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## The Rust Inventory of Schizotypal Cognitions (RISC)

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It has long been argued that the bizarre idea systems of the schizophrenic patient, the odd ideas of the schizotypal personality, and normal cognition lie on a continuum ( [Kraepelin 1919](#); [Chapman 1966](#); [Heston 1970](#); [Spitzer et al. 1979](#); [Chapman and Chapman 1980](#)). If this is the case, then the position of an individual on this continuum should be psychometrically measurable as with, for example, some subscales of the Minnesota Multiphasic Personality Inventory (MMPI) ( [Golden and Meehl 1979](#)). However, the MMPI emphasizes diagnostic discrimination in the psychiatric patient population at the expense of normal population validity. The Eysenck Psychoticism Scales (The PEN, PI, PQ, EPQ, and EPQ-R) ( [Eysenck and Eysenck 1976](#); [Eysenck et al. 1985](#)) were intended to be more applicable to the normal population, but they have suffered from an asymmetrical distribution, poor discrimination between psychotic and normal control subjects, a conceptual confusion with psychopathy and tough-mindedness, poor face and content validity, a heavy sociobiological bias, and a conceptual straightjacket imposed by the pre-existing Extroversion and Neuroticism scales ( [Claridge and Broks 1984](#)).

The *DSM-III-R* and related category systems ( [American Psychiatric Association 1987](#)) have now led to the widely held view that the schizophrenic-normal spectrum is not unitary, and it has been postulated ( [Spitzer et al. 1979](#); [Stone 1980](#); [Lanin-Kettering and Harrow 1985](#)) that different dimensions relate different aspects of schizophrenic symptomatology to the schizoid personality, personality disorder, and the schizotypal personality, respectively. When common language usage is considered, personality disordered individuals or psychopaths have many attributes associated with "bad" people, while schizotypal individuals have attributes associated with "mad" people, and this seems to be an important distinction. Two scales to measure different aspects of schizophrenia proneness have been constructed by [Chapman et al. \(1976, 1978\)](#); however, these have concentrated on anhedonia and body-image aberration, and thus emphasize the negative symptoms of schizophrenia. [Claridge and Broks \(1984\)](#) report two scales, the STA and the STB, which look at the positive and the negative symptomatology of schizophrenia, respectively ( [Crow 1980](#)), but these were not psychometrically constructed.

[Baron et al. \(1981, 1985\)](#) describe a diagnostic interview specifically designed to diagnose along a spectrum from schizophrenic to normal thought through the schizotypal personality. This instrument is of particular interest as it emphasizes the positive cognitive content of schizotypal ideation rather than the negative aspects of cognitive deficit. It thus has more affinity with popular ideas of "madness" than do other dimensional theories of schizophrenia. This cognitive emphasis for schizotypy also has certain parallels with the cognitive approach to depression and anxiety taken by [Beck et al. \(1979, 1985\)](#).

The Rust Inventory of Schizotypal Cognitions (RISC) ( [Rust 1987, 1988](#)) is a short questionnaire designed to tap this cognitive schizotypal dimension in the normal population. It takes as its source the idiosyncratic ideas of those who are seen to be schizotypal or eccentric; *DSM-III-R* category A of schizophrenia and *DSM-III-R* categories 1, 3, 4, 5, 7, 9 of schizotypal personality disorder ( [American Psychiatric Association 1987](#)). These schizotypal ideas form the extremes of the cognitive schemata of suspicion, magical ideation, ritual, subjectivity, thought isolation, and self-delusion which are not uncommon in the normal population.

### Methods

#### Test Specification

The test specification was two-dimensional. The first axis defined content, and it included areas traditionally associated with positive schizophrenic and schizotypal symptomatology (delusion, derealization and depersonalization, ideas of reference, intrusive and extrusive thought, hallucination, and persecution) as well as

idea systems often associated with these (magical ideation, superstition, secretiveness, coherence of identity, subjectivity, ritual, and fantasy). The second dimension covered ways in which the cognitive variation may manifest itself: insight, emotion, motivation, social observation, distorted reality, and defense mechanisms.

