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Classifying psychotic disorders: issues regarding categorial vs. dimensional approaches and time frame to assess symptoms

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Abstract The study's aims were to empirically derive classes of disorders and dimensional syndromes within psychotic disorders on the basis of the three time frames of symptom assessment and to comparatively examine their external validity. The level of concordance among classes and among dimensions across the time frames was generally low. The external correlates of psychopathological syndromes differed as a function of both type of assessment and the dimensional or categorical approach used. The dimensional approach was more effective than the categorical approach in predicting a set of clinical variables, irrespective of the time frame used to assess the symptoms. It is concluded that classification of psychotic disorders is highly dependent upon the time frame considered to assess symptoms and that dimensional classifications do have higher predictive power than categorical ones.

Key words Psychosis · categories · dimensions · latent class analysis · factor analysis

Introduction

At our present stage of knowledge we are not able to classify psychotic disorders by their nature and we must rely on their describable manifestations. Accordingly, our efforts should be directed to develop classifications based on symptoms as valid and reliable as possible. We have to clarify what we classify, by which criteria and for what purposes, questions that are inherently linked to the difficult task of drawing sharp boundaries between the disorders.

In their seminal articles, Robins and Guze (1970) and Kendler (1991) set the basis for the modern development of a scientific psychiatric nosology. Robins and Guze articulated a series of progressive steps, ranging from clinical description to external validation, for developing valid diagnostic categories. According to Kendler, the application of the scientific method to psychiatric nosology requires distinguishing between what is and what is not an empirical question. One established that a nosological problem may be subjected to scientific scrutiny; thus, one should be able to form a empirically testable hypothesis. Among the major factors that have guided the classification of psychosis are the categorical vs. dimensional approach, and the time span to assess diagnostic symptoms. Both questions are of great theoretical and practical relevance and they are amenable to empirical testing.

Recent trends in conceptualizing and classifying psychopathology have focused on the comparative utility of categorical and dimensional approaches. The diagnostic-categorical approach has traditionally dominated the symptom-dimensional approach; however, theoretical and empirical research during the last few years has provided cumulative evidence in favor of the dimensional approach (Strauss 1973; van Os et al. 1996, 1999; Goldberg 2000). Regarding the time frame question for assessing diagnostic symptoms, it remains unclear whether diagnoses should be based on either index episode psychopathology, as in DSM-IV, (APA 1994) or lifetime psychopathology, as is usual in genetic studies (Maier et al. 1993).

No previous studies have quantified the level of agreement and the differential validity of empirically derived psychopathological syndromes within psychotic disorders, and the main aim of this study was to comparatively evaluate the performance of psychopathological syndromes which were derived on the basis of three different time periods for symptom assessment: index episode, lifetime and interepisode psy-

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chopathology. The specific aims were a) to empirically derive classes of disorders and dimensional syndromes within psychotic disorders on the basis of the three time frames for symptom assessment, b) to examine the degree of overlap among alternative dimensions and categories, c) to examine the external validity of alternative classes of disorders and dimensional syndromes, and d) to comparatively examine the external validity of categorical and dimensional classifications.

Patients and methods

Patients

Sample population comprised 110 psychotic inpatients who were consecutively admitted to the Psychiatric Unit of the Virgen del Camino Hospital in Spain. To be included in the study, patients had to meet the following inclusion and exclusion criteria: presence of at least one psychotic symptom at index admission as defined by DSM-IV criterion A of schizophrenia, lack of drug abuse confounding diagnosis, lack of mental retardation, and lack of a neurological or major medical disease. The main clinical and demographic characteristics of the patients are shown in the Table 1.

