

ORIGINAL PAPER

Heinz Häfner · Birgit Nowotny · Walter Löffler
Wolfram an der Heiden · Kurt Maurer

When and how does schizophrenia produce social deficits?

Received: 7 December 1994 / Accepted: 3 May 1995

Abstract The present study is an empirical contribution to the controversy over whether the poor social performance and lower social class of schizophrenic patients are consequences of the illness, consequences of changes in the individuals predisposed to develop schizophrenia or are due to the adverse social conditions that lead to schizophrenia. The study focuses on the socioeconomic status at onset, on the performance of social roles in the early course of schizophrenia by taking age, gender and the individual level of social development into account. In a representative sample of 232 first episodes of schizophrenia age and type of onset, type and accumulation of symptoms and social functioning in the prodromal and the psychotic prephase and at first admission were assessed and analysed for their predictive power concerning social disability 2 years after first admission. In a case-control study expected and observed social functioning from onset until first admission were compared. The subsequent course was followed up prospectively in five cross sections until 2 years after first admission. In women the age at onset was significantly higher than in men, whereas symptomatology and type of onset showed no gender differences. In 73% of the sample the prodromal phase covered 5 years on average, and the psychotic prephase (until the maximum of positive symptoms) 1.1 years. Deficits in social functioning occurred predominantly during the prodromal and the psychotic prephase. The course over 14 years showed stable group trends in social and symptom measures. By the end of the prodromal phase it was possible to predict social disability 2 years after first admission with a correct classification of 81%. The main factor determining social outcome appeared to be the acquired social status during the prodromal phase of the disorder. The unfavourable early course in men was due mainly to their significantly lower age at onset. These results raise

questions concerning an earlier therapeutic and rehabilitative intervention.

Introduction

The association between low socioeconomic status and schizophrenia has often been replicated (Ödegård 1972; Stein 1957; reviews: Dohrenwend and Dohrenwend 1969; Eaton 1985; Liberatos et al. 1988). Three different explanatory approaches have been discussed: The decline or social-drift hypothesis, which in essence had been postulated already by Kraepelin (1893), is based on the assumption that cognitive and social impairments due to schizophrenia will result in social decline during the course of the disorder. In addition to the hypothesis that social deficits are a consequence of the disorder, it includes the finding that even before the first psychiatric contact schizophrenics may be at a social disadvantage and/or may not have reached their parents' social status (Goldberg and Morrison 1963; Turner and Wagenfeld 1967; Erickson et al. 1989; Muntaner et al. 1993). This assumes that personality traits associated with the genotype or with the morbid risk (Ödegård 1971; Wiersma et al. 1983) or other impairments preceding the disorder hamper social achievement ["non-starter" (Dunham 1965) or "social-stagnation" hypothesis (Freeman and Alpert 1986)]. Schizophrenia is therefore regarded by some authors as a continuous disorder existing from childhood on (Ödegård 1972).

The two hypotheses, social stagnation and social decline, which may both be true for the same case, differ concerning their specific involvement in the social achievement of an individual. They both have in common that disease-dependent "social selection" processes may lead to an accumulation of schizophrenics in the lowest social class.

The alternative hypothesis "social causation" assumes that poor living conditions or the lower-class subculture may contribute to an increased morbid risk for schizophrenia either directly through psychosocial processes or

Heinz Häfner (✉) · Birgit Nowotny · Walter Löffler
Wolfram an der Heiden · Kurt Maurer
Schizophrenia Research Unit, Central Institute of Mental Health,
P.O.Box 12 20 21, D-68159 Mannheim, Germany

indirectly through neurodevelopmental disorders due to higher rates of perinatal complications [reviews on psychosocial processes: Dohrenwend and Dohrenwend 1969; Kohn 1972; Häfner 1971; neurodevelopmental disorders: Jacobson et al. 1980; Lewis and Murray 1987; Eagles et al. 1990]. Dohrenwend et al. (1992) tested the alternative hypotheses "social causation versus social selection" in a comprehensive population study of high methodological standard in Israel by comparing the morbid risk for socioeconomic versus ethnic status. The results supported the selection issue in schizophrenia. The social-causation hypothesis, on the other hand, was confirmed for the risk of depression in women and for the risk of antisocial personality and substance abuse in men. Moreover, notwithstanding the findings of a few studies with questionable methodology (e.g. Turner and Wagenfeld 1967), strong evidence for the selection hypothesis stems from the fact that schizophrenic individuals are obviously not born predominantly into lower-class families (Goldberg and Morrison 1963; Muntaner et al. 1993), but rather suffer from a social disadvantage in the course of their lives.

If the social environment plays no important aetiological part, which is supported by the observation of a fairly equal morbid risk across nations and cultures (Häfner 1987; Jablensky et al. 1992) and by the low contribution of nonfamilial environment to the morbid risk in heritability models developed on the basis of epidemiological family studies (Maier et al. 1993), then the question of when and how the disease produces social consequences becomes increasingly interesting.

The answer is of both theoretical and practical relevance (1) for our understanding of consequence of the interaction between dysfunction that results from the disease and influence of the social environment (Strauss and Carpenter 1977; Kokes et al. 1977; Bland et al. 1978); (2) for a precise distinction of premorbid social and cognitive deficits from early symptoms and impairments due to the disease as prognostic indicators of the course of schizophrenia (Strauss and Carpenter 1977; Kokes et al. 1977; Bland et al. 1978; Angst et al. 1985). Most of these studies failed to give a clear temporal distinction between antecedents and early consequences of the disorder; (3) which can be applied to the preventive and rehabilitative strategies.

Social achievement and onset of schizophrenia

The period of most rapid change of social roles in life, from about 15–30 years of age, when adult roles are taken up, coincides with the period of the maximum risk for the onset of schizophrenia. Social dysfunctioning occurring early, i.e. at the beginning of the steep increase in social achievement, is presumably associated with a high risk for social stagnation. Onset of the disorder after the consolidation of the main social roles, on the other hand, will result mainly in social decline. Later in life the extent of social decline will presumably decrease again, because some components of social status, once they have been reached, like "educational level" and "marital status", will

not or not easily be lost. Later onset also provides the opportunity for having achieved a higher level of social competence at the outbreak of the disorder.

With equal severity of symptoms, early-onset schizophrenias may therefore result in greater social disadvantage than late-onset schizophrenias, developed at a socially and economically more advanced and better secured stage of life. Early onset hits men more often than women in a phase of unfinished social consolidation. This may explain why the disorder tends to display a less favourable social course in men than in women at least for a certain time (reviews: Angermeyer et al. 1990; McGlashan and Bardenstein 1990). Some methodologically sound studies indeed report a diminishing or disappearing gender difference in the long-term course (Biehl et al. 1986; Goldstein 1988; Nyman 1989; Childers and Harding 1980; Häfner et al. 1991 a).

The disease onset – often with socially relevant symptoms – lies on average several years prior to first admission (Lindelius 1970; Angermeyer et al. 1990; Häfner et al. 1994). It is therefore relevant to assess retrospectively the individual's social achievement and simultaneously the early course of schizophrenia registering when (time), with what (symptoms) and how (acuity) the disease started.