One particular problem for all psychosis-related scales has been the difficulty of producing relevant items that are acceptable to nonpatients and have no obvious cues identifying them as good (healthy and normal) or bad (ill or mad). This, as well as the extremity of the items, has generally led to large positive skews in the distributions for the normal population. To overcome the problem of extreme items, the RISC was developed in two pilot stages. The first stage identified moderate items which correlated with the more traditional extreme items with high face validity, while the second stage was a more formal one of item selection and elimination.

### **Stage 1 Pilot Study**

Four hundred and fifty items within guidelines produced by the test specification were generated and reduced to a 300-item pilot version. All items were statements with a 4-point forced choice response set (Strongly Agree, Agree, Disagree, Strongly Disagree).

Item analysis was carried out on responses from 183 subjects, mostly mature students at the London University Institute of Education, or teachers. Extreme items, defined as more than 8 people out of 10 responding to the item in the same way, which had good face validity were selected. These provided an intermediate correlational validation of the moderate items, but they were subsequently eliminated. Factor analysis showed that the structure of the questionnaire continued to be a projection of the test specification. This was best described using a 10-factor solution. Three of these factors were related to paranoid symptomatology (paranoia, delusions of grandeur, and secretiveness), three to general schizophrenic symptomatology (hallucination, derealization and depersonalization, and thought direction), three to defense mechanisms (defense of identity, defense against disturbing ideas, and avoidance of unfamiliar situations), and one to ritual. An intermediate 120-item version of the questionnaire was constructed which included a balanced number of positive and negative items from each of these factors.

### **Stage 2 Pilot Study**

The 120-item version was administered to three groups to search for an item structure that was parallel across differing populations. Group 1 consisted of 70 men and 70 women from a student, academic, and support population in London University. This British group was English speaking but racially and culturally heterogeneous. The mean age of the sample was 33.43 years (most of the students were mature). Group 2 was a rather younger sample (aged 17–20 years) of 161 male and 154 female, oriental Hong Kong students from English medium colleges. Group 3 consisted of 104 men and 504 women from the University of Venezuela in Caracas (mean age 24.96 years), the questionnaire being administered in Spanish translation. The three groups therefore represented speakers of English as a first language, Chinese speakers with English as a second language, and speakers of a non-English language (Spanish). For each group separately the data were factor analyzed (principal axis), and a projection scale was constructed from equal numbers of positive and negative items taken from the first two factors rotated to eliminate acquiescence effects. Item correlations with this projection scale provided a pool of items that were further selected to balance across the test specification. Items were then reduced by classical item analysis to eliminate those with poor discriminability. Items that were nonparallel across the three samples were additionally excluded to minimize cultural or linguistic bias. Further analysis in which the sample was broken down by sex within the groups showed that there were no important sex differences in the items. The resultant scale had 13 positive and 13 negative items, whose item characteristics appear in [table 1](#). The analysis of variance test of nonadditivity was nonsignificant ( $F = .74$ ,  $df = 1/15$ , 174). The correlation with age across the three nonpatient groups was  $-.18$ ,  $p < .001$ , with younger persons showing higher scores. There were no significant sex or social class differences. The split-half reliabilities and Cronbach  $\alpha$  coefficient for the RISC were both  $.77$ .

