MANUAL FOR THE SCHIZOTYPAL PERSONALITY QUESTIONNAIRE (SPQ and SPQ-B)

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# INTRODUCTION

This manual was written some time ago and has not been thoroughly updated, but information on scoring remains accurate. It is written for researchers interested in the use and application of the full-length SPQ and the briefer SPQ-B. It briefly summarizes the psychometric properties of these instruments and reports findings on construct validity. The SPQ is based on DSM criteria for schizotypal personality disorder. These instruments can be freely used for research purposes, but I would appreciate knowing a little about your study first at [araine@sas.upenn.edu](mailto:araine@sas.upenn.edu)

Citation For The SPQ

Raine, A. (1991). The SPQ: A scale for the assessment of schizotypal personality based on DSM-III-R criteria. *Schizophrenia Bulletin, 17*(4), 555-564.

Citation For The SPQ-B

Raine, A., & Benishay, D. (1995). The SBQ-B: A brief screening instrument for schizotypal personality disorder. *Journal of Personality Disorders, 9*(4), 346-355.

# Usage

The SPQ and SPQ-B are provided for unlimited use and free of charge. They can be used with both adults and adolescents, and with both normal and pathological populations.

SCORING FOR SPQ AND NORMS

# Scoring

Full details of the SPQ are obtained in Raine (1991). A copy of the instrument may be obtained from the author. Each "Yes" response on the SPQ scores one point. Total scores can therefore range from 0 to 74. As well as a total score, subscales can be derived. There are three broad factors: cognitive-perceptual, interpersonal, and disorganized. In addition there are 9 scales, each based on the nine signs/symptoms of schizotypal personality disorder listed in DSM 5.

Sub-scale scores for the three broad factors can be calculated by summating the following items:

COGPER 1 3 4 9 10 12 13 18 19 21 22 27 28 30 31 36 37 39 40 44 45 47 48 52 53 55 56 59 60 61 63 64 65

INTERPER 2 6 8 9 11 15 17 18 20 24 26 27 29 33 35 36 38 41 43 44 46 49 51 52 54 57 59 62 65 66 68 71 73

DISORG 5 7 14 16 23 25 32 34 42 50 58 67 69 70 72 74

Subscales

*Ideas of reference* 1 10 19 28 37 45 53 60 63

*Excessive social anxiety* 2 11 20 29 38 46 54 71

*Odd beliefs or magical thinking* 3 12 21 30 39 47 55

*Unusual perceptual experiences* 4 13 22 31 40 48 56 61 64

*Odd or eccentric behavior* 5 14 23 32 67 70 74

*No close friends* 6 15 24 33 41 49 57 62 66

*Odd speech* 7 16 25 34 42 50 58 69 72

*Constricted affect* 8 17 26 35 43 51 68 73

*Suspiciousness* 9 18 27 36 44 52 59 65

Scores to measures three factors of schizotypy (Cognitive-Perceptual, Interpersonal, and Disorganized) can be derived by simple summation of the sub-scale raw scores for the relevant factors (see Factor Structure below for a breakdown).

# Norms for the SPQ

In the original population on which the instrument was developed, norms were as follows:

Sample 1 (N=302): M = 26.9, SD = 11.0, range = 0-58.

Sample 2 (N=220). M = 26.3, SD = 11.4, range = 1-57

Ten percent high and low cut-offs on the distribution of scores of the SPQ were 41 and 12 respectively.

A sample of 103 male and female adults (age range 18-45) recruited from temporary employment agencies in Los Angeles had the following scores:

Mean SD Minimum Maximum

Total SPQ 26.4 15.3 0 72

Cognitive-perceptual 11.1 7.4 0 31

Interpersonal 9.7 6.8 0 28

Disorganized 6.0 4.5 0 16

While very similar to the original normative sample, it should be born in mind that while unselected, this community sample showed significant elevations in the base-rate of DSM-IV schizotypal and paranoid personality disorders.

Experience has shown that mean scores and 10% cut-offs can range from sample to sample and country to country. For example, normative data for a community sample of 1201 male and female 23 year-old Mauritians are as follows:

Total SPQ: M = 24.2, SD = 13.1, range = 0 – 67.

