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THE SPQ-B: A BRIEF SCREENING INSTRUMENT FOR SCHIZOTYPAL PERSONALITY DISORDER

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Currently there are no brief screening instruments for *Diagnostic and Statistical Manual of Mental Disorders* (DSM) defined schizotypal personality disorder (SPD). This study reports the development of a brief, 2-minute, 22-item self-report screening instrument, the Schizotypal Personality Questionnaire–Brief (SPQ-B), for SPD. Four independent subject samples provided the basis for test development. The SPQ-B contains a total scale score and three subscales to assess the three main factors of SPD, viz. Cognitive-Perceptual Deficits, Interpersonal Deficits, and Disorganization. Reliability for the scales averaged 0.76, and scale scores correlated significantly with independent clinical ratings of DSM-III-R schizotypal traits (average $r = 0.62$), indicating criterion validity for the scales. The SPQ-B is recommended for use in large-scale screening for SPD prior to a confirmatory clinical interview and also for dimensional research on the correlates of schizotypal features in the normal population.

Schizotypal personality disorder (SPD) represents a serious personality disturbance that borders on the major psychoses (Siever & Gunderson, 1983) and is thought to be closely related to chronic schizophrenia (Siever, Kalus, & Keefe, 1993). Some have thought SPD to be genetically related to schizophrenia (Kendler, Gruenberg, & Strauss, 1981; Kety, Rosenthal, Wender, Schulsinger, & Jacobsen, 1975), although this link has been thought by others to be moderate in strength (Torgersen, Onstad, Skre, & Evardsen, 1993). There has been a recent resurgence of interest in SPD (Raine & Lencz, 1995), which in part reflects the recognition of SPD as important in its own right as a significant personality disorder, but is also based on its promises to shed light on the etiology of schizophrenia, as

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schizotypals are free of the institutionalization and medication confounds that hinder research on schizophrenic patients (Raine & Lencz, 1995).

Research on SPD is, in turn, hampered by the fact that schizotypals are difficult to detect and recruit in research. Siever and colleagues have recruited relatively large samples of patients with SPD (Siever, 1995), but such research is the exception rather than the rule, and such subjects have been hospital-based as opposed to noninstitutionalized community subjects. Facilitating research on nonpatient populations with SPD would be of considerable value in allowing for more extensive research on SPD free of the confounds surrounding hospitalized populations.

Several self-report scales have been developed to assess psychosis proneness in general, such as the Physical and Social Anhedonia scales (Chapman, Chapman, & Raulin, 1976), Magical Ideation scale (Eckblad & Chapman, 1983), Perceptual Aberration scale (Chapman, Chapman, & Raulin, 1978), the Schizophrenism scale (Venables, Wilkins, Mitchell, Raine, & Bailes, 1990) and the STA scale (Claridge & Broks, 1984). These scales are excellent measures of psychosis proneness in general (Chapman, Chapman, & Kwapil, 1995; Lenzenweger, 1994), but they are relatively long and they do not represent the nine features of schizotypal personality outlined in DSM-IV (APA, 1984), as each usually measures one, or at best three, of the nine DSM-IV defined schizotypal traits. These limitations are of importance because McGlashan (1987) has argued that the core symptoms of SPD are odd communication, paranoid ideation, and social isolation, whereas Torgersen (1985) has argued that these same traits in addition to odd behavior help characterize a form of schizotypy genetically related to schizophrenia. These features are not well measured by the above-mentioned self-report scales, and some are not measured at all.

To address the latter limitation, the Schizotypal Personality Questionnaire (SPQ) was developed as a 74-item self-report scale modeled on DSM-III-R criteria for SPD (Raine, 1991), and included nine subscales to reflect the nine traits of schizotypal personality listed in DSM-III-R (APA, 1987). These traits are unchanged in DSM-IV. A confirmatory factor analysis of these nine scales (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, and the three schizotypal factors appear to parallel the three analogous factors that have been reported for schizophrenic symptomatology (e.g., Arndt, Alliger, & Andreasen, 1991).

