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Dimensions of psychopathology in paranoid schizophrenia

Abstract Recently, there has been a great deal of interest in understanding the latent organisation of the phenomenology of schizophrenia through examination of the fit of dimensional models to observed symptoms date. A group of 66 DSM-IV paranoid schizophrenic in-patients were assessed three times using the SAPS, SANS, BPRS and PAS. The interrelations between individual symptoms of each scale were examined by means of principal component analysis. The results of factor analysis of the findings from SANS and SAPS confirm the three-factor model, composed of a negative, disorganisation and psychotic factor. Extending the range of symptomatology using BPRS resulted in a five-factor model, composed of the following factors: paranoid, negative, affective, cognitive and disorganised behaviour. In view of the findings based on Strauss' work (1974) the PAS has been added to the SANS, SAPS and BPRS, whose results were examined by factor analysis. The findings indicate that it is possible to consider a six-factor model, composed of the following dimensions: paranoid, negative, affective, cognitive, disorganised behaviour and premorbid social adjustment deficits. The number of factors that best reflect the structure of the symptomatology of paranoid schizophrenia depends on the range of the symptoms under study, i.e., on the type of scales. It follows from our study that six-factor model appears to be the most suitable and clear model in rendering the multidimensionality of paranoid schizophrenia phenomenology.

Key words Paranoid schizophrenia · Multidimensional scaling · Factor analysis

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Introduction

Numerous attempts have been made to classify and systematise the symptoms of schizophrenia. Studies by H. Jackson in the 19th century and his theory of dissolution even today are of great importance. Strauss et al. [36] have proposed a three-factor model of schizophrenia composed of the following groups of symptoms: positive, negative and disordered interpersonal relationships. This model has linked the current classification with Jackson's theory.

The theory, however, that electrified the world of science was the hypothesis of a two-factor model of schizophrenia, formulated by T. Crow in 1980 [11]. According to this model, both the positive and negative symptoms had their correlation with their underlying possible neuronal mechanisms, premorbid adjustment, prognosis and response to treatment. One attempt to organize symptoms according to the criteria proposed by Crow was Andreasen's Scale for Assessment of Negative Symptoms [2] and Scale for Assessment of Positive Symptoms [3]. The initial research using these scales confirmed the positive-negative model of schizophrenia. However, in the following years, more studies appeared which, especially with regard to the construct of positive symptoms, did not confirm Crow's hypothesis [4, 5, 7, 8, 12, 17, 22, 24, 28, 31, 33, 34, 35, 38].

Generally, the research on this subject questioned, with some exceptions, such a simplistic division, and suggested that at least three different dimensions should be considered to account for the diversity of schizophrenic symptoms. The model of a positive/negative division presented here deals mainly with the symptoms listed in SANS, SAPS or other scales related to them. However, clinical experience shows that the diversity of symptoms in schizophrenia exceeds the framework defined by those scales. To expand the spectrum of reported symptoms the items of a more extensive scale (i.e., PANSS) should be considered or a scale like BPRS could be added. The factor analysis of findings from these scales is more precise

in reflecting the diversity of schizophrenic symptoms. Relying on the findings obtained by means of PANSS, Kay and Sevy [18] differentiated seven factors: negative, positive (composed of hallucinations and delusions), cognitive impairment, suspicion of persecution, agitated behaviour, depression or stereotyped thinking. On the basis of these factors a mathematical model of schizophrenia in the form of a pyramid was conceived. This division consisted of four main groups of symptoms: positive, negative, depressive and agitated.

The search for a phenomenological structure of schizophrenia, as Strauss et al. [36] suggested, takes into account the impairment in the interpersonal relationships in addition to the positive and negative symptoms [20] or the positive, negative, excited, anxious/depressive and cognitive factors presented by Lindstrom and Knorring [25].

Summing up the findings of various authors, who used different research tools, we come to the following conclusions: 1) A positive/negative model of schizophrenia symptoms seems to simplify their division too much, and does not reflect their complexity or connections with other factors, 2) the negative symptoms appear to be a fairly homogenous group and are similarly defined by various authors, 3) the positive symptoms show a considerable heterogeneity, which in many studies resulted in breaking up this group into a smaller, but more cohesive cluster of symptoms, 4) some suggestions have been made to include depressive symptoms and deficits in the premorbid social adjustment as an integral part of schizophrenic process.

