

The Study of Psychometric Properties of Schizotypal Personality Questionnaire-Brief (SPQ-B)

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Abstract

The different scales for assessing schizotypal traits were developed from different perspectives. These scales confined themselves only to certain aspects (syndromes) of the schizotypal personality, and they do not represent the nine features of schizotypal personality outlined in DSM-IV-TR. In contrast the Schizotypal Personality Questionnaire and its brief version are symptom-oriented and more comprehensive scales based on clinical features of schizotypal personality disorder described by the DSM. The aim of this study was to investigate the psychometric properties of the Schizotypal Personality Questionnaire-Brief (SPQ-B). The current study was conducted in survey and cross sectional as well as ex-post facto research context. In order to study the reliability and validity of the SPQ-B, its items were translated into Persian and then retranslated into English. A group of 402 normal participants (160 males & 242 females) from colleges of Allameh Tabatabaie University took part in this research. Principal Component Analysis with promax rotation for SPQ-B extracted three factors which were labeled cognitive perceptual deficits, interpersonal deficits, and disorganization factors, respectively, and accounted for 32.64% of the variance. However, for this scale two other types of validity (convergent validity & intercorrelations between subscales and the whole scale) and two reliabilities (test retest & internal consistency) were reported. Based on these results, it was concluded that SPQ-B possesses good validity and reliability in Iranian population and it can be used, as a valid measure, in psychological and psychiatric research. The results of this study also support prior findings of gender differences in schizotypal scores.

Keywords: Schizotypal Personality Questionnaire, schizotypal personality disorder, validity, reliability, psychometric properties.

In recent years there have been increased research efforts to assess schizotypal personality disorder (SPD) based on the Diagnostic and

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Statistical Manual of Mental Disorders, fourth edition (DSM-IV; American Psychiatric Association, 1994) (Vollema & Bosch, 1995). The interest mainly stems from the fact that SPD is frequently seen in relatives of schizophrenic patients and is a sign of a predisposition to develop schizophrenia in some individuals. Thus, schizotypal traits and schizophrenic psychosis are conceptualized as different points on a continuum, expressing different degrees of risk according to the assumptions of the vulnerability-stress-model (e.g., Wolfradt & Straube, 1998).

The different scales for assessing schizotypal traits were developed from different perspectives: Some were symptom-oriented (e.g., Schizotypal Personality Questionnaire, Schizotypal Trait Questionnaire), some syndrome-oriented (e.g., Physical and Social Anhedonia Scales, Perceptual Aberration Scale and Magical Ideation Scale) and some were personality-oriented (e.g., Eysenck Personality Questionnaire). Several self-report scales were used as the first screening instruments in research on psychosis proneness, such as the Physical and Social Anhedonia Scales (Chapman, Chapman & Raulin, 1976), the Perceptual Aberration Scale (Chapman, Chapman & Raulin, 1978), the Magical Ideation Scale (Eckblad & Chapman, 1983). These scales confined themselves only to certain aspects (syndromes) of the SPD. Also, they are relatively long and they do not represent the nine features of schizotypal personality outlined in DSM-IV-TR (American Psychiatric Association, 2000), as each usually measures one, or at best three, of the nine DSM-IV-TR (American Psychiatric Association, 2000) defined schizotypal traits. These features are not measured well by the above-mentioned self-report scales, and some are not measured at all (Raine & Benishay, 1995). In contrast, the Schizotypal Personality Questionnaire, its brief version (Raine & Benishay, 1995) and the Schizotypal Personality Scale (STA, Claridge & Broks, 1984) are symptom-oriented and more comprehensive scales based on clinical features of SPD described by the DSM-III-R (American Psychiatric Association, 1987). Specially, to address the latter limitation, the Schizotypal Personality Questionnaire (SPQ) was developed as a 74-item

self-report scale modeled on DSM-III-R (American Psychiatric Association, 1987) criteria for SPD (Raine, 1991), and included nine subscales to reflect the nine traits of schizotypal personality listed in DSM-III-R (American Psychiatric Association, 1987). These traits are unchanged in DSM-IV-TR (American Psychiatric Association, 2000). A confirmatory factor analysis of these nine subscales (Raine et al, 1994) revealed that three main factors best represent schizotypal personality, namely Cognitive-Perceptual Deficits (made up of Ideas of Reference, Magical Thinking, Unusual Perceptual Experiences, and Paranoid Ideation), Interpersonal Deficits (Social Anxiety, No Close Friends, Blunted Affect, Paranoid Ideation) and Disorganization (Odd Behavior, Odd Speech). This three-factor model fitted the data better than single or two-factor models. The three schizotypal factors appear to parallel the three analogous factors that have been reported for schizophrenic symptomatology (Fossati, Raine, Carretta, Leonardi, Maffei, 2003). This scale has shown excellent psychometric properties (Raine, 1991).

