The relationship between positive symptoms and instrumental work functioning in schizophrenia: A 10 year follow-up study

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Abstract

This longitudinal investigation was designed to determine the association between the positive symptoms of psychosis and instrumental work functioning among patients with schizophrenia in comparison to patients with affective disorders. 173 participants were assessed prospectively for the presence of psychosis and concurrent work adjustment using a series of standardized measures at four consecutive follow-ups over a 10 yr period. The data demonstrate a significant relationship between psychosis and increased impairment in work functioning across diagnostic groups for three of the four follow-up periods ($p < 0.01$), with this relationship being most consistent for the schizophrenia patients throughout the course of their disorder ($p < 0.01$). The more severely psychotic patients, regardless of diagnosis, are least likely to be working effectively; however, the debilitating effect of psychosis on work adjustment is most evident for schizophrenia patients. © 2002 Elsevier Science B.V. All rights reserved.

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Positive symptoms such as delusions and hallucinations are among the hallmark diagnostic features of schizophrenia. Deterioration in occupational and/or social functioning is also one of the defining features of the disorder. The association between psychopathology and instrumental functioning has been hypothesized to be a loosely linked, semi-independent system in schizophrenia patients (Strauss and Carpenter, 1974). The present research was designed to study on a longitudinal basis, whether ongoing psychotic symptoms, or more specifically, delusions and hallucinations, are associated with impaired instrumental work performance in schizophrenia patients. This relationship will also be examined among psychiatric control groups, namely patients with affective disorders to determine if this association is unique to schizophrenia patients.

While psychosis and functional impairment are core features of schizophrenia, few studies have been able to demonstrate a direct association between positive symptoms and functional outcome (Green, 1996), though some have found a relationship between thought disorder and psychosocial functioning (Lysaker et al., 1995b; Perry et al., 1995; Racenstein et al., 1999). Conversely, there are much

data supporting a link between negative symptoms and psychosocial functioning (Bell and Lysaker, 1995; Breier et al., 1991; Kay and Lindenmayer, 1987; Lysaker and Bell, 1995; Solinski et al., 1992). More recent research suggests that neurocognitive deficits (e.g. executive functions), rather than psychopathology in general, have significant predictive utility with respect to functional outcome (Breier et al., 1991; Green, 1996; Lysaker et al., 1995a). Some have even concluded that there is a *weak* relationship between positive symptoms and functional outcome (Green, 1996). Although the data suggest that neurocognitive factors play a more prominent role in mediating outcome, over time, severe and persisting positive symptoms are also likely to affect occupational and social functioning (Grinker and Harrow, 1987; Pouge-Guile and Harrow, 1984).

Several investigators have speculated that the relationship between psychopathology and future functioning is phase-specific, meaning the stage of illness from which the predictor variable (i.e. psychosis) is derived may be directly related to its validity (Kay and Lindenmayer, 1987; Harrow et al., 1997). Symptoms measured during the acute phase may not carry the same prognostic influence on future instrumental performance as those symptoms assessed during the more chronic phase. However, when symptoms persist beyond the acute phase, they offer more prognostic value (Grinker and Harrow, 1987; Mueser et al., 1991). Thus, the prognostic utility of enduring psychosis is often obscured when studies assess psychotic symptoms at one point in time (i.e. the inpatient hospitalization phase). Extending upon previous research, few studies have examined the longitudinal relationship between positive symptoms (i.e. delusions and hallucinations) and instrumental functioning, across repeated follow-ups, throughout the course of schizophrenia, establishing the consistency of the relationship between these variables over time. Therefore, it is proposed that the association between psychosis and instrumental functioning in schizophrenia is stronger when it is measured during the more stable, chronic phase of the illness.

Finally, diagnosis has been known to be a strong predictor of functional outcome, with schizophrenia patients demonstrating significantly more impairment in work functioning than patients with affective disorders (Beiser et al., 1994; Breier et al., 1991;

Racenstein et al., 1999). However, the presence of psychotic symptoms among patients with primary affective disorders has also been associated with poorer functional outcome (Rosen et al., 1983). In the current research, patients with schizophrenia will be compared to those with affective disorders to determine the differential prognostic utility of psychotic symptoms in these populations.