All the studies to date dealt with the structure of schizophrenic symptoms as an expression of general disorder, but disregarded its various clinical subtypes. Such an approach facilitates the search for a common pathogenic and prognostic basis, however it does not take into account a totality of symptoms present in schizophrenia (e.g., the catatonic symptoms have been excluded from the scales SANS-SAPS). Therefore, we decided to perform an analysis of findings from a uniform group of patients who were diagnosed with paranoid schizophrenia and whose symptoms were rated on scales which fully embrace the symptoms found during its course and on the scale of premorbid adjustment.

Sample

The subjects consisted of patients hospitalized in the Psychiatric Department of Medical Academy of Lublin from January 1995 to November 1996. The criteria for inclusion was the presence of the schizophrenic paranoid syndrome in the current clinical notes, a syndrome that satisfies the criteria DSM-IV [1], the International Classification of Diseases and the Health Problems of X Revision [40] for paranoid schizophrenia of the active phase.

Six subjects have been excluded from the groups of 72. The reasons for their exclusion were the following: 1) the diagnosis in two subjects was changed during hospitalisation to schizoaffective disorder, 2) in the cases of two sub-

jects it was impossible to come up with a full assessment due to a discontinuation of hospital treatment, 3) some CNS organic impairment or mental retardation was diagnosed in two subjects.

Thus, the primary group of subjects was reduced to 66 people, made up of 33 women and 33 men. The mean age for the population under study was 26.36 (SD = 7,8) years. Among the subjects single people were dominant (74.2%), among women 66% and among men 82%. The largest group were patients during their first stay in a psychiatric hospital (69.7%); the smallest group was made up of those with their fifth or more hospitalisation (in total 3%). 51.5% of patients had no family history of mental disorders. There was a family history of schizophrenia in 21.2%, of affective diseases in 3%, of suicides in 9.1% and of alcoholism in 13.6% patients.

Measurements

The following research tools have been employed:

1 – sociodemographic inventory including the basic personal, demographic data and some selected data concerning the disease

2 – the list of scales for the assessment of positive and negative symptoms according to Andreasen
a – Scale for the Assessment of Negative Symptoms – SANS [2]
b – Scale for the Assessment of Positive Symptoms – SAPS [3]

3 – the symptomatic scale has been used as an auxiliary scale for the assessment of general psychopathology – Brief Psychiatric Rating Scale – BPRS [31]

4 – for the assessment of premorbid adaptation the Scale of Premorbid Assessment – PAS has been used [10]. PAS is designed to rate the level of premorbid functioning (i.e., the period up to six months before the onset of manifest psychopathological symptoms) in the main areas of life at each of the four developmental stages. The following areas are rated: availability-isolation, relationships with others, ability to function beyond the biological family of origin, intimate socio-sexual relationships. The items assessing the age appropriate functioning in each of the above areas are repeated in each of the four stages of life: 1) childhood up to 11 years, 2) early adolescence (age 12–15), 3) late adolescence (age 16–18), 4) adulthood (older than 19 years). Additionally, the so-called general scale evaluates the highest achieved level of functioning before the onset of the disease. Each of the subscales includes a definite number of items with a possibility to rate them from 0 to 6.

The evaluations have been made at three different points during hospitalisation (1) within the first three days, assuming the existence in this period of most florid and severe psychotic symptoms, 2) in the third or fourth week of hospitalisation, which is the period when psychotic symp-

toms usually subside, 3) at the moment of discharge, on remission) with a view to increasing the number of assessments under statistical analyses and in order to include the whole period of active phase of paranoid schizophrenia. In each of these points the battery of tests has been used. The battery comprised the rating scales: general psychopathology (BPRS) and positive and negative symptoms in schizophrenia (SANS and SAPS). When the psychotic symptoms subsided, the Scale of Premorbid Adjustment (PAS) was used. The data elicited from subjects were supplemented by information from the family and medical records. All rating was done by one investigator (HK).

