PREDICTIVE FACTORS OF SCHIZOTYPY: A STUDY UPON CREATIVITY, NEUROTICISM, EXTRAVERSION AND GENDER

Dr. Anita Shrivastava [*]

Fouzia Siddique [**]

ABSTRACT

Background: *A bulk of research in schizotypy has focused on - its comparison with other disorders and susceptibility to psychosis and psychopathological illness Researches that specifically focused on establishing link between schizotypy and other factors, have mainly concentrated on creativity while ignoring other personality and demographic factors.*

Method: *Data was collected from 91volunteer undergraduate students(30 females and 61 males) of Middlesex University, Dubai using Schizotypal questionnaire (SPQ-A), Creative Analysis Questionnaire(CAQ)and International and Personality Item Pool (IPIP) test.*

Results: *Pearson's r and subsequent stepwise hierarchical regression analysis suggest significant relationship between schizotypy and extraversion ($r = -.449$, $p < .05$) ; between schizotypy and neuroticism ($r = .378$, $p < .05$). Extraversion, neuroticism and gender appeared to be significant predictors (accounting for 31% variance)of schizotypy. Creativity did not emerge as significant predictor.*

Conclusion: *The study suggests that factors other than creativity might predict schizotypy and creativity seems to be mediated by other factors of personality and intelligence.*

Key words: *Extraversion, gender, neuroticism, predictive factors, schizotypy.*

[*] Campus program coordinator and Sr. Lecturer, Dept. of Psychology, Middlesex University, Dubai, UAE

[**] Doctorate student of Clinical Psychology at University Collage London, UK

INTRODUCTION

Schizotypy as a construct represents the dimensions of psychosis, its clinical and non clinical manifestations within people (Claridge, 1997). This construct is supported by empirical research that has suggested that, rather than there being categorical differences in the presence of psychotic-like characteristics (ie, either present or absent), these characteristics are present in varying degrees of severity in the population, blending from the normal to the pathological (Nelson, & Rawlings,2010). While disease theories have primarily been categorical, within personality psychology, the continuation of traits along dimensions is used effectively to explain individual differences (Claridge, 1997). and unusual beliefs and experiences have been found in the general population in research as well (Verdoux, & van Os, 2002). Hence, schizotypy as a psychological construct of personality is defined as the existence of divergent thinking, unusual beliefs and atypical perception and variation in information processing along a continuum from normality to psychosis in the general non clinical population (Kehagia, 2009; Burch, Pavelis, Hemsley & Corr, 2006). A lot of people in the general population are said to exhibit these characteristics and lead fulfilling and successful lives without any form of intervention (Bowman, & Turnbull, 2009).

A number of studies have sought to look at personality correlates of highly creative people and various studies have demonstrated a relationship between creativity and schizotypy (Furnham, & Crump,2014), suggesting creatively active people score higher on scales of schizotypy (Rubinstein, 2008). Other studies have successfully demonstrated a positive relationship between creativity and schizotypy among creative artists (Miller, & Tal, 2007; Burch et. al., 2006; Nettle, 2006) and even among the general younger population (Miller, &Tal, 2007). But debate on the validity of the link between madness and creativity has been going on for over a century. In fact, research in creativity has simultaneously found openness to experience from the five factor model of personality and intelligence as significant predictors of creativity and not schizotypy(Miller, & Tal 2007). Other studies have also not found direct associations between creativity and schizotypy (e.g. O'Reilly,Dunbara,&Bentall, 2001; Burch et. al., 2006).