The present study describes the development of a briefer, self-report scale of schizotypal personality that may be used as an initial instrument on large samples to screen for DSM-IV-defined SPD. The key goals of this research were to produce an instrument which (1) was short, (2) correlated highly with longer self-report and clinical assessment measures of schizotypal personality, (3) assessed the three main factors of schizotypal personality, (4) had internal reliability, (5) showed test-retest reliability, and (6) evidenced criterion validity as indicated by significant relationships with

clinical measures of SPD. The original SPQ was used as the basis for the development of this new brief instrument.

METHOD

SUBJECT SAMPLES

Four independent samples were used to construct and validate the new short scale as follows:

Sample 1. This sample was used to make the initial selection of items for the new scale. It consisted of 220 undergraduates drawn from an Introduction to Psychology class at the University of Southern California (USC) who had been administered the Schizotypal Personality Questionnaire (SPQ).

Sample 2. This new independent sample was used as a replication sample for initial item selection. It consisted of 162 undergraduates at USC who completed the SPQ.

Sample 3. This sample (n = 68) was employed to assess criterion validity for the new scale using a categorical conceptualization of SPD. Subjects in this sample had been initially selected from a pool of undergraduate students who had been administered the Schizotypal Personality Questionnaire (SPQ). Subjects participated in the experiment for course credit. Subjects scoring in the top 10% (score of 41) or bottom 10% (12 or less) of the distribution of scores on the original SPQ were invited back for diagnostic testing and were administered the Structured Clinical Interview for DSM-III-R Personality Disorders (SCID—Spitzer, Williams, & Gibbon, 1987). Presence of each schizotypal trait was assessed on a 3-point scale (1 = absent, 2 = sub-threshold, 3 = threshold); subjects had to have five traits out of nine at threshold level for a DSM-III-R diagnosis of schizotypal personality disorder. Interviews were videotaped and scored by two trained research assistants who independently rated the subject in order to obtain consensus ratings (coefficient kappa = 0.95). Interviewers were blind to group membership and each other's assessment at the time ratings were conducted. Interviews took place on average 2 months following administration of the SPQ (range 1–3 months). Thirteen individuals scoring in the top 10% on the SPQ (out of a total of 22 interviewees) received a DSM-III-R diagnosis of schizotypal personality disorder. None of the 46 subjects taken from the bottom 10% received the diagnosis, and these subjects formed the control group. All 68 subjects (regardless of clinical diagnostic status) were utilized for the psychometric analyses reported below.

Sample 4. This sample was employed to assess criterion validity using a dimensional (i.e., individual difference) conceptualization of SPD. It consisted of 41 volunteers from a sample of undergraduate students enrolled in an Introduction to Psychology class at the University of Southern California. These subjects volunteered in the experiment for course credit.

SCHIZOTYPAL PERSONALITY QUESTIONNAIRE (SPQ)

This questionnaire was administered to all subjects in all samples and provided the basis for the development of the new brief scale (SPQ-B). Full reliability and validity data for the SPQ, as well as comparisons with other schizotypy scales, are provided in Raine (1991) and Chapman, Chapman, and Kwapil (1995). This 74-item self-report questionnaire has been found to have high internal reliability (alpha = 0.91). Convergent validity, as assessed by correlations between the SPQ and other measures of schizotypal personality, ranged from .59 to .81 (Raine, 1991). Test-re-

test reliability was .82. Criterion validity for the SPQ was indicated by a .60 correlation between SPQ scores and a clinical diagnosis of DSM-III-R schizotypal personality disorder, and by a .68 correlation between the SPQ and continuous scores of schizotypal personality disorder derived from diagnostic interviews. The internal reliabilities of the nine SPQ subscales ranged from .71 to .78 (Cronbach's alpha), with a mean of .74.

DIAGNOSTIC INTERVIEW FOR SCHIZOTYPAL PERSONALITY DISORDER

Subjects in samples 3 and 4 were additionally administered the Structured Clinical Interview for DSM-III-R Personality Disorders (SCID-II—Spitzer, Williams, & Gibbon, 1987). Presence of each schizotypal trait was assessed on a 3-point scale (1 = absent, 2 = subthreshold, 3 = threshold); subjects had to have five traits out of nine at full threshold level for a DSM-III-R diagnosis of schizotypal personality disorder. All nine SPD traits were probed for independent of the subjects' answers on the SCID-II self-report questionnaire. In addition to making a yes/no diagnosis for each subject, scores on the nine traits were summated to provide a dimensional index of schizotypal personality disorder as a parallel to the dimensional format of the SPQ. Scores were also created to reflect the three factors of SPD by summating scores on the relevant subscales for each factor.