The SPQ-B (Raine & Benishay, 1995) is a shorter, 22 item version of the SPQ, and consists of the most reliable items from the original SPQ, the nine sub-scales being equally represented. It was designed to be used when time limitation in a research protocol does not allow the use of the longer SPQ, or alternatively to screen large numbers for predisposition to schizotypal personality disorder. The SPQ-B yields a total score, together with scores for each of the three main sub-factors (cognitive-perceptual, interpersonal, and disorganized).

This three-factor structure of the SPQ and SPQ-B has been shown to have cross-cultural construct validity (Reynolds, Raine, Mellinger, Venables, & Mednick, 2000). Principal component analyses of the Italian translation of the Schizotypal Personality Questionnaire (SPQ) confirmed the three-factor model of cognitive-perceptual, interpersonal, and disorganized features (Fossati et al. 2003). Mata, Mataix-Cols and Peralta (2005) using a Spanish version of the Schizotypal Personality Questionnaire-Brief (SPQ-B), replicated these three factor structure of schizotypy. The aim of the present study was to investigate the

psychometric properties of the SPQ-B questionnaire, i.e., reliability, internal consistency and test-retest, intercorrelations, convergent and construct (factorial) validity, and thus contribute to the cross-cultural equivalence and similarity of original constructs as well as the application of the test to Iranian population.

Method

Participants

The sample consisted of 402 mostly undergraduate students from Allameh Tabatabaie University (242 males, with mean age and standard deviation of 22.31 and 2.50, and 160 females, with mean age and standard deviation of 23.8 and 2.62, respectively). The Schizotypal Personality Questionnaire Brief version (Raine & Benishay, 1995) and the Schizotypal Trait questionnaire A form (STA, Claridge & Broks, 1984), which was previously adapted for the Iranian population by Mohammadzadeh, Goodarzi, Taghavi and Mollazadeh (2007), were administered to 80 individuals in order to determine the correlation coefficients between the scales of the two tests.

Research design

The current study was a cross sectional ex post facto research to determine the psychometric properties of SPQ-B. The SPQ-B was first translated into Persian language by the author. Then, it was given to ten people to complete and to report any problems they had in understanding its items. After some revisions in the statements, the translated copy was given to two Ph.D. students of the English language to retranslate into English. Finally, the original and the retranslated versions were compared and some revisions were made with the help of the above students to minimize the differences between the two versions.

Instruments

The Schizotypal Personality Questionnaire Brief Version (SPQ-B)

The SPQ-B (Raine & Benishay, 1995) is a 22-item self-report

instrument designed to assess all nine features of SPD as defined in DSM-IV and its recent version, DSM-IV-TR (American Psychiatric Association 1994, 2000). A three-factor solution has been found to be most appropriate for the SPQ-B (Raine & Benishay, 1995), with three subscales. The cognitive-perceptual dysfunction factor refers to ideas of reference, odd beliefs, suspiciousness, and unusual perceptual experiences. The interpersonal deficits factor is composed of the no close friends, constricted affect and excessive social anxiety subscales. The disorganization factor is composed of the odd speech and odd behaviour subscales. Total scores were obtained by summing up the scores of the individual subscales composing each factor. The SPQ-B has been found to have good psychometric properties; Internal reliabilities of these sub-scales range from 0.72 to 0.80 (mean = 0.76). The two-month interval test-retest reliability coefficients range from 0.86 to 0.95 (mean = 0.90). Criterion validity coefficients as indicated by correlations between SPQ-B sub-scales and clinical interview measures of SPD are good for the total scale (0.66), cognitive-perceptual (0.73) and interpersonal (0.63), but lower for disorganized (0.36) (Raine & Benishay, 1995).

Schizotypal Trait questionnaire A form (STA; Claridge & Broks, 1984)

The STA is a widely used 37-item self-report measure of schizotypal personality traits based on DSM-IV-TR (American Psychiatric Association, 2000) criteria. Each item is presented in a Yes/No format so that the total scores can range from 0 to 37 with higher scores indicating greater proneness to psychosis. The STA was designed to identify a general psychosis-proneness by addressing multidimensional sets of schizotypal traits. The STA assesses three factors: (a) unusual perceptual experiences, (b) paranoid suspiciousness/social anxiety and (c) magical thinking. The STA has good construct and discriminant validity in the original culture (Rawlings, Claridge & Freeman, 2001) and in Iranian population (Mohammadzadeh et al., 2007). Internal reliabilities of its sub-scales range from 0.60 to 0.83 (mean = 0.69). Four-week interval test-retest reliability coefficients range from 0.59 to 0.86 (mean = 0.71).