Just as characteristics that underlie psychosis share a similarity with creative traits (Barrantes-Vidal, 2004), they may also share a similarity with other personality traits and be influenced by factors that influence creativity. Two such personality traits closely associated with creativity that are worth considering are neuroticism and introversion (Maddux, & Galinsky; 2009; Haller, & Courvoisier, 2010). Introversion is commonly associated with creativity (Brod, 1997) and creative people tend to have high levels of neuroticism (Burch et. al., 2006; Spauwena, Krabbendam, Lieb,Wittchen,& van OS, 2003). Research in schizotypy has revealed positive symptoms to be associated with neuroticism while negative symptoms are associated with both neuroticism and introversion (Fisher, Mohanty, Herrington, Koven,Miller, & Heller,2004; Ross, Lutz, & Bailley,2002). In a rather recent research , neuroticism was positively and extraversion was negatively related to total schizotypy scores, and agreeableness was negatively and openness to experience was positively related to total schizotypy scores (Asai, Sugimori, Bando, & Tanno, 2011).

Gender is another factor that is known to bring about differences in various personality traits and creativity (Cheng,Kim,& Hull, 2010; Reis, 2002). Research has pointed to a higher incidence of psychosis in women (Raine, 1992; Spauwen et al., 2003; Maric, Krabbendam, Vollebergh, de Graaf, van Os, 2003). Specific research in schizotypy has established that women score higher on positive symptoms of schizotypy and men on negative symptoms (Paino-Pineiro, Fonseca-Pedrero, Lemos-Giraldez, Muniz, 2008; Verdoux & van Os, 2002) but overall relationship between gender and schizotypy have not been given much attention in research.

A large body of research in schizotypy has focused on - its comparison with other disorders such as depression, bipolar, hypomania and chiefly, schizophrenia (e.g. Rubinstein, 2008), and susceptibility to psychosis and psychopathological illness (Claridge, 1997). Researches that specifically focused on establishing link between schizotypy and other factors, have mainly concentrated on creativity while ignoring factors such as personality dimensions and demographic characteristics that may or may not impact Schizotypy traits. Therefore this research aimed at to investigate possible relationships and predictors of schizotypy among creativity, neuroticism extraversion, and gender. Based on existing literature it was hypothesized that there will be significant relationship between schizotypy, creativity,

neuroticism extraversion, and gender; and creativity will be the most significant predictor of variance in schizotypy.

MATERIAL AND METHOD

Participant

Participants in this study were 91 undergraduate students of Middlesex University campus in Dubai. 30 females and 61 males comprised the sample. They were composed of different nationalities and voluntarily participated in the study.

Design

The design of the study was a within groups co-relational design. The dependent/outcome variable was Schizotypy and the independent/predictive variables were creativity, extraversion, neuroticism, and gender.

Materials

Participants were assessed using following questionnaires

Schizotypal Personality Questionnaire- A (SPQ-A ; Raine , 1991). This standardized questionnaire measures schizotypy characteristics in healthy people. The title was modified to Personality Dimensions Questionnaire for this research to avoid ceiling effect when participants answered the questionnaire. This questionnaire has 74 items that need to be answered in either yes or no. All affirmative responses are added to get a total score.

Creativity Achievement Questionnaire (CAQ; Carson, 2005). This questionnaire comprises of two sections part A ask participants to choose area of creativity, and Part two 2 consist of 10 items that measures the different levels of creative achievement in 10 different and wide ranging domains of creativity such as music, architecture, humor, culinary skills etc. These 10 items provide 7 statements to select one from these. Response on each of these 10 items are added to calculate total creativity score.

International and Personality Item Pool (IPIP; Goldberg, 1999). Extraversion and neuroticism scales were obtained from IPIP which is a publicly available online personality inventory. The extraversion and neuroticism scales have 40 items rated on a 5-point Likert-type scale (1 = *vary inaccurate*, 5 = very *accurate*).Total extraversion and neuroticism scores are obtained by adding ratings.

Procedure

This study was reviewed and approved by the ethics committee of Middlesex University Dubai. Data was collected in classrooms by taking prior permission from program coordinators and lecturers as well by contacting participants individually. All participants were briefed about the study. Participants were provided with an information sheet and subsequent consent form to sign. Participation was voluntary and confidentiality of results was assured. Those who consented were then administered the SPQ-A, CAQ, and the IPIP. Upon completion of all three questionnaires participants were debriefed.

