RELATIONSHIP OF PERSONALITY TRAITS WITH ANXIETY, DEPRESSIVE AND PTSD SYMPTOMATOLOGY AND ACADEMIC PERFORMANCE
Experience with an Arab college student sample

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ABSTRACT • Background : The objective was to highlight the profile of Eysenck Personality Questionnaire traits of a sample of Arab college students, and assess the relationship of trait scores with gender, age and symptoms of anxiety, depression, PTSD and grade point average (GPA) score. Similar reports from the Arab world were restricted to neuroticism/extraversion and rarely involved traumatic experience and psychosocial performance. **Methods:** Participants (N = 624) were Kuwaiti national college students who completed, in class, the EPQ-90, Hopkins Symptoms Checklist, and the PTSD Checklist. **Results :** Men had higher psychoticism ($p < 0.004$) and extraversion ($p < 0.03$) scores, while women had higher neuroticism ($p < 0.001$) and lie scale scores ($p < 0.001$). Students with the lowest GPA had the highest scores for psychoticism ($p < 0.01$). Psychoticism and neuroticism were significantly correlated with each other, but negatively with extraversion and lie scale. The correlations of psychopathology were strongest with neuroticism and psychoticism; and negative with extraversion and the lie scale. In regression analyses, the dominant predictor of psychopathology was neuroticism. With neuroticism as covariate, the sex difference in depression scores was no longer significant. **Conclusions:** Our findings support the usefulness of neuroticism as reflecting characteristic level of distress; and a combination of high neuroticism and low extraversion as vulnerability marker for psychopathology. Psychoticism needs further study as a marker of psychosocial underachievement.

Keywords: personality, traits, EPQ, psychopathology, PTSD, academic,- Arab

INTRODUCTION

Personality traits have been shown to significantly mediate the broad range of physical and mental morbidity conditions that afflict human beings [1-3], as well as the pattern of mortality [4-7], and psychosocial performance (e.g., academic achievement and subjective quality of life) [8-11]. This wide-ranging influence is probably based on heritability for the traits, neuroticism, extraversion and psychoticism [12], as well as shared heritability between internalizing disorders and neuroticism [13], and covariance of brain areas with personality traits [14].

The Eysenck model [15] has been the dominant conceptual framework in these studies, and has inspired numerous studies on the relationship between common psychopathology (especially depression and anxiety) and personality traits [1,16]. The model states that anxiety and depression are highly positively correlated with neuroticism and moderately negatively correlated with extraversion; such that a combination of high neuroticism and low extraversion is associated with high vulnerability for anxiety and depression [16-19]. Although the model has been robustly replicated, research attention has been mostly focused on neuroticism and extraversion, while less attention has been given to the other dimensions of the Eysenck Personality Questionnaire (EPQ), namely, psychoticism and the lie scale. This is a reflection of the more controversial understanding of the significance of psychoticism [20-22] and the lie scale [23], which have been referred to as indicating "tough mindedness" and "social desirability," respectively. In addition, broader types of psychopathology, such as the three dimensions of posttraumatic stress disorder (PTSD) [24,25], and issues of psychosocial performance, such as academic achievement [9,26], have received relatively lesser attention, simultaneously, along with depression/anxiety.

Our study was aimed at filling these gaps in the literature, in the context of a nonclinical sample from an Arab culture. Although there are reports on the relationship of psychopathology with personality traits from the Arab world, those reports were restricted to neuroticism/extraversion [27-29], and rarely involved traumatic experience [30] and psychosocial performance.

The objective of the study was to highlight the profile of EPQ personality traits of a sample of Arab college students, and assess the relationship of the traits with symptoms of anxiety, depression, and PTSD, as well as recent grade point average score.