Cog-Perceptual M = 11.1, SD = 6.1, range = 0 - 31

Interpersonal M = 12.4, SD = 6.7, range = 0 - 32

Disorganized M = 4.6, SD = 3.9, range = 0 – 16

10% high-low cut-offs on the total score were 42 and 8 respectively (i.e. those scoring 8 or less fell into the bottom 10%, while those scoring 42 or more fell into the top 10%). Hall and Habbits (1996) obtain cut-offs of 39 and 10 for English undergraduate.

The original population on which the SPQ was developed consisted of Californian undergraduates at a large private university in Los Angeles, and experience has shown that they appear to have higher scores than more selected undergraduates (e.g. medical students in England) and other community populations. Examples of other means for the SPQ are 23.5 for English undergraduates (Hall and Habbits, 1996).

It is likely that the culture in Los Angeles provides a more comfortable atmosphere for the expression of unusual ideas, odd beliefs, and eccentric behavior than some other locations, resulting in greater representation of high schizotypal scorers in the original sample. Schizotypy scores are also consistently found to be higher in adolescents and young adults (both on the SPQ and other schizotypy scales), and furthermore scores can be influenced significantly by the research context and local sub-culture.

It is recommended therefore that researchers interested in defining extreme groups in their studies should not stick rigidly to the original normals, but should instead develop their own high-low cut-offs based on normative data from their population of interest. The original paper (Raine, 1991) used 10% high-low cut-offs, but other researchers may wish to explore other stricter (e.g. 5%) or more lax (e.g. 15%) cut-offs.

# Norms for SPQ-B

Means and SDs for the total score and sub-factors for a sample of 220 male and female undergraduates (Raine and Benishay, 1995) 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 two or less made up the bottom 8% while those scoring 3 or less made up the bottom 14% of scores.

RELIABILITY AND VALIDITY OF SPQ

Internal Reliability.

Coefficient alpha for the total scale score is assessed at .90 and .91. Alpha for the individual sub-scales range from .71 to .78 (mean .74) (Raine, 1991). Very similar reliabilities were obtained by Calkins et al. (2004) in an analysis of relatives of schizophrenics (total scale = .92, subscales ranged from .61 to .90); while similar reliabilities were again found for normal controls, the odd beliefs / magical thinking subcale was found to be surprisingly low (alpha = 0.09).

Test-retest reliability

Two-month test-retest reliability is .82 (Raine, 1991).

Convergent Validity

The SPQ correlates .81 with the STA and from .59 to .65 with the Schizophrenism scale, scales which assess several of the DSM-III-R traits for schizotypal personality (Raine, 1991).

Discriminant Validity

The SPQ has low correlations with scales which assess psychosis-proneness but which are not included in DSM-III-R criteria for schizotypal personality (.18 to .19 with Anhedonia, and .27 to .37 with Psychoticism). These correlations are significant, but significantly lower than correlations with the STA and Schizophrenism scales (Raine, 1991).

Criterion Validity

55% of those scoring in the top 10% of SPQ total scores have a DSM-III-R clinical diagnosis of schizotypal personality disorder as assessed by the SCID (Raine, 1991).

Subjects judged to have a specific schizotypal trait present as opposed to absent (as judged from a SCID interview) have higher scores on the SPQ sub-scale measuring this trait (Raine, 1991).

Mannan et al. (2001) found that 12 out of 21 (57.1%) of Japanese undergraduates scoring high on the SPQ (mean 51.2, range 34-64) fulfilled full DSM-III-R criteria for schizotypal personality disorder.

Kremen et al. (1998) in their sample of relatives of schizophrenics observed that both of the “definite schizotypal” subjects (p. 35) were in the top 10th percentile on the SPQ.

BRIEF VERSION OF THE SPQ (SPQ-B)

The SPQ-B (Raine and Benishay, 1995) is a quick, two minute, 22 item instrument which is based on the SPQ. It may be used when time limitations in a research protocol does not allow for use of the longer SPQ, or alternatively it may be used to screen large numbers, either by mail or telephone, for predisposition to schizotypal personality disorder prior to a later confirmatory diagnostic interview.