Interviews were carried out by a clinical doctoral graduate student trained on the SCID by the first author in conjunction with the NIMH Clinical Research Center for Schizophrenia at UCLA. The interviewer was blind to group membership and SPQ scores at the time ratings were conducted. Interviews were videotaped and scored by a second research assistant who independently rated the subject blind to SPQ scores and the other diagnostician's ratings. In cases of disagreement between the two assessments, consensus ratings were obtained. Interviews took place on average 2 months following administration of the SPQ (range 1–3 months).

Coefficient kappa for agreement between the two independent ratings of the two diagnosticians for presence of DSM-III-R schizotypal personality disorder using the SCID was 0.89. The degree of concordance between the two interviewers for diagnosis of schizotypal personality disorder was high and significant ($\tau = 0.87$, $p < .0005$). The intraclass correlation for rater reliability for the dimensional measure of schizotypal personality disorder was also high and significant ($r = .98$, $p < .0005$).

RESULTS

INITIAL ITEM SELECTION

One goal of scale construction was to assess the three main factors of schizotypal personality with acceptable reliability using only a few items. Consequently, using Sample 1 (220 undergraduates), item-total correlations were calculated for the items making up each factor. Items with the highest correlations with that factor were retained for the new scale. One constraint was that each of the subscales that made up the factor in question contributed two items to the new scale. For example, two items from each of the four SPQ subscales making up the factor of Cognitive-Perceptual Deficits were selected, making a total of eight items to measure that factor in the new scale. Similarly, two items from each of the four SPQ subscales making up the Interpersonal Deficits factor were selected, totaling eight items. Only two SPQ subscales make up the Disorganization

factor; in order to ensure adequate internal reliability for this factor, three items from each subscale were selected to make a total of six items. Consequently, the new SPQ-B scale was based on a total of 22 items. In all cases, individual item-total correlations ranged between .41 and .55 (mean = .50).

The 22 items in the new SPQ-B scale are shown in Table 1. Each question answered affirmatively receives a score of 1, so that scores can range from a minimum of 0 to a maximum of 22. Scores representing each of the three factors were derived by simple summation of scores for each item on the particular subscale. Means and standard deviations (SD) for the scales are as follows: Total scale score, $M = 9.6$, $SD = 5.3$; Cognitive-Perceptual, $M = 3.6$, $SD = 2.3$); Interpersonal, $M = 3.6$, $SD = 2.4$; Disorganized, $M = 2.5$, $SD = 1.9$. Subjects scoring 17 and above made up the top 10% of the distribution of scores; subjects scoring 2 or less made up the bottom 8%, and those scoring 3 or less made up the bottom 14% of scores.

INTERNAL RELIABILITY

Internal reliabilities for the new scale and its three subscales are shown in Table 2. Reliabilities ranged from .72 to .80, with a mean of 0.76, and are consequently viewed as acceptable.

INTERCORRELATIONS WITH LONGER SCALE

The intercorrelations between the new short scales and the longer, original SPQ scales are shown in Table 2. These range from 0.89 to 0.94, with a mean of 0.91. Consequently, the new short scale adequately reflects the factors measured by the original longer instrument.

REPLICATION ON INDEPENDENT SAMPLE

The psychometric properties of the new scale were reassessed in an independent sample (Sample 2, 162 undergraduates) in order to assess replicability of findings. These findings are shown in Table 2. Internal reliabilities in Sample 2 ranged from 0.72 to 0.83 ($M = 0.76$), while inter-correlations with the original SPQ ranged from 0.82 to 0.92 ($M = 0.87$). Consequently, findings from the original sample replicated well to an independent sample.

TEST-RETEST RELIABILITY

Retest data on the new scales were collected from 31 of the subjects who undertook the clinical interview for schizotypal personality disorder. Two-month test-retest reliability for the scales ranged from .86 to .95 ($p < .0001$) with a mean of 0.90.

