

The Relationship between Personality Traits, Psych morbidity and Academic Performance in Fresh Entrants to the Professional College

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ABSTRACT

In order to evaluate the combined effects of the two personality traits, namely, Neuroticism and Extraversion on academic performance among fresh entrants to professional college, the present study was undertaken by enrolling 142 participants from a private professional college, South India. Students with psych morbidity such as anxiety and / or depression were identified using Zung's self-rated Anxiety and Depression Scales. Personality traits were determined using the NEO-FFI devised by Costa & Mc Crae. The academic performance of the students in four consecutive examinations was evaluated, and high and low achievers were identified. It was found that among mentally healthy students, those with the personality trait combination of low Neuroticism & low Extraversion (low-keyed) are significantly high achievers, when compared to those with the combination of high Neuroticism & high Extraversion (overly emotional). Students with depression were low achievers when compared to normal students, but this difference was significant only in the case of low-keyed individuals and upbeat optimists (low Neuroticism & high Extraversion). Our findings demonstrate that the key towards high achievement in examinations is the personality trait combination of low Neuroticism (emotional stability) and introversion (which allows more time for studies). The relevance of Gray's BAS/BIS hypothesis concerning the aetiology of depression, with respect to our findings is discussed.

Key words: Personality traits, Psych morbidity, Academic performance, Professional college students

BACKGROUND

Academic excellence is possible only when students are mentally healthy, along with an ideal combination of certain personality traits. [1] Several studies have found negative associations between Neuroticism and academic performance, [2] suggesting that emotionally stable students perform better academically than do more neurotic students. This impairment in academic achievement has been interpreted in terms of the debilitating effects of anxiety and stress accompanying high levels Neuroticism. [3] Magnetic resonance imaging has validated these findings by revealing decreases in brain volume in healthy individuals who score high on Neuroticism scales. [4]

While Neuroticism is associated with negative emotionality (NEM), researchers have found a positive correlation between extraversion and positive emotionality (PEM). [5] Although extraverts report higher levels of happiness than introverts, they are found to be unsuccessful in academic environments. [6]

Hans Eysenck, the famous British psychologist, states that although neither introversion nor extraversion is pathological, introverts tend to be more

successful in academic performance, while extraverts may find it boring, becoming restless during long periods of quiet study.^[7] Further, it has been discovered that introversion is strongly associated with positive traits such as intelligence and giftedness.^[8,9]

It was Hans Eysenck who elucidated the two main super traits of Introversion-Extraversion and Neuroticism-Emotional Stability.^[10] Similar to Eysenck,^[11] Gray^[12] suggested that there are two systems in the brain that correspond to two major personality traits, and postulated a model comprising of a Behavioral Approach System (BAS) and a Behavioral Inhibition System (BIS), by rotating the axes of Eysenck's Extraversion-Neuroticism structure 45 degrees clockwise. The BAS (labeled as impulsivity) ranged from a combination of low extraversion and low Neuroticism to high Extraversion and high Neuroticism; while the BIS (labeled as Anxiety) ranged from a combination of high

Extraversion and low Neuroticism to low Extraversion and high Neuroticism. Gray hypothesized that people who have a highly active BAS tend to be high in Extraversion, and have higher levels of dopamine in their synapses.^[13] Interestingly, recent research also suggests that Extraversion is related to high levels of dopamine.^[14] According to Gray, people who have a highly active BIS tend to be high in anxiety (Neuroticism according to Eysenck).

Recently, several authors have confirmed his hypothesis, stating that Neuroticism is positively correlated with the BIS scale, and negatively correlated with the BAS scale.^[15,16]

Since Gray's model offers a more fine-grained description of the psychological processes underlying the personality traits, we have attempted to present the findings of our present study based on Gray's bio-psychological theory, which is a slight modification of Eysenck's model of personality based on biology.