Essentially, the SPQ-B consists of the most reliable items from the original SPQ. The 9 subscales were equally represented in this instrument in order to obtain sampling validity. However, one limitation of the short SPQ-B relative to the SPQ is that the nine sub-scale scores cannot be derived. Instead, the SPQ-B yields a total score, together with scores for each of the three main sub-factors (cognitive-perceptual, interpersonal, and disorganized). Item analysis of the SPQ-B produces essentially the same three-factor structure as is obtained from sub-scale analysis of the SPQ (Axelrod et al. 2001), the SPQ-B factors correlate very highly with the SPQ factors (see below).

Internal reliabilities of these sub-scales range from .72 to .80 with a mean of .76. Axelrod et al. (2001) obtain the similar findings, with reliabilities ranging from (.74 to .76). Two month test-retest reliabilities range from .86 to .95 (mean = .90). Intercorrelations between SPQ-B factors and SPQ factors range from .89 to .94 (mean = .91). Criterion validity as indicated by correlations between SPQ-B subscales and clinical interview measures of SPD are good for the total scale (.66) cognitive-perceptual (.73) and interpersonal (.63), but are lower for disorganized (.36).

As with the SPQ, each "Yes" response scores one point. Scoring for the three factors is as follows.

Cognitive-Perceptual: 2 4 5 9 10 12 16 17

Interpersonal: 1 7 11 14 15 18 21 22

Disorganized: 3 6 8 13 19 20

The total score is the simple summation of the three factor scores. Question numbers from the original SPQ for these items may be located in Table 1 in Raine and Benishay (1995).

Mean scores for the SPQ-B are as follows:

Raine and Benishay (1995) Axelrod et al. (2001) Irwin (2001)

(220 undergraduates) (237 inpatients, (116 Australian adults)

13-19 years)

Cog-Per 3.6 (2.3) 2.7 (2.2) 3.4 (2.0)

Interpersonal 3.6 (2.4) 3.6 (2.4) 3.4 (2.2)

Disorganized 2.5 (1.9) 2.3 (2.0) 2.5 (1.9)

Total score 9.6 (5.3) 8.6 (5.5) -

Scores of 17 and above fall into the top 10% while scores of 2 or less fall into the bottom 8% (Raine and Benishay, 1995).

FACTOR STRUCTURE

Confirmatory factor analysis has repeatedly shown that the SPQ breaks down into three factors of Cognitive-Perceptual Deficits, Interpersonal Deficits, and Disorganized (Raine et al. 1994). This three-factor structure has been closely replicated in England (Gruzelier et al. 1995; Gruzelier, 1996), Taiwan (Chen et al. 1997), Mauritius (Reynolds et al. 2000), Greece (Stefanis et al. 2004b) and France (Doumas et al. 2000). In total it has been replicated in at least 10 independent samples (see Reynolds et al. 2000 for further details). In addition, Vollema and Hoijtink (2000) also found the same three-factor structure in psychiatric inpatients and outpatients using analysis of individual items using generalized multidimensional Rasch models. Stefanis et al. (2004) while providing strong support for the three-factor model also found support for a four-factor model in which a fourth factor of paranoid was made up of loadings from ideas of reference, suspiciousness, and social anxiety. The positive factor was reduced to magical thinking and unusual perceptual experiences. Calkins et al. (2004) employed exploratory PCA on the 74 items and found three factors with eigenvalues > 1 which were highly concordant with the three factors obtained from a CFA of the 9 subscales. These findings in normals were closely replicated in a sample of relatives of schizophrenics.

In addition to the 9 sub-scale scores and the total scale score therefore, scores from the SPQ can be computed to assess these three factors by summating sub-scale scores as follows :

Factor 1: Ideas of Reference

(Cognitive- Odd beliefs / Magical Thinking

Perceptual) Unusual Perceptual Experiences

Paranoid Ideation

Factor 2: Social Anxiety

(Interpersonal) No Close Friends

Constricted Affect

Paranoid Ideation

Factor 3: Odd Behavior

(Disorganized) Odd Speech

TRANSLATIONS

The SPQ has been translated into Russian, Chinese, French (Doumas et al. 1999, 2000), German (Klein, 1997), Italian, Spanish, Polish, Spanish, Dutch, Arabic, and Mauritian Creole. Contact the author if you need a translation into one of these languages.