CRITERION VALIDITY

Sample 3. In order to assess the extent to which the new short self-report scales relate to independent clinical ratings of schizotypal personality disorder, Sample 3 ($n = 68$) was utilized. Dimensional scores for schizotypal

TABLE 1. The 22 Items Making Up the New SPQ-B Scale and Its Three Subscales

Questions should be administered in the order indicated by the number at the beginning of each question. Question numbers from the original SPQ scale are given in parentheses at the end of each item. The response format is Yes/No. All items endorsed Yes score 1 point.

Cognitive-Perceptual (Factor 1)

2. Have you ever had the sense that some person or force is around you, even though you cannot see anyone? (13)
4. Are you sometimes sure that other people can tell what you are thinking? (21)
5. Have you ever noticed a common event or object that seemed to be a special sign for you? (28)
9. Do you often pick up hidden threats or put-downs from what people say or do? (44)
10. When shopping do you get the feeling that other people are taking notice of you? (45)
12. Have you had experiences with astrology, seeing the future, UFOs, ESP, or a sixth sense? (47)
16. Do you ever suddenly feel distracted by distant sounds that you are not normally aware of? (61)
17. Do you often have to keep an eye out to stop people from taking advantage of you? (65)

Interpersonal (Factor 2)

1. People sometimes find me aloof and distant. (8)
7. I feel I have to be on my guard even with friends. (36)
11. I feel very uncomfortable in social situations involving unfamiliar people. (46)
14. Have you found that it is best not to let other people know too much about you? (52)
15. I tend to keep in the background on social occasions. (57)
18. Do you feel that you are unable to get "close" to people? (66)
21. I feel very uneasy talking to people I do not know well. (71)
22. I tend to keep my feelings to myself. (73)

Disorganized (Factor 3)

3. People sometimes comment on my unusual mannerisms and habits. (14)
6. Some people think that I am a very bizarre person. (32)
8. Some people find me a bit vague and elusive during a conversation. (42)
13. I sometimes use words in unusual ways. (50)
19. I am an odd, unusual person. (67)
20. I find it hard to communicate clearly what I want to say to people. (69)

personality disorder and its three subfactors derived from the diagnostic interview were correlated with the new SPQ scales. Results of these analyses are shown in Table 3. It can be seen that all self-report scales significantly correlated with their respective dimensional scale derived from the clinical interview ($p < .005$), with correlations ranging from .34 to .73 ($M = 0.62$).

Sample 4. In order to assess the replicability of criterion validity for the

TABLE 2. Internal Reliabilities (Coefficient Alpha) for the New Scale and Its Three Subscales, and Intercorrelations Between the New Short Scales and the Original SPQ Scales. Psychometric Properties Are Given for Both the Sample on Which Test Construction Was Based (Sample 1) and an Independent Replication Sample (Sample 2)

	Internal Reliability	
	Sample 1	Sample 2
Total score	.80	.83
F1 (Cognitive-Perceptual)	.72	.72
F2 (Interpersonal)	.78	.76
F3 (Disorganized)	.75	.73

Inter-correlations between original scales and new short scales

	Sample 1				Sample 2			
	Long F1	Long F2	Long F3	Long Total	F1	F2	F3	Total
Short F1	.89				.85			
Short F2		.90				.88		
Short F3			.90				.82	
Short Total				.94				.92

new SPQ scales using a different method, Sample 4 (41 randomly selected undergraduates assessed on both the SPQ and SCID-II) was utilized. SPQ scores were correlated with dimensional clinical interview scores. Results of this analysis are shown in Table 3. Intercorrelations ranged from .37 to .73 (M = .56) and were all statistically significant ($p < .05$).

DISCUSSION

Results of this study confirm the notion that a quick screening instrument for schizotypal personality can be developed that has acceptable reliability and validity. The new instrument is short and takes only 2 minutes on average to complete, but internal reliability and test-retest reliability proved to be reasonable (r = 0.72 to 0.95), and good criterion validity (mean r = 0.62) was also demonstrated. Although there may be some bias in criterion validity in study 3 because subjects were initially selected as being high- or low-scoring SPQ subjects, the fact that the correlations between self-report and clinical measures of SPD in an unselected sample of subjects (Sample 4) are of the same magnitude as for Sample 3 indicates support for the criterion validity of the SPQ-B. This new scale is the only short instrument currently available using a DSM conceptualization of schizotypal personality disorder.