ABC study (first episode) sample

Figure 1 shows the catchment area with a population of approximately 1.5 million in the centre of western Germany (Mannheim, Heidelberg and a surrounding region, about 50% urban and 50% rural) and the sample of the

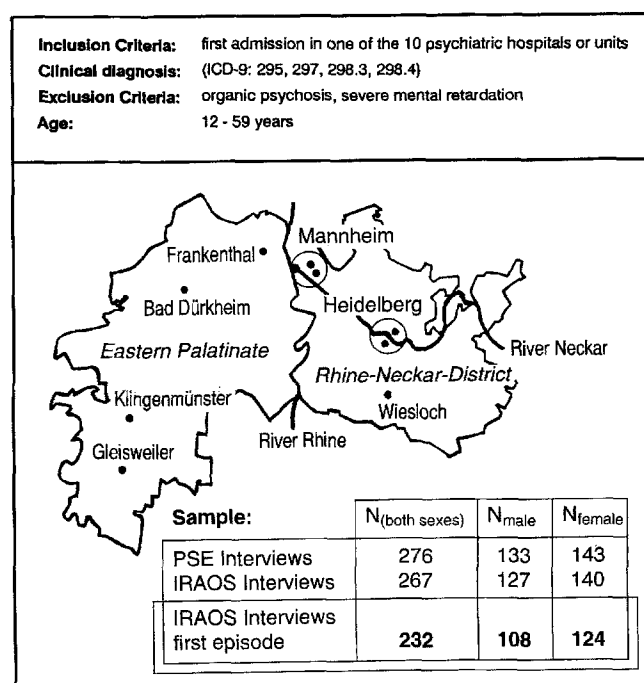
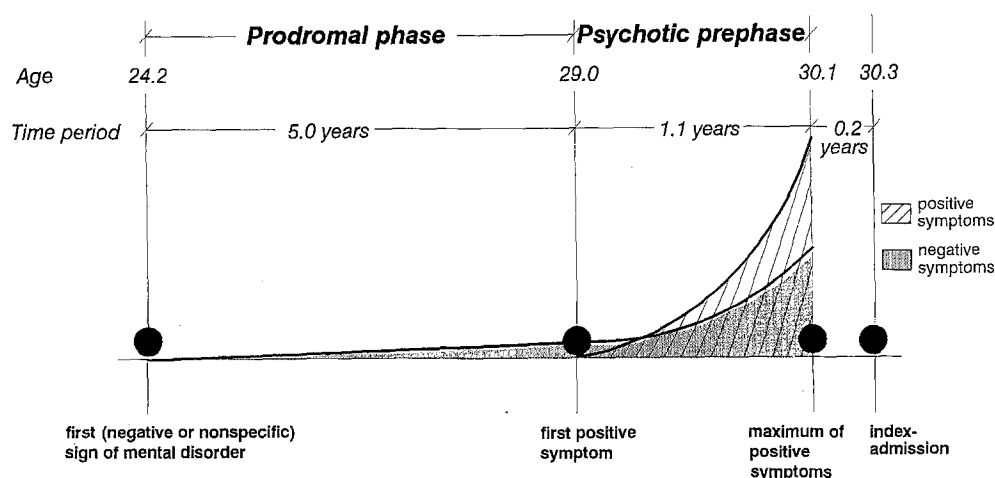


Fig.1 ABC First-episode sample. Catchment area of Rhine-Neckar district and eastern Palatinate

Fig. 2 The prephases of schizophrenia from first sign of mental disorder to first admission ($n = 232$; 108 males, 124 females; for both sexes together). (From Häfner et al. 1995)



ABC schizophrenia study (Häfner et al. 1993): patients consecutively first admitted with a broad diagnosis of schizophrenia (ICD-9: 295, 297, 298.3, 298.4) over 2 years (1988–1989) to the ten psychiatric and child psychiatric units and hospitals serving the population. We interviewed a total of 232 first-episode schizophrenics, 84% of the whole sample, within 1 week with PSE-9 (symptomatology) and 6 weeks of first admission with the standardised interview IRAOS (social biography, prodromes, symptom development), both analysed with the CATEGO algorithm. Instrument and sample have been described elsewhere (Häfner et al. 1992, 1993). Social disability was assessed by DAS (WHO 1988; German version: Jung et al. 1989).

For testing our hypotheses we used two different cohorts and two subsamples of the first cohort, and examined them with the same instruments in three observation periods. The issues, observation periods and subsamples examined were (see Fig. 2):

1. The prephase, lasting on average 6.1 years from the first sign of the disorder until the culmination of the first episode, retrospectively by means of the IRAOS interview on the entire ABC first-episode sample ($n = 232$)
2. The social course in the prephase on a representative subsample of 57 cases of the ABC sample, matched by age and gender with 57 controls from the general population of the same catchment area (Mannheim)
3. The early course after first admission prospectively in five cross sections so far from first admission over 3 years on a representative subsample of the ABC sample ($n = 133$)
4. The later course at 14-year follow-up, assessed by ander Heiden et al. (1995) from our group on a first-admission cohort of schizophrenics studied by Biehl et al. (1986) in seven cross sections over 5 years ($n = 70$)

Descriptive results

Onset and early development of disorder

To reduce the inevitable risk of contaminating the prodromal signs with preexisting or schizophrenia-independent symptoms we operationalised onset according to a phase model:

1. *Nonspecific symptoms* were taken as first signs only if continuously present from their occurrence until index admission.
2. *Negative symptoms* only if they were either continuous or recurring.
3. *Positive symptoms* were considered in any case, even if they occurred only once.

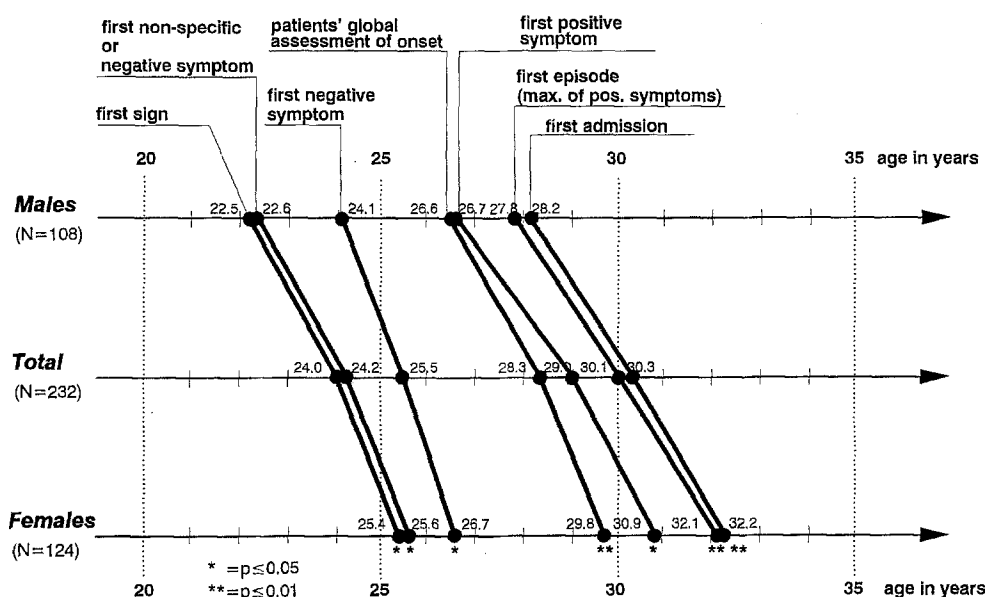
As first admission is also determined by disease-independent factors, the first episode was operationalised as the point when the maximum of positive symptoms was reached for the first time indicating the end of the prephase (Häfner et al. 1995).