FINDINGS ON CONSTRUCT VALIDITY

Relatives of schizophrenics

Kremen et al. (1998) show that relatives of schizophrenics have higher scores on cognitive-perceptual factor of the SPQ than controls. A trend (p < .07) was observed for the Interpersonal factor, but there was no main effect for Disorganization. For both Cognitive-Perceptual and Interpersonal factors, males relatives in particular had high scores.

Yaralian et al. (2000) found that relatives of schizophrenics scored significantly higher on the Cognitive-Perceptual factor. These positive findings are in contrast to other schizotypy scales which fail to find higher scores for positive schizotypal features in relatives of schizophrenics.

In contrast to the above-two studies, Calkins et al. (2004) found that 124 biological relatives of schizophrenics differed from 109 normal controls on the interpersonal deficits factor, but not the other two factors, with significant effects also being observed for all four scales making up this factor. Authors suggested that discrepant results may be due to smaller sample sizes in the two former studies, and point out that their findings are more consistent with findings on interview assessments of schizotypy in relatives of schizophrenics which observe strongest effects for interpersonal features, not cognitive-perceptual features. However, consistent with the prior two studies, Calkins et al. (2004) did find relatives of schizophrenics scoring higher on unusual perceptual experiences, and they comment that the SPQ may be a more sensitive indicator of these positive features than interview methods or other self-report instruments.

# Gender Differences

Raine et al (1992b) found that females score higher on positive symptom sub-scales (Ideas of Reference and Odd Beliefs / Magical Thinking) and the factor of Cognitive / Perceptual Dysfunction. Males scored higher on negative symptom sub-scales (No Close Friends, Constricted Affect). These findings replicated across two independent samples. Findings are similar to previous findings of sex differences on schizotypal scales, and are analogous to the sex differences reported in schizophrenic symptomatology. Effects sizes for sex differences are relatively small (.average .31) and may not be detected by small sample sizes. It was argued that possible that sex differences in schizophrenic symptomatology may be an exaggeration of small sex differences found in normals.

Miller and Burns (1995) also found that males scored higher on negative symptoms using the SPQ. However, they did not find females scoring higher than males on positive schizotypal features.

Kremen et al. (1998) in a study of relatives of schizophrenics found a group x sex interactions such that males had higher scores than females on both Interpersonal and Cognitive-Perceptual factors. For Disorganization there was a main effect for Disorganization, with males (irrespective of schizophrenic relative status) scoring higher than females.

Langdon and Coltheart (1999) found higher cognitive-perceptual scores in females, and high interpersonal deficits in males.

Roth and Baribeau (1997) found that males are significantly higher only on the Eccentric-Odd Behavior subscale of the SPQ , while females score higher on the Ideas of Reference, Odd Beliefs/Magical Thinking, and Social Anxiety subscales. Females also scored higher on the Cognitive-Perceptual and Interpersonal Deficits factors.

Frontal neurocognitive tasks

Spatial working memory Poor spatial working memory is found to characterize high scorers on the SPQ, particularly those scoring high on poor social functioning (Park and McTigue, 1997).

Olfactory identification Males with high SPQ scores on the interpersonal Deficits factor made more olfactory identification errors than did low-scoring males, findings not attributable to differences in olfactory acuity per se (Park et al. 1996). Findings were interpreted as suggesting orbitofrontal (olfactory identification) deficits in males with negative schizotypal features.

Wisconsin Card Sort Daneluzzo et al. (1998) found significant relationships between total and subscale scores on the SPQ and performance on the Wisconsin Card Sorting task.

Continuous Performance Task. High SPQ scorers have been shown to perform more poorly on the continuous performance task (Chen et al. 1998). Chen et al. (1997) found that high scores on the Interpersonal and Disorganized factors (but not the Cognitive-Perceptual factor) was associated with poor performance on the continuous performance task.

Handedness

Mixed-handed subjects (relative to left and right handed subjects) have higher scores on the Cognitive-Perceptual factor and its sub-scales of Unusual Perceptual Experiences, Paranoid Ideation, Odd / Eccentric Behavior, and Odd Speech (Kim et al., 1991). The single best correlate of mixed handedness was the Odd Speech sub-scale. This appears consistent with findings of associations between thought disorder and sinistrality in schizophrenics. Mixed handedness has previously been found to be selectively related to Magical Ideation and Perceptual Aberration, but not with more negative features such as anhedonia (Chapman and Chapman, 1987).