This prospective, longitudinal investigation represents an extension and replication of previous research (Goldberg et al., 1995; Harrow et al., 1997; Racenstein et al., 1999). Overall the current study was designed to answer the following research questions: (1) At repeated follow-ups over 10 yr (after the index hospitalization) are schizophrenia patients with psychosis able to work effectively? (2) If there is a relationship between psychosis and impaired work functioning, is it specific to schizophrenia or does it cut across other psychiatric diagnoses?

1. Method

1.1. Patient characteristics

This research is based upon the data gathered from the Chicago Follow-up Study, a prospective, multidimensional investigation of the longitudinal course and clinical correlates of schizophrenia and other major psychiatric disorders (Carone et al., 1990; Goldberg et al., 1995; Harrow et al., 1997; Racenstein et al., 1999; Sands and Harrow, 1994). The current sample consists of 173 patients (50% female), who were recruited during consecutive inpatient admissions early in the course of their disorder, and then administered consecutive follow-ups over a 10 yr period. Using RDC criteria for diagnosis (Spitzer et al., 1978), there were 70 schizophrenia patients (36% female), 43 affective disordered (psychotic controls) patients (60% female), and 60 nonpsychotic depressed (control) patients (60% female). The patients assigned to the 'psychotic control group' or 'other psychotic' group included 25 bipolar, manic type patients, and 18 unipolar depressives, with psychotic features), *each* of whom were initially psychotic at the acute phase, or index hospitalization. The nonpsychotic depressed patients are defined as a group in a similar manner as above, as *none* of these patients demonstrated any

signs of psychosis at the acute phase or index hospitalization; however, a subgroup of these patients were occasionally psychotic at later follow-ups. RDC diagnoses were based on at least one of two extensive standardized structured interviews at index hospitalization (e.g. the Schedule for Affective Disorders and Schizophrenia (SADS; Endicott and Spitzer, 1978), and/or the Schizophrenic State Inventory (Grinker and Harrow, 1987). To assess inter-rater reliability for a diagnosis of schizophrenia, we obtained a kappa of 0.88. The reliability of psychosis over time was very high when adjacent follow-ups were used; the correlations were always > 0.60.

Following the acute episode, or index hospitalization, patients were assessed at four successive follow-up periods, at a mean of 2, 4.5, 7.5, and 10 yr later. Outcome data at the 10 yr follow-up were available for slightly over 80% of the original sample studied at the index hospitalization. Written informed consent was obtained at index and at each follow-up. Ninety-one percent of the current sample were administered all four follow-up assessments, with the remaining 9% having participated in 3 of the 4 follow-up periods, with this including the 10 yr follow-up. To assess for potential differences regarding subject loss, a separate sub-sample of schizophrenia patients who had completed assessments at the 2 yr follow-up (but were not available for the 10 yr follow-up) were compared to the present sample of schizophrenia patients who had completed the 2 and 10 yr follow-up assessments. At the 2 yr follow-up schizophrenia patients in the current sample did not differ significantly from the other subjects who had completed the 2 yr and the 10 yr follow-up in age at index hospitalization, gender, or education level; in addition, the subjects did not differ in severity of psychosis or work functioning at the 2 yr follow-up (all $p > 0.05$). Assessments were administered by trained research assistants, blind to the patients' diagnosis, as well as the results from the previous follow-up.

The participants were recruited at the index hospitalization at a relatively young age, 98% were between 17 and 30 yr of age. Seventy-five percent had never been married. The mean age of the study sample was 23 yr (± 3.74) at index, with 73% of the sample having had one or no prior hospitalizations. The mean number of years of education was 13.11.

Seventy-five percent of the sample was Caucasian, the remaining 25% of the patients were African–American and of mixed race.

There were no significant differences between diagnostic groups with respect to age at index hospitalization, marital status, or social class. There were more males in the schizophrenia group relative to the other psychotic patients ($\chi^2 = 6.58$, $p < 0.01$), and more females among the nonpsychotic depressive patients relative to those with schizophrenia ($\chi^2 = 7.65$, $p < 0.005$). These gender differences are in accord with the typical distributions of schizophrenia and depressive patients. The diagnostic groups differed significantly in their number of years of education completed; those with nonpsychotic depression completed more education than the schizophrenia and psychotic control patients ($p < 0.01$). Notably, when the entire sample was stratified by high verses low education, the same trends emerged within both groups, with the more psychotic individuals demonstrating poorer work functioning.

