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The pathoplastic effect of culture on psychotic symptoms in schizophrenia

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Abstract *Contemporary psychiatry attempts to clarify etiological and pathogenetic aspects of a number of suspected "biological" disorders, like severe affective disorders and schizophrenia, primarily by means of biomedical methods. But there are phenomena like contents of delusions which cannot be easily explained by biological or allied socio-medical sciences. Although it is generally accepted knowledge that prevalence and shape of certain psychotic phenomena are influenced by cultural patterns, the degree of the pathoplasticity of these symptoms is yet unknown. Based on data of the International Study on Psychotic Symptoms (ISPS) including 1080 subjects from Austria, Poland, Lithuania, Georgia, Pakistan, Nigeria, and Ghana we tried to estimate the culture-sensitive variance of contents of delusions, hallucinations and first rank symptoms. We found rates between 15% and 40% by means of canonical discriminant analysis. Our results confirm cultural psychiatry as an important tool for the understanding and consequently for the treatment of patients with major mental disorders.*

Key words: culture, schizophrenia, delusional contents

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INTRODUCTION Schizophrenia in the so-called developing countries is characterized by lower prevalence rates and better outcomes compared with schizophrenia in developed countries (Saha et al., 2005; Jablensky, 1987; Leff et al., 1992; Sartorius et al., 1986; .Edgerton and Cohen, 1994; Hopper and Wanderling, 2000). While the impact of culture on better outcome is still under discussion (Patel et al., 2006), data on psychotic symptoms like contents of delusions, hallucinations, or Schneider's first rank symptoms evoke the existence of a remarkable influence of culture.

For the contents of delusions the personal and cultural system of values of an individual is of particular importance. For example, delusions of grandeur can hardly be found in village communities where it is regarded as reprehensible and dangerous to strive for a given social level (Pfeiffer, 1994, Stompe et al., 1999). While religious delusions and delusional guilt are primarily found in societies with a Jewish-Christian tradition, these contents are infrequent in Islamic, Hindu or Buddhist societies (Kim et al., 2001, Murphy, 1967, Ndetei and Vadher, 1984a, Stompe et al., 1999 and 2006, Tateyama et al., 1998)

The first large study about the frequency of different kinds of hallucinations in a cross-cultural investigation was conducted in the 1960ties (Murphy et al., 1963). One of the central findings was that visual hallucinations as well as tactile hallucinations occurred most frequently in patients from Africa and the Near East. Nearly 20 years later, Ndetei and Vadher carried out a cross-cultural study including patients with schizophrenia from nine ethnics admitted to a London

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hospital (Ndetei and Vadher, 1984c). The authors found higher rates of both auditory and visual hallucinations in Non-European patients compared to English and Continental Europeans. To investigate the impact of the culture of origin and the environmental influence of the second home, Suhail and Cochrane compared a sample of patients from Pakistan living in their home country, with a sample of Pakistani, who immigrated to Great Britain, and with patients of white British origin (Suhail and Cochrane, 2002). Patients living in Pakistan reported statistically significantly more often visual hallucinations and also visualisations of spirits or ghosts compared with the two British groups. Acoustic hallucinations were significantly less frequent in the Pakistani group than in the both British groups. These findings underline the major importance of the immediate environment on the phenomenology of hallucinations compared with the influence of culture.
Critical of the theoretical complexity of Bleuler's approach to define schizophrenia, Schneider introduced the concept of 'nuclear' or first-rank' symptoms (FRS; Schneider, 1992). They include psychotic phenomena like delusional perceptions, audible thoughts, thought broadcasting, thought insertion, thought withdrawal, commenting and dialogue voices, made volition, and somatic passivity. The pathognomonicity of the FRS has been challenged, as their frequency was primarily depended on the cultural context. The frequency of the FRS in general has been found to be low in a number of non-Western countries: 56.5% in Saudi Arabia (Zarrouk, 1978), 35% in India (Radhakrishnan et al. 1983), 25% in Sri Lanka (Pela, 1982), 26.7% in Malaysia (Salleh, 1992), between 31% and 43% among non-Western immigrant groups in England (Ndetei and Vadher, 1984b). On the other hand, a study from Nigeria reported 60.3% FRS (Gureje and Bamgboye, 1987). These differences could be due to different definitions of the single symptoms and to the time under study, because the FRS are not as stable as delusional contents. However, they could also reflect true cultural differences.