Data analysis

The statistical analyses have been conducted with SPSS-Statistic Package for the Social Sciences [30].

The following methods have been used to work out the data: 1) calculating mean values, standard deviations, 2) Pearson product – moment correlations analysis, 3) principal components analysis. The version PCA – Rotation type Varimax with Kaiser Normalisation has been used in the statistical analysis. Factor rotated were those eigenvalues greater than or equal to 3.0 that evidenced a cohesive cluster of highly loading symptoms above 0.4. If the traditional eigenvalue criterion of greater than unity had been used, then too large a number of factors would have been isolated. Therefore, the number of factors was made precise by the analysis of several solutions (from 2 to 6 factors). The solution was selected whose variables had made up clear and interpretable factors. Thus, extracted factors have been labeled by the variable with the highest loading.

Results

In this study, factor analysis has been chosen to analyse the findings on the scales SANS and SAPS, as well as SANS, SAPS and BPRS. The last scale includes a wider range of symptoms present in schizophrenia, and therefore helps us to demonstrate the diversity of phenomena existing in this illness. The findings of the scales SANS, SAPS and SPP have been analysed according to what Strauss et al. [36] and then Lenzeweger and Dworkin [20] have theoretically assumed. They suggested that it was necessary to take into account yet one more dimension, namely the deficits of premorbid adjustment.

Factor analysis of the symptoms listed
in the scales SANS and SAPS

The sought factors were extracted by the method of principal components, with eigenvalue, and then they were rotated by means of Varimax procedure. Factor analysis of the symptoms from the scales SANS and SAPS allowed

Table 1 Percentage of the explained variance by successive distinguished factors (PCA of the SANS, SAPS)

Factor	Eigenvalue	% of variance	Cumulative % of variance
1	18.273	30.97	30.97
2	9.064	15.36	46.33
3	3.392	5.75	52.08

us to distinguish three groups of symptoms whose cumulative percentage of eigenvalue was 52.083% (Table 1).

This means that thus constructed division allows to predict, not accidentally (> 50%), possible relations between symptoms. The following groups of factors have been defined (Table 2). Our findings emphasise that the negative symptoms appeared to be the most homogenic group, containing all the twenty-four symptoms listed in SANS. In fact two symptoms belonging to this scale (global rating of attention and inattentiveness) seem to be related to impaired cognition, since their affinity is also very high for the disorganisation factor. The positive symptoms included in SAPS are made up of two factors: psychotic and disorganisation. The psychotic factor contains hallucinations and delusions, while the disorganisation factor includes bizarre behaviour, positive formal thought disorder and inappropriate affect.

Factor analysis of the symptoms listed
in SANS, SAPS and BPRS

On the basis of the factor analysis of the symptoms listed in SANS, SAPS and BPRS we have formulated the structure of the schizophrenic paranoid syndrome. This allows us to take into consideration the five-factor model, consisting of the following factors: paranoid, negative, affective, cognitive, disorganised behaviour (see Table 3).

These findings are different from our findings based on the exclusive use of SANS and SAPS. The difference is not only in the number of extracted factors, but also in their sequence. Priority has been given here to the symptoms from the paranoid group, symptoms, which were described by Schneider as first rank in diagnosing schizophrenia. In addition, we find here delusions of guilt and delusions of grandeur which in view of clinical observation may be more characteristic of other mental disorders (e.g., delusional disorder, affective disease). The negative factor was next and included all elements of SANS and the symptoms from the "negative" subscale BPRS: autism, blunted affect and motor retardation. This group of symptoms seems to be most cohesive and probably has a similar genetic substratum. The affective factor contained the items from BPRS and SAPS. We find here symptoms that are usually associated with an intense emotionality. The deviations from the baseline mood would have a two-direction character (depressive mood and elevated mood). It is extremely important that such a factor has been differentiated, that fact which indicates the

Table 2 Factor loadings for 3-factor solution from the set of SANS and SAPS items