Assessment

Psychopathology was assessed using the Comprehensive Assessment of Symptoms and History (CASH) (Andreasen et al. 1992). Patients were assessed using the information provided by the clinical interviews with the patients, significative others, staff nurses and medical records. Three types of assessments according to different time frames and phase of the illness were conducted. Index episode psychopathology comprised the symptoms observed across the index admission and over the month before admission. Lifetime psychopathology comprised all the symptoms observed since the time of illness onset. Lastly, interepisodic psychopathology comprised the usual level of symptoms between the exacerbation periods and was rated following the procedure by Maziade et al. (1995). In the present study only the 12 subscale global ratings of symptoms plus inappropriate affect were submitted for analysis. Accordingly, the 13 symptoms were assessed three times, namely, index episode, lifetime and interepisodically.

Interviews were conducted by the last three authors over the index episode and psychopathological ratings were reviewed by the patient attendant psychiatrist (VP or MJC). Presence or absence of individual items such as their severity was discussed at regular meetings and disagreements were resolved by consensus. After reviewing all available information, patients received a consensus best-estimate DSM-IV (APA 1994) diagnosis.

Table 1 Sample characteristics

	Mean (SD)	Number (%)
Age	36.3 (13.1)	
Years of education	9.3 (3.9)	
Age at onset (first symptom)	26.3 (9.4)	
Duration of illness	9.9 (9.7)	
Number of previous hospitalizations	3.7 (4.2)	
Number of previous episodes	4.3 (4.0)	
GAF, past year	64.3 (11.3)	
Gender, male		66 (60)
Civil status, single		82 (74.5)
DSM-IV diagnosis		
Schizophrenia		52 (47.3)
Schizophreniform disorder		6 (5.5)
Schizoaffective disorder		10 (9.1)
Mood disorder		25 (22.7)
Delusional disorder		2 (1.8)
Brief psychotic disorder		12 (10.9)
Atypical psychosis		3 (2.7)
Treatment during index episode		
Neuroleptics		102 (92.7)
Biperiden		32 (29.1)
Mood stabilizers		28 (25.5)
Antidepressants		18 (16.4)
Electro-convulsive therapy		6 (5.5)

Statistics and procedure

Latent class analysis (LCA) was used to determine class membership. LCA is a statistical procedure that assumes that there exists a certain number of mutually exclusive classes of patients. Using the version 1.0 of the WINMIRA–32 program (Von Danvier 1999), LCA was applied to a ([110 × 13] × 3] ([patients × symptoms] × type of assessment) data matrix. Patients were assigned class membership on the basis of their particular item profile. For LCA, symptom ratings were dichotomized as present or absent. To determine the most appropriate number of classes that best fit the data, alternative LCA solutions were computed. As goodness of fit measures we used a χ^2 parametric bootstrap estimation method and the Akaike Information Criterion (AIC). The bootstrap estimation is particularly adequate for sparse data and/or a relatively small sample size as is our case. A nonsignificant χ^2 value indicates that the LCA solution does not reject the model and that the model fits the data well. Solutions fitting well the data were examined for parsimony (as indicated by lower AIC indices) and that with the lowest AIC was preferred over the rest.

All other statistical procedures were performed using the Statistical Package for Social Sciences (SPSS V6.1; Norusis 1994). The level of agreement among classes across the three types of assessments was examined by using the kappa (κ) statistic, which may be interpreted as the chance corrected proportional agreement among classes. The usual guidelines for interpreting κ values in terms of strength of agreement is as follow: < 0.20 indicates poor agreement, 0.21–0.40 fair agreement, 0.41–0.60 moderate agreement, 0.61–0.80 good agreement, and 0.81–1 very good agreement.

Like for LCA, three independent factor analyses were conducted on the 13 symptoms reflecting index episode, interepisode and lifetime psychopathology. To determine the number of factors to retain, the eigenvalue > 1 criterion was used and to interpret the factors they were subjected to varimax rotation. To examine the degree of association between dimensions across time frame assessments, Pearson correlations coefficients were computed and statistical significance was corrected for multiple comparisons.

External or predictive validity of classes and dimensions was examined against 9 external variables: gender, years of education, premorbid adjustment as assessed by the Phillips scale (Harris 1975), age at illness onset, number of episodes as determined by the number of admissions, duration of illness, psychosocial stressors (acute and chronic) as assessed by the DSM-III-R psychosocial stressors scale (APA 1987), functional deterioration over the past year as assessed by the Global Assessment of Functioning scale (APA 1994), and treatment response as assessed by the Clinical Global Impressions scale (Guy 1976).

