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Pre-morbid Psychopathology in Schizophrenia Spectrum

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In a prospective, longitudinal study of high-risk offspring of schizophrenic mothers, of several dimensions of pre-morbid behaviour 'peculiarity' predicted subsequent schizophrenia or schizotypy. Peculiarity/eccentricity may represent a subtle marker of the schizophrenic genotype. 'Pre-schizophrenics', as compared with 'pre-schizotypes', were characterised by affective dyscontrol, reflected in less introverted and more disturbed behaviour.

Both Kraepelin (1971, first published 1919) and Bleuler (1950, first published 1911) emphasised the similarity of pre-morbid characteristics in schizophrenia to mental deviations observed in relatives of schizophrenics, in schizophrenics in remission, and in very 'pure' or 'basic' forms of schizophrenia. Consequently, such characteristics could be regarded as 'trait' disorders or markers indicating presence of the schizophrenic genotype. In fact, in the current version of the DSM (DSM-III-R; American Psychiatric Association, 1987), there is a substantial overlap between schizotypal features and prodromal and residual symptoms of schizophrenia.

We have previously reported that elevated levels of defective emotional rapport and formal thought disorder at the age of 15 years predicted an adult schizophrenia spectrum in the offspring of schizophrenic mothers (Parnas *et al*, 1982*a*). Gunderson *et al* (1983) reported results from the Danish adoption sample indicating that eccentricity and paranoid traits were genetically related to typical process schizophrenia. Similar results emerged from a Norwegian twin study (Torgersen, 1985). Such results are consistent with the views of Bleuler and Kraepelin, who considered unique disturbances in interpersonal and social functioning as cardinal symptoms of schizophrenic disorders.

In the present study, we evaluated the prognostic value of different personal attributes as recorded pre-morbidly at the mean age of 15 years with respect to outcome ten years later. Specifically, we were interested in disentangling 'defective emotional rapport' into 'passive' (introverted) and 'inadequate' (peculiar) components. In fact, Stransky identified two dimensions in the Kraepelinian concept of 'emotional deterioration' (which according to Kraepelin was a fundamental symptom of schizophrenia): "First, the poverty or superficiality of emotional reactions; second, their incongruity with the ideational content dominating the psyche at that time, the latter being predominant at the onset of the disease" (Stransky, 1903).

Method

The present investigation is a part of an ongoing prospective longitudinal study of children of schizophrenic mothers (Mednick & Schulsinger, 1965). In 1962, 207 children (mean age 15 years) of schizophrenic women (of whom 91% meet the DSM-III-R criteria for schizophrenia (Jorgensen *et al*, 1987)) were pre-morbidly examined by a psychiatrist (Dr Fini Schulsinger) who completed an adjective check-list (ACL) consisting of 241 adjectives rated as appropriate or inappropriate to the subject and referring to the subject's mental status and behaviour during the interview.

In addition, a school behaviour questionnaire (SBQ) consisting of 30 questions was completed by the teacher most familiar with the subject. Behaviours were rated as present or absent. Since the study was prepared in the late 1950s, no modern reliability measures were performed.

In 1972–74, a ten-year diagnostic follow-up of 175 subjects of the original sample (mean age 25 years) was performed (Schulsinger, 1976) using a comprehensive interview consisting of the Present State Examination (Wing *et al*, 1974), Current and Past Psychopathology Scales (Endicott & Spitzer, 1972), and numerous additional ratings of various schizophrenia spectrum characteristics, such as subtle perceptual disturbances, formal thought disorder, and the quality of emotional rapport. On the basis of this reassessment, 15 subjects (including two deceased for whom only hospital record information was available) were diagnosed as ICD-8 schizophrenic (all of whom are DSM-III schizophrenic) and 29 subjects as ICD-8 borderline schizophrenics who fulfil the current DSM-III-R diagnosis of schizotypal personality disorder (Schulsinger & Parnas, 1988).

We have pooled schizophrenics and schizotypes ($n = 44$) on the assumption that they carried a greater genetic predisposition to disease, and on the basis that these disorders are of comparable inheritance (Inouye, 1970; Gottesman & Shields, 1972; Kety *et al*, 1978; Parnas *et al*, 1985). The remaining sample consisted of a group with various non-schizotypal diagnoses (diverse personality disorders and neuroses) ($n = 76$) and a group without any mental illness ($n = 55$). Pooling the diagnostic groups was determined not only by our theoretical assumptions, but also by our ultimate reliance on multivariate non-parametric statistics with binary outcome (Fleiss *et al*, 1986).