Factor I-Negative	Factor loadings
Global Rating of Anhedonia-Asociality	0.8801
Relationships with Friends and Peers	0.8652
Global Rating of Affective Flattening	0.8650
Ability to Feel Intimacy and Closeness	0.8417
Poverty of Speech	0.8386
Recreational Interests and Activities	0.8329
Global Rating of Avolition-Apathy	0.8239
Lack of Vocal Inflections	0.8217
Social Inattentiveness	0.8204
Physical Anergia	0.8182
Paucity of Expressive Gestures	0.8065
Decreased Spontaneous Movements	0.8001
Global Rating of Alogia	0.7991
Affective Nonresponsivity	0.7961
Sexual Interest and Activity	0.7954
Unchanging Facial Expression	0.7854
Impersistence at Work or School	0.7193
Poor Eye Contact	0.6751
Increased Latency of Response	0.6434
Global Rating of Attention	0.6122
Poverty of Content of Speech	0.6014
Grooming and Hygiene	0.5899
Inattentiveness During Mental Status Testing	0.4349
Blocking	0.4298

Factor II-Disorganisation	
Global Rating of Severity of Bizarre Behaviour	0.7330
Global Rating of Positive Formal Thought Disorder	0.7258
Derailment	0.7182
Pressure of Speech	0.6926
Tangentiality	0.6913
Inappropriate Affect	0.6780
Incoherence	0.6181
Social and Sexual Behaviour	0.5903
Illogicality	0.5858
Ritualistic or Stereotyped Behaviour	0.5665
Distractible Speech	0.5612
Grandiose Delusions	0.5528
Circumstantiality	0.5454
Clothing and Appearance	0.5291
Aggressive and Agitated Behaviour	0.5227
(Global Rating of Attention	0.4053)
(Inattentiveness during Mental Status Testing	0.4125)

Factor III-Psychotic	
Global Rating of Severity of Hallucinations	0.8228
Global Rating of Severity of Delusions	0.7501
Delusions of Being Controlled	0.7359
Auditory Hallucinations	0.7216
Thought Insertion	0.7137
Voices Commenting	0.7133
Ideas and Delusions of Reference	0.6761
Somatic and Tactile Hallucinations	0.6017
Voices Conversing	0.5890
Delusions of Mind Reading	0.5693

Table 2 (continued)

Persecutory Delusions	0.5655
Somatic Delusions	0.5645
(Illogicality	0.4325)
Olfactory Hallucinations	0.5031
Delusions of Sin or Guilt	0.5021
(Aggressive and Agitated Behaviour	0.4325)
(Derailment	0.4262)
Religious Delusions	0.4175

Notes: The symptoms have been listed according to the decreasing affinity for a particular factor. Some symptoms tend to be two-factor, therefore symptoms with lower affinity are placed in brackets

presence of symptoms which are often masked by other affective disorders. The next factor – disordered behaviour – includes symptoms which assess the subject's behaviour, his behavioural reactions and, surprisingly, persecutory delusions. It seems, however, that this type of delusion is most often associated with grossly abnormal behaviour. The factor thought disorders consist of the symptoms mainly present with formal thought disorders. We find here also an element of SAPS – inappropriate affect. The cumulative percentage of eigenvalue for such extracted factors was 61.946% (Table 4).

The division of psychopathological symptoms is quite clear. They have been obtained due to the use of a factor analysis. This division corresponds to clinical experience but would undermine the proposal of a bipolar division of schizophrenia.

Factor analysis of the symptoms listed in SANS, SAPS, BPRS, and PAS

Relying on the theoretical presumptions of Strauss et al. [36], as well as on further research findings as the possibility and need to take into account an additional dimension of schizophrenic psychopathology of deficits in premorbid adjustment [12, 20] we have conducted a factor analysis of the findings from the scales SANS, SAPS, BPRS and PAS. The six-factor model appeared to be the clearest. It contained quite compact groups of symptoms and listed the following factors: paranoid (psychotic), negative, affective, cognitive, disorganised behaviour and premorbid social adjustment disorders. The first five factors comprise the same symptoms, which have been presented while discussing the PCA findings of the scales SANS, SAPS and BPRS. The sixth factor, namely deficits in premorbid social adjustment, contained four elements PAS (C, EA, LA, G), apart from the findings of the level of adjustment during adulthood (A).