Age at first onset

The mean age at the different definitions of onset depicted in Fig. 3 serves to illustrate seven consecutive milestones in the development of the disorder up to the first psychotic episode and first admission. The mean age of women, at each event 3–4 years significantly higher than in males, presumably results from a raised vulnerability threshold for schizophrenia in women due to estrogens reducing the sensitivity of D_2 receptors in the brain (Häfner et al. 1991 b; Riecher-Rössler et al. 1994). A more restricted definition of the diagnosis, such as ICD-9: 295 or CATEGO S+, produced no essential changes either in age at first onset or in the significant gender differences in age at onset.

Of all schizophrenics, 77% (82% of males, but only 73% of females) presented the first sign of the disorder before the age of 30 years and 4% (males 7% and females

Fig. 3 Mean age values at seven definitions of onset until first admission. First episode sample of schizophrenia broad definition ($n = 232$). (From Häfner et al. 1995)



2%) before the age of 10 years (Table 1). The maximum of positive symptoms or the climax of the first psychotic episode was reached before the age of 30 years in 59% and before the age of 20 years in 9% of cases.

Initial symptoms and types of onset

In contrast to age at onset, the types of onset and of the initial symptoms, i.e. how and with what schizophrenia starts, showed no significant gender differences (Table 1). In 73% of the sample schizophrenia started with a negative or nonspecific symptom, in 20% simultaneously with symptoms of both categories and in the remaining 7% with a positive symptom only. The five most frequent initial symptoms were poor concentration and subjective thought disorder (22%: males 26% and females 18%), lack of energy and slowness (19%: males 18% and females 21%), suspiciousness and social withdrawal (19%:

males 21% and females 17%), overall slowing down (16%: males 14% and females 18%) and anxiety (14%: males 15% and females 13%). No significant gender differences were found here, either. A considerable part of schizophrenias therefore presented symptoms associated with the risk of social impairment from disease onset on and long before first admission.

Symptomatology at first admission, assessed by PSE, showed only few age and very few gender differences. The only pronounced gender difference emerged with 11 socially negative behavioural items such as self-neglect, no interest in job etc., which were all more frequent among males, social overcompliance being the only behavioural item significantly more frequent among females (Häfner et al. 1993). If persistent over time, these marked differences in illness behaviour, presumably due to normal gender-specific and not to disease-specific patterns of behaviour, can be assumed to exert an additional impact towards a less favourable social course in men.

Table 1 Onset of schizophrenia

ABC first-episode sample	Total ($n = 232$)	Males ($n = 108$)	Females ($n = 124$)
Age at onset of the earliest sign ^a			
< 10 years	4%	7%	2%
< 20 years	41%	46%	37%
< 30 years	77%	82%	73%
Type of onset ^a			
Acute (≤ 1 month)	18%	19%	17%
Subacute (> 1 month ≤ 1 year)	15%	11%	18%
Insidious or chronic (> 1 year)	68%	70%	65%
Type of first symptoms ^a			
Negative or unspecific	73%	70%	76%
Positive	7%	7%	6%
Both	20%	22%	19%

^a No significant gender difference in all variables listed

*Social course in the prephases of first episodes:
expected and observed social achievement
in the early course of schizophrenia*

To assess the relevant points or stages in the early course of schizophrenia we defined:

1. The prodromal or "nonpsychotic" phase from the first sign of the disorder (according to our phase model described previously) until the first positive symptom. It was found in 73% of our sample and lasted 5.0 years on average.
2. The psychotic prephase with a mean duration of 1.1 years until the maximum of positive symptoms. First admission followed on average 2 months later.

The following hypotheses were used:

1. Social-status deficits appear in the prephase of schizophrenia prior to the first episode.
2. The short-term social course of schizophrenia is more favourable with women compared with men, due mainly to their later onset and not to gender differences in the early course of the disease.

First we tested hypothesis no. 1. We looked at four typical social roles, which are usually acquired between the ages of 15 and 30 years, namely employment, own income, own accommodation and partnership or marriage. Up to one quarter of the patients had never performed certain roles. A small proportion of the patients with an adequate role performance before onset or in the prephase of the disorder showed losses of these roles. A total of 18% lost their job in the prodromal phase due to abnormal behaviour, poor work performance, conflicts or psychological problems, and 15% gave up own accommodation and returned to their parents. The proportion of males with a job or own accommodation was significantly lower than that of females at the appearance of the first sign of the disorder, first psychotic symptoms and at index admission. Hence, in this regard males were more frequently non-starters. In the field of employment and own accommodation role losses were almost equally frequent among males and females. Pronounced sex differences emerged in partnership and marriage. Of the males, 35% but only 10% of the females, had never had a sexual relationship before first admission. At first admission 77% of the males and 53% of the females were without a partner ($p < 0.001$). No fewer than 42% of all males suffering from schizophrenia had lost their partner before first admission (Nowotny et al. 1995).

Our data therefore tends to support an important precondition for hypothesis no. 2: The social conditions at the beginning of the psychosis are clearly worse for males, because onset hits them at a lower level of social achievement than the 3- to 4-years-older females, although steps of social decline are nearly equally frequent for both genders.

On the other hand, a considerable proportion of the patients were capable of acquiring and maintaining social

roles: 50% got a job, 66% moved away from their parents to own accommodation or a sheltered apartment, 14% were married or lived with a partner at first admission and 18% had a sexual relationship without cohabitation.

Case-control study

In order to further test hypothesis no. 2 and to measure the deviation of the observed from the expected social achievement in the early course of schizophrenia, we matched a representative subsample of 57 first-admitted schizophrenics from our Mannheim ABC sample with 57 controls from the Mannheim population for age and gender. By the IRAOS interview the same social indicators were assessed at exactly the same points in time, determined by the first sign of the disorder, the first positive symptom and first admission, among the patients and the matched controls. To give an example, if a patient had the first positive symptom 1.5 years before the interview, then the social status of the aged-matched control person was also assessed 1.5 years before. Thus, it was possible to compare changes in social-status components for the same age periods in schizophrenics and controls.

By dichotomous operationalisation of the variables (present versus not present) differences in the frequency of social-role performance were compared between the matched pairs by means of the McNemar test (Brittain and Schlesselman 1982).

School education and occupational training (Fig. 4)

In the observation period nearly all schizophrenic and control probands concluded their school education without significant differences between the groups. Only in terms of advanced-level education, despite fairly equal starting conditions, the schizophrenic men fell off distinctly ($p = 0.10$) reaching only 27% compared with 53% of the male controls. This is the first piece of evidence for an element of social stagnation, a deficit in social achievement (advanced-level school education), indicating that in the prephase of

