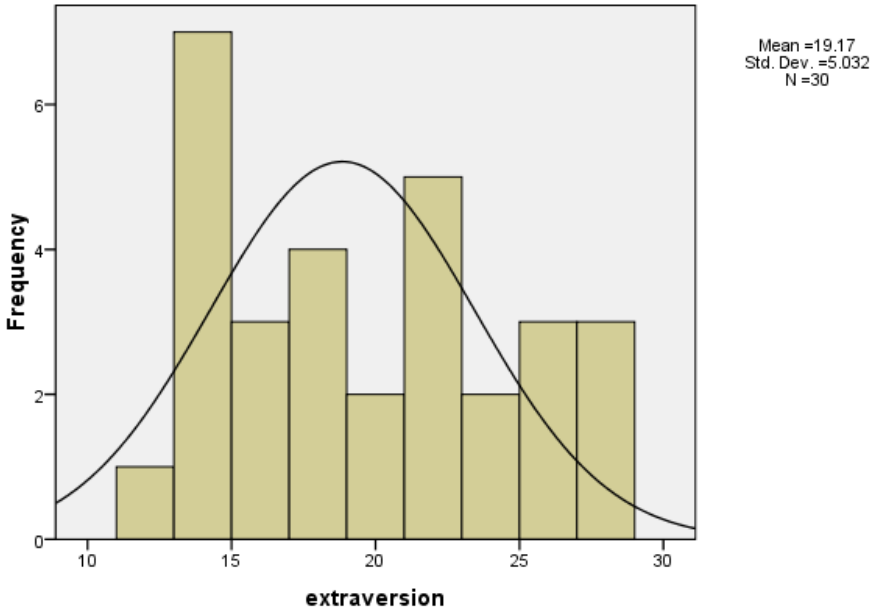
Cronbach's Alpha =.55(30). Other Descriptive Statistics of the scale are as follows in the Table 1:

Table 1. Descriptive Statistics of the scores on Extroversion Scale

Descriptive Statistics	
N valid	30
Mean	19.17
Median	18.50
Mode	22
Std. Deviation	5.032
Skewness	.281
Std. Error of Skewness	.427
Kurtosis	-1.233
Std. Error of Kurtosis	.833
Minimum	12
Maximum	28

Average statistics in the above table shows that there is no large difference between Mean and Median. Dispersion statistics shows that standard deviation is not large i.e. the data are not widely dispersed. Skewness is less than 1 with .427 value of standard error. All these statistics show that data is approximately normally distributed. The result is also supported by the shape of histogram and the bell shape curve on it in figure 1 below.

Figure 1 Histogram of the scores on Extroversion Scale



Secondly the reliability analysis of 24-item Perceived Arousal Scale was executed and the reliability statistics displayed Cronbach's Alpha value as α=.87, N=30 which indicates that the scale is highly reliable. As for other descriptive statistics, it is given in the Table 2.

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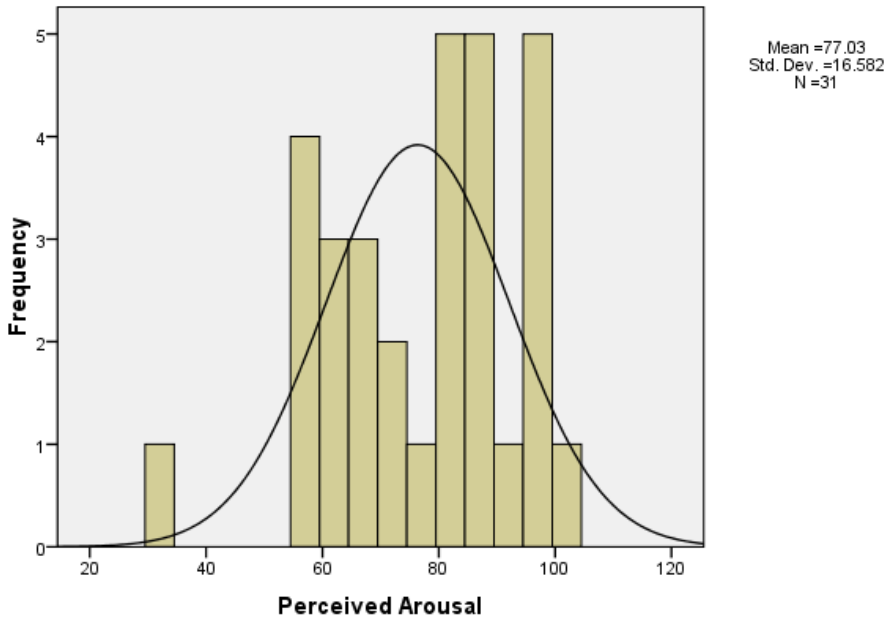
Table 2 Descriptive statistics on the score of Perceived Arousal Scale Statistics Perceived Arousal