RESULTS

Means and standard deviations for subscales by culture are provided in Table 1. Mean schizotypy score indicate participant's lower tendency towards schizotypy which is expected from non-clinical population. Creativity mean score once again indicate lower tendency towards creativity , whereas mean score of extraversion and neuroticism suggested participants being moderately extravert, and less neurotic.

The collected data was further analyzed using Pearson's 'r' followed by hierarchical multiple linear regression.

A series of Pearson's r revealed that **e**xtraversion was significantly negatively correlated with schizotypy ($r = -.449$, $p < .05$) suggesting highly extraverted people will have less schizotypal characteristics. Neuroticism was significantly positively correlated with schizotypy ($r = .378$, $p < .05$) suggesting highly neurotic people will display more schizotypal characteristics. However creativity was not significantly correlated with schizotypy ($r = .034$, $p > .05$) suggesting creativity level not corresponding with high or low schizotypy.

Stepwise hierarchical multiple regression revealed that extraversion and neuroticism(step1) together account for 27.4% of variability in schizotypy. The addition of gender (step2) improves this to 31%. Multiple regression analysis revealed that extraversion and neuroticism were significant predictors of schizotypy. Gender was approaching significance however creativity was not significant predictor. This suggest that less extraverted and highly neurotic people would have higher probability of schizotypy traits.

Both models(step1 and 2) are highly significant as F (3,90)=12.30,P<.001; F(5,90)=9.08,p<.001. These findings suggest that initial model have significant ability to predict schizotypy and 2nd model has added comparatively smaller predictive value.

DISCUSSION

As creativity did not demonstrate significant relationship with schizotypy our first hypothesis is only partially accepted. Further hierarchical multiple regression analysis indicate Instead of creativity, extraversion and neuroticism are the strongest predictors whereas gender though found significant, has explained smaller variation in predicting schizotypy. Therefore our 2nd hypothesis is rejected.

Contrary to existing literature our findings failed to demonstrate creativity as the sole contributing factor in schizotypy. Nonetheless our findings are in agreement with past researchers Barrantes-Vidal, 2004; Rawlings et.al., 2008). Research into creativity has found other factors and not schizotypy to predict creativity (O'Reilly et. al., 2001; Burch et. al., 2006; Miller, & Tal, 2007). Associations between creativity and psychopathology are complex and varied (Glazer, 2009) and research associating psychosis and creativity has always contained inconsistencies (Rubinstein, 2008). Intrinsic differences in scientific and artistic creativity would create differences in how they map onto schizotypy (Glazer, 2009). Moreover, a lot of research on creativity and psychosis uses anecdotal, biographical and psycho-biographical evidence (Brod, 1997; Glazer, 2009).

Extraversion and neuroticism emerged as the strongest predictors of schizotypy in this study. In line with previous research (Maddux & Galinsky; 2009; Claridge, 1997; Haller & Courvoisier, 2010; Asi et al.,2011) that has associated introversion with creativity, extraversion in our research is negative predictor for schizotypy. These personality factors commonly established as personality traits of creative individuals are also important factors in understanding variation in schizotypy. As stated earlier, traits that underlie psychosis and share a similarity with creativity (Barrantes-Vidal, 2004) can indeed share similarities with other personality traits associated with a creative person.

Gender in our research also emerged relatively significant predictor of schizotypy, as outlined by previous research that has measured gender differences in personality arising due to variation in neurology, psychology, biology and culture (Fossati et. al., 2003; Reis, 2002). Each

of these factors interact with each other to affect the development, experience and expression of psychosis in health and illness. For example, exposure to estrogen has been shown to protect against the risk of psychosis, thereby affecting the level of psychosis in men and women in the general population (Maric et. al., 2003).