**Table 1. Adjusted item total correlations on the RISC for 4 groups of subjects**

	Group 1	Group 2	Group 3	Group 4	Total sample
Mean age (yr)	33.4	18.3	25.0	36.4	24.6
Men (n)	70	161	104	13	367
Women (n)	70	154	504	18	761
<b>Item</b>					
1	.19	.23	.15	.59	.20
2	.27	.09	.07	-.05	.14
3	.22	.15	.13	.21	.20
4	.26	.25	.21	.35	.28
5	.32	.07	.27	.57	.25
6	.50	.18	.29	.39	.31
7	.20	.08	.14	.05	.17
8	.02	.24	.12	.09	.15
9	.35	.08	.23	.56	.21
10	.39	.16	.10	.26	.19
11	.09	.12	.11	.01	.15
12	.40	.11	.26	.36	.30
13	.17	.28	.22	.50	.24
14	.38	.13	.20	.37	.27
15	.23	.14	.33	.26	.31
16	.22	.04	.06	.24	.11
17	.47	.21	.31	.28	.36
18	.53	.17	.12	.27	.22
19	.14	.08	.20	.10	.18
20	.33	.12	.14	.33	.19
21	.31	.21	.25	.15	.20
22	.34	.27	.29	.21	.28
23	.53	.31	.33	.57	.34
24	.39	.22	.11	.41	.21
25	.41	.17	.15	.56	.20
26	.39	.17	.16	.42	.29

Note—RISC = Rust Inventory of Schizotypal cognitions. Group 1 = British. Group 2 = Hong Kong. Group 3 = Venezuela. Group 4 = British acute schizophrenia. Both British groups were from a multicultural inner city area. The Hong Kong Group consisted of English-speaking Chinese. The Venezuelan group all spoke Spanish, and the RISC was administered in Spanish translation. The statistics are also given for the total sample, which contained a few additional subjects.

#### *Adjusted item total correlations on the RISC for 4 groups of subjects*

#### **Validity**

A sample of 61 acute presenters at psychiatric clinics and hospitals meeting *DSM-III* schizophrenia category A criteria (The Royal Bethlem and Maudsley Hospitals, St. Mary's Hospital, Dulwich Hospital, and St. George's Hospital, all in London) was obtained to check the discriminative validity of the RISC between this group and the nonschizophrenic groups. However, 19 subjects were subsequently eliminated on the basis of *DSM-III* schizophrenia categories B to F, and 11 additional patients were unable to complete the questionnaire properly. There were 13 men and 18 women in the acute schizophrenic group, with a mean age of 36.41 years. The British group and the schizophrenic group were not significantly different in age or sex. Analysis of variance comparing RISC scores in the schizophrenic group (mean = 47.83, SD = 9.87) with the London group (mean = 35.67, SD = 7.67) was significant at the .001 level, as were further separate and combined analyses comparing the schizophrenic group with the Hong Kong group (mean = 38.65, SD = 5.41) and the Venezuelan group (mean = 34.27, SD = 5.48). If a scale score of 49 was taken as a cutoff, more than 4 out of 10 schizophrenics had a score higher than this as compared to fewer than 3 out of 200 nonpatient controls.

[Rust et al. \(in press\)](#) looked at the relationship between the RISC and the Eysenck Personality Questionnaire (EPQ) ([Eysenck and Eysenck 1976](#)). A correlational analysis between the two scales in the sample of 608 Venezuelan university students (both scales in Spanish translation) showed that the RISC and EPQ Psychoticism have a rather low, although significant, correlation of .12. The RISC, however, was found to have a noticeable correlation of .38 with the EPQ Neuroticism scale. These results are considered further in the discussion. [Rust and Chiu \(in press\)](#) carried out a validation of the RISC against the Minnesota Counseling Inventory (MCI) ([Berdie and Layton 1957](#)). Subjects were 174 Hong Kong pre-university students from four English medium schools in Hong Kong (86 boys and 88 girls, mean age 18.20 years, SD = .91), subjects were all oriental, but had been educated in English from an early age and were bilingual in Chinese and English. The MCI was used to

identify the characteristics of interpersonal disharmony and emotional instability identified in a study by [Watt et al. \(1982\)](#) as being characteristic of people at risk for schizophrenia by virtue of having a schizophrenic parent. The RISC correlated significantly with all MCI subscales. The size of the correlations showed that high RISC scorers are particularly high on emotional instability, ( $r = .45$ ) and nonconformity ( $r = .40$ ), but correlations with low mood ( $r = .27$ ) and poor social relations ( $r = .26$ ) were also significant at the .001 level. The RISC thus showed a degree of concurrent validity with the MCI subscales.