The cumulative percentage of eigenvalue of such construct was 59.952% (Table 5).

We have conducted an analysis of correlation matrix, searching for the relations between the dimension of premorbid deficits and the remaining factors in the thus worked out model. Therefore, we have calculated the cor-

Table 3 Factor loadings for the 5-factor solution from the set of SANS, SAPS, BPRS items

Factor I-Psychotic (Paranoid) has almost become a replica of Schneiderian first-rank symptoms	Factor loading
Hallucinatory behaviour (BPRS)	0.8137
Global Rating of Severity of Hallucinations	0.8026
Thought Insertion	0.7510
Global Rating of Severity of Delusions	0.7120
Delusions of Being Controlled	0.7030
Somatic or Tactile Hallucinations	0.7028
Voices Commenting	0.6701
Somatic Delusions	0.6542
Unusual Thought Content (BPRS)	0.6250
Auditory Hallucinations	0.5998
Voices Conversing	0.5775
Ideas and Delusions of Reference	0.5466
Delusions of Mind Reading	0.4447

Factor II-Negative, being the most homogenous one, contains all negative symptoms listed in SANS and, additionally, symptoms from BPRS-blunted affect, autism and motor retardation	
Global Rating of Anhedonia-Asociality	0.8876
Relationships with Friends and Peers	0.8743
Global Rating of Affective Flattening	0.8664
Ability to Feel Intimacy and Closeness	0.8468
Global Rating of Avolition-Apathy	0.8367
Recreational Interests and Activities	0.8335
Physical Anergia	0.8329
Poverty of Expressive Gestures	0.8197
Lack of Vocal Inflections	0.8184
Poverty of Speech	0.8181
Decreased Spontaneous Movements	0.8091
Social Inattentiveness	0.8045
Affective Nonresponsivity	0.7958
Unchanging Facial Expression	0.7848
Sexual Interest and Activity	0.7782
Global Rating of Alogia	0.7763
Impersistence at Work or School	0.7311
Blunted Affect (BPRS)	0.7081
Poor Eye Contact	0.6322
Increased Latency of Response	0.6102
Emotional Withdrawal (BPRS)	0.5149
Motor Retardation (BPRS)	0.4801

Factor III-Affective is composed of psychotic experiences which usually entail a big load of emotions and groups of symptoms from subscale anxiety-depression BPRS	
Grandiosity (BPRS)	0.6842
Grandiose Delusions	0.5583
Clothing and Appearance	0.5477
Depressive Mood (BPRS)	0.5441
Guilt Feelings (BPRS)	0.4972
Delusions of Sin or Guilt	0.4348
Somatic concern (BPRS)	0.4238
(Anxiety (BPRS)	0.4078

Table 3 (continued)

Factor IV Disorganised behaviour composed mainly of behavioural symptoms which describe relations with the surroundings	
Hostility (BPRS)	0.7982
Excitement (BPRS)	0.7679
Tension (BPRS)	0.7640
Suspiciousness (BPRS)	0.7522
Aggressive and Agitated Behaviour	0.6944
Uncooperativeness (BPRS)	0.6691
Persecutory Delusions	0.6501
Anxiety (BPRS)	0.6044
Global Rating of Severity of Bizarre Behaviour	0.5513

Factor V-Cognitive	
Tangentiality	0.7421
Derailment	0.6971
Conceptual Disorganisation (BPRS)	0.6115
Inappropriate Affect	0.6099
Global Rating of Positive Formal Thought Disorder	0.5949
Blocking	0.5807
Incoherence	0.5449
Clanging	0.4479

Notes: The symptoms have been listed according to the decreasing affinity for a particular factor. Some symptoms tend to be two-factor, therefore symptoms with lower affinity are placed in brackets

Table 4 The percentage variance which has been explained by successive, distinguished factors (PCA of the scales SANS, SAPS and BPRS)

Factor	Eigenvalue	% of variance	Cumulative % of variance
1	22.887	30.115	30.115
2	10.793	14.202	44.316
3	4.872	6.410	55.862
4	3.904	5.137	59.086
5	2.450	3.223	61.946

Table 5 Percentage of the explained variance by successive factors (PCA of the SANS, SAPS, BPRS and PAS)

Factor	Eigenvalue	% of variance	Cumulative % of variance
1	22.985	28.376	28.376
2	10.883	13.436	41.812
3	5.345	6.599	48.410
4	4.125	5.093	53.503
5	2.765	3.413	56.916
6	2.459	3.036	59.952

relations between particular scales SANS, SAPS, and BPRS, and the results of adjustment in successive stages of life: childhood – C, early adolescence – EA, late adolescence – LA, adulthood – A and the result of the general scale – G PAS. The findings are listed in Table 6.