In a general population that is not biased to include creative individuals, creativity is seen as the exception rather than the norm. However, traits of schizotypy are seen to exist in this population where creativity can at best be described as average, as is evident in this research. In light of this, other personality factors already recognized by theorists and researchers emerge as stronger predictors of schizotypy and account for greater variation in it. As a matter of fact, among a few limitations that do exist in this study, one of the most important one is the sample size. Research into domains of personality requires a huge sample size to be effectively validated and hold enough importance to influence theory and popular opinion. In comparison to this, this research has a relatively smaller sample size and future research into the field should attend to this limitation. other limitation include limiting this research to specific personality dimensions & demographics.

Other traits in the five factor model of personality are also known to be associated with creativity and future research should study the relationship of these traits with schizotypy as well. Particularly, openness to experience that has been known to have the strongest association with creativity (Barrantes-Vidal, 2004; Nelson & Rawlings, 2010) should be studied in conjunction with schizotypy. As well other demographic variables like culture, living status, age etc also needed to be included. Besides few limitation this study has shown that schizotypy is related to other personality factors. This allows us to1)see psychosis as a continuum of personality akin to anxiety or other characteristics, 2)understand that schizotypy is present in everyone in varying degrees, and 3) normalize an often stigmatized concept.

ACKNOWLEDGEMENT

The authors would like to thank Prof. Ajit Karnik and Dr. Jakob Pietschnig for providing valuable guidelines in statistical analysis. We further like to extend our sincere thanks to all participants and Ethic Committee of Middlesex University Dubai.

REFERENCES

Asai, T., Sugimori, E., Bando, N., & Tanno, Y. (2011). The hierarchic structure in schizotypy and the five-factor model of personality. *Psychiatry Research,185,*78-83.

Barrantes-Vidal, N.(2004). Creativity & madness revisited from current psychological perspectives. *Journal of Consciousness Studies,11,*58-78.

Bowman, C.H. & Turnbull, O.H.(2009). Schizotypy and flexible learning: A prerequisite for creativity. *Philoctetes,2,*39-42.

Brod, J.H.(1997). Creativity and schizotypy. In: Claridge,G editor. *Schizotypy: Implications for Illness and Health*.New York: Oxford University Press

Burch, G. St. J., Pavelis, C., Hemsley, D.R. & Corr, P.J.(2006). Personality, creativity and latent inhibition. *European Journal of Personality,20,* 107-122.

Cheng,Y., Kim, K.H. & Hull, M.F.(2010). Comparisons of creative styles and personality types between American and Taiwanese college students and the relationship between creative potential and personality types. *Psychology of Aesthetics, Creativity, and the Arts,4,*103-112.

Claridge G.(1997) *Schizotypy: Implications for illness and health*. New York: Oxford University Press.

Fisher, J.E., Mohanty, A., Herrignton, J.D., Koven, N.S., Miller, G.A. & Heller, W.(2004).Neuropsychological evidence for dimensional schizotypy: Implications for creativity and psychopathology. *Journal of Research in Personality,38,* 24-31.

Fossati, A., Raine, A., Carretta, I., Leonardi, B. & Maffei, C.(2003). The three-factor model of schizotypal personality: Invariance across age and gender. *Personality and Individual Differences,35,* 1007-1019.

Furnham, A.& Crump, J.(2014). A bright side, facet analysis of Schizotypal Personality Disorder: The relationship between the HDS imaginative Factor, the NEO-PI-R personality trait facets in a large adult sample. *Thinking Skills and Creativity, 11,*42-47.

Glazer, E.(2009). Rephrasing the madness and creativity debate: What is the nature of the creativity construct. *Personality and Individual Differences,46,*755-764.

Haller, C.S.& Courvoisier, D.S.(2010) Personality and thinking style in different creative domains. *Psychology of Aesthetics, Creativity, and the Arts,*4 , 149-160.