1.2. Medications

The presence and dosage of pharmacological treatments were assessed in the month prior to each follow-up. At the 10 yr follow-up 56% of the schizophrenia patients were on neuroleptics, 26% of the psychotic control patients were on neuroleptics, and 10% of the nonpsychotic depressive control patients were being treated with neuroleptics (either alone or in combination with other medications). Eighteen percent of the schizophrenia patients, 14% of the psychotic affective patients, and 22% of the nonpsychotic depressive patients were being treated with psychotropic medications other than neuroleptics. Twenty-five percent of the schizophrenia patients, 60% of the other psychotic patients, and 68% of the nonpsychotic depressive patients were not on any medications at the 10 yr follow-up. However, 72% of all schizophrenia patients were receiving some form of treatment at the 10 yr follow-up.

Regarding neuroleptic medications, at the 4.5, 7.5, and 10 yr follow-up periods, schizophrenia patients who were prescribed antipsychotic medications demonstrated significantly poorer work functioning than those who were not on any neuroleptics (4.5 yr $p < 0.0001$, 7.5 yr $p < 0.005$, and 10 yr $p < 0.05$).

Thus, findings suggest that the sicker, more chronic and more severe patients were those who were prescribed neuroleptics. Findings were similar for the other psychotic patients (4.5 yr $p < 0.004$, 7.5 yr $p < 0.0001$, and 10 yr $p < 0.0001$). Of the patients who were diagnosed with nonpsychotic depression at the index hospitalization, differences in work performance among those who were prescribed anti-psychotic medications emerged at the 7.5 yr follow-up, with patients on neuroleptics demonstrating poorer work functioning ($p < 0.05$).

1.3. Follow-up assessments

Psychosis was assessed at each of the follow-up periods with the use of a standardized psychiatric interview (the SADS) focusing on the month pre-ceding the follow-up assessment. Psychosis (or posi-tive symptoms) was defined as the presence of delusions and/or hallucinations, and was rated as (1) absent, (2) equivocal (suspected or weak, and/or occurring infrequently), or (3) definitely present, using a system reported previously (Harrow et al., 1995; Sands and Harrow, 1994). A measure of nega-tive symptoms was derived by the SADS interview, which focuses on a combination of flat affect, psychomotor retardation and paucity of speech. This measure has been used successfully in previous reports (Herbener et al., 2001; Pouge-Guile and Harrow, 1984).

1.4. Work functioning

The Strauss–Carpenter Outcome Scale (SCS) has been frequently used in previous longitudinal research with adequate inter-rater reliability to assess social and work adjustment (Hawk et al., 1974; Racenstein et al., 1999). One major index from the S–C scale was used which characterized the amount of useful employment. The latter is defined as paid employment and also includes work as a primary caretaker or student) during the last year prior to each follow-up. The 5 point scale includes items such as: "(4) 'Employed' continuously, (3) 'Employed' more than half of the year, but less than continuously, (2) 'Employed' part-time or full-time about half the time in the past year, (1) 'Employed' less than half the time in the past year, (0) no useful work." In some analyses we classified 'adequate work functioning'

by dividing the samples into two separate groups including: (1) those subjects scoring among the top 2 highest work functioning items ('3s' and '4s' on the SCS) and (2) less than adequate functioning was classified as those subjects measuring in the lower functioning work descriptions (<3 on the SCS). Ratings for the employment scale were confirmed by a lengthy detailed structured interview, which was not used in the data analysis (The Harrow Func-tioning Questionnaire; HFQ), administered by trained research assistants blind to participants' diagnosis, which has been used successfully in several longitu-dinal studies (e.g. Grinker and Harrow, 1987; Harrow et al., 1997; Racenstein et al., 1999). To control for type I error, an experiment-wide alpha level of $p < 0.01$ was set.