For the purpose of analyses, we have generated *a priori* scales from the ACL and SBQ. From the ACL it was

TABLE I
Pre-morbid behaviour scales

	Cronbach's α
Peculiarity[1]	0.68
peculiar *(ejendommelig)*, fatuous *(fjoget)*, awkward *(kejtet)*, clownish *(klovnet)*, giddy *(pjanket)*, queer *(sær)*, eccentric *(særpræget)*,	
Introversion–schizoid[1]	0.72
dreamy *(drømmende)*, cautious *(forsigtig)*, shy *(genert)*, inhibited *(hæmmet)*, introvert *(indadvendt)*, shut-in *(indesluttet)*, cool *(kølig)*, reserved *(reserveret)*, detached *(sky)*, silent *(tavs)*, withdrawn *(tilbageholdende)*	
Paranoid[1]	0.48
hostile *(fjendtlig)*, distrustful *(mistroisk)*, rigid *(rigid)*, formal *(stiv)*, guarded *(vagtsom)*	
Schizoid class behaviour	0.76
rarely asks questions, rarely takes the initiative, rarely takes part in spontaneous activities, seldom laughs or smiles, has difficulty in making friends, content with isolation, shy, reserved, and silent, uncomfortable in contact with classmates, uncomfortable in contact with the teacher, behaviour marked by passivity	
Class-disturbing behaviour	0.75
easily upset, excitement persists, disturbs class, dominating and aggressive, creates disciplinary problems	

1. Translations from the Danish.

possible to create scales measuring introversion/schizoid behaviour, peculiarity, and paranoid tendencies. In each case, a scale score was expressed as the number of adjectives appropriate to the subject. Similarly, from the SBQ we created scales measuring schizoid class behaviour (SCB) and class-disturbing behaviour (CDB).

The scales were subjected to an item analysis (Cronbach, 1951) which maximises biserial correlations between items and scale totals. The scales' composition and their measures of internal consistency appear in Table I. Cronbach's α could not be further improved by deletion of any items.

The composition of the scales was determined by the availability of items, our clinical judgement, and various literature sources. Since the nature of the data is at best ordinal, non-parametric statistical methods were employed (Mann–Whitney *U* test, Kendall's tau correlations). As a multivariate technique we have utilised logistic regression, which is adequate for ordinal data with dichotomous dependent variables (Fleiss *et al*, 1986). For the purpose of comparing relative contributions from schizophrenics and schizotypes to the possible differences, an analysis of variance with subsequent multiple range tests was employed. Probability levels below 5% were accepted as statistically significant.

Results

The comparison of schizophrenia spectrum (i.e. schizophrenia and schizotypy) v. the remainder of the high-risk sample on measures of pre-morbid behaviour is shown in Table II.

Those who later suffered schizophrenia spectrum disorders scored significantly higher on pre-morbid ratings of peculiarity and paranoia, whereas introversion, SCB, and CDB ratings did not discriminate between the groups.

TABLE II
Pre-morbid behaviour: schizophrenia spectrum v. others

	Peculiarity	*Introversion*	*Paranoid*	*Schizoid class behaviour*	*Class-disturbing behaviour*[1]
Schizophrenia spectrum ($n=44$)					
mean	1.18	2.59	0.82	7.68	4.27
s.d.	1.5	2.3	0.9	2.3	1.1
Other or no disorders ($n=131$)					
mean	0.51	2.35	0.53	8.01	4.39
s.d.	0.9	2.2	0.8	2.1	1.2
Two-tailed *P*, Mann–Whitney *U*-test	0.002	NS	0.03	NS	NS

1. High scale value corresponds to low level of abnormal behaviour.

TABLE III
Tau correlations within pre-morbid behaviour scales

	Introversion	*Paranoid*	*Schizoid class behaviour*[1]	*Class disturbing behaviour*[1]
Peculiarity	0.16**	0.36**	−0.08	−0.06
Introversion		0.32**	−0.13*	−0.11
Paranoid			−0.18**	−0.03
Schizoid class behaviour				0.17*
Class-disturbing behaviour				-

*$P<0.05$, 2-tailed, **$P<0.01$, 2-tailed.
1. High scale value corresponds to low level of abnormal behaviour.

Because all five scales were correlated (see Table III), we performed a series of logistic regressions in order to separate correlated effects. Following free entry, only peculiarity retained its predictive power ($P=0.01$).

Since introversion, SCB and CDB were far from reaching predictive significance, we performed a separate logistic regression entering only peculiarity and paranoia and the interaction term between those two. Only peculiarity was a significant predictor ($P<0.001$).

In order to examine the specificity of the diagnostic differences, we performed a one-way analysis of variance on schizophrenia, schizotypy (schizophrenia spectrum), other diagnoses, and no mental illness. Peculiarity was a significant predictor of schizophrenia spectrum from the other diagnostic groups (i.e. other diagnoses and no mental illness), which did not differ from each other (mean values close to 0.5). In the case of paranoia, a similar analysis of variance indicated that those with no mental illness scored significantly lower than subjects in all other diagnostic groups, who did not differ from each other. These results are in agreement with those obtained from logistic regression analysis.