Gray's bio-psychological model

Behavioral Approach System (BAS)	Behavioral Inhibition System (BIS)
Gray (1994) ----- Biological Basis for depression	
Under sensitive BAS → depression	Oversensitive BIS → depression
Gray (1994) suggested that depression may be associated with a combination of an extremely active BIS and an extremely underactive BAS, involving the medial forebrain bundle and lateral hypothalamus	

Though several studies have evaluated the association between single personality traits and academic achievement, the role of a combination of various personality traits in manifesting academic excellence is still unclear. The lacuna in this aspect prompted us to undertake the present study, to evaluate the association of various degrees of Neuroticism and Extraversion with academic achievement, in both mentally healthy students, and those with psychomorbidity.

AIM AND OBJECTIVES

1. To determine the association of the combined effects of Neuroticism and Extraversion with academic performance in normal versus students

with psychomorbidity among fresh entrants to the professional college.

2. To correlate the high and low achievers in academic examinations with the bio-psychological theory of Jeffrey Gray, namely, the BAS or reward system and the BIS or Punishment-Avoidance system.

MATERIAL AND METHODS

The voluntary participants of the study include one hundred and forty-two first year professional students (68 males, 74 females) from a private college in South India. Their mean age was 21.4 years (SD - 2.3 years; range - 17 to 23 years).

ANXIETY – The Self-rating Anxiety Scale (SAS) of Zung^[17] is a brief, 20 item self-report questionnaire that measures the presence and magnitude of the anxiety-

based symptoms that are listed in the DSM-IV-TR (APA 2000) criteria for anxiety. Each item is scored on a 4-point Likert scale and raw scores were converted into SAS indices, with participants having cut-off index scores above 45 being classified as “clinically anxious”.

DEPRESSION – The Self-rating Depression Scale (SDS) devised by Zung [18] was used to identify the students with depressive symptoms. This scale is also a brief, 20-item self-support questionnaire which measures the presence and extent of depressive symptoms. The same 4-point scale as in the SAS was used. Raw scores (Range = 20-80) were converted into SDS indices, and a cut-off index score of 50 was used to identify the participants experiencing significant depressive symptoms.

After computing their SAS and SDS indices, the personality traits were elucidated using the NEO-FFI (NEO Five Factor Inventory), [19] which was administered to the participants. The NEO-FFI comprises 60 items developed to provide a concise measure of the five basic personality factors and uses a five-point Likert response format. The participants responded by marking on each of 60 items whether they *strongly agree, agree, neutral,*

disagree or strongly disagree with a given proposition about themselves. The scores of 12 items were summed to provide an overall measure of every factor. Raw scores were converted to T-scores using the formula $T = 50 + 10(X - Y) / Z$, where, X = Raw score of the student; Y = Average Score of the whole cohort; Z = Standard Deviation. Those with T-scores above 50 were classified as having elevation in the concerned personality trait. After evaluating the scores of the various personality traits, the average marks secured by the students in four consecutive academic examinations were entered. Statistical analysis was performed using one-way ANOVA and t-test, and the results have been graphically represented below.

RESULTS

Our results demonstrate a definite and concrete pattern of the two personality traits, namely Neuroticism and Extraversion among low and high academic achievers, a) among mentally healthy students, and b) normal students versus those with depression.

a) Fig.1 reveals that mentally healthy students with the combination of ↓N ↓ E (low-keyed) are significantly high achievers ($p < 0.05$), when compared to those with the combination of ↑N↑E.