In line with the literature reviewed above, we used the alternative (i.e., not null) hypotheses, as follows: (i) men would score significantly higher on extraversion and psychoticism, while women would score significantly higher on neuroticism and the lie scale; (ii) grade point average score, as a measure of academic achievement, would be significantly negatively associated with neuroticism and positively with extraversion; (iii) depression/anxiety and the three dimensions of PTSD would be more

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highly correlated with neuroticism, while being negatively correlated with extraversion; (iv) of the EPQ dimensions, neuroticism would have the dominant influence in predicting psychopathology, and could account for the noted higher depression score among women [16,31].

METHOD

Subjects and procedure

Study participants were students of the College of Education, Public Authority for Applied Education and Training (PAAET), Kuwait, a four-year, degree-awarding institution with a total population of 8,000 students (2,000 men; 6,000 women).

The 624 participants consisted of 182 (29.2%) men and 442 (70.8%) women from all years of study. Our sex ratio was fairly similar to the ratio of men to women in the entire student population. Participants ranged in age from 18 to 38 years (mean: 20.8; SD: 2.9; mode and median: 20 years). About 30% (186) were aged 18 to 19 years, the majority (404, or 64.7%) was aged 20 to 25 years, and 11 (17.6%) were aged 31 to 38 years.

Participants completed the questionnaires, translated into Arabic by the method of back-translation, in class. They were approached at the end of lectures by the research team. In order to include students from all the disciplines, the classes chosen were those of the courses of compulsory general studies. One course of general studies was chosen for each year of the 4-year study program. Participants self-completed the questionnaires anonymously. First, the objectives of the study were explained. The students were duly informed that they were free to decline participation and that there would be no penalty for refusing to participate. Participants also gave verbal informed consent. There were no refusals. This is not surprising in view of the way they were approached, and the non-threatening nature of the items of the questionnaires. We ensured that all items of the questionnaires were completed. The study was approved by the institutional review panel of the PAAET.

The questionnaires

Assessment instruments included the EPQ-90, the 25-item Hopkins Symptoms Checklist (HSCL-25) [32], and the 17-item PTSD Checklist (PCL) [33,34].

They recorded their most recently available grade point average (GPA). Considering the fact that questionnaires were completed anonymously, we could only ensure that the correct GPA score was entered by each participant at the point of submitting the questionnaire to the research team, by reminding them about the need for the accuracy of the recorded score.

➢ **The EPQ-90**

This 90-item questionnaire is well known, as it has been used in several cultures, including the Arab [27,28]. It assesses the following dimensions: psychoticism (25 items), extraversion (21 items), neuroticism (23 items), and the lie scale (21 items). The *internal consistency* (Cronbach's alpha) of the whole questionnaire for the responses of the 624 participants was 0.75 (split-half reliability = 0.75). The *reliability coefficients* for the subscales were: (i) neuroticism, 0.82; (ii) extraversion, 0.69; (iii) psychoticism, 0.43; and (iv) the lie scale, 0.44.

➢ **The PTSD Checklist (PCL)**

This is a screening instrument for PTSD. The 17 items correspond with the symptoms for diagnosing PTSD in the DSM-IV/V. The items are grouped into the three dimensions of PTSD, viz: (i) re-experiencing (5 items); avoidance (7 items); and arousal (5 items). The *internal consistency* (Cronbach's alpha) for the responses of the 624 subjects was 0.89.

➢ **Hopkins Symptoms Check-List-25 (HSCL-25).**

The HSCL-25 is a valid cross-cultural measure of depression and anxiety [35,36]. The first ten items of the questionnaire concern anxiety while the remaining 15 relate to depression. The response options for each item are: "not at all", "a little", "quite a bit" and "extremely", rated 1-4, respectively. Higher scores indicate worse mental functioning. Three summed scores are calculated: the total score (average of all 25 items); the anxiety score (average of the 10 anxiety items); and the depression score (average of the 15 depression items). The *internal consistency* (Cronbach's alpha values) of the questionnaire for the responses of all 624 participants was as follows: (i) for the 25 items, 0.91; (ii) for the 10 anxiety items, 0.85; and (iii) for the 15 depression items, 0.86.