Poreh (1993) failed to find a relationship between mixed handedness and the SPQ, but Poreh et al. (1997) found that high scorers on the SPQ were more likely to be non-right handed, especially for skilled tasks. Gruzelier and Doig (1996) found that left-handedness, and to a lesser extent mixed-handedness, was associated with odd speech, odd behavior, and negative (withdrawn) SPQ traits.

Hemisphere asymmetries.

Gruzelier et al. (1995) showed that high scores on the more positive SPQ traits (Gruzelier’s “active” syndrome) are associated with left temporo-parietal dysfunction, whereas more negative SPQ traits (“withdrawn”) are associated with right temporo-parietal dysfunction. Similar findings were again reported by Gruzelier and Doig (1996) in which withdrawn scales (Loneliness and constricted affect) were associated with a right hemisphere, face advantage asymmetry, while active scales (odd behavior and odd speech)were associated with self-report activation.

Klein et al. (1999) show that high scorers on the SPQ have smaller left-than-right temporal P300b amplitudes, and also a failure to show the right-sided predominance in the post-imperative negative variation (PINV) observed in normals (Klein et al. 1998).

Cognitive functioning

Negative priming Moritz et al. (1998) found that high scorers on the "positive" SPQ scales showed reduced negative priming. Skosnik et al. (2001) also found that high SPQ scorers show reduced negative priming. In contrast, with the exception of social anxiety, no “negative” subscale was associated with negative priming. In a later study no relationships with semantic priming were observed (Moritz et al. 1999).

Latent inhibition. Baruch et al. (1988) found high SPQ scorers to show reduced latent inhibition relative to low scorers. Latent inhibition was measured using an auditory task, and results were interpreted as indicating an inability to screen out irrelevant information in schizotypals. Wuthrich and Bates (2001) in contrast in an Australian sample observed significant non-linear relationships between auditory latent inhibition and the SPQ, with both low and high scorers showing reduced latent inhibition. The same effects were observed fro priming. Braunstein-Bercovitz (2000) observed disrupted latent inhibition in those scoring high on the SPQ and argued that the anxiety component of the SPQ, more than the cognitive – perceptual and disorganization features, that accounts of latent inhibition deficits.

#### Shadowing In a shadowing task involving two prose passages presented simultaneously, high SPQ scorers were more likely to show intrusion errors from the passage to be ignored (Hall and Habbits, 1996).

Reaction-time cross-over Sarkin et al. (1998) using the SPQ showed that negative schizotypal symptoms were associated with the early reaction-time crossover pattern, while positive schizotypal symptoms related to longer overall reaction time.

Defective mentalizing Langdon and Coltheart (1999) observed those with selective mentalizing deficits (measured by a false-belief picture sequencing task) to score higher on cognitive-perceptual and interpersonal deficits, but not on disorganization. In a second experiment they obtained effects for disorganization and cognitive-perceptual deficits, but not interpersonal deficits.

Trail making Slower performance on Trails A and B and the Stroop task have been associated with higher scores on the Disorganization factor of the SPQ (Moritz et al. 1999).

Psychophysiological functioning

EEG High-scorers on the SPQ show greater left hemisphere EEG activation (Kidd and Powell, 1993). This same finding was shown for persistent schizotypals (defined as those high on the Venables measure of schizophrenism at age 17 years and the SPQ at age 23 years); such individuals showed reduced slow-wave EEG power (delta, theta, alpha 1)over the left (but not right) hemisphere during the beginning of the continuous performance task.

Event-related potentials. High scorers on the SPQ show lower amplitudes of the P300b (Klein et al. 1999), and a failure to show the right-sided predominance in the post-imperative negative variation (PINV) observed in normals (Klein et al. 1998). Those scoring high on the SPQ (range 43-64) who also fulfilled criteria for DSM-III-R SPD smaller auditory P300 amplitudes and longer latencies compared to low-scoring controls (Mannan et al., 2001).