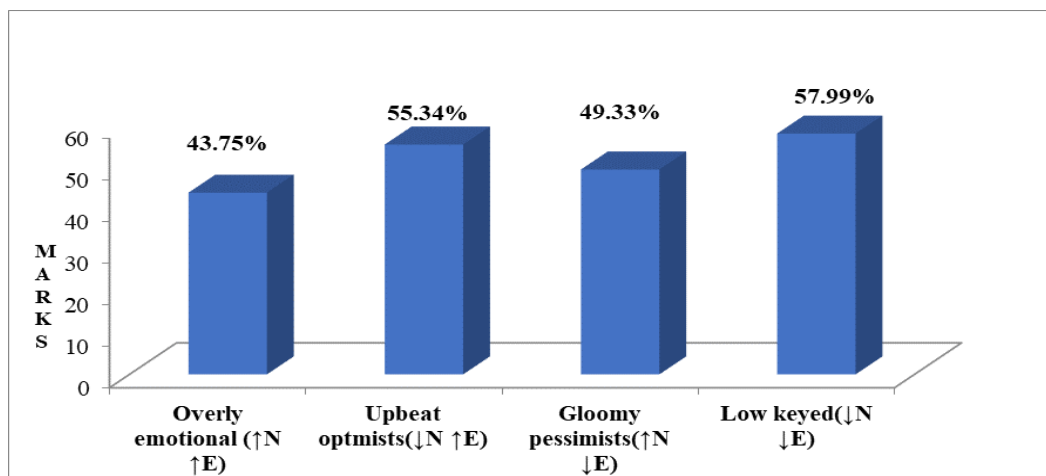


Figure. 1: High and low academic achievers among Students with normal mental health
N – Neuroticism E – Extraversion

b) Fig.2a & b illustrate that (1) students with depression who have the trait combination of ↓N↓E (low-keyed), are found to be significantly low achievers ($p < 0.05$), when compared to normal students with a similar combination of ↓N↓E.