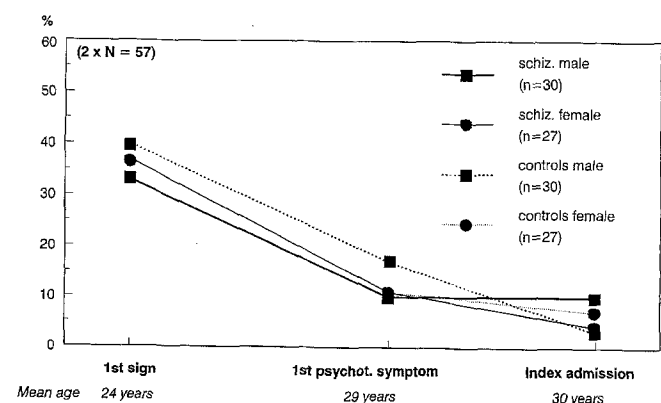


Fig. 4 Percent patients and controls who have not achieved final examinations

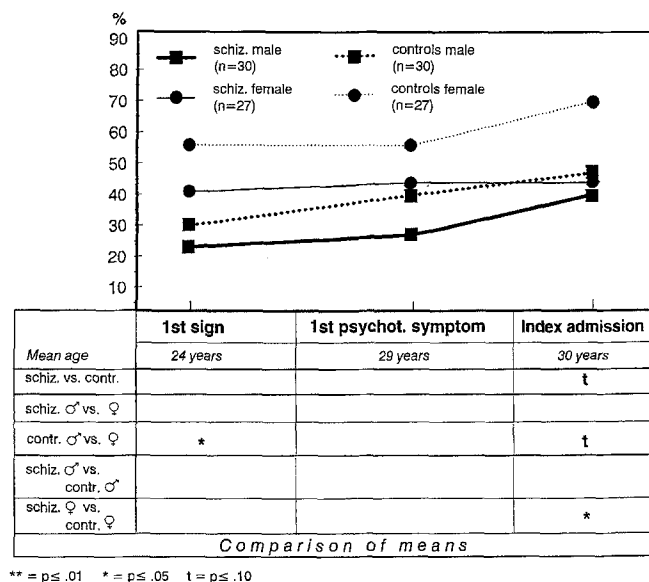


Fig.5 Percent employed

the disorder only the early afflicted schizophrenic men and not the schizophrenic women lag to a considerable extent behind healthy men. In occupational training, which is less exacting than advanced-level education, no significant group differences were found compared with the controls, nor gender differences among the schizophrenics.

Employment and own income (Fig. 5)

With employment the percentage of occupied women was higher among both schizophrenics and controls than that of men in both groups at the first sign of the disorder, although significantly higher only among controls. Apart from the higher age of women, their shorter occupational training and earlier start into working life contributed to this result. Although the percentages of occupied male as well as female schizophrenics were slightly below those of their matched controls at the first sign of the disorder, the group difference reached a statistical trend ($p = 0.08$) only at first admission. The fact that schizophrenics lagged behind at first admission was due exclusively to the females, 44% of female schizophrenics versus 70% of female controls being employed ($p = 0.04$). Closely associated with employment, own income showed an almost identical trend. This astonishingly less favourable course in females of an important social-status component, i.e. job and income, is presumably based on gender-specific aspects of social behaviour and of the social environment such as a greater readiness of women to leave their jobs or of employers to dismiss women on the grounds of illness.

Own accommodation (Fig. 6)

For own accommodation separate from the parent household, however, no differences in trends were found be-

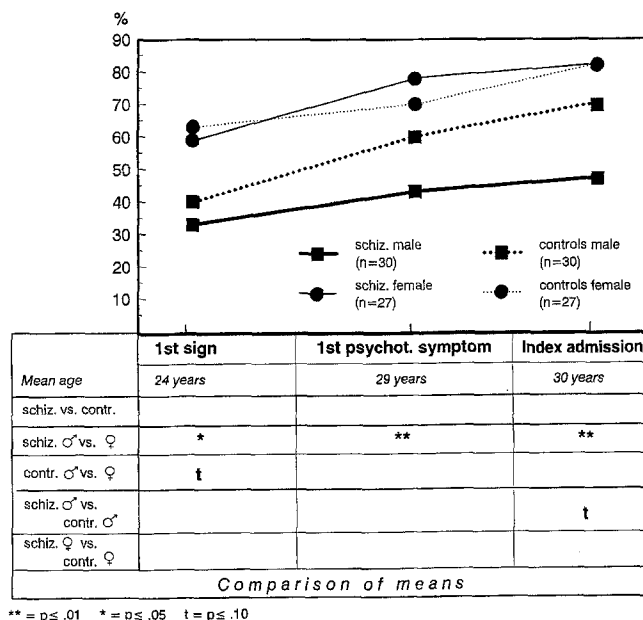


Fig.6 Percent living with relatives

tween schizophrenic and healthy women. Schizophrenic and control men showed identical starting conditions, but schizophrenic men lagged increasingly behind across the entire prephase. This difference accumulated to a statistical trend ($p < 0.1$) at first admission with 47% of the schizophrenics living in their own accommodation as compared with 70% of the controls. In the control group the initially lower proportions of males with own accommodation clearly approached those of the on average 3-years-older females towards first admission. Also, schizophrenic males lagged significantly behind schizophrenic females at the beginning. But the difference did not shrink, as it did with controls; it grew across the entire prephase to reach a highly significant value. At first admission the same proportion of schizophrenic and healthy women, namely 82%, but only 47% of schizophrenic men, lived in their own accommodation. In contrast to employment and income, in the social-status component "own accommodation" the schizophrenic women were able to further increase their clear advantage over the schizophrenic men and to perform the same trend of social achievement as healthy women. Schizophrenic males, whose starting position was significantly less favourable, e.g. due to their lower age, could only slightly improve their position in absolute terms and, concerning the expectations, were bound to fall behind.

Partnership (Fig. 7)

It was in heterosexual partnership and marriage that schizophrenics lagged behind the controls most markedly. Being younger at onset and marrying on average 2.5 years later in general (Statistisches Bundesamt 1993; personal communication) males showed clearly lower initial values than index and control females. But in the control group

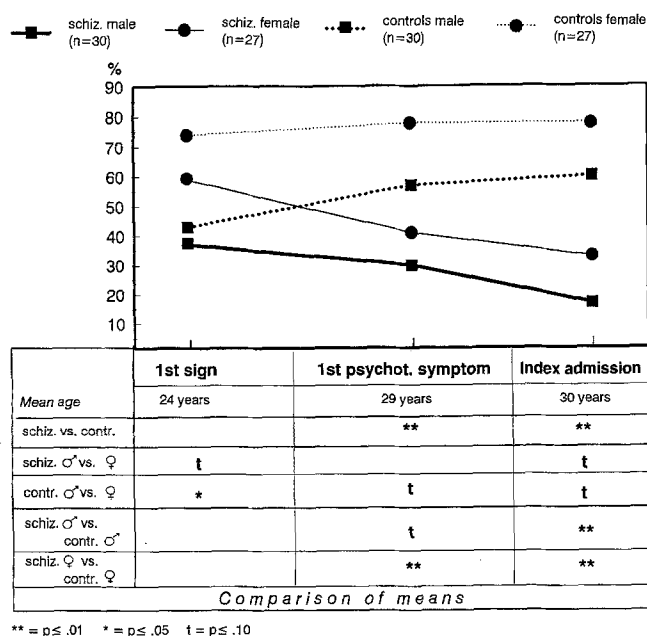


Fig. 7 Percent married or in stable partnership

males caught up with females, reducing the difference to healthy females almost by half. In contrast, schizophrenics showed a markedly falling trend, which by the end of the prodromal phase had grown to a highly significant difference against the controls ($p < 0.001$). At 17% schizophrenics showed an extremely low proportion of married or engaged males as compared with 32% of schizophrenic females and 60% of healthy males. Among the controls the initially low percentage of males was bound to increase with age. Among the schizophrenics the parallel falling trends of males and females indicated that the expected values were unlikely to be reached.

Discussion of results on the social course during the prephase

The demonstrated trends of social achievement result from the balance of ascent, stagnation and decline in the groups examined. At the beginning of the prodromal phase only slight differences emerged between schizophrenics and controls, which never reached the level of significance. This means that the impact of premorbidly existing social deficits on the social course cannot be very great. Delayed effects emerging with more stressful demands can, of course, not be excluded. Nevertheless, at this early point several gender differences are found among both controls and schizophrenics, which are due to the higher age (about 3 years on average) and the more advanced stage of social achievement in women.