For examining the comparative predictive validity of classes and dimensions, we used step-wise logistic regression analysis and multiple regression analysis, respectively, where classes and dimensions were the dependent variables and the 9 predictive features, the independent ones. As an index of goodness of fit of the models pseudo R^2 (for binary outcomes) and R^2 (for continuous outcomes) were used. While both R^2 are interpreted in a similar way as expressing the percent of variance in the dependent variables accounted for by the independent ones, they are not totally comparable as logistic and regression analyses represent somewhat different approaches in estimating and interpreting coefficients and parameters. We, therefore, also used canonical correlation analysis (from the MANOVA and discriminant analysis subroutines for dimensional and categorical

dependent variables, respectively) to comparatively examine the overall predictive power of classes and dimensions. This is a powerful multivariate technique which allows one to study the relationship between a set of independent variables and a set of dependent variables. It produces squared canonical correlations, which provides an estimate of the amount of shared variance between the respective optimally weighted canonical variates of dependent and independent variables (Hair et al. 1992). This single estimator allows a direct comparison between the amount of variance of independent variables explained by categorical and dimensional representations of psychosis.

Results

Table 2 presents the statistical parameters for alternative LCA solutions. For index episode and lifetime assessments, the best solution comprised four classes of psychotic disorders, and for the interepisode assessment, the best solution comprised three classes. The frequencies pattern for individual symptoms across class membership and assessment method revealed a readily interpretable classification of psychotic disorders (Table 3). In naming the classes of psychoses, we will refer to those derived from the cross-sectional assessment as episodes and to those derived from longitudinal assessments (i. e., lifetime and interepisode assessments) as disorders.

Regarding index episode psychopathology, the first class (psychotic episode, 37 % of the sample) was characterized mainly by psychotic symptoms plus anhedonia; the second class (mixed positive-negative episode, 33 % of the sample) was composed by a mixture of positive and negative symptoms; the third class (schizomanic syndrome, 21 % of the sample) comprised mania and psychotic symptoms; lastly, the fourth class (schizodepressive syndrome, 9 % of the sample) was mainly made of depression and negative symptoms.

Table 2 Statistical parameters for alternative solutions in latent class analysis

No. of solutions by type of time frame assessment	Pearson Chi-square*				AIC[a]
	Z	p (X > Z)	mean (SD)	p-value	
Index episode					
1	40.566	0.000	8234 (1497)	0.000	1782.58
2	3.017	0.001	8030 (2156)	0.000	1626.66
3	0.256	0.399	6651 (9072)	0.067	1581.65
4	−0.092	0.537	4196 (1518)	0.333	1562.25
5	0.140	0.000	3360 (2360)	0.267	1567.86
Lifetime					
1	40.021	0.000	8486 (4365)	0.000	1729.46
2	−0.027	0.551	11913 (17956)	0.133	1592.58
3	1.187	0.118	4889 (2797)	0.067	1555.45
4	−0.249	0.598	3189 (2258)	0.133	1537.80
5	5.464	0.000	2957 (1229)	0.000	1531.33
Interepisode					
1	2.037	0.000	2718 (2594)	0.000	1127.15
2	0.764	0.223	2645 (1310)	0.133	883.42
3	0.334	0.369	2065 (1954)	0.200	869.62
4	0.266	0.395	1212 (965)	0.267	877.90
5	−0.271	0.607	1833 (3022)	0.200	883.07

* Parametric bootstrap estimates for goodness of fit
[a] Akaike Information Criteria

Table 3 Relative category frequencies for individual symptoms across class membership according to index, lifetime and interepisode assessments