Eye tracking abnormalities. Subjects screened on the SPQ (top 10% scorers) who also get a confirmed clinical diagnosis of SPD are found to have significantly poorer eye tracking abnormalities (Lencz et al. 1993)

Skin conductance arousal and orienting abnormalities. Raine et. al. (1997) have found that those scoring in the top 10% of the SPQ and who have a diagnosis of schizotypal personality disorder show retarded SC habituation relative to low-scoring subjects. It was hypothesized that this retarded habituation reflects a deficit in per-attentive template matching which may partly relate to the working memory and prefrontal deficits observed in both schizophrenics and schizotypals (Park and Holzman, 1992, Park et al. 1997).

Persistent schizotypals (defined as those high on the Venables measure of schizophrenism at age 17 years and the SPQ at age 23 years) showed significantly increased skin conductance arousal and increased skin conductance amplitudes to neutral and aversive stimuli at both ages 3 and 11 (Raine et al. 2001). Findings were taken to support the view that heightened SC arousal and orienting in early childhood is a significant risk factor for later schizotypal personality.

# Pubertal timing

Gruzelier and Kaiser (1996) in a study of pubertal timing (early, normal, late) developed three syndrome scores form the SPQ: Active, Withdrawn, and Unreality. Those with both early and late development of puberty showed higher Unreality scores compared with the normal maturers. Compared with the late maturers, early maturing females were Withdrawn, and showed features of social withdrawal. In females, the Active syndrome was associated with late maturation. In contrast, Withdrawn males were late maturers, with features of social withdrawal and social anxiety.

Personality

Total SPQ scores map on to the Neuroticism (r = .47) and Extraversion (r = -.36) components of the NEO (Wuthrich and Bates, 2001). In addition to these findings, Widiger (1998) finds an addition relationship with low Agreeableness and the SPQ.

Wuthrich and Bates (2001) report a significant positive association between creativity and the SPQ.

# Clinical features

# Drug use Current cannabis users have been found to have higher scores on the SPQ than past users and controls (Skosnik et al. 2001)

Childhood Trauma Irwin (2001) find significant positive correlations between all three SPQ-B sub-factors and physical, sexual, and emotional trauma in a sample of Australian adults drawn from university and community settings.

Dissociative experiences High SPQ-B scorers were more likely to have dissociative traits (Irwin et al. 1999). High scorers on the SPQ-B were found to have higher pathological and nonpathological dissociative scores even after removal of the influence of earlier childhood trauma (Irwin, 2001). High SPQ-B scores correlate positively with dissociative experiences in adolescents, with the Cognitive-Perceptual sub-factor correlating more strongly with imaginative involvement than the Interpersonal deficits factor (Axelrod et al. 2001). Irwin (1998) similarly report significant relationships for all three SPQ-B sub-factors and dissociative experiences in a mixed undergraduate and community sample.

Obsessive-compulsive personality Roth and Baribeau (2000) in an investigation of schizotypy and obsessive-compulsive personality found that the strongest links with the SPQ were for compulsive checking as opposed to compulsive washing, slowness or doubting. Tallis and Shafran (1997) find that OCD patients with higher SPQ scores have higher obsessive-compulsive features, and find particularly strong links between the Cognitive-Perceptual subscale even after controlled for anxiety and depression.

Personality disorder. Axelrod et al. (2001) find that all sub-factors of the SPQ-B correlate positively with the introversion (schizoid) and inhibited (avoidant) subscales of the MACI, but that these correlations were significantly higher for the Interpersonal Deficits factor ( r = .49 to .66) than for Cognitive-Perceptual and Disorganized factors (r = .22 to .46).

Behavior problems Persistent schizotypals (defined as those high on the Venables measure of schizophrenism at age 17 years and the SPQ at age 23 years) show higher age 17 behavior ratings on conduct disorder, as well as on psychotic behavior and anxiety-withdrawal (Raine et al. 2001).

Genetics.

The SPQ was administered to approximately 90 pairs of MZ and DZ twins in Los Angeles in a pilot study. If schizotypal personality is genetically related to schizophrenia, it would be predicted that the SPQ should have a significant genetic loading. Preliminary analyses indicated heritabilities of about .40 for the total scale and sub-factors (Raine and Baker, 1992a).

Stefanis et al. (2004) found a relationship between the SPQ and variation in the COMP gene in army conscripts. Specifically, conscripts with the high activity val allele had higher scores on the negative and disorganized factors, but not on positive and paranoid factors. These findings replicated those of Avramopoulos et al. (2002) showing a link between total SPQ scores and the val loading on COMP.

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