During the prephase and up to index admission schizophrenic women lag behind the controls in terms of employment (also but not significantly concerning own income) and most markedly in marriage and stable partner-

ship. Schizophrenic men are inferior to healthy men and schizophrenic women in advanced-level school education and own accommodation. In terms of marriage and stable partnership they differ considerably and increasingly from healthy men, and to some extent, although only slightly significantly, even from schizophrenic women. Hence, compared with age-matched healthy individuals, schizophrenics tend to show clear social-status deficits in the prodromal phase and the psychotic prephase of the disorder including a definite decline in marriage and partnership. Men are more severely afflicted because of their younger age at onset resulting more often in social stagnation at a lower stage of achievement compared with women.

It is therefore in the early stage that the psychosis has its worst impact on partnership and marriage, and for males also on own accommodation. The finding is consistent with the results of the ECA Study (Tien and Eaton 1992; odds ratio for males 49 and for females 16), despite the methodological shortcomings of the latter, of Ödegård's (1971) case register studies and of our own analyses (Riecher-Rössler et al. 1989). Social spheres that are less close to the individual, however, seem to be less severely involved in the early stage of the disorder. This may be explained by the model of a shell, which allows impairing consequences of schizophrenia to occur first in spheres close to the individual and only later in more distant spheres of social competence. An alternative explanation may be a different latency period, because disturbed social functioning results in school failure, loss of job and of income only with some delay compared with the breakup of partnerships possibly as a consequence of the German social legislation.

Later social course

Using a larger representative subsample ($n = 133$) from our ABC study, we have by now followed up the later social and symptom-related course at five cross sections within 3 years of first admission. Figure 8 shows that after first admission, apart from short-term variation, no essential changes occur in the mean values of the social-status indicators, the only exception being a decrease in the proportion of unemployed due to rehabilitation measures. As shown in the case-control study, the slight upward trends of social functioning prior to first admission can probably be explained by contamination with the rapid social achievement in this period of life.

Social disability (DAS total score), defined as an expert rating, on the basis of a relative's interview of the dysfunction in the performance of social roles in family, job and social environment, was assessed prospectively at first admission (t_0) and 6 months ($t_{1/2}$), 1 year (t_1), 2 years (t_2) and 3 years (t_3) after first admission. A continuous decline from a mean value of 2.2 at t_0 to 1.5 at t_3 was observed, the most pronounced drop taking place from t_0 to t_1 . The rapid improvement in the disability scores is probably accounted for by the homogeneity of the sample in the period from the first psychotic episode to index ad-

mission. As earlier studies (Salokangas 1983; Deister and Marneros 1992) indicate, social adjustment in the early course of schizophrenia tends to be clearly poorer in males than in females. This finding was also valid for

“Overall behaviour” (DAS section 1) without taking social-role performance in family or employment, which showed marked gender differences, into account.

Early predictors of disability at cross section 2 years after first admission

By taking type of onset (acute, subacute or insidious), age and gender into account, we tested by logistical regression to what extent demographic, social-status and disease indicators in the early stages of schizophrenia are predictive of social disability 2 years after first admission (Fig. 9). To assess the influence of symptomatology on social disability at 2-year follow-up, CATEGO syndrome total scores were included in the regression analysis. To ensure statistical power, the number of variables had to be reduced. We formed a “global index of social-status deficits” from variables of social achievement by means of nonlinear principal-components analysis (Kohlmann 1988). Occupational training, employment, own income and own accommodation were combined to form the principal dimension (Nowotny et al. 1995). School education and partnership were dealt with separately, because their contribution to the global index was small. The global rating of social disability as an outcome variable was dichotomized (by a DAS score ≥ 2 = social disability).

At onset (first sign) the global index of social-status deficits failed to predict social disability 2 years after first admission, thus indicating again that sensu stricto premorbid deficits are fairly unimportant or that their effect is masked by a low stage of social achievement in this age group.

At the end of the prodromal phase, i.e. when the first positive symptom occurred, the global index of social deficits turned out to be the main predictor as already sug-

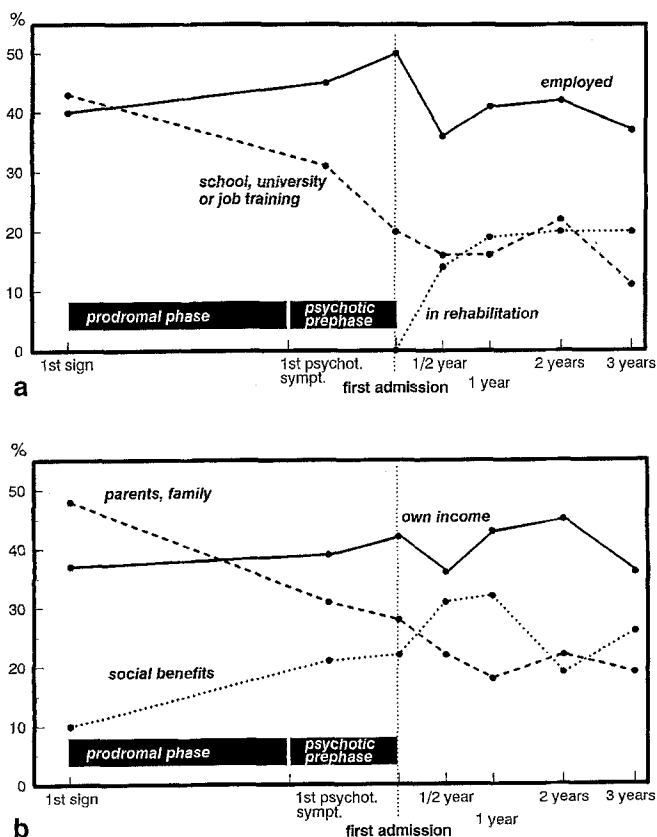
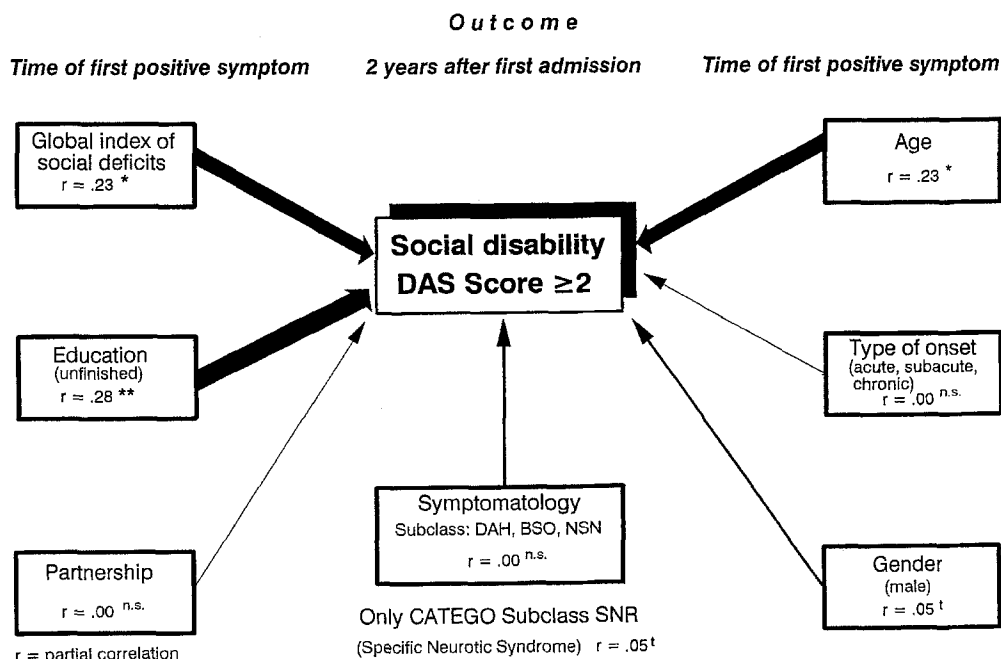