Results

Factorial validity

The factorial validity of the Iranian version of SPQ-B was investigated with an exploratory principal components analysis (PCA) followed by a promax rotation. Promax has advantages over alternative oblique methods in terms of the general robustness of the solution it provides (Rawlings et al., 2001)

First, the ability of factor analysis confirmed by Kaiser-Meyer-Olkin (KMO) Measure (KMO = .760) and Bartlett's Test of Sphericity (1301.58, $p < .000$).

Then, an item was included in a factor if its loading was 0.30 or higher. A plot of eigenvalues (scree test) and the pattern of factor loadings suggested a three-factor solution.

These three factors together explained 32.64 percent of the variance. Table 1 presents the factor analysis information of SPQ-B.

Table 1
Results of SPQ-B Factor Analysis Using Principal Components Analysis (PCA)

Factors	eigenvalues	% of variance	Items	alpha
cognitive-perceptual	3.92	17.84	2, 4, 5, 9, 10, 12, 16, 17	0.66
Interpersonal	1.82	8.31	1, 7, 11, 14, 15, 18, 21, 22	0.70
Disorganization	1.42	6.48	3, 6, 8, 13, 19, 20	0.68

Convergent validity:

To calculate the convergent validity of SPQ-B scale, convergent application of Schizotypal Trait questionnaire A form (STA) was used. 80 people from research sample were selected randomly and answered both of the questionnaires. To control the probable effect of answering order, half of the participants answered SPQ-B scale first and STA next and the other

half did it the reverse manner. The convergent validity correlations are depicted in Table 2.

Table 2
Correlations between SPQ-B & STA

questionnaires	STA	Unusual perceptual	paranoid suspiciousness	magical thinking
SPQ-B	0.75*	0.64*	0.70*	0.61*
Cognitive perceptual	0.66*	0.78*	0.67*	0.70*
Interpersonal	0.55*	0.62*	0.72*	0.55*
Disorganization	0.60*	0.67*	0.76*	0.60*

* The correlation coefficient is significant at the 0.01 level (n=80)

Intercorrelation of subscales with each other and with the whole scale

In this research, the correlations of subscales with each other and with the whole scale are summarized in Table 3. This Table shows that the correlations between the whole SPQ-B with cognitive perceptual deficits, interpersonal deficits and disorganization factors were 0.75, 0.77, and 0.73, respectively, which are acceptable. Correlation between factors was significant from 0.34 to 0.39.

Table 3
Internal Correlations of Subscales with Each Other and with the Whole SPQ-B

	SPQ-B	Factor 1	Factor 2	Factor 3
SPQ-B	--	0.75*	0.77*	0.73*
Cognitive perceptual	0.75*	--	0.39*	0.38*
Interpersonal	0.77*	0.39*	--	0.34*
Disorganization	0.73*	0.38*	0.34*	--

* The correlation coefficient is significant at the 0.01 level (n=402)

Test-retest reliability

To determine the test-retest reliability of the scale, 47 people were selected from the research sample and were tested twice with a four-week interval. The reliability coefficients, for SPQ-B, were 0.94 for the whole scale and 0.83, 0.90 and 0.85 for cognitive perceptual deficits, interpersonal deficits and disorganization factors respectively, which are considered appropriate values for stabilities over time.

Internal consistency reliability

To calculate the internal consistency reliability of the scale, Cronbach's alpha coefficient was used. Again the whole data (n=402) were used. According to the results, alpha coefficients were 0.83 for the whole scale, 0.66 for the cognitive perceptual deficits, 0.70 for interpersonal deficits, and 0.68 for the disorganization factors.

Gender differences

To compare separate male and female samples, t-test was used. The results which are presented in Table 4, indicate a significant difference between the two groups concerning the whole SPQ-B scale and its relevant factors. Females had higher scores on whole scale and on the cognitive-perceptual deficits factor, whereas males had higher scores on interpersonal deficits and disorganization subscales.

Table 4
A Comparison of SPQ-B Score in Male and Female Subjects

	Gender	mean	SD	t
SPQ-B	male	9.28	3.35	14.45*
	female	11.20	3.12	
Cognitive perceptual	male	2.86	1.19	51*
	female	3.37	1.32	
interpersonal	male	3.18	1.41	98*
	female	2.20	1.25	

Disorganization	male	2.22	1.46	56*
	female	1.66	0.81	

*The correlation coefficient is significant at the 0.01 level (n = 402)

Discussion

Exploratory principal Components Analysis with promax rotation for SPQ-B extracted three factors which were labeled cognitive perceptual deficits, interpersonal deficits and disorganization, respectively. The comparison between the derived factors in the original culture and in the present study shows that these factors were reported in the same order. Thus, the factor structure in our Iranian sample was similar to the factor structure in the American samples. Each factor closely matched Raine and benishay's (1995) corresponding factor. However, although some differences can be noted in terms of factor order, our factor solution bears considerable resemblance to that reported by Mata et al. (2005) using a Spanish version of SPQ-B. Our findings confirm this factor solution on a sample of students, giving further evidence of the existence of three factors underlying differences in schizotypy when measured by the SPQ-B.