### Discussion

The content and face validity of the RISC are clearly apparent. The major validation for the RISC was against a target group of acute schizophrenic presenters. The discrimination between these groups has been shown to be high, providing little overlap between the patient and normal population.

A study of the RISC's correlations with the EPQ confirms that the RISC and the EPQ Psychoticism scales are measuring rather different constructs. Inspection of item correlations showed that a common element between the two scales exists only for paranoid items, and an inspection of the face validity of the items confirmed that this is the only area in which the test specifications overlap. Items other than the paranoid items within the EPQ Psychoticism scale seem to be more obviously related to psychopathy and personality disorder than to the schizotypal personality and borderline schizophrenia. The results confirm those of [Claridge and Broks \(1984\)](#), who found that only their STB scale (related to personality disorder) correlated with EPQ Psychoticism. The STA scale (related to the schizotypal and borderline schizophrenic personality) had no relation with the EPQ Psychoticism Scale. Claridge and Broks also found that both of their scales, like the RISC, correlated with Eysenck's Neuroticism scale, and all these results suggest that Eysenck may well have been misguided in attempting to construct a Psychoticism scale completely orthogonal to Neuroticism. Borderline psychotic states have traditionally tended to some degree of diagnostic overlap with the neuroses.

To what extent are persons with a high score on the RISC "at risk" for schizophrenia or schizotypal disorders phenomenologically related to it? The items of the RISC have been constructed from downward projections into the normal population of diagnostic symptomatology. Thus, for each positive item response, there is an increased probability of the subject's exhibiting a schizophrenic or schizotypal symptom. The cumulative summation of these items produces a test score that reflects the conceptual framework of normal diagnostic procedure for the positive symptoms. The concept of risk is implicit in the RISC through its content validity insofar as it measures a schizophrenic/schizotypal/normal continuum ([Kraepelin 1919](#); [Chapman 1966](#)), and it is an emergent property of current diagnostic practice.

Risk for schizophrenia has frequently been viewed within a biological framework, and indeed genetic studies ([Heston 1970](#); [Gottesman and Shields 1982](#)) have demonstrated that schizophrenic symptomatology has a strong genetic link. [Gunderson and Siever \(1985\)](#) further argue that the genetic link is much stronger for negative symptoms than for positive ones, although this contention is disputed by [McGuffin et al. \(1987\)](#). [Mednick et al. \(1975\)](#), pursuing a family study of genetic links between schizophrenic and criminal subjects, also argued that it was the psychopathically related symptoms of schizophrenia that dominated in any genetic causality. Generally, studies within the sociobiological approach have emphasized the negative symptoms of schizophrenia at the expense of the positive ones.

Perhaps also because of this sociobiological emphasis, there has been a tendency to view genetic relationship as the only manner for identifying a population of persons at risk for schizophrenia. However, since the development of cognitive theories of anxiety and depression (e.g., [Beck et al. 1979, 1985](#)), there has been a shift within clinical theory toward cognitive rather than behavioral or sociobiological explanations for the etiology of these disorders. In schizophrenia research, cognitive aspects have always been considered important, but much of the emphasis has been on cognitive deficit and negative symptoms, instead of on the cognitive content of positive symptoms. However, cognitive content is now receiving more attention, and interest has developed in the manner in which cognitions manifest themselves at different stages of information processing ([Fritz 1979](#)). While cognitive research of this type is compatible with many biological or behavioral assumptions, it does additionally allow scope for other forms of explanation for schizophrenic risk. Much of the interest in the schizophrenic/normal continuum stems from the way it relates the positive schizotypal symptoms of bizarre and idiosyncratic thinking to forms of eccentric, religious, or creative thought in otherwise normal people. The items of the RISC, although based on acute schizophrenic and schizotypal borderline symptomatology, measure, by degrees, ideas that frequently are seen as "risky" by the general population, and that are related to the fear of madness in normal individuals. The RISC is thus sensitive to that part of the normal/schizophrenic continuum which is of special interest to those who wish to investigate the relationship between normal cognitive functioning and the very particular forms of cognitive dysfunction found in schizophrenia and its schizotypal borderline.

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