Fig. 8a, b Onset social course from 3 years after first admission. a Percent patients employed; b main source of income

Fig. 9 Prediction model of social disability (correct overall classification 81%). (From Häfner et al. 1995)



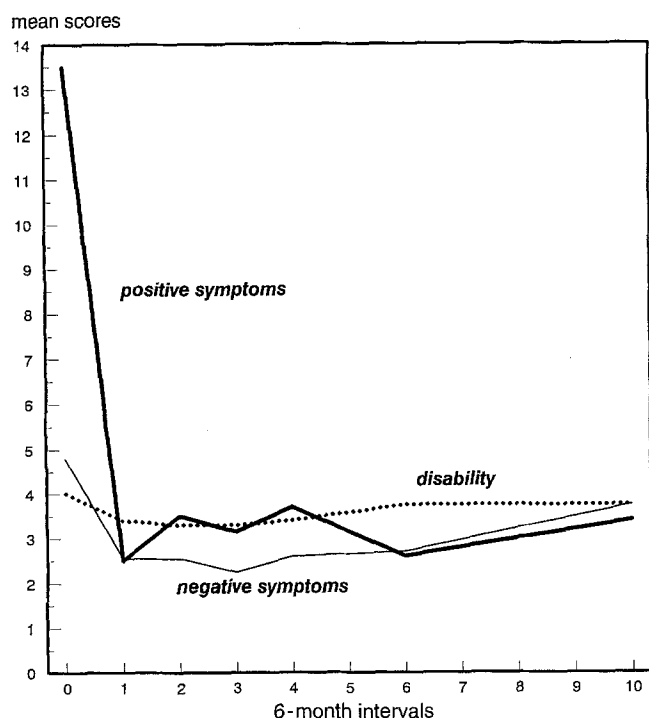


Fig. 10 WHO Disability study: Mannheim cohort. Comparison of mean scores over time. (From Biehl et al. 1988)

gested by the case-control study. In addition, at the beginning of the psychotic prephase for the first time age and, with a considerably lower magnitude, male gender had an independent effect not mediated through social-status deficits. The overall correct classification by means of this model was 81% (82% correct negative and 79% correct positive). The usual explanation by a more severe form of early-onset schizophrenia has to be employed with some reservation, because the impact of age shows no linear course (Riecher-Rössler et al. 1994). The impact of gender may well be the result of the socially negative male behaviour in early schizophrenia.

Of the disease variables only the specific neurotic syndrome showed an effect, although a weak one, perhaps because this score includes some behavioural items. The other syndrome scores, including positive and negative symptoms, and type of onset (acute, subacute, insidious) showed no significance at all. At the time of first admission the predictors did not change essentially. Again, deficits in social status constituted the main, although at this later stage slightly less powerful, predictor (overall correct classification: 85%).

Long-term course

14-year follow-up of a first-admission sample

The change of the downward trend of the mean values for social-status indicators in the prodromal phase to a state of stability immediately after the remission of the first

episode prompts the question of the long-term course. On social disability, operationalised by DAS sections, Biehl et al. (1988) had obtained an analogous finding (Fig. 10). They had assessed a different representative cohort of first-admitted schizophrenics from Mannheim ($n = 70$) after the remission of the first episode at five cross sections over 4.5 years. A 14-year follow-up of this cohort has been conducted by van der Heiden et al. (1995) from our research group with the same instruments.

The preliminary results indicate that the group trends of the DAS section "Overall behaviour" both in extent and profile (self-care, underactivity, slowness, social withdrawal, social contacts: friction in interpersonal relationships, behaviour in emergencies) and of the schizophrenic symptomatology (PSE, CATEGO-DAH subscore) had not undergone any essential change between the 5- and 14-year assessments (Fig. 11). The individual courses, however, showed considerable variability. This result, which has been confirmed by Harrison et al. (1994) assessing a parallel cohort of the WHO Disability study in Nottingham, puts a large question mark behind the traditional assumption of schizophrenia being associated with a progressive social decline. The result of a generally improved trend of social functioning reported by some long-term schizophrenia studies conducted with clinical samples (Ciampi and Müller 1976; Bleuler 1972; Huber et al. 1980; Marneros et al. 1989; Harding et al. 1987; Tsuang et al. 1979) must be challenged as well. The issue of stable course types has not yet been settled conclusively. They can be interpreted as consequences of either different severities of the biological disease process or of the interaction of early deficits in social functioning and corollaries of the disorder with illness behaviour, personality and social environment.

Conclusions

A successful replication of these results would have important implications. It appears that schizophrenia frequently leads to social deficits in the prodromal phase. Particularly at young age, in a period of rapid social achievement requiring the performance of new and increasingly complex social and cognitive tasks, the early symptoms of the disorder seem to be associated with an increased risk of deficient social functioning. The fact that the main period of social achievement coincides with the main period of risk for schizophrenia is bound to lead to the failure of schizophrenics to climb the social ladder as their healthy peers do.

In this way the age at which the disorder starts to disrupt social achievement exerts an important influence on the social course of schizophrenia for at least some years. Hence, the mean gender difference of 3–4 years in age of onset has an unfavourable impact on the social course of schizophrenia in males as compared with females. But soon after the remission of the first psychotic episode the group trend changes: Given the current conditions of care and treatment, the disorder appears not to progress. Of