Kehagia, A.A.(2009). Anais Nin: A case study of personality disorder and creativity. *Personality and Individual Differences,46,* 800-808.

Maddux, W.W. & Galinsky, A.D.(2009). Cultural borders and mental barriers: The relationship between living abroad and creativity. *Journal of Personality and Social psychology,96,* 1047-1061.

Maric, N., Krabbendam, L., Vollebergh, W., de Graaf, R. & van OS, J.(2003) Sex differences in sypmtoms of psychosis in a non-selected, general population sample. *Schizophrenia Research, 93,* 89-95.

Miller, G.F. & Tal, I.R.(2007). Schizotypy versus openness and intelligence as predictors of creativity. *Schizophrenia Research, 93,* 317-324.

Nelson, B. & Rawlings, D.(2010). Relating Schizotypy and personality to the phenomenology of creativity. *Schizophrenia Bulletin,36,* 388-399.

Nettle, D.(2006). Schizotypy and mental health amongst poets,visula artists, and matmaticians. *Journal of Research in Personality,40,* 876-890.

O'Reilly, T., Dunbara, T. & Bentall, R.(2001). Schizotypy and creativity: An evolutionary connection. *Personality and Individual Differences,31,* 1067-1078.

Paino-Pineiroa, M., Fonseca-Pedreroa, E., Lemos-Giraldez, S. &, Muniz, J. (2008). Dimensionality of schizotypy in young people according to sex and age. *Personality and Individual Differences,45,* 132-138.

Raine A.(1992). Sex differences in schizotypal personality in national population. *Journal of Abnormal Psychology,101,* 361-364.

Rawlings, D. &, Locarnini, A.(2008). Dimensional schizotypy, autism, and unusual word association in artists and scientists. *Journal of Research in Personality,*42, 465-471.

Reis, S.M.(2002) Toward a theory of creativity in diverse creative women. *Creativity Research Journal,3,4,* 305-316.

Ross, S.R., Lutz, C.J. & Bailley, S.E.(2002). Positive and negative symptoms of schizotypy and the five-factor model: A domain and facet level analysis. *Journal of Personality Assessment,79,* 53-72.

Rubibstein, G.(2008). Are schizophrenic patients necessarily creative? A comparative study between three groups of psychiatric In-patients. *Personality and Individual Differences,45*, 806-810.

Spauwen, J., Krabbendam, L., Lieb, R., Wittchen, H. & van Os, J.(2003). Sex differences in psychosis: Normal or pathological. *Schizophrenia Research, 62*, 45-49

Verdoux, H. & van OS, J.(2002). Psychotic symptoms in non-clinical populations and the continuum of psychosis. *Schizophrenia Research, 54*, 59-65