		Type of symptom assessment										
		Index episode				Lifetime				Interepisode		
	Classes	Ia	IIa	IIIa	IVa	Ib	IIb	IIIb	IVb	Ic	IIc	IIIc
	No	41	36	23	10	44	26	24	16	66	25	19
	%	37	33	21	9	40	24	22	14	60	23	17
Delusions		**0.97**	**0.78**	**0.99**	**0.59**	**0.98**	**0.96**	**0.92**	**1.00**	0.08	**0.70**	0.38
Hallucinations		**0.70**	**0.74**	0.47	0.42	**0.84**	**0.88**	**0.63**	**0.67**	0.00	0.47	0.22
Bizarre behavior		**0.54**	**0.90**	**0.72**	0.12	**0.92**	**0.90**	**0.58**	0.00	0.00	0.27	**0.58**
Catatonia		0.00	0.24	0.19	0.42	0.31	0.07	0.12	0.30	0.00	0.00	0.05
Thought disorder		0.14	**0.77**	**0.84**	0.00	**0.86**	0.12	**0.63**	0.00	0.00	0.00	0.20
Affective flattening		0.31	**0.97**	0.12	**0.90**	**0.89**	0.43	0.16	**0.56**	0.01	0.31	**0.53**
Alogia		0.14	**0.85**	0.19	**1.00**	**0.91**	0.17	0.25	**0.63**	0.00	0.23	**0.67**
Avolition-apathy		0.32	**0.89**	0.00	**1.00**	**1.00**	0.47	0.00	**0.84**	0.02	0.42	**0.79**
Anhedonia		**0.70**	**0.99**	0.13	**0.90**	**0.98**	**1.00**	0.01	**0.93**	0.06	**0.86**	**1.00**
Attention		0.16	**0.93**	**0.63**	**0.60**	**1.00**	0.40	**0.54**	0.37	0.00	0.00	**0.86**
Inappropriate affect		0.30	**0.54**	0.24	0.17	**0.65**	0.35	0.20	0.35	0.01	0.11	**0.57**
Mania		0.10	0.28	**1.00**	0.00	0.48	0.19	**0.67**	0.23	0.01	0.04	0.10
Depression		0.11	0.28	0.09	**1.00**	0.49	0.11	0.29	**1.00**	0.00	0.00	0.30
Class concordance (κ)	Ia					**−0.44**	**0.47**	−0.08	0.09	0.05	0.24	−0.31
	IIa					**0.69**	−0.24	−0.35	−0.20	−0.22	−0.10	**0.41**
	IIIa					−0.21	−0.18	**0.59**	−0.14	0.23	−0.22	−0.17
	IVa					−0.04	−0.15	−0.08	0.39	−0.06	0.05	0.10
	Ib									−0.22	0.00	0.27
	IIb									−0.12	0.31	−0.14
	IIIb									0.28	−0.23	−0.24
	IVb									0.04	−0.09	0.01

High category frequencies (> 0.50) and relevant concordance among categories (κ > 0.40) are shown in boldface

Regarding lifetime psychopathology, the first class (mixed psychotic disorder, 40 % of the sample) displayed the broadest array of symptoms as every feature was present in this category in a meaningful frequency. The second class (psychotic disorder, 24 % of the sample) comprised psychotic symptoms and anhedonia. The third class (schizobipolar disorder, 22 % of the sample) was best represented by psychotic symptoms and mania. It was so called because almost a third of the patients had depression. The fourth class (schizodepressive disorder, 14 % of the sample) comprised depression, psychotic and negative symptoms.

Regarding interepisode psychopathology, the first class (remitting psychosis, 60 % of the sample) was by far the largest one and represented an asymptomatic group. The second class (chronic psychosis, 23 % of the sample) comprised psychotic, and in a lesser extention, negative symptoms. The third class (defect psychotic disorder, 17 % of the sample) was mainly defined by negative symptoms and in a lesser way by disorganization – inappropriate affect and bizarre behavior – symptoms.

Overall, agreement among categories across assessment procedures was modest, the only exceptions to this rule being the substantial agreement observed between mixed episode and mixed disorder ($\kappa = 0.69$), and between schizomanic episode and schizobipolar disorder ($\kappa = 0.59$).