The discussion whether and to which extent the prevalence and shape of psychotic symptoms depends on culture has a long tradition, also in German-speaking psychiatry (e.g. Lenz, 1964; Zutt, 1967). Zutt established the term pathoplasticity in German psychiatry in order to describe the culture-sensitive part of the symptomatology of mental disorders. However, until today this term has a more or less metaphoric character. Although most professionals would agree that cultural pattern may influence psychotic features, it is an unsolved question to which extent the variability of psychotic symptoms is caused by culture in a wide sense (socialization, religion, symbols, values, but also climate or nutrition).
In this study we try to estimate the culture-sensitive proportions of the total variance of three groups of psychotic symptoms in schizophrenia: contents of delusions, hallucinations and Schneider's FRS.

METHOD Data were obtained from the International Study on Psychotic Symptoms (ISPS) conducted between 1995 and 2004 in Austria, Poland, Lithuania, Georgia, Pakistan, Nigeria and Ghana. Inclusion criteria were a clinical diagnosis of schizophrenia in patients between 18 and 60 years of age. DSM-IV (APA 1994) diagnoses were achieved by use of the Structured Clinical Interview for DSM-IV –SCID 1. Contents of delusions, hallucinations and first rank symptoms were classified by means of the 'Fragebogen für psychotische Symptome' FPS – a semi-structured questionnaire developed by our research group, which was translated into the languages of the countries included into the study.
Our total sample consisted of 1080 subjects from Austria (n=350), Poland (n=80), Lithuania (n=73), Georgia (n=84), Pakistan (n=103), Nigeria (n=324), and Ghana (n=76) suffering from schizophrenia. Out of these 1080 patients we selected 73 patients from each centre, and we performed discriminant analyses separately for each symptom group in order to estimate the impact of culture on the one year-prevalence of the contents of delusions, hallucinations and FRS.

Discriminant analysis is used to classify cases into the values of a (usually dichotomous) categorical dependent variable. If discriminant function analysis is effective for a set of data, the classification table of correct and incorrect estimates will yield a high percentage of correctly classified cases. There are several reasons to apply discriminant analysis: (a) to classify cases into groups using a discriminant prediction equation, (b) to test a theory by observing whether or not cases are correctly classified, (c) to investigate differences between or among groups, and (d) to determine the most parsimonious way to distinguish between groups. The classification table is used to assess the performance of discriminant analysis. This is simply a table in which the rows are the observed categories of the dependent variable and the columns are the predicted categories of the dependent variables. If prediction is perfect, all cases will lie on the diagonal.

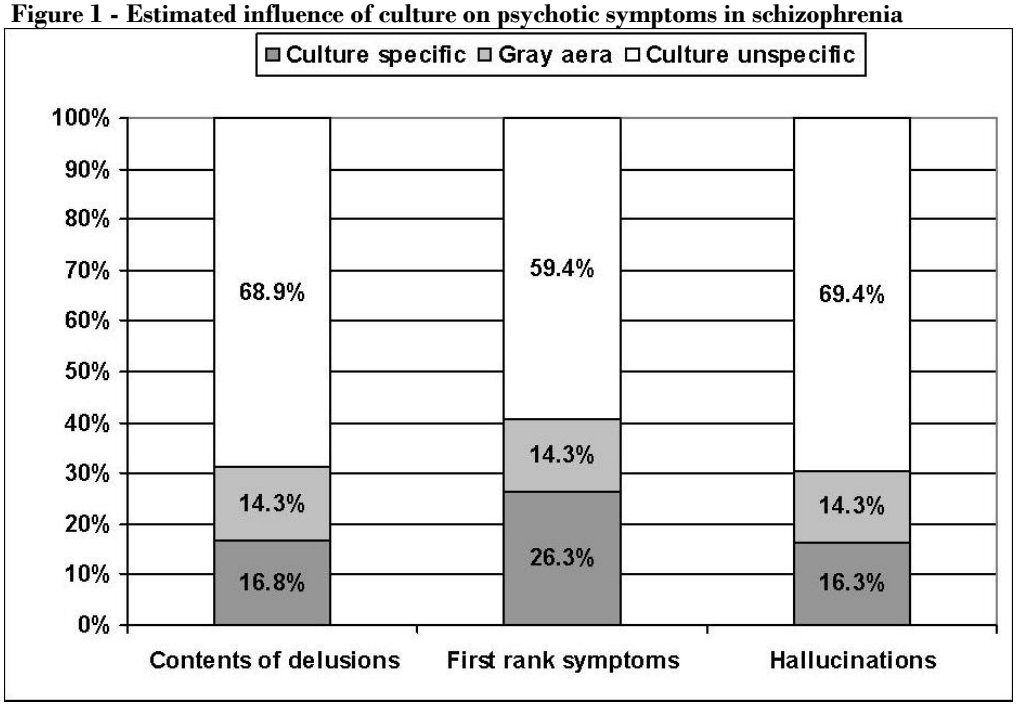
RESULTS Independent of culture, persecution was the most common delusional theme in all sites followed by grandeur. Pakistan, the only pure Islamic country, showed a pattern of delusional contents remarkably different from the other sites with Christian majorities: low rates of religious delusions, delusions of grandeur and delusions of guilt (Stompe et al., 2006). Religious delusions occured only as persecution by demons or obsession by Djins (Stompe et al., 1999). In contrast to the African countries religious grandiosity ('Being and Angel or a Prophet' etc.) was not reported by Pakistani patients.