The psychometric properties of the SPQ-B indicate that there are two main ways in which it may be used, ways reflecting both dimensional (individual difference) and categorical (clinical) approaches to schizotypal personality

TABLE 3. Intercorrelations Between New SPQ Self-Report Scales and Dimensional Clinical Interview Measures of Schizotypal Personality Disorder Derived from Sample 3 (n = 68) and Sample 4 (n = 41)

	Self report measures			
Clinical Measures	F1	F2	F3	Total
Sample 3				
Cognitive-Perceptual (F1)	.73[a]			
Interpersonal (F2)		.68[a]		
Disorganized (F3)			.34[b]	
Total				.72[a]
Sample 4				
Cognitive-Perceptual (F1)	.73[c]			
Interpersonal (F2)		.55[c]		
Disorganized (F3)			.37[d]	
Total				.60[c]

[a] $p < .0001$
[b] $p < .005$
[c] $p < .01$
[d] $p < .05$

(Frances, 1993; Gunderson, Links, & Reich, 1991). First, it can be used to screen large numbers, either by telephone or mail, for predisposition to schizotypal personality disorder prior to a later confirmatory diagnostic interview for DSM-IV SPD. The brevity of the SPQ-B may be expected to result in a higher mail return rate than longer instruments, thus increasing the study's validity. Based on experience with its parent interview, the SPQ (Raine, 1991), it is anticipated that most subjects with SPD will lie in the top 10% of the distribution of scores of the SPQ-B (score of 17 or more). This strategy is currently being applied with this instrument to mass-screen thousands of subjects in China for schizotypal personality disorder (S. A. Mednick, personal communication, July 17, 1994).

Second, the psychometric properties indicate that the SPQ-B may also be used in dimensional research in which individual differences in schizotypal personality are correlated with individual differences in external measures such as genetic, biochemical, psychophysiological, and neuropsychological variables (Kendler et al., 1991; Lenzenweger, Cornblatt, & Putnick, 1991; Siever, 1995; Siever, Keefe, Bernstein, & Coccaro, 1990). In particular, findings indicate that the total score and two of the subscales of the SPQ-B have sufficient reliability and validity to measure the three main factors of schizotypal personality; as such, the SPQ-B may be used to research the individual correlates of these three subscales.

One limitation of the SPQ-B relative to its parent instrument, the SPQ, is that it is not capable of providing reliable and valid indices of the nine individual features of SPD. Consequently, it is recommended that studies intending to assess these individual schizotypal traits, or having more time available for test administration should use the SPQ in preference to the SPQ-B. A second limitation of the SPQ-B is that the criterion validity for

the Disorganization factor (average $r = .36$) was lower than for either the Cognitive-Perceptual factor ($r = .73$) or the Interpersonal Factor ($r = .62$). This may reflect both the difficulty in measuring signs (as opposed to symptoms) using self-report methods and also the more limited empirical and conceptual basis to this relatively new factor. Research findings for this subfactor should take this caveat into account. Alternatively, the longer SPQ questionnaire provides much better criterion validity for the two signs making up the Disorganization factor (Raine, 1991). Consequently, in research where Disorganization is of central interest, all Disorganization items from the original SPQ scale may be used to supplement the SPQ-B. A third limitation of the SPQ-B is that, like all other self-report scales developed to date, it is primarily based on college students. We are currently using the SPQ and SPQ-B on community subjects to further test the psychometric properties of these scales on noncollege samples.

In other ways the reliability and validity coefficients for the SPQ-B were surprisingly good given the short length of this new instrument and the subscales. This may be ascribed to the fact that the original SPQ demonstrated good psychometric properties (Raine, 1991), and that by choosing the most reliable of the items from the SPQ to make up the SPQ-B, the psychometric properties of the new screening instrument were maximized. It is conceivable, therefore, that stronger relationships might be obtained with external variables using the total score of the SPQ-B than with the total score from the SPQ. It is recommended, therefore, that investigators who have employed the SPQ in their research on the correlates of schizotypy might usefully derive SPQ-B scores from their data to explore this possibility.

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