Data analysis

Data were analyzed by the Statistical Package for Social Sciences, version 15 (SPSS Inc., Chicago, Illinois). Since the data were fairly normally distributed (as the mean, median and mode were close – see Table I), the data were analyzed by parametric statistics. In the uni-

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TABLE I

PATTERN of EPQ PERSONALITY TRAITS, HOPKINS CHECKLIST ANXIETY/DEPRESSION and PTSD CHECKLIST DIMENSIONS*

	Psychoticism	Neuroticism	Extraversion	Lie scale	Anxiety subscale ♦	Depression subscale ♦	HSCL Total	PTSD re-experience	PTSD avoidance	PTSD arousal
Mean (SD)	5.7 (3.1)	15.7 (4.5)	13.9 (4.2)	11.4 (3.6)	1.97 (0.59)	2.02 (0.55)	2.0 (0.52)	6.7 (4.8)	9.5 (5.9)	6.9 (4.8)
Median	5.0	16.0	15.0	11.0	1.9	1.9	1.96	6.0	9.0	6.0
Mode	4	18	18	11	1.8	1.67	1.76	5	9	5
Range	0-18	0-23	1-21	1-20	11-3.9	1-3.87	1.04-3.6	0-20	0-26	0-20

*The scores for the HSCL-25 anxiety/depression/total scores are average scores for the respective subscales, as recommended by Derogatis *et al.* [32].
♦Anxiety and depression subscale refer to the Hopkins Checklist (HSCL-25).

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variate analyses, the personality traits were the dependent variables. Thus, the association of personality traits with one another, as well as with age, and the total scores for anxiety, depression and three dimensions of PTSD, was assessed by Pearson's correlation; while the association with gender and grade point average was assessed by t-test and one-way ANOVA, respectively. But in multivariate analyses, using multiple (step-wise) regression analysis, the dependent variables were the total scores for anxiety, depression, and the PTSD dimensions, while the independent variables were the personality dimensions and gender, because we wanted to examine the influence of the traits and gender on psychopathology.

Analysis of covariance (ANCOVA) was used to assess the impact of trait scores on sex differences in psychopathology. The level of statistical significance was set at $p < 0.05$

RESULTS

Associations of EPQ scale scores with gender and grade point average score (Table II)
Men had significantly higher psychoticism ($p < 0.004$) and extraversion ($p < 0.028$) scores; while women had significantly higher neuroticism ($p < 0.001$) and lie scale scores ($p < 0.001$). Regarding academic performance (i.e., grade point average - GPA), Table II shows that, in comparison with high GPA subjects, students with the poorest performance were outliers in personality traits, having the highest mean scores for psychoticism (5.0 *vs.* 9.1, $p < 0.01$) and neuroticism ($p > 0.05$); as well as the lowest mean scores for extraversion ($p > 0.05$) and the lie scale ($p > 0.05$). On the other hand, the subjects with the best performance had average trait scores (i.e., they could be described as level-headed or balanced).

In exploring whether the differences in trait scores by GPA groups could be associated with psychopathology, we found that there was a tendency for those with poorer GPA to have higher anxiety/depression scores ($p > 0.05$).

Exploring this relationship further in analysis of covariance (ANCOVA), controlling for scores in anxiety/depression, we found that differences in neuroticism and extraversion scores between those with highest GPA and those with lowest GPA remained not significant ($p > 0.05$), as noted in the univariate analysis. But differences in psychoticism scores remained significant ($p < 0.003$).

Correlations of EPQ scale scores with anxiety, depression and PTSD scores (Table III)
Age was not significantly correlated with any personality trait scores.

Psychoticism and neuroticism were significantly correlated with each other ($p < 0.001$), but negatively with extraversion and lie scale scores ($p < 0.001$).

Psychoticism and neuroticism were positively correlated with psychopathology, while extraversion and the lie scale were negatively correlated with psychopathology ($p < 0.001$). However, the correlations of psychopathology were strongest with neuroticism (r = 0.52 - 0.61).