Descriptive Statistics	
N Valid	31
Mean	77.03
Median	82.00
Mode	55a
Std. Deviation	16.582
Skewness	-.625
Std. Error of Skewness	.421
Kurtosis	.115
Std. Error of Kurtosis	.821
Minimum	32
Maximum	100

a. Multiple modes exist. The smallest value is shown

Average statistics in the above table show that Mean and Median values largely differ. Dispersion statistics show that standard deviation is also large i.e. the data are widely dispersed. It indicates to the abnormality of the data distribution. But when we see that Skewness is less than ±1 with .421 value of standard error which indicates towards the approximation of normality of data distribution, we have to change our decision. It is further verified by the shape of histogram and the bell shape curve on it in figure 2 below. The curve on histogram bars is forming bell shape meaning that data may be supposed to be approximately normally distributed.

Figure 2 Histogram of the scores on Perceived Arousal Scale



Thirdly the Descriptive analysis was done on the scores achieved in Verbal Ability Test 1 (Teachers made, non-standardized) and in Verbal Ability Test 2 (NTS made standardized) and the results are displayed in Table 3 and Figures 3 & 4.

Table 3 Descriptive statistics on the score of Verbal Ability Test 1 & 2

Descriptive Statistics		
	Verbal Score 1	**Verbal Score 2**

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N	Valid	30	28
Mean		9.90	11.18
Median		10.00	11.00
Mode		8	11
Std. Deviation		3.067	2.803
Skewness		-.030	-.393
Std. Error of Skewness		.427	.441
Kurtosis		-.265	.893
Std. Error of Kurtosis		.833	.858
Minimum		3	4
Maximum		16	17

Table 3 shows that the score of two participants in the second verbal ability test was not reported. Mean and median and mode values of the first verbal test are very close to each other and skewness value is negative but minor. Verbal Sore 2 in the third column shows nearly the same behavior. It means that both scores have likelihood of correlating with each other. Furthermore, the scores on both verbal tests are approximately normally distributed supported by Figures 3.