Table 4 present factor analyses of symptoms across assessments. Index episode psychopathology resulted in four factors (depression-motor poverty, negative, disorganization, and psychosis; 68 % of explained variance). Lifetime psychopathology resulted in four factors (negative, mania, depression, and psychosis; 60 % of explained variance), and interepisode psychopathology resulted in 3 factors (negative-disorganization, psychosis and depression-motor poverty; 59 % of explained variance). Dimensions comprising negative, depression and psychotic symptoms were relatively stable across assessments, while symptoms of mania and disorganization were less stable. As expected, dimensions across assessments formed by a similar pattern of symptoms tended to be correlated; this was particularly evident for dimensions comprising negative symptoms.

Table 5 presents results for the comparative validity study of dimensions and categories by time frame assessment. Is was evident that the type of predictors included in the alternative regression models was dependent on both type of classification (dimensional or categorical) and time frame for symptom assessment. Fig. 1 presents the comparative predictive power (in terms of percent of explained variance as derived by squared canonical correlations) of categorical and dimensional approaches for type of psychopathological assessment. Consistently, dimensional models were superior to the categorical ones in terms of percent of variance explained by the set of external variables.

Discussion

Before going on to discuss the study results, it is important to bear in mind the characteristics and limitations of the study. The sample consisted of consecutive admissions of relatively chronic psychotic patients. They

Table 4 Factor analysis of symptoms

		Type of symptom assessment										
		Index episode				Lifetime				Interepisode		
	Factors	Ia	IIa	IIIa	IVa	Ib	IIb	IIIb	IVb	Ic	IIc	IIIc
Delusions		−0.15	−0.18	−0.02	**0.84**	−0.15	0.06	0.11	**0.86**	0.23	**0.84**	0.00
Hallucinations		0.00	0.18	0.05	**0.88**	0.19	0.10	−0.21	**0.56**	0.05	**0.87**	0.15
Bizarre behavior		0.09	0.03	**0.75**	0.00	0.27	0.40	**−0.57**	0.22	**0.61**	**0.51**	0.07
Catatonia		**0.72**	−0.02	−0.05	−0.06	0.34	0.27	0.47	−0.10	0.00	0.19	**0.66**
Thought disorder		**0.50**	−0.31	**0.58**	0.09	0.21	**0.79**	−0.04	0.14	**0.70**	0.04	−0.22
Affective flattening		**0.55**	**0.56**	0.28	−0.14	**0.80**	0.06	0.06	0.04	**0.71**	0.22	0.17
Alogia		**0.70**	0.41	0.16	−0.14	**0.71**	0.22	0.30	0.00	**0.86**	−0.02	0.18
Avolition-apathy		**0.57**	**0.62**	0.09	−0.13	**0.71**	−0.04	0.18	0.35	**0.64**	0.21	0.45
Anhedonia-asociality		0.27	**0.79**	0.22	−0.03	**0.67**	−0.39	−0.05	0.37	**0.68**	0.34	0.33
Attention		**0.76**	0.03	0.37	0.00	**0.51**	**0.57**	−0.08	−0.02	**0.68**	0.08	0.47
Inappropriate affect		0.05	0.31	**0.56**	−0.02	**0.54**	0.07	−0.25	−0.16	0.38	0.31	0.48
Mania		0.15	**−0.83**	0.17	−0.13	−0.24	**0.69**	0.07	0.03	0.08	0.02	0.02
Depression		**0.57**	0.32	−0.48	−0.11	0.11	0.00	**0.82**	0.06	0.20	−0.17	**0.83**
Factor intercorrelations	Ia					**0.44**	**0.43**	**0.54**	0.03	0.11	**−0.36**	0.18
	IIa					**0.64**	**−0.62**	−0.06	0.08	**0.41**	0.14	0.24
	IIIa					**0.41**	**0.48**	**−0.56**	0.05	**0.35**	0.20	−0.09
	IVa					−0.02	−0.06	−0.22	**0.29**	−0.22	0.26	−0.15
	Ib									**0.51**	0.05	0.22
	IIb									0.05	−0.16	−0.05
	IIIb									−0.13	**−0.46**	**0.29**
	IVb									0.14	0.13	0.01