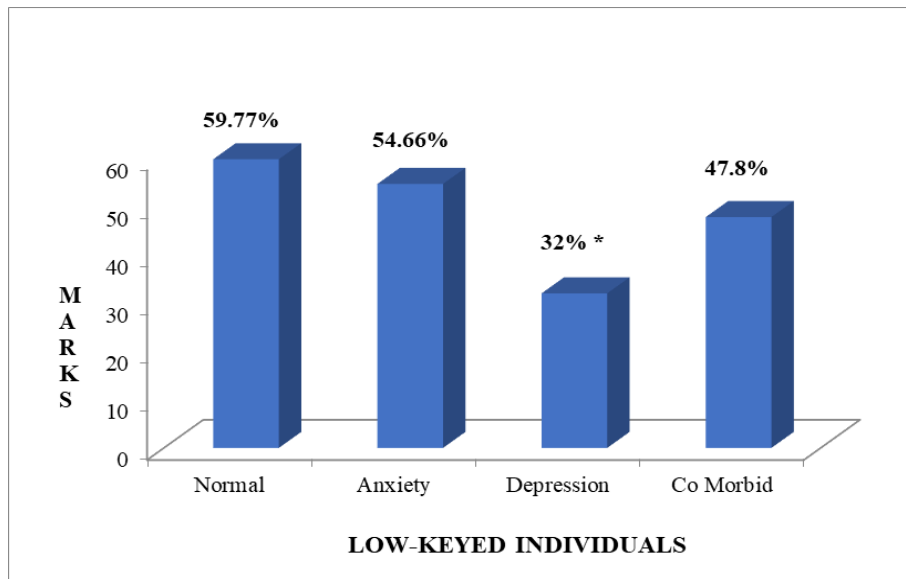


Figure.2 a: Performance Vs Psychomorbidity in low-keyed individuals

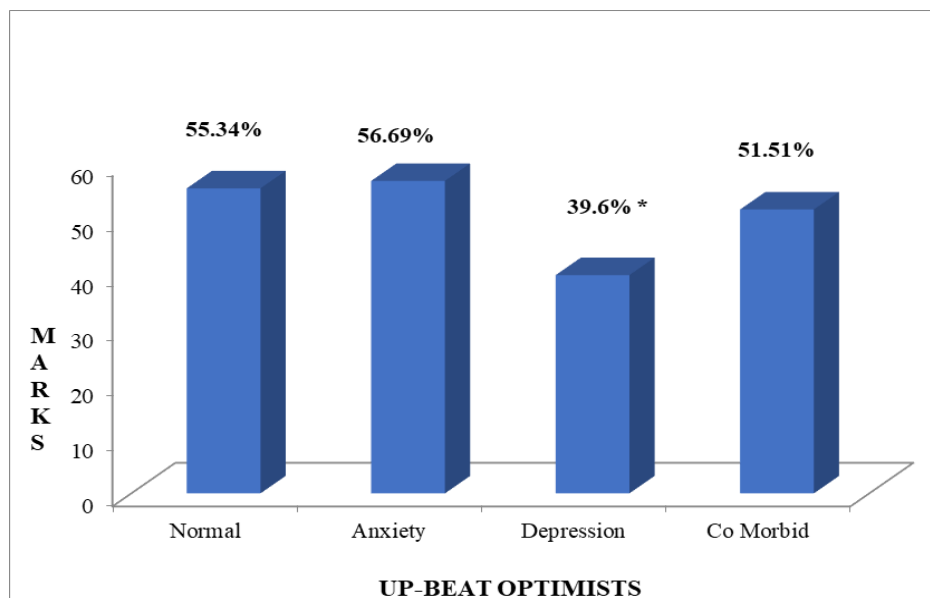


Figure. 2 b: Performance Vs Psychomorbidity in up-beat optimist

(2) Students with depression who have the trait combination of $\downarrow N \uparrow E$ (upbeat optimists) are found to be significantly low achievers ($p < 0.05$), when compared to normal students with a similar combination of $\downarrow N \uparrow E$ (upbeat optimists).

DISCUSSION

It is easily understandable that mentally healthy students who are low in both Neuroticism and Extraversion (low-keyed) are high achievers in examinations when compared to their peers at the opposite end of the spectrum, who have the combination of high Neuroticism and high

Extraversion (overly emotional). Low Neuroticism confers emotional stability and makes them less reactive to stress, whereas at the other end of the spectrum, neurotic extraverts experience high levels of both positive and negative emotional states, akin to an “emotional roller coaster”. [20]

Thus, it is evident from the above findings, that it is not merely the absence of psychomorbidity, but an ideal combination of the personality traits causing positive or negative emotional states, which is important for academic achievement, high Neuroticism leading towards, mental

debilitation as a result of the accompanying anxiety and stress. [3]

When we consider the case of extraverts, they are sensation seekers, and as a result, lack the inner silence and concentration essential for internal focusing and retrieval of memorized theories, lagging behind in academic achievement. Several studies have reported a negative relation between Extraversion and academic tests, stating that this negative relationship is due to the differences in time spent for acquiring knowledge between introverts, who spend more time studying, and extraverts who spend more time socializing. [21] Therefore, the combination of increased Neuroticism + increased Extraversion is detrimental for performance in academic examinations.

Students with depression are found to be low achievers when compared to mentally healthy students, but this difference is significant only in those who have the combination of ↓N ↓ E (low-keyed) and ↓N ↑ E (upbeat optimists), i.e. the trait combinations which are located at the lower ends of both the BAS and BIS spectra.

The lower end of the BAS spectrum constitutes decreased Extraversion (or introversion) along with decreased Neuroticism, exhibiting a trend towards under-sensitivity (vide table 1), which may lead to depression. On the other hand, the lower end of the BIS spectrum is marked by the combination of ↓ N+ ↑ E (high impulsivity in Gray's hypothesis), which at its extreme lower end leads towards over sensitivity, manifesting as depression. This may be the reason for the distinction between low and high achievers among normal students and those with depression becoming more apparent at this point. As we ascend higher up the spectra, the elevation in Neuroticism scores masks the prominent difference between low and high achievers among normal students versus those with psych morbidity.

The validity of Gray's theory has been reinforced by researchers in the field of molecular genetics. Reuter et al [17]

investigated the interactions between two gene loci- the dopamine D₂ receptor polymorphism, and the Catechol-O- methyl transferase (COMT) polymorphism, and demonstrated that a genetic disposition located on the above two gene loci, is significantly related to Gray's personality dimensions of BAS and BIS, confirming that dopamine is related to the personality traits of Positive Emotionality. Certain authors who undertook Neurophysiological studies using fMRI, [18, 19] have demonstrated the validity of Gray's theory by the findings that personality predicts working memory-related activation in the caudal anterior cingulate gyrus.

CONCLUSION

Our findings clearly demonstrate that the key towards high achievement in examinations is the personality trait combination of low Neuroticism (which confers emotional stability) and introversion (which allows more time for studies). This is in consonance with Eysenck's hypothesis which states that an introvert is more sensitive and arousable to stimulation as his Ascending Reticular Activating System (ARAS) lets in lots of stimulation. Therefore, they avoid social stimulation, parties, etc., directing all their energies towards academic achievement. In contrast, in the case of extraverts, the ARAS cuts brain off from stimulation, making them chronically under-aroused, as a result of which they crave stimulation, becoming sensation-seekers. [10]

The distinction between low and high achievers among mentally healthy students versus those with psych morbidity is significant only in those with low Neuroticism scores; elevation in Neuroticism levels masks the differentiation between low and high achievers among the above two categories of University students.