Figure 3 Histogram of the scores on Verbal Ability Test 1

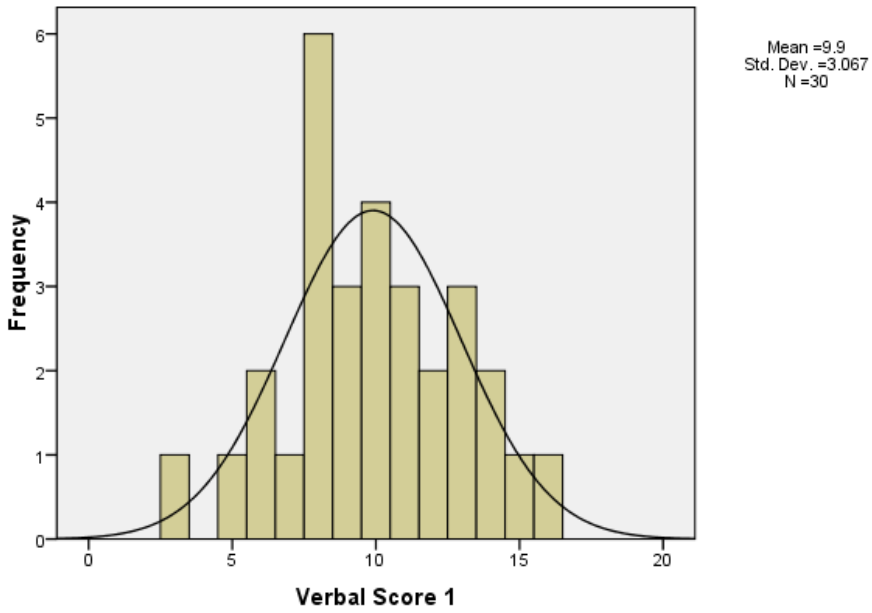

Figure 4 Histogram of the scores on Verbal Ability Test 2

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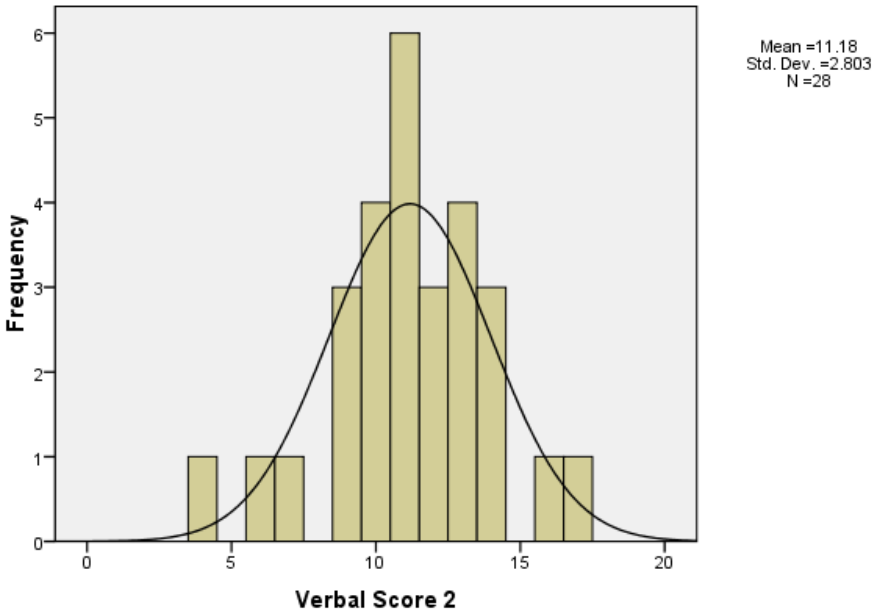

Fourthly the descriptive analysis was done on the scores of Analytical Ability Test 1 (teacher made, non-standardized) and Analytical Ability Test 2 (NTS made, standardized) and the results are shown in Table 4 and Figures 5 & 6.

Table 4 Descriptive statistics on the score of Analytical Ability Test 1 & 2

Descriptive Statistics			
		Analytical Score 1	**Analitical Score 2**
N	Valid	30	28
Mean		6.67	14.25
Median		7.00	14.00
Mode		6	13a
Std. Deviation		2.496	3.978
Skewness		-.390	-.754
Std. Error of Skewness		.427	.441
Kurtosis		-.439	.320
Std. Error of Kurtosis		.833	.858
Minimum		2	4
Maximum		11	19

a. Multiple modes exist. The smallest value is shown

Table 4 shows that in both Analytical Scores the values of Mean, Median and Mode are close to each other identifying that they are approximately normally distributed. The range of skewness<±1 also corroborates the characteristic. One important point is shown that the values of Analytical Score 2, in column 3, are much bigger than those in one indicating that there would be little likelihood of existing correlation between the two score which we will examine later in the paper.

Figure 5 Histogram of the scores on Analytical Ability Test 1

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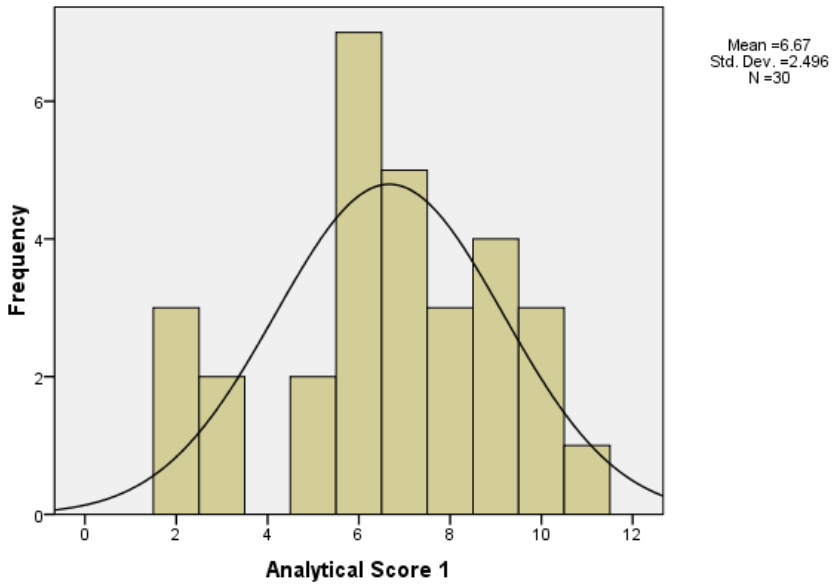
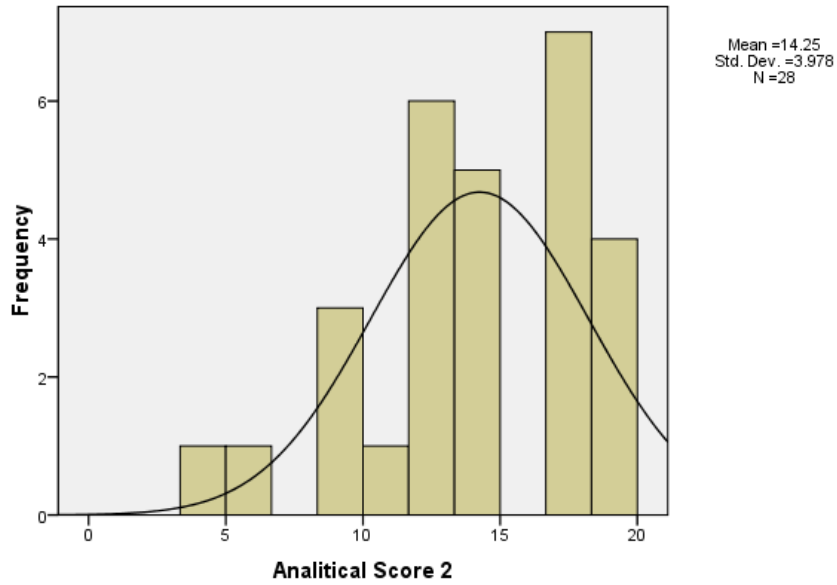