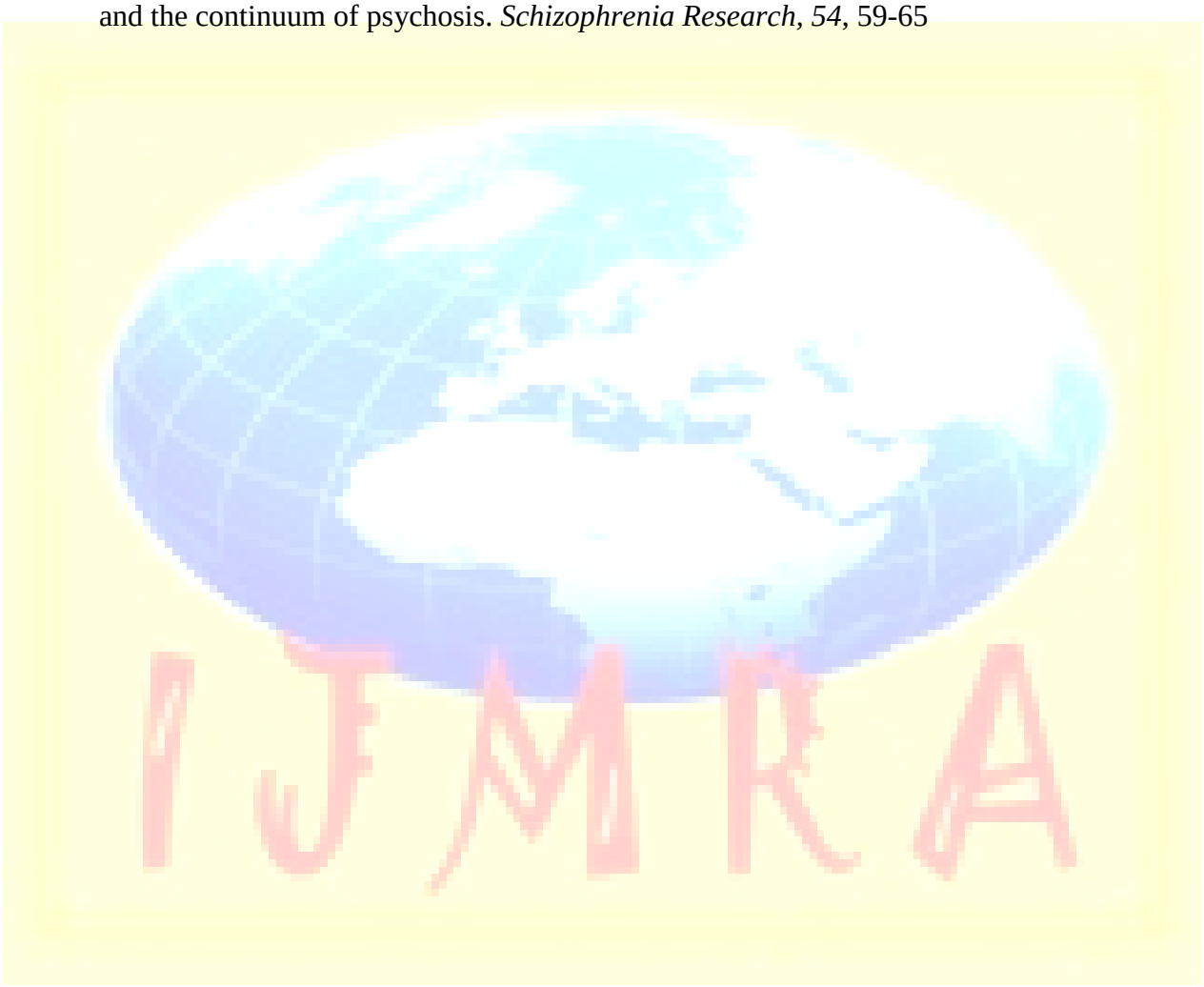

Table 1: Mean and SD of schizotypy, creativity, extraversion and neuroticism

Variables	(N= 91)Mean	Standard Deviation
Schizotypy	30.03	12.37
Creativity	11.46	12.67
Extraversion	65.22	13.12
Neuroticism	57.21	15.29

Table 2: Standard Error, Beta, t, and significance values of coefficients

		b	*SE*	Beta	*t*	*p*
Step 1			ΔR^2 =.274			
	Intercept	40.61	8.09		5.02	<.001
	Creativity	0.15	0.09	.16	1.71	.092
	Extraversion	-0.39	0.09	-.41	-4.32	<.001
	Neuroticism	0.23	0.08	.28	3.04	.003
Step 2			ΔR^2 =.310			
	Constant	25.89	9.84		2.63	.010
	Creativity	0.17	0.09	.18	1.95	.06
	Extraversion	-0.37	0.09	-.39	-4.11	<.001
	Neuroticism	0.28	0.08	.34	3.62	<.001
	Gender	4.85	2.41	.19	2.02	.047

Note. *B* = unstandardized regression coefficient, *SE* = standard error, ΔR^2 = Adjusted R Square.