Statistically significant differences (Chi-Square-Test) in the frequencies of several kinds of hallucinations were found in our study. The prevalence of visual hallucinations in the developing countries was inhomogeneous. As to be expected, in every country auditory hallucinations showed the highest prevalence. In line with the literature, visual hallucinations were most frequently reported by West-African patients (Nigeria, 45.8%; Ghana, 53.9%), the rate for Pakistanis was only 3.9%. As mentioned above the distinction 'developing' and 'developed' countries seems not to be meaningful. To explain these different rates one has to separately scrutinize the cultural tradition and the socialization pattern of each country.

At least one FRS across the regions was registered between 100% (Nigeria), 97.3% (Georgia), 96.3% (Poland), 90.4% (Lithuania), 90.3% (Austria), 83.5% (Pakistan), and 81.6% (Ghana). The frequency of the single FRS varied remarkably in the different subsamples. Those FRS associated with disturbances of the ego-boundaries (audible thoughts, thought broadcast, and thought insertion) most frequently occur in both West-African countries. The acoustic first rank hallucinations were also most common in Nigeria and in Ghana; however, they were also very often reported in Poland and in Georgia. Somatic passivity was most frequent in Poland and in Lithuania. The rates for delusional perception exceeded the numbers found in other studies to a high extent. This may be due to the fact that this phenomenon is part of the symptomatology of acute psychotic episodes and very rare in sub-acute or chronic states.

The proportion of the variance of psychotic phenomena which cannot be correctly assigned to the country of origin of patients (culture-unspecific) is between 60 and 70 % (figure 1). Therefore the proportion of correctly classified cases is between 30 and 40 %. This percentage is the upper border of the possible influence of culture. However, the likelihood to classify correctly by chance in our sample is 14.3 % (100: 7 countries). This percentage has to be seen as a kind of "gray zone", i.e., in 14.3% it cannot be definitely excluded that the 'correct' assignment has been achieved by chance.

Figure 1 - Estimated influence of culture on psychotic symptoms in schizophrenia



So taking this into account, the average correct assignment of psychotic phenomena to countries of origin is between 16 and 40 %. Only Pakistan had a special position with correct classifications between 20 and 60 %.

DISCUSSION Taking into account the different rates of single delusional contents, hallucinations and FRS in Pakistan and the West-African countries but also in the four European countries, one has to conclude that the distinction 'developed' versus 'developing' countries is an oversimplification with little explanatory value.

Between 15% and 30% of the frequencies of contents of delusions, modalities of hallucinations and first rank symptoms may be caused by differences in the cultures of origin. In contrast between 70% and 85% of the variance of the prevalence of psychotic symptoms does not depend on the culture of origin. This does not mean that more than two thirds of the variance of these symptoms is directly caused by the basic syndromes of schizophrenic disorders (Janzarik 1988; Klosterkötter 1988) or the 'lost of the Copernican turn' (Conrad, 2003). Variables like confession or schizophrenic subtype, age at onset and duration of illness may also contribute to the total variance. Our findings confirm that the occurrence of different psychotic symptoms is the result of a combination of the incorporation of culture-specific material an expression of the self-organizing pathogenesis of schizophrenia.