2. Results

2.1. Are psychotic patients working effectively?

2.1.1. Psychosis and work impairment

At each follow-up separate 2X3 analyses of variances (psychotic/nonpsychotic at that follow-up by 3 diagnostic groups) were conducted to examine whether psychosis and diagnosis influenced work functioning at each respective follow-up. At the 2 yr follow-up there was only main effect for diagnostic groups ($p = 0.055$). At the 4.5 yr follow-up there was a significant main effect for diagnosis [$F(1, 99) = 10.85$, $p < 0.001$], with the schizophrenia patients demonstrating the most impairment in work function-ing in comparison to both the other psychotic patients and the nonpsychotic depressive patients (Newman–Keuls test, $p < 0.0001$). There was also a significant main effect for psychosis, with the psychotic indivi-duals demonstrating more work impairment [$F(1, 99) = 13.47$, $p < 0.0001$]. The patterns were similar at the 7.5 and 10 yr follow-up for diagnosis [7.5 yr: $F(1, 97) = 11.78$, $p < 0.001$; 10 yr: $F(1, 97) = 9.44$, $p < 0.01$], with the schizophrenia patients demonstrating the most impairment in work functioning in comparison to both the other psychotic patients and the nonpsychotic depressive patients (Newman–Keuls test, $p < 0.0001$). There were also main effects for psychosis at the 7.5 and 10 yr follow-ups, with the more psychotic patients demonstrating
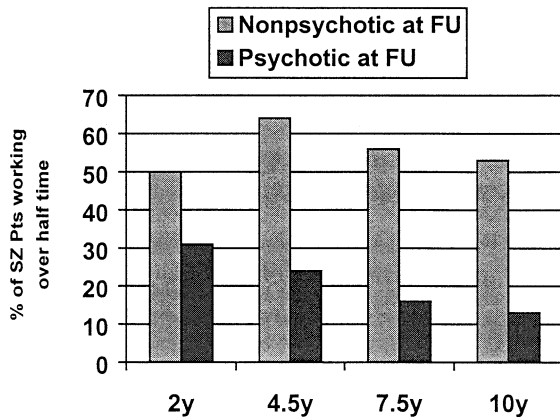
Fig. 1. Percentage of schizophrenia patients with and without signs of psychosis working effectively.

poorer work performance [7.5 yr: $F(1,97) = 13.59$, $p < 0.0001$; 10 yr: $F(1,97) = 6.83$, $p < 0.01$].

Notably, because the psychotic and nonpsychotic groups differed at baseline in level of education each of the ANOVAs were reanalyzed as ANCOVAs, using education as a covariate and all findings at each respective follow-up remained unchanged.

Prior to the more detailed analyses that follow, separate analyses were conducted to verify whether the 3 diagnostic groups differ significantly in extent of psychosis at follow-up. Analyses on diagnostic differences in psychotic symptoms were significant at all 4 follow-up periods (Kruskal–Wallis test, all $p < 0.0001$). Post-hoc analyses indicate that the schizophrenia group demonstrated significantly more severe psychosis than the nonpsychotic depressive patients at all four follow-ups (Mann–Whitney U, $p < 0.001$). The schizophrenia patients also demonstrated significantly more severe psychosis than the other psychotic patients at the 7.5 and 10 yr follow-ups (Mann–Whitney U, $p < 0.001$).

2.1.2. Schizophrenia, work functioning, and psychosis

Fig. 1 reports the data on the 2 yr follow-up, in which 31% (11/35) of the schizophrenia patients with signs of psychosis were working effectively, which was defined as working continuously more than half the time or full-time in the year prior to the follow-up. Fifty percent (13/26) of the schizophrenia patients who were not psychotic were working effectively. By the 4.5 yr follow-up only

24% (7/29) of the schizophrenia patients with psychotic symptoms were working effectively verses 64% (21/33) of the patients who were not currently psychotic. At the 7.5 yr follow-up 16% (6/37) of the schizophrenia patients who were psychotic were working effectively verses 56% (11/25) of those without psychosis. Patterns were similar at the 10 yr follow-up, with only 13% (4/30) of the schizophrenia patients with signs of psychosis working effectively versus 53% (17/32) of those patients without psychosis. A separate repeated measures ANOVA was conducted on those schizophrenia patients who had all 4 follow-up assessments. There was a trend to suggest that the overall severity of psychosis worsened over time ($F(3,129) = 3.07$, $p = 0.03$). (See Fig. 1).