Factor loadings > 0.50 and significative factor intercorrelations (after Bonferroni correction, p= 0.5÷40 =0.001) are shown in boldface

Table 5 External validity of categories and dimensions

Categorical dependent variables	R^2	Predictor variables	Dimensional dependent variables	R^2	Predictor variables
INDEX EPISODE					
Psychotic	0.08	Illness duration (+) Age at onset (+)	Psychotic	–	–
Mixed	0.19	Gender (male)	Negative	0.34	Age at onset (+) Premorbid adjustment (–) Premorbid adjustment (+) Global functioning (–)
Schizomanic	0.14	Premorbid adjustment (+)	Disorganization	0.17	Age at onset (–) Global functioning (+)
Schizodepressive	0.05	Illness duration (+)	Depressionmotor poverty	–	–
LIFETIME					
Undifferentiated	0.15	Illness duration (+) Premorbid adjustment (–)	Negative	0.29	Premorbid adjustment (–) Global functioning (–)
Psychosis	0.09	Illness duration (+) Treatment response (+)	Psychosis	0.04	Illness duration (+)
Schizomanic	0.14	Premorbid adjustment (+)	Mania	0.11	Age at onset (+) Premorbid adjustment (+)
Schizodepressive	0.09	Gender (female) Age at onset (+)	Depressionmotor poverty	0.11	Gender (female) Treatment response (+)
INTEREPISODE					
Remmiting psychosis	0.34	Global functioning (+) Premorbid adjustment (+)	Depressionmotor poverty	0.10	Global functioning (+)
Chronic psychosis	0.08	Global functioning (–)	Psychosis	0.14	Treatment response (–) Global functioning (–)
Defect psychosis	0.20	Premorbid adjustment (–)	Negativedisorganization	0.21	Premorbid adjustment (–) Illness duration (+)

(+) and (–) indicate, respectively, positive and negative associations of the predictor variable with categorical or dimensional clinical syndromes

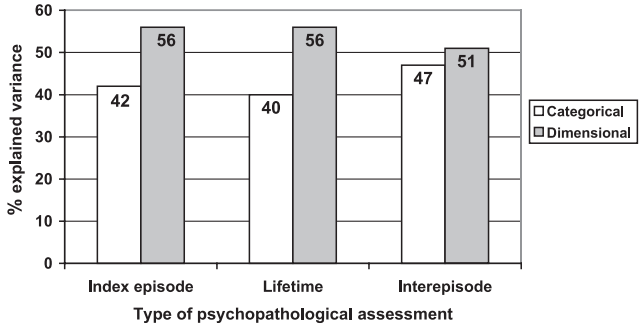

Fig.1 Overall predictive power (squared canonical correlations) for categorial vs dimensional classification of psychotic disorders.

were assessed at different levels of chronicity over an exacerbation phase, and except for the index episode ratings, we relied on retrospective assessments for rating lifetime and interepisode psychopathology; lastly, the sample size was relatively small. All of these, thus, limit the generability of our results. While the small sample size particularly affects the LCA solutions, three reasons make unreliability of our results rather unlikely. First, classes had clinical and face validity. Second, the number of classes and their symptom composition were very similar to those obtained in previous studies (Angst 1993; Kendler et al. 1997, 1998) using larger samples of patients, similar statistical methodology and diagnosis spectrum. Lastly, we used a bootstrap estimation procedure which is particularly useful for sparse data and relatively small sample size.

There are three main findings of our study. First, the level of concordance among classes and among dimensions across the three time frame assessments was relatively low. Thus, classes and dimensions of psychotic disorders were highly dependent on the period considered for assessing symptoms. Second, the external correlates of psychopathological syndromes differed as a function of both type of assessment and the dimensional or categorical approach used. Third, the dimensional approach was more effective than the categorical one in predicting a set of demographic and clinical variables, irrespective of the time frame used to assess the symptoms.