A comparison between predictors of schizophrenia v. schizotypal personality disorder appears in Table IV. 'Pre-schizophrenics' scored higher on CDB and lower on introversion. These were the only significant differences. Finally, we performed a logistic regression with free entry of all scales. Only high levels of CDB discriminated 'pre-schizophrenics' from 'pre-schizotypes' ($P<0.002$).

We did not detect any relationship between sex and the predictive value of the scales.

Discussion

The present investigation provides support for the original conceptualisations of which symptoms are cardinal to schizophrenia spectrum disorders. Both Bleuler and Kraepelin considered unique disturbances in emotional contact with the patient as so-called fundamental (or axial), i.e. pathognomonic, features of schizophrenia. This idea was shared by many of their contemporary researchers (Stransky, 1903, 1904; Jung, 1960, first published 1907; Kretschmer, 1925; Minkowski, 1927; Jaspers, 1963).

However, all these authors did not attribute the uniqueness of this emotional disturbance to pure introversion, but rather to a disorganisation of mental activity as a whole, e.g. "psychaesthetic disequilibrium" (Kretschmer, 1925), "loss of inner unity" (Kraepelin, 1971). Ruemke (1942) claimed that experienced psychiatrists may have, "often at a glance", a feeling that a person is schizophrenic. This "praecox feeling" signified the inability to empathise with the patient's personality as a whole.

TABLE IV
Pre-morbid behaviour: schizophrenic v. schizotypic

	Peculiarity	*Introversion*	*Paranoid*	*Schizoid class behaviour*[1]	*Class disturbing behaviour*[1]
Schizophrenic ($n=15$)					
mean	1.00	1.53	0.60	7.45	3.64
s.d.	1.4	1.7	0.9	2.8	1.6
Schizotypic ($n=29$)					
mean	1.28	3.14	0.93	7.78	4.54
s.d.	1.6	2.4	0.88	2.0	0.8
Two-tailed *P*, Mann–Whitney *U*-test	NS	0.03	NS	NS	0.04

1. High scale value corresponds to low level of abnormal behaviour.

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Jaspers (1963) formulated it similarly: "we do not grasp it; instead we enumerate a vast number of particulars or simply say un-understandable". Originally such an idea was vividly expressed by Stransky (1904) as a so-called "intrapsychic ataxia", i.e. the dissociation or dyscoordination between and within cognition, emotion and their expression (e.g. formal thought disorder, parathymia and paramimia). One may consider the dimension of peculiarity/eccentricity/oddity as related to the above-mentioned schizophrenic phenomena such as "loss of inner unity" and "intrapsychic ataxia", where components of expressive behaviour do not genuinely and cohesively fit with each other.

In our earlier study (Parnas *et al*, 1982*b*) we found pre-morbid measures of formal thought disorder predictive of later schizophrenia spectrum disorder. This finding is concordant with the general notion of Stransky and Bleuler that disintegration in schizophrenia is operating both within and between cognition and emotion. It may be appropriate to consider the so-called 'negative symptoms' as composite and multidetermined (Sommers, 1985). The symptom of inadequate rapport or eccentricity may actually represent a 'direct' reflection of the schizophrenic genotype, whereas other 'negative' symptoms, such as severe anergia, may constitute an interactional product of genetic vulnerability and organic insult to the central nervous system (Cannon *et al*, 1989; Parnas *et al*, 1988). In fact, recent factor analytic studies demonstrated that inappropriate affect (Gibbons *et al*, 1985) and bizarre behaviour (Bilder *et al*, 1985) do not correlate with avolition/apathy. Paranoid attitude, as observed pre-morbidly, was a univariate predictor of later schizophrenia spectrum, but was not specific to this diagnosis. Rather, it was the low scores of those with no mental illness that contributed to differences reported in Table II.

Our analyses did not reveal any predictive value of introversion or schizoid school behaviour with respect to later development of schizophrenia spectrum disorder. This indicates that introversion, as conventionally measured, is not specific to schizophrenic disorders. However, within the schizophrenia spectrum disorder, 'pre-schizophrenics' were more disturbed in school and less introverted than 'pre-schizotypes'. This finding suggests that 'pre-schizophrenics' as compared with 'pre-schizotypes' exhibit behavioural dyscontrol, possibly due to early environmental insults (e.g. perinatal damage (Parnas *et al*, 1982), or early emotional deprivation (Parnas *et al*, 1985)). It is, furthermore, noteworthy that SCB and CDB were slightly positively intercorrelated (Table III), indicating that these types of behaviour can coexist in the same individual. The results of this study are only preliminary, especially with respect to their specificity, because the study deals with a sample of young adults who may change their diagnosis in the future.

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