Multiple regression analyses with anxiety, depression and PTSD scale scores as dependent *vs.* EPQ subscales and sex as independent variables (Table IV)
While the personality trait dimensions accounted for 30.2% - 44% of variance in anxiety, depression and dimensions of PTSD, the robustly dominant predictor of psychopathology was neuroticism, as it accounted for 81.2% - 91.6% of available variance for each psychopathology dimension. Psychoticism was a stronger predictor of anxiety and depression (3.7% - 4.6% of variance), than sex (0.5% - 1% of variance) and extraversion (0.4% - 2.4% of variance).

Analyses of covariance (ANCOVA)
In view of the robust findings about the predictive power of neuroticism in psychopathology, and following the impression in the literature that the universal finding of

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TABLE II

ASSOCIATIONS of EPQ SCALE SCORES with GENDER, GRADE POINT SCORE, and FEELINGS of SADNESS and PESSIMISM

Factors		Psychoticism	Neuroticism	Extraversion	Lie scale
		Mean (SD)			
GENDER	Male (N = 182)	6.2 (3.1)	14.4 (4.6)	14.5 (4.1)	10.6 (3.4)
	Female (N = 442)	5.4 (3.1)	16.3 (4.4)	13.7 (4.3)	11.7 (3.7)
Statistical significance: df = 622		T = 2.9; *p < 0.004*	T = 4.8; *p < 0.001*	T = 2.2; *p < 0.028*	T = 3.7; *p < 0.001*
GRADE SCORE	3.5 - 4.0 (N = 97) (a)	5.0 (2.7)	15.9 (4.5)	13.9 (3.9)	11.9 (3.9)
	3.0 - 3.49 (N = 185) (b)	5.3 (2.9)	15.9 (4.4)	13.6 (4.6)	11.5 (3.5)
	2.5 - 2.99 (N = 225) (c)	5.9 (3.1)	15.7 (4.4)	14.1 (3.9)	11.3 (3.6)
	2.0 - 2.49 (N = 69) (d)	6.1 (3.5)	15.4 (5.1)	14.3 (4.5)	10.6 (3.8)
	1.0 - 1.99 (N = 41) (e)	6.2 (3.5)	15.1 (4.9)	13.9 (4.2)	12.3 (2.8)
	< 1.0 (N = 7) (f)	9.1 (3.3)	17.1 (5.60)	12.3 (3.9)	7.7 (3.4)
*Statistical significance: df = 5/618		(f) > a, b; *p < 0.01*	n.s	n.s.	(e) > f; *p < 0.025*
		f = 3.9, *p < 0.002*			f = 3.2, *p < 0.008*
*Using one-way ANOVA; (a) - (f): categories of grade point average.					

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sex difference in depression is attributable to higher neuroticism score in women, the data were subjected to analysis of covariance (ANCOVA). This was with a view to seeing the impact of neuroticism on the sex differences in depression score. In ANCOVA, examining sex differences in HSCL-25 depression scores, with neuroticism as covariate, we found that the significant sex difference in depression scores, earlier noted in univariate analysis, was no longer significant (corrected means: Male = 2.004, SE = 0.033; Females = 2.029, SE = 0.021; F = 0.389, $p > 0.05$). But when the ANCOVA analysis was repeated using psychoticism as covariate, gender differences in depression remained highly significant: (F = 19.5, $p < 0.001$).