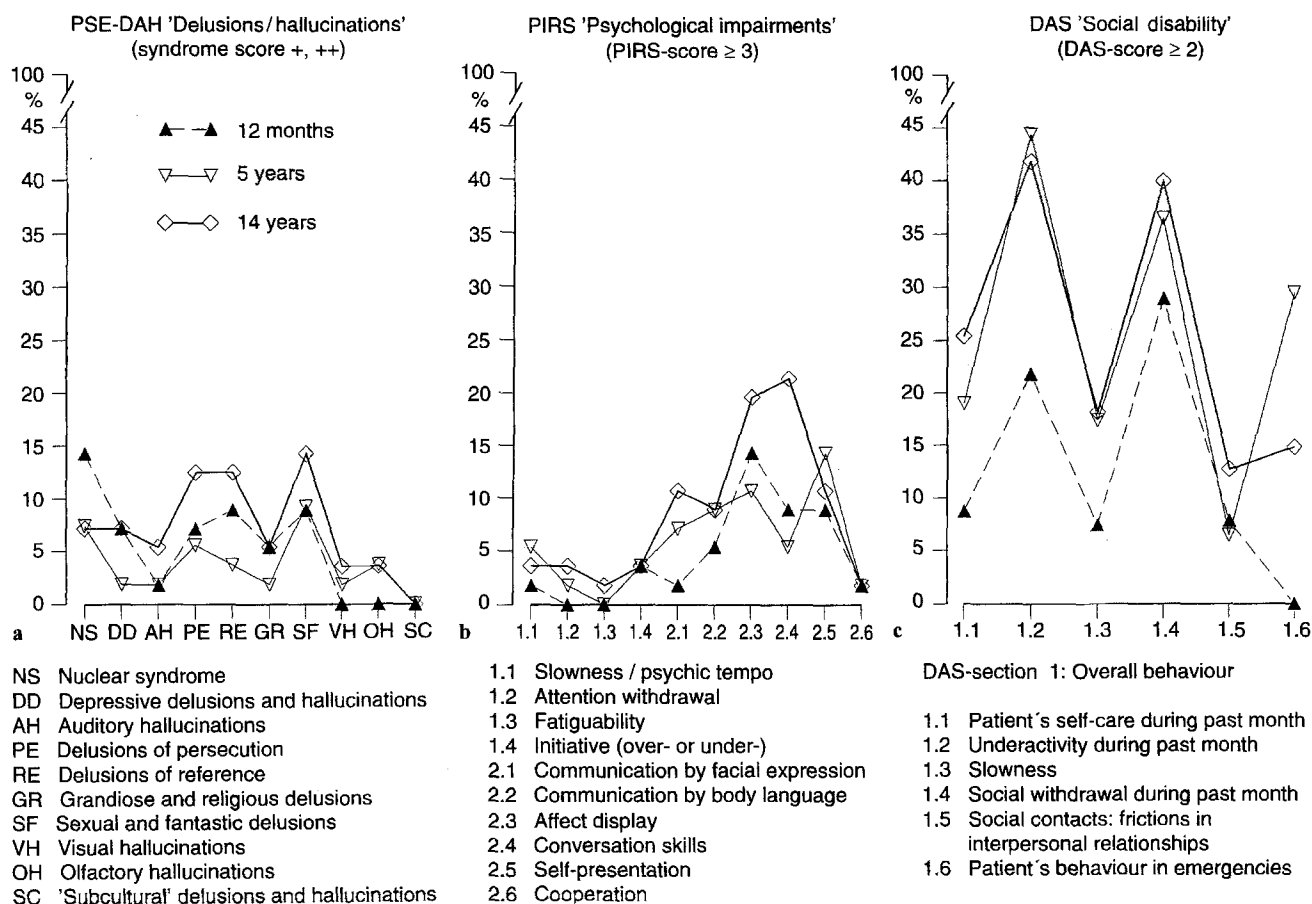


Fig. 11a-c Profiles of positive symptoms (PSE-DAH), psychological impairments (PIRS score ≥ 3) and social disability (DAS score ≥ 2) at three follow-up assessments after first admission (Mannheim cohort of the WHO disability study). (From Häfner et al. 1995)

course, these conclusions, based on statistical analyses of group data, do not say anything about a high variability of individual courses or about stable course types and their predictors.

In view of the psychological, neurological and brain morphological precursors, which can be shown to exist long before onset, although they probably occur in less than 50% of all schizophrenic cases, the explicatory model of a neurodevelopmental disorder (Weinberger et al. 1979; Lewis and Murray 1987) sounds more plausible than Jaspers' (1913) and Schneider's (1950) model of a lifelong progressing disease process. In a period when maximum demands are placed on the cognitive and communicative competence of an individual, reduced cognitive and social functioning – as a result of a presumably genetically determined neurodevelopmental deficit – might produce a maximum of pathological derailments. This biological model is compatible with the assumption that the reduced level of role functioning and coping and the social consequences interacting with the social environment may produce secondary psychological processes with different social outcomes. An example would be the development of negative symptoms in the sense of secondary disabilities (Wing and Brown 1970) after long-term social deprivation in schizophrenia.

References

- Angst J, Isele R, Scharfetter C, Scheidegger P (1985) Zur prä-mor-biden Persönlichkeit Schizophrener. *Schweiz Arch Neurol Psychiatr* 136:45–53
- Angermeyer MC, Kühn L, Goldstein JM (1990) Gender and the course of schizophrenia: differences in treated outcomes. *Schizophr Bull* 16:293–307
- Biehl H, Maurer K, Schubart C, Krumm B, Jung E (1986) Prediction of outcome and utilization of medical services in a prospective study of first onset schizophrenics – results of a prospective 5-year follow-up study. *Eur Arch Psychiatr Neurol Sci* 236:139–147
- Biehl H, Maurer K, Schubart C (1988) Dimensionen der Psychopathologie und sozialen Anpassung im natürlichen Verlauf schizophrener (Erst-) Erkrankungen. In: Olbrich R (ed) *Prospektive Verlaufsforschung in der Psychiatrie*. Springer, Berlin Heidelberg New York
- Bland RC, Parker JH, Orn H (1978) Prognosis in schizophrenia. Prognostic predictors and outcome. *Arch Gen Psychiatry* 35: 72–77
- Bleuler M (1972) *Die schizophrenen Geistesstörungen im Lichte langjähriger Kranken- und Familiengeschichten*. Thieme, Stuttgart
- Brittain E, Schlesselman JJ (1982) Optimal allocation for the comparison of proportions. *Biometrics* 38:1003–1009
- Childers SE, Harding CM (1980) Gender, premorbid social functioning, and long-term outcome in DSM-III schizophrenia. *Schizophr Bull* 16:309–318