When we analyse particular relations of the negative factor we should pay attention to high correlations be-

Table 6 Correlations of the dimensions of deficits in premorbid adjustment as rated by the scale PAS, and the remaining dimensions of the six-factor model

	PAS				
	C	EA	LA	A	G
Negative factor					
Poverty of Content of Speech	–	–	–	–	0.245*
Grooming and Hygiene	–	–	–	–	0.245*
Impersistence at Work or School	–	–	–	–	0.265*
Global Rating of Avolition-Apathy	–	–	–	–	0.245*
Recreational Interests and Activities	–	–	0.288*	–	0.263*
Sexual Interest and Activity		–	0.325**	–	0.244
Ability to Feel Intimacy and Closeness	–	–	0.266*	–	0.298*
Relationships with Friends and Closeness	–	–	0.296*	–	0.268*
Global Rating of Anhedonia-Asociality	–	–	0.321**	–	0.292*
Social Inattentiveness	–	–	0.318**	–	0.276*
Global Rating of Attention	–	–	0.269*	–	0.268*
Psychotic Factor					
Thought Insertion	–	–	–	0.246*	–
Cognitive Factor					
Tangentiality	–	0.291*	–	–	–
Circumstantiality	–	–	0.243*	0.304*	–
Global Rating of Positive Formal Thought Disorder	0.250*	–	0.291*	–	–
Affective Factor					
Depressive Mood	–	–	–	0.254*	–
Somatic concern	–	–	–	0.254*	–

* p < 0.05

tween the subscale anhedonia/asociality ("recreational interests", "sexual activity", "ability to feel intimacy and closeness", "relationships with friends and peers", "global rating of anhedonia") and between social inattentiveness and premorbid adjustment in late adolescence and general scale. This could suggest that adaptation in one's familial milieu runs without any disturbances. It is only attempts at socialisation as regards taking up social roles that may prove unfavourable.

The paranoid factor occurs in this relation very rarely and then concerns only thought insertion, which insertion is negatively correlated with adjustment during adulthood. In conclusion, we have to state that the factor of deficits in premorbid adjustment is most strongly related to the group of negative symptoms, and it seems to be independent of the remaining dimensions.

Discussion

The dualistic model of psychopathological symptoms in schizophrenia, deeply rooted in the research of the 1980s, is at a critical point. Several papers on this subject have appeared recently and they verify the positive-negative model of the illness. Depending on the choice of scales designed to study psychopathology, the number of factors which are taken into consideration here is five with the use of PANSS [24, 25] or four with the use of SANS and SAPS [13]. Objections to this model form mainly on the positive syndrome whose consistency in numerous studies seems to be low.

In our study we have performed a factor analysis of the results from the SANS and SAPS. On the basis of this analysis three groups of factors have been identified. The first is the negative factor, which correlates closely with the group of symptoms listed in SANS and is composed of 24 symptoms. However, two symptoms listed in this scale (global rating of attention and inattentiveness during mental status testing) seem to be related with cognition impairment, for their affinity for the factor of disorganisation is also high. Other studies report similar results suggesting that inattentiveness should not be included in the negative factor [23, 34]. Positive symptoms listed in SAPS make up two factors: disorganisation factor and psychotic factor. The latter factor includes hallucinations and delusions; while within the disorganisation factor bizarre behaviour, positive formal thought disorder and inappropriate affect are present. These three symptoms included in the psychotic factor (illogicality, aggressive and agitated behaviour, derailment) demonstrate a significant affinity to the disorganisation factor. These results are not surprising, despite low interior consistency of the scale SAPS, for which Cronbach's alpha coefficient in various studies ranged between 0.48 and 0.30 in comparison with the scale SANS – from 0.85 to 0.78 [34]. The results agree with several studies dealing with these issues [4, 5, 34]. Among numerous studies on this subject matter the research done by Arndt et al. [6] deserves our attention. This longitudinal study on the factor structure in schizophrenia, encompassing various stages of the disease, permitted them to formulate a factor model related both to the acute and residual phase and to identify the presence