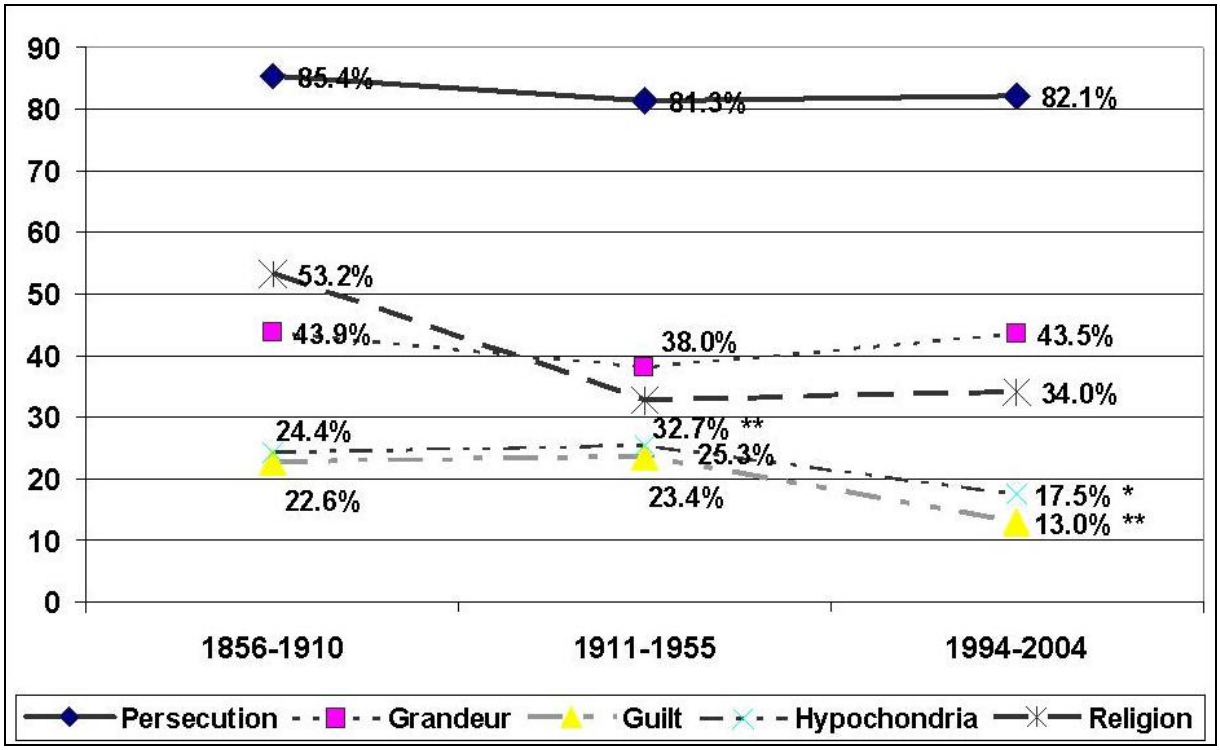
What is the possible meaning of our results? Can we proceed on the assumption that we have now an idea to which extent psychotic symptoms are influenced by socio-cultural patterns? There are two ways to interpret our findings:

a. It can be assumed that 15-30 percent of the psychotic symptomatology is culture-dependent.

b. This percentage represents only a cross-sectional snapshot, reproducing the present cultural distances of the countries included in our study.

If the second hypothesis is correct, one could expect that the process of an increasing evening out of the existing cultural differences and the development towards a uniform global culture ('globalization') will also even out the differences concerning psychotic symptomatology. As a consequence, one could expect a decreasing impact of "pathoplastic effects of culture" for the future and postulate a stronger "influence of culture" for the past. The 'eccentric' position of the Pakistani patients could be taken as a clue for the correctness of the second hypothesis. However, in this case, we are confronted with new challenges. Longitudinal investigations, comparing present data with results of older studies as well as prospective studies will be necessary.
To estimate the speed of the change of the contents of delusions, we have compared the prevalence rates of delusional themes in schizophrenia investigated in three periods (Stompe et al. 2003).

Figure 2 - Development of the frequency of delusional themes in schizophrenia during the last 145 years in Austria



Source: 1865-1910 and 1911-1855: Lenz (1964); 1994-2004 own data (Stompe et al. 2003)

Figure 2 shows that despite the enormous social and cultural changes in Austria during the last 150 years, the most frequent themes - delusional persecution and grandiosity – have been remarkably stable over decades. However, the rates of guilt, hypochondria and especially of religious delusions decreased slowly but significantly. This result of our longitudinal study leads us to the conclusion that one has to expect a reduction of the impact of culture on the phenomenology of psychotic symptoms. However, this change will manifest slowly and staggered to the rapid change of cultures in the era of globalization. Therefore the range of 15% to 30% of culture sensitivity might be a good estimation for the next two or more decades.

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