Figure 6 Histogram of the scores on Analytical Ability Test 2



After completing descriptive analysis, we come towards inferential statistics to test any relationship between the various variables. For the purpose a Correlation Matrix (Table 5) was generated looking for association between all the variables in the study.

Table 5 Correlation Matrix of all the study variables

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		Extroversion	Perceived Arousal	Verbal Score 1	Analytical Score 1	Verbal Score 2
Perceived Arousal	*r*	.212				
	p	.279				
	N	28				
Verbal Score 1	*r*	.113	.174			
	p	.553	.374			
	N	30	28	30		
Analytical Score 1	*r*	-.155	.155	.491**		
	p	.414	.430	.006		
	N	30	28	30		
Verbal Score 2	*r*	.159	.283	.425*	.203	
	p	.420	.161	.024	.299	
	N	28	26	28	28	
Analytical Score 2	*r*	-.177	.257	-.009	.297	-.051
	p	.368	.205	.964	.125	.798
	N	28	26	28	28	28

** Correlation is significant at 0.01 level.

* Correlation is significant at 0.05 level.

The closer look at correlation matrix above reveals that only two correlations are found: one between Analytical Score 1 and Verbal Score 1, and the other is between Verbal Score 1 and Verbal Score 2. All other correlations are not statistically significant.

Because Analytical Score 1 and Verbal Score 1 were attained through teacher-made non-standardized tests, they cannot be fully relied. Just one thing can be initially inferred that the participants who are good in Verbal ability will show relatively better performance on Analytical tests than those who are lower in Verbal ability.

DISCUSSION

The purpose of including teacher-made tests (Verbal Ability Test 1 and Analytical ability test 1) in the study was to compare their scores with those attained by respective standardized tests. And the results show that moderate statistically significant correlation $r = .425$, $p = .024$ was found between Verbal score 1 and Verbal score 2 indicating that teacher-made test may not necessarily be invalid and unreliable at least in the case of present study. However, no statistically significant correlation was found between the results of both conductions of Analytical tests. Further research is needed to probe the issue because multiple factors may be involved in the problem.

One remarkable point is there that extroversion is not correlated with any other variable of the study. Nonexistence of association between Extroversion and Perceived Arousal tends to refute the theory of Cortical Arousal (Eysenck, 1967), but we have to be very careful before giving any verdict as to whether Perceived Arousal Test used in the study was originally based

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on Cortical Arousal theory or it represents a different construct. We think that Cortical Arousal theory was presented on biological basis and it cannot be measured directly by questionnaires and tests in social research. For the moment we can infer that our findings support Gray (1981) and Geen (1984) views to the extent that extroverts and introverts have no differences regarding arousal level.

The results of the study revealed that there is no association between Extroversion or Perceived Arousal and Verbal or Analytical Ability. As discussed above that verbal ability incorporates various types of lexical, grammatical and reading skills. It presents the holistic picture of language learning ability from academic and intellectual point of view. It seems to assess how much knowledge a person possesses about a language, but it is not necessary if he can speak it or understand the language spoken by natives or others. It means that although Verbal Test is validated and standardized but it cannot claim to assess all components of a language. A lot of research has been done to examine the impact of extroversion on L2 proficiency or on academic achievement (e.g. Ahmad, 2013; Paoli Lee, 2005; Rossier, 1976; Wankowski, 1973) but wide discrepancy is observed between the findings. Such as Ahmad (2013) and Paoli Lee (2005) reported that oral proficiency in L2 is positively correlated with Extroversion. Since Verbal Ability test does not address verbal proficiency assessment, probably due to this reason it has not demonstrated any association with Extroversion in the present study. Furthermore, the present study finds no evidence of association between Analytical ability and Extroversion.

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