The goal of this study was not to develop a new empirical classification of psychoses, but to examine the influence of the time-span for symptom assessment and the categorical vs. dimensional issues on classification. The classes of psychoses were based on symptomatological and statistical grounds (i. e., co-occurrence of symptoms) and it was not intended to have predictive validity beyond the construct validity provided by its empirical basis. We consciously did not include course or outcome measures to form the classes since it would have biased the comparison among types of symptom assessments.

The poor agreement among the classes derived from

the different time-spans is in agreement with the only previous study addressing this issue, in which low agreement between cross-sectional and lifetime classes of psychotic disorders was also found (Angst 1993). An important finding of our study was that lifetime psychopathology produced a large class (40 %) of patients who had virtually presented all the symptoms of psychosis over the entire illness course. Given that our patient population had, on average, an illness duration of ten years, it might be inferred that with higher levels of chronicity this group of undifferentiated psychosis would rise. This represents a serious problem for the diagnosis stability assumption of categorical diagnosis and raises serious doubts about the sharp delineation of psychotic disorders over time (Marneros et al. 1991). Given that the time-span for assessing symptoms substantially influences the typological classification of patients, both diagnostic systems and researchers should clearly specify the time-span and illness phase at which the symptoms are elicited for diagnosis.

Dimensions were relatively more stable than categories across the different time frames (although only dimensions involving negative symptoms were relatively stable), and dimensions also explained greater variance of the external variables than categories did. This seems to represent two clear advantages of the dimensional approach over the categorical one. These findings are in agreement with previous work showing that dimensional models were superior to categorical ones in predicting outcome (Van Os et al. 1996), treatment needs (Van Os et al. 1999) and response to treatment (Johnstone et al. 1988). Furthermore, van Praag (1997) has reviewed the drawbacks inherent to any nosological approach addressed to uncover the biological basis of psychiatric disorders and elsewere we have outlined the pros and cons of the dimensional approach (Peralta and Cuesta 2000), showing compelling evidence that the dimensional approach better captures the neurobiological basis of psychotic disorders. To cite only a few examples, it has been shown that the dimensions of the psychoses are linked to familial morbidity risk of psychosis (Van Os et al. 1997), developmental abnormalities (Jones and Tarrant. 2000), attentional impairment (Nelson et al. 1998), ventricular enlargement (Pearlson et al. 1984), and prefrontal dysfunction (Dolan et al. 1993), irrespective of the diagnostic categories considered in the respective studies. The superior predictive validity for the dimensional approach may be rooted in the nature of the psychotic symptoms itself, since as Strauss (1969) has convincingly shown, delusions and hallucinations can be better understood as points on continua rather than as categorical phenomena. In this regard, the dichotomization of symptom ratings in order to be latent class analyzed may have conveyed a substantial loss of information.

Despite evidence favoring the dimensional approach, it should be taken into account that dimensional and categorical approaches often have different aims and answer different questions. For example, the categorical approach seems to more appropriate to define caseness (Tsuang et al. 1993) and for administrative and epidemiological pourposes; on the contrary, the dimensional approach seems to be more adequate for unraveling the neurobiological basis of psychotic disorders. Therefore, the two approaches should not be viewed as antagonistic but complementary (Millon 1991), and ideally, they should be used conjointly in order to examine their comparative validity for specific clinical or research questions. For example, if the research question is the association between symptoms and illness duration, our study, by showing that a greater illness duration does predict the index episode categories of psychosis and schizodepression but not the corresponding psychotic and depressive dimensions, suggests that the categorical approach may be preferred over the dimensional one to examine the psychopathological correlates of duration of illness. Although it is rather unsatisfying that classification of psychotic phenomena depends to a great extent on the varying time perspective and the categorical versus dimensional approach used, this state of the art clearly reflects the complexities inherent to this issue. The literature on classification of psychotic phenomena has traditionally neglected these complexities, which should be addressed in future studies aimed at disentangling the neurobiological basis of psychotic disorders.

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