of factors predictive of the illness progression. The results confirm a three-factor model of symptoms, in which the negative symptoms are most persistent and most resistant to pharmacological treatment. The second, psychotic factor was less consistent in consecutive investigations. The symptoms reflecting the disorganisation factor were most variable during the study, while inappropriate affect was relatively stable.

The scales SANS, SAPS and BPRS have been used in our study to extend the spectrum of symptoms for the assessment of the severity of the illness and for further statistical analyses. We obtained a structure of a paranoid syndrome, using the factor analysis, and this allows us to create a five-factor model composed of the following factors:

– paranoid, including all Schneiderian first rank symptoms,

– negative, represented by most negative symptoms of the scale SANS and symptoms included in BPRS (blunted affect, autism and motor retardation),

– affective, composed of the symptoms from the anxiety-depression subscale of BPRS and including delusions also present in depressive and manic states and which often carry a considerable affective load,

– disorganised behaviour, composed of behavioural symptoms and including interpersonal relations,

– cognitive, composed of positive formal thought disorders and inappropriate affect.

It should be added that the unpublished data indicate that there is a possibility for a four-factor division of the obtained results into negative, paranoid-depressive, cognitive and disorganised behaviour. The five-factor division, however, has been chosen in our study, since this resulted in increased cumulative percentage of eigenvalue to 61.9%, and the factors were clearly and logically interrelated. It appeared that the increase in the number of factors to five was due to the splitting of the paranoid-depressive factor into paranoid and affective factors. The latter contain not only the element of depressive mood but also elevated mood and delusions usually present in the affective disorders. We have also compared our findings with the results reported by other authors, in particular those who have made use of the same set of scales (SANS, SAPS and BPRS). Such studies were conducted by Stuart et al. [37], although in subjects diagnosed with psychotic disorders according to DSM-III-R. The results of our study will now be discussed and compared to other studies in the literature.

The most constant element in all studies is the negative factor. All studies reported here blunted affect, poverty of speech and motor retardation. This agrees with the observations made by other authors who believe that the only common negative symptoms for all the scales are the following: blunted affect and poverty of speech [1, 21, 28]. Most scales also include in this group anhedonia, apathy, avolition and abulia. These symptoms were placed in the negative factor extracted in our study. The fact that atten-

tion impairment has been included in this group has been criticised. For instance, according to Stuart et al. [37] the negative factor is composed of three subgroups, represented by: 1) flat affect (includes most of symptoms from affective flattening subscale of SANS, together with the BPRS items: blunted affect, emotional withdrawal, motor retardation and the SANS Attention subscale item, 2) alogia (corresponding to SANS alogia), 3) social dysfunctions (represent apathy/avolition and anhedonia/asociality subscales of SANS).

The second factor, common in most of the analyses, is the factor in which the most essential element is a combination of hallucinatory and delusional phenomena. With the five-factor division, as described in our study, this factor included primary symptoms as defined by Schneider. This is not surprising, since the inclusion criteria was the diagnosis of paranoid schizophrenia. Meanwhile the delusions related to the affective disorders and persecutory delusions have not been included in this factor. Minas et al. [29] described the different character of persecutory delusions. Also in the studies of Stuart et al. [37] the group of delusions and hallucinations was divided into the following subgroups: 1) hallucinations, 2) loss of boundary delusions (delusions of mind reading, delusions of being controlled, thought broadcasting and thought insertion), 3) paranoia (delusions of reference, of persecution and suspicion as listed in BPRS) and 4) delusions of grandiosity (grandiose delusions, religious delusions, grandiosity as listed in BPRS).