Also, when the ANCOVA analysis of sex differences was done for anxiety, with neuroticism as covariate, the

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TABLE III

CORRELATIONS (PEARSON'S) of EPQ SCALE SCORES with ANXIETY, DEPRESSION and PTSD SCORES (N = 624)[†]

Factors	Psychoticism	Neuroticism	Extraversion	Lie scale
		r (p level)		
Psychoticism	1	0.147 (0.001)	– 0.14 (0.001)	– 0.42 (0.001)
Neuroticism	0.147 (0.001)	1	– 0.26 (0.001)	– 0.24 (0.001)
Extroversion	– 0.14 (0.001)	– 0.26 (0.001	1	0.09 (0.01)
Lie scale	– 0.42 (0.001)	– 0.24 (0.001)	0.09 (0.01)	1
Hopkins Symptoms Checklist				
HSCL anxiety	0.28 (0.001)	0.53 (0.001)	– 0.22 (0.001)	– 0.19 (0.001)
HSCL depression	0.29 (0.001)	0.59 (0.001)	– 0.32 (0.001)	– 0.25 (0.001)
HSCL total	0.30 (0.001)	0.61 (0.001)	– 0.30 (0.001)	– 0.24 (0.001)
Post Traumatic Stress Disorder				
PTSD re-experiencing	0.17 (0.001)	0.53 (0.001)	– 0.21 (0.001)	– 0.24 (0.001)
PTSD avoidance	0.19 (0.001)	0.52 (0.001)	– 0.35 (0.001)	– 0.25 (0.001)
PTSD arousal	0.22 (0.001)	0.61 (0.001)	– 0.29 (0.001)	– 0.22 (0.001)

*Age was not significantly correlated with any personality trait.

TABLE IV

MULTIPLE REGRESSION ANALYSIS with ANXIETY, DEPRESSION and PTSD SCALE SCORES as DEPENDENT VERSUS. EPQ SUBSCALES and SEX as INDEPENDENT VARIABLES*

Dependent variables	Independent (predictor) variables	R square: Variance (%)	Standard β	p level
HSCL anxiety	Neuroticism	27.5 (84.4% of total)	0.46	0.001
	Psychoticism	3.7	0.20	0.001
	Sex	1.0	0.09	0.004
	Extroversion	0.4 (Total = 32.6%)	– 0.07	0.05
HSCL depression	Neuroticism	35.0 (84.3% of total)	0.52	0.001
	Psychoticism	4.1	0.19	0.001
	Extroversion	2.4 (Total = 41.5%)	– 0.16	0.001
HSCL total score	Neuroticism	37.2 (84.5% of total)	0.53	0.001
	Psychoticism	4.6	0.21	0.001
	Extroversion	1.7	– 0.13	0.001
	Sex	0.5 (Total = 44%)	0.07	0.02
PTSD (PCL) re-experiencing	Neuroticism	28.4 (90.0% of total)	0.49	0.001
	Lie scale	1.3	– 0.11	0.01
	Extroversion	0.5 (Total = 30.2%)	– 0.07	0.04
PTSD avoidance	Neuroticism	26.7 (81.2% of total)	0.43	0.001
	Extroversion	4.8	– 0.22	0.001
	Lie scale	1.4 (Total = 32.9%)	– 0.12	0.01
PTSD arousal	Neuroticism	37.3 (91.6% of total)	0.56	0.001
	Extroversion	2.1	– 0.14	0.01
	Psychoticism	1.3 (Total = 40.7%)	0.12	0.01

*No significant multi-collinearity; tolerance values: 0.88 - 0.93.

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score for women remained significantly higher, though at a reduced level of significance (F = 4.1, $p < 0.043$) than noted for the univariate analysis

DISCUSSION

Guided by hypotheses about information that had been robustly replicated in the literature, we assessed the relationship of EPQ dimensions with one another, and with psychopathology, age, gender, and academic score (GPA). What we added to the literature is a simultaneous consideration that included the four dimensions of the EPQ, anxiety/depression, and the three dimensions of PTSD, in detailed multivariate analyses, using a sample from a culture where such analyses had not been undertaken. The fact that the reliability of psychoticism and lie scale was < 0.7, is a well-sknown characteristic of these dimensions [20-22].