- Ciampi L, Müller CH (1976) Lebensweg und Alter der Schizophrenen. Eine katamnestic Langzeitstudie bis ins Senium (Monographien aus dem Gesamtgebiet der Psychiatrie, Bd. 12). Springer, Berlin Heidelberg New York
- Deister A, Mameros A (1992) Geschlechtsabhängige Unterschiede bei endogenen Psychosen. Ein Vergleich zwischen schizophrenen, schizoaffektiven und affektiven Psychosen. *Fortschr Neurol Psychiatr* 60:407–419
- Dohrenwend BP, Dohrenwend BS (1969) Social status and psychological disorder: a causal inquiry. John Wiley New York
- Dohrenwend BP, Levav I, Shrout PE, Schwartz S, Naveh G, Link BG, Skodol AE, Stueve A (1992) Socioeconomic status and psychiatric disorders: the causation-selection issue. *Science* 255:946–952
- Dunham HW (1965) Community and schizophrenia. An epidemiological analysis. Wayne State University Press, Detroit
- Eagles JM, Gibson J, Brensner MH, Clunie F, Ebmeier KP, Smith NC (1990) Obstetric complications in DSM-III schizophrenics and their siblings. *Lancet* 335:1139–1141
- Eaton WW (1985) Epidemiology of schizophrenia. *Epidemiol Rev* 7:105–126
- Erickson DH, Beiser M, Iacono WG, Fleming JAE, Lin T (1989) The role of social relationships in the course of first-episode schizophrenia and affective psychosis. *Am J Psychiatry* 146:1456–1461
- Freeman H, Alpert M (1986) Prevalence of schizophrenia in an urban environment. *Br J Psychiatry* 149:603–611
- Goldberg EM, Morrison SL (1963) Schizophrenia and social class. *Br J Psychiatry* 109:785–802
- Goldstein JM (1988) Gender differences in the course of schizophrenia. *Am J Psychiatry* 145:684–689
- Häfner H (1971) Der Einfluss von Umweltfaktoren auf das Erkrankungsrisiko für Schizophrenie. *Nervenarzt* 42:557–568
- Häfner H: Epidemiology of schizophrenia. In: Häfner H, Gattaz WF, Janzarik W (eds) Search for the causes of schizophrenia. Berlin, Springer, 1987:47–74
- Häfner H, Behrens S, Vry J de, Gattaz WF (1991a) An animal model for the effects of estradiol on dopamine-mediated behavior: Implications for sex differences in schizophrenia. *Psychiatry Research* 38:125–134
- Häfner H, Riecher-Rössler A, Fätkenheuer B, Hambrecht M, Löffler W, an der Heiden W, Maurer K, Munk-Jørgensen P, Strömberg E (1991b) Sex differences in schizophrenia. *Psychiatr Fennica* 22:123–156
- Häfner H, Riecher-Rössler A, Maurer K, Fätkenheuer B, Löffler W (1992) First onset and early symptomatology of schizophrenia: a chapter of epidemiological and neurobiological research into age and sex differences. *Eur Arch Psychiatr Clin Neurosci* 242:109–118
- Häfner H, Riecher-Rössler A, Hambrecht M, Maurer K, Meissner S, Schmidtke A, Fätkenheuer B, Löffler W, an der Heiden W (1992) IRAOS: an instrument for the assessment of onset and early course of schizophrenia. *Schizophr Res* 6:209–223
- Häfner H, Maurer K, Löffler W, Riecher-Rössler A (1993) The influence of age and sex on the onset and early course of schizophrenia. *Br J Psychiatry* 162:80–86
- Häfner H, Maurer K, Löffler W, Fätkenheuer B, an der Heiden W, Riecher-Rössler A, Behrens S, Gattaz WF (1994) The epidemiology of early schizophrenia. Influence of age and gender on onset and early course. *Br J Psychiatry* 164 (Suppl 23):29–38
- Häfner H, Maurer K, Löffler W, Bustamante S, an der Heiden W, Riecher-Rössler A, Nowotny B (1995) Onset and early course of schizophrenia. In: Häfner H, Gattaz WF (eds) Search for the causes of schizophrenia III. Springer, Berlin Heidelberg New York, pp 43–66
- Harding C, Brooks GW, Ashikaga T, Strauss JS, Breier A (1987) The Vermont longitudinal study: II. Long-term outcome of subjects who once met the criteria for DSM-III schizophrenia. *Am J Psychiatry* 144:718–727
- an der Heiden W, Krumm B, Müller M, Weber I, Biehl H, Schäfer M (1995) Mannheimer Langzeitstudie der Schizophrenie: Erste Ergebnisse zum Verlauf der Erkrankung über 14 Jahre nach stationärer Erstbehandlung. *Nervenarzt* (submitted for publication)
- Huber G, Gross G, Schüttler R (1980) Schizophrenie. Eine Verlaufs- und sozialpsychiatrische Langzeitstudie. Springer, Berlin Heidelberg New York
- Jablensky A, Sartorius N, Ernberg G, Anker M, Korten A, Cooper JE, Day R, Bertelsen A (1992) Schizophrenia: manifestations, incidence and course in different cultures. A World Health Organization ten-country study. *Psychol Med Monogr (Suppl 20)*. Cambridge University Press, Cambridge
- Jacobson AM, Goldberg ID, Burns BJ, Hooper EW, Hankin JR, Hewitt K (1980) Diagnosed mental disorder in children and use of health services in four organized health care settings. *Am J Psychiatry* 137:559–565
- Jaspers K (1948) Allgemeine Psychopathologie. Berlin, 1913; 5th unaltered edn., Springer, Berlin Heidelberg New York
- Jung E, Krumm B, Biehl H, Maurer K, Bauer-Schubart C (1989) Mannheimer Skala zur Einschätzung von sozialer Behinderung (DAS-M). Beltz, Weinheim
- Kohlmann T (1988) Nichtlineare Hauptkomponentenanalyse. *Soziologie* 17:474–482
- Kohn M (1972) Class, family and schizophrenia: a reformulation. *Soc Forces* 50:295–304
- Kokes RF, Strauss JS, Klarman R (1977) Premorbid adjustment in schizophrenia. Part II. Measuring premorbid adjustment: the instruments and their development. *Schizophr Bull* 3:186–205
- Kraepelin E (1893) Psychiatrie, 4th edn. Barth, Leipzig
- Lewis SW, Murray RM (1987) Obstetric complications, neurodevelopmental deviance and schizophrenia. *J Psychiatr Res* 21:413–421
- Liberatos P, Link BG, Kelsey JL (1988) The measurement of social class in epidemiology. *Epidemiol Rev* 10:87–121
- Lindelius R (1970) A study of schizophrenia. *Acta Psychiatr Scand Suppl* 216:1–125
- Maier W, Lichtermann D, Minges J, Hallmayer J, Heun R, Benkert O, Levinson DF (1993) Continuity and discontinuity of affective disorders and schizophrenia: results of a controlled family study. *Arch Gen Psychiatry* 50:871–883
- Mameros A, Steinmeyer EM, Deister A, Rohde A, Jünemann H (1989) Long-term outcome of schizoaffective and schizophrenic disorders: a comparative study. III: Social consequences. *Eur Arch Psychiatr Neurol Sci* 238:135–139
- McGlashan TH, Bardenstein KK (1990) Gender differences in affective, schizoaffective, and schizophrenic disorders. *Schizophr Bull* 16:319–329
- Muntaner C, Pulver AE, McGrath J, Eaton WW (1993) Work environment and schizophrenia: an extension of the arousal hypothesis to occupation self-selection. *Soc Psychiatry Psychiatr Epidemiol* 28:231–238
- Nowotny B, Häfner H, Löffler W (1995) Die beginnende Schizophrenie als Einbruch in die soziale Biographie – Folgen für soziale Behinderung versus soziale Wiederanpassung. *Klin Psychol* (in press)
- Nyman K (1989) We visited 2 unisexual courses. Women or men in the SHSTF – does it have any significance? *Vardfacket* 13:16–20
- Ödegård Ö (1971) Hospitalized psychoses in Norway: time trends 1926–1965. *Soc Psychiatry* 6:53–58
- Ödegård Ö (1972) Epidemiology of the psychoses. In: Kisker KP, Meyer J-E, Müller M, Strömberg E (eds) Psychiatrie der Gegenwart, vol 2/part 1: Forschung und Praxis. Springer, Berlin Heidelberg New York
- Riecher-Rössler A, Maurer K, Löffler W, Fätkenheuer B, an der Heiden W, Häfner H (1989) Schizophrenia – a disease of young single males? *Eur Arch Psychiatr Neurol Sci* 239:210–212
- Riecher-Rössler A, Häfner H, Stumbaum M, Maurer K, Schmidt R (1994) Can estradiol modulate schizophrenic symptomatology? *Schizophr Bull* 20:203–214
- Salokangas R (1983) Prognostic implications of the sex of schizophrenic patients. *Br J Psychiatry* 142:145–151
- Schneider K (1950) Klinische Psychopathologie, 3rd edn. Thieme, Stuttgart
- Stein L (1957) “Social class” gradient in schizophrenia. *Br J Prev Soc Med* 11:181–195

- Strauss JS, Carpenter WT Jr (1977) Prediction of outcome in schizophrenia. *Arch Gen Psychiatry* 34:159–163
- Tien AY, Eaton WW (1992) Psychopathologic precursors and sociodemographic risk factors for the schizophrenia syndrome. *Arch Gen Psychiatry* 49:37–46
- Tsuang MT, Woolson RF, Fleming JA (1979) Long-term outcome of major psychoses. I. Schizophrenia and affective disorders compared with psychiatrically symptom-free surgical conditions. *Arch Gen Psychiatry* 36:1296–1301
- Turner RJ, Wagenfeld MO (1967) Occupational mobility and schizophrenia. *Am Soc Rev* 32:104–113
- Weinberger DR, Torrey EF, Neophytides AN, Wyatt RJ (1979) Structural abnormalities in the cerebral cortex of chronic schizophrenic patients. *Arch Gen Psychiatry* 36:935–939
- World Health Organization (1988) Psychiatric Disability Assessment Schedule. WHO, Geneva
- Wiersma D, Giel R, DeJong A, Slooff CJ (1983) Social class and schizophrenia in a Dutch cohort. *Psychol Med* 13:141–150
- Wing JK, Brown GW (1970) Institutionalism and schizophrenia. A comparative study of three mental hospitals 1960–1968. Cambridge University Press, Cambridge