Findings of factor analysis in this study support the idea of similarity between schizotypy and schizophrenia (Johns & van Os, 2001). The three factors found to underlie SPD in nonclinical samples in this study as well as in previous research, mentioned in introduction, may represent the three factors of schizophrenic symptomatology. The cognitive-perceptual SPD factor may be analogous to the positive symptom factor (delusions and hallucinations). The interpersonal factor may be an SPD analog to the more negative symptom factor in schizophrenia patients, although social anxiety, which loads on this factor, has no clear analog in positive or negative schizophrenic symptoms. The disorganization factor may be a schizotypal analog to the third schizophrenic factor, which is made up of thought disorder and bizarre behavior. So, according to the dimensional model of psychotic traits (e.g., Wolfradt & Struabe, 1998), it may be, that the three-factor structure found in schizophrenia represents an exaggeration of the same factor structure in the normal population.

With regard to other psychometric properties of the SPQ-B Questionnaire, i.e., internal consistency and test-retest

reliabilities, also convergent, and intercorrelation validities, the results revealed that using SPQ-B scale in Iranian students and probably other social groups, can measure the schizotypal traits to an acceptable degree.

An important element to be considered in the analysis of schizotypy data is that of gender. Females are reported to score higher than males on scales that measure “positive schizotypal characteristics”, such as Perceptual Aberration, Magical Ideation, STA, and Hallucinatory Predisposition. On the other hand, males tend to score higher than females on scales that measure “negative schizotypal characteristics”, such as Physical and Social Anhedonia (Venables & Bailes, 1994). Using the SPQ, Raine (1992) found that females score higher on positive symptom sub-scales, whereas males score higher on negative symptom subscales. Miller and Burns (1995) using the same scale, also reported that males scored higher on negative and disorganized symptoms. These sex differences appear to parallel those reported in schizophrenic patients, as female schizophrenics are characterized by more positive symptoms than male schizophrenics (Goldstein, Santangelo, Simpson, & Tsuang, 1990), while male schizophrenics have been found to be more withdrawn, socially isolated, and characterized by negative symptomatology (Bardenstein & McGlashan, 1990). Results of this study are in line with the studies mentioned in the literature review.

Using this scale can be a facilitator in many studies in which measuring schizotypal trait is of great importance. This short scale is intended for research use in non-clinical samples and it is important to highlight that it is not intended diagnostically. In particular, they are aimed to facilitate large N designs such as epidemiological, survey or high-risk identification paradigms; or completion in naturalistic "real world" and nonlaboratory settings such as in studies of drug-takers. Finally, the researcher hopes to facilitate such research by making the scales easily available for use by those suitably qualified.

Appendix: SPQ-B

Please answer each item by clicking Y (Yes) or N (No). Answer **all** items even if unsure of your answer. When you have finished, check over each one to make sure you have answered them all.

1. People sometimes find me aloof and distant.
2. Have you ever had the sense that some person or force is around you, even though you cannot see anyone?
3. People sometimes comment on my unusual mannerisms and habits.
4. Are you sometimes sure that other people can tell what you are thinking?
5. Have you ever noticed a common event or object that seemed to be a special sign for you?
6. Some people think that I am a very bizarre person.
7. I feel I have to be on my guard even with friends.
8. Some people find me a bit vague and elusive during a conversation.
9. Do you often pick up hidden threats or put-downs from what people say or do?
10. When shopping, do you get the feeling that other people are taking notice of you?
11. I feel very uncomfortable in social situations involving unfamiliar people.
12. Have you had experiences with astrology, seeing the future, UFOs, ESP or a sixth sense?
13. I sometimes use words in unusual ways.
14. Have you found that it is best not to let other people know too much about you?
15. I tend to keep in the background on social occasions.
16. Do you ever suddenly feel distracted by distant sounds that you are not normally aware of?
17. Do you often have to keep an eye out to stop people from taking advantage of you?

18. Do you feel that you are unable to get "close" to people?
19. I am an odd, unusual person.
20. I find it hard to communicate clearly what I want to say to people.
21. I feel very uneasy talking to people I do not know well.
22. I tend to keep my feelings to myself.

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