The first hypothesis was upheld. While the significantly higher male score on extraversion and the higher female score on neuroticism have been widely reported [1,16], the literature is more silent on gender differences in psychoticism and the lie scale [37] – a reflection of the controversy in the literature about the meaning of these dimensions. But from a social behavior perspective, our findings of significantly higher male score for psychoticism and higher female score for the lie scale make sense for dimensions that have been described as reflecting "tough mindedness" and "social desirability", respectively [20]. Although the interpretation of the meaning of the lie scale score is problematic in situations in which there is considerable motivation to "fake good" [23], the circumstance of our study did not provide such a motivation.

For the second hypothesis, although poor academic achievers had outlying personality trait scores, and high achievers had more average trait scores, the differences were significant only for psychoticism, a finding that was unchanged after controlling for differences in anxiety/depression scores. Regarding the high neuroticism/psychoticism scores of the poor academic achievers, it has been shown that high-neuroticism persons with depression may have more clinical benefit from positive life events (e.g., social rewards) than low-neuroticism persons [38]. Hence students with high neuroticism scores who perform poorly academically, could benefit from teacher-directed social rewards, such as extra lessons, show of patience and understanding, and appropriate praise.

For the third and fourth hypotheses, our findings about the differential correlations of EPQ dimensions with scores on anxiety, depression, and PTSD dimensions, add robustness to the reports in the literature. In particular, for the fifth hypothesis, the dominant role of neuroticism was evident in multivariate analyses, accounting for over 80% of available variance for each domain of psychopathology. In general, the results indicated that while psychoticism and neuroticism constituted vulnerability to anxiety, depression and PTSD, with neuroticism playing the dominant

vulnerability role, extroversion and lie scale seemed to have constituted more protective, but marginally important factors.

A noteworthy result is that, in ANCOVA, examining sex differences in HSCL-25 depression scores, with neuroticism as covariate, we found that the significant sex difference in depression scores, earlier noted in univariate analysis, was no longer significant. In view of the fact that the subjects did not have clinically severe symptoms of anxiety/depression, our ANCOVA finding is in line with the impression that the universally noted higher prevalence rates for depression in women is more likely to be explained by their higher neuroticism score [16,31].

However, there is no explanation for why women have higher neuroticism scores, as a population-based twin study found no significant gender difference in the correlation between neuroticism and major depression [39]. Furthermore, it has been noted that it is unclear how useful neuroticism is in studies of the etiology of psychopathology, because no one knows the nature of neuroticism as a vulnerability marker, and the underlying psychobiological mechanisms have not been elucidated [40]. Accordingly, it has been proposed that neuroticism reflects a person's characteristic or mean level of distress over a protracted period of time [40].

Limitations
The limitations of the study are that it was cross-sectional and involved subjects within a rather narrow age group, although no substantial age-related shifts in traits have been found during adulthood [40], and age was not significantly correlated with trait scores in this study. In addition, the small sample size for the lowest GPA scorers may have affected the statistical tests of significance. Furthermore, we could not compare the EPQ dimension scores for our subjects with those of previous studies, because authors commonly did not state the scoring method for the dichotomous items of the EPQ, i.e., either 1/3 or 0/1 [41,42], coupled with the fact that a variety of versions of the EPQ were used. As such, our findings can be said to have generated hypotheses for broad-based longitudinal studies in the culture.

CONCLUSIONS

With one exception [43], the consensus of opinion is that the major personality traits are universal [41]. Our findings support this consensus, as well as the associations of personality traits with gender, psychopathology and psychosocial outcome [44,45]. Within the limitations of the study, our findings support the usefulness of assessment of neuroticism as reflecting characteristic level of distress; a combination of high neuroticism and low extraversion as vulnerability marker for a wider range of problems; while psychoticism needs further study as a marker of psychosocial underachievement.

Based on the findings, we suggest that longitudinal

studies with adequate sample size are needed, to examine possible changes in personality traits over time, and assess the contribution of personality traits to clinical and psychosocial outcomes. This is with a view to articulating interventions that take into consideration, the dynamics of these deeply ingrained characteristics in the clinical and psychosocial contexts.

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CONFLICTS OF INTEREST
The authors declare that they have no conflicts of interest.

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