REFERENCES

1. Furnham, A., Forde, L., & Cotter, T. (1998 a). Personality and intelligence. *Personality and Individual differences*, 24;2, 187 – 192.

2. Chamorro-Premuzic, T., & Furnham, A. (2003a). Personality traits and academic examination performance. *European Journal of Personality*, 17, 237-250.
3. Chamorro-Premuzic & Furnham, A (2005) *Personality and Intellectual Competence*. Mahwah, NJ: Lawrence Erlbaum Associates.
4. Brian Knutson, Reza Momenan, Robert R. Rawlings, Grace W.Fong and Daniel Hommer (November 2001) "Negative association of neuroticism with brain volume ratio in healthy humans". *Biological Psychiatry* 50 (9): 685 -690.
5. Pavot, W., Diener, E., & Fujita, F. (1990). Extraversion and happiness. *Personality and Individual Differences*, 11, 1299 – 1306.
6. Rolfhus, E., & Ackerman, P. (1999). Assessing individual differences in knowledge. Knowledge, intelligence, and related traits. *Journal of Educational Psychology*, 91, 511-526.
7. Eysenck, H.J. (1971). *Readings in Extraversion – Introversion*. New York: Wiley.
8. Gallagher, S.A. (1990). Personality patterns of the gifted. *Understanding our Gifted*, 3, 11-3.
9. Hoehn, L. & Birely, M.K. (1988). Mental process preferences of gifted children. *Illinois council for the Gifted Journal*, 7, 28-31.
10. Eysenck, H.J. (1967). *The biological basis of personality*. Springfield, IL: Thomas Publishing.
11. Eysenck, H.J. (1990). Biological dimensions of personality. In L.A. Pervin (Ed..) *Handbook of personality: Theory and research* (pp.244-276). New York: Guilford.
12. Gray, J.A. (1981). A critique of Eysenck's theory of personality. In H.J. Eysenck (Ed.), *A model for personality* (pp.247-276). New York: Springer.
13. Gray, J.A. (1987). The neuropsychology of emotion and personality. In S.M. Stahl, S.D. Iverson, & E.C. Goodman (Eds), *Cognitive neurochemistry*. Oxford: Oxford University Press.
14. Depue, R.A., & Collins, P.F. (1999). Neurobiology of the structure of personality: Dopamine, facilitation of incentive motivation, and extraversion. *Behavioral and Brain Sciences*, 22, 491-517.
15. Boksema, M.A.S, Topsa, M., Westera, A.E., Meijmana, T.F. & Lorist, M.M. (June 2006) "Error-related ERP components and individual differences in punishment and reward sensitivity". *Brain Research* 1101 (1):92-101.
16. Carver, C.S. & White, T.L. (1994) "Behavioral Inhibition, Behavioral Activation, and Affective Responses to Impending Reward and Punishment: The BIS/BAS scales". *Journal of Personality and Social Psychology*, 67(2):319-333.
17. Martin Reuter, Anja Schmitz, Philip Corr and Juergen Hennig (2005). *International Journal of Neuropsychopharmacology* (2006), 9, 155-166.
18. Gray JR, Braver TS (2002). Personality predicts working – memory- related activation in the caudal anterior cingulate cortex. *Cognitive, Affective & Behavioral Neuroscience*. 2, 64-75.
19. Reuter M, Stark R, Hennig J, Walter B, Kirsch P, Schienle A, Vaitl D (2004). Personality and emotion: Test of Gray's personality theory by means of an fMRI study. *Behavioral Neuroscience* 118, 462-469.
20. Michael W. Passer, Ronald E. Smith (2009). *Psychology: the science of mind and behaviour*. Mc Graw- Hill Higher Education.
21. Sanchez- Marin, M., Rejano – Infante, E., & Rodriguez – Troyano, Y. (2001). Personality and academic productivity in the university student. *Social Behavior and Personality*, 29, 299-305.

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