Then we had the group of items defined as cognitive factors (disordered thought), which included various types of a positive formal thought disorder. Other authors [37] describe the content of this factor in a similar way. Inappropriate affect appeared to be an additional element in this group, as confirmed in other studies [5, 26]. In the studies of Lindenmayer et al. [26] this factor was also called cognitive and contained also attention disorders, disorientation and abstract thought disorders.

The cognitive factor is often combined with the factor of disorganised behaviour, which some authors labelled disorganisation factor [4, 5]. In our study this factor is composed of the symptoms describing patient's behaviour, behavioural responses and delusions of persecution. In clinical experience these delusions are often combined with such symptoms as hostility, suspiciousness, aggressiveness and uncooperativeness, the symptoms which also compose that factor. Therefore, their presence in this group should not be surprising.

What is interesting in our study is that the affective factor has been clearly differentiated and established. The symptoms present in this factor indicate that paranoid schizophrenia patients experience an intense emotionality. This factor was listed in Kay [18], Lindenmayer et al. [24], McAdams et al. [27], and Van der Does et al. [39] and has been described as a depressive factor, by Stuart et al. [37] as a factor of bipolar mood disorders, and by Lindstrom and Knorring [25] as an anxious/depressive factor.

At this point, it is difficult to establish whether the affective symptoms are symptoms secondary to the axial

symptoms of schizophrenia, or whether they are a primary component of psychotic process, if only due to the fact that the question of the nosologic location of schizoaffective psychosis has not yet been defined. It might be that the two categories of symptoms coexist, especially in the case of paranoid schizophrenia. We may then consider the proportions between symptoms: how many negative, psychotic, disorganisation or affective symptoms are there in paranoid schizophrenia. Following Strauss' suggestions, the factor of the deficits in premorbid adjustment has been added since it should be included in the conceptualisation of a latent model of schizophrenia. The results suggest that it is right to add such a dimension in view of a relative independent character of this construct, apart from fairly numerous connections with the group of the symptoms of negative factor. Relations between the presence of adjustment disorders and elements of the cognitive factor pertained to the correlation between circumstantiality and tangentiality and deficits in premorbid adjustment in the period from early childhood to adulthood. This fact, to some extent, confirms the findings of Parnas and Jorgens [32]. These authors claim that premorbid formal thought disorders are the factor that allows us to predict the development of schizophrenia in later age. This concerned in particular the occurrence of formal thought disorders at the age of 15, as well as the emotional relations in the children of schizophrenic mothers. In these studies the introverted or schizoid personality traits of the subjects constituted no essential prognostic factor for schizophrenia.

Poor premorbid adjustment has been established as one of the characteristic traits of schizophrenia of type II, according to Crow's division [11], apart from the presence of negative symptomatology and the structural changes in the brain. Most likely the premorbid adjustment may be related to structural changes within the central nervous system. Neurological research also suggests a relationship between some CNS dysfunction and poor premorbid adjustment of patients with schizophrenia [22]. Many studies suggest a relationship between the functioning before the onset of schizophrenia, clinical picture 22, 33, 34] and further prognosis [14, 16]. The fact that this construct is valid is also confirmed by its connection with premorbid personal traits, which in schizophrenia are bound with schizoid and schizotypal personality [33]. The exacerbation of those personality traits may lead to the onset of schizophrenia.

Many reports emphasise the significance of predictive and prognostic value of premorbid adjustment for the cause of schizophrenia. Therefore, it might be helpful to include premorbid adjustment in the diagnostic considerations.

In summary, the limitations of our study are a small sample population and the strict inclusion criteria paranoid schizophrenia only. The last limitation, depending on the objective of the study, may be an advantage or disadvantage in explaining the latent organisation of schizophrenic phenomenology.

Conclusions

The great interest in the positive-negative division results from a necessity to simplify and clarify our view on the symptoms of schizophrenia. It is also an attempt to understand the biological mechanism underlying this group of disorders on the basis of the external markers of psychopathological symptoms. Dividing the symptoms of paranoid schizophrenia into V or VI factors is an attempt to expand the spectrum of phenomena present in this disease. It seems that geneticists, neurophysiologists and neuropathologists will have the final say. This kind of consideration may be a starting point for further research.

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