2.1.3. Other psychotics, work functioning, and psychosis

Regarding the affective disorders patients who were originally psychotic at the acute phase (Other Psychotics, OPs), at the 2 yr follow-up 50% (9/18) of those patients who were psychotic at follow-up were working effectively, versus 61% (11/18) of the patients without any psychotic symptoms. Sixty-four percent (9/14) of the OPs with positive symptoms at the 4.5 yr follow-up were working effectively as opposed to 85% (23/27) of those patients without psychotic symptoms. Fifty percent (5/10) of the other psychotic patients with signs of psychosis at the 7.5 yr follow-up were working effectively, as opposed to 76% (22/29) of those without psychotic symptoms. By the 10 yr follow-up, 57% (4/7) of the OPs with psychotic symptoms were effectively working as opposed to 69% (22/32) without psychosis. (See Fig. 2).

A separate look at the two major nonschizophrenia groups who were initially psychotic at the index hospitalization (bipolar manic type patients and the unipolar depressive patients with psychotic features), demonstrated that these two groups did not differ significantly in work functioning at the 2, 4.5, and 7.5 yr follow-ups. However, at the 10 yr follow-up there was a trend to suggest that the psychotic depressive patients demonstrated better work functioning than the bipolar manic patients ($p < 0.05$).
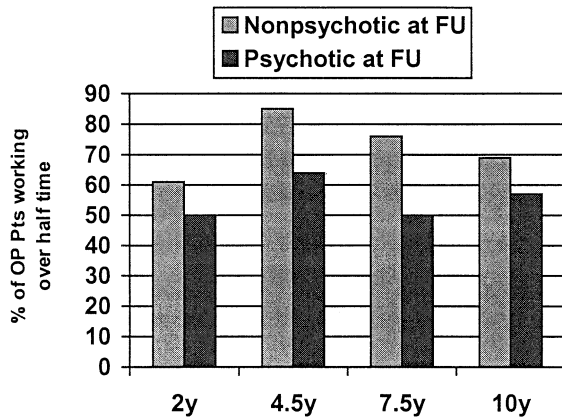
Fig. 2. Percentage of other (initially) psychotic patients with and without signs of psychosis (at follow-up) working effectively.
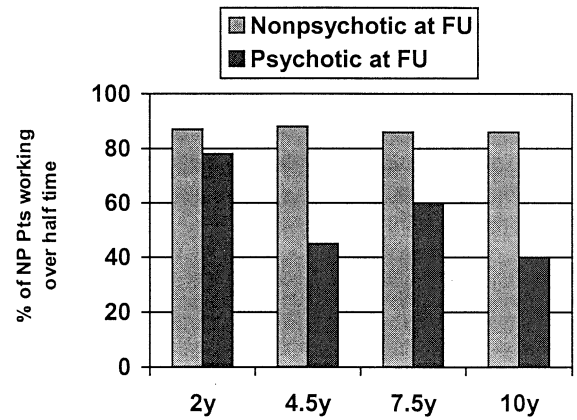

Fig. 3. Percentage of other (initially) nonpsychotic patients with and without signs of psychosis (at follow-up) working effectively.

2.1.4. Nonpsychotic depressives, work functioning, and psychosis

At the 2 yr follow-up, 87% (34/39) of the nonpsychotic depressive patients (or controls) without signs of psychosis at follow-up were working effectively versus 78% (11/14) of these controls who had psychotic symptoms. At the 4.5 yr follow-up 45% (5/11) were psychotic and working effectively verses 88% (36/41) of those without positive symptoms. At the 7.5 yr follow-up 60% (3/5) of the patients with signs of psychosis were working effectively as opposed to 86% (43/50) of those who were not psychotic. By the 10 yr follow-up 40% (2/5) of the patients with signs of psychosis were working effectively versus 86% (45/52) of those patients without psychotic symptoms. (Fig. 3) It should be noted that when the schizophrenia patients were divided into those who were psychotic at follow-up versus those who were not psychotic at follow-up, there were always at least 25 participants in each subgroup at each follow-up. However, among

the patients who were initially nonpsychotic at index hospitaliztion (nonpsychotic depressives), when those who were psychotic at follow-up were compared to those who were nonpsychotic at follow-up, on several occasions there were as few as 5 subjects in the nonpsychotic group.

2.2. Diagnostic differences in work functioning

To examine the overall diagnostic differences in work functioning across each of the follow-up periods three separate 1-way ANOVAs were conducted. Significant differences in work performance were found among the diagnostic groups at each of the follow-up periods (all $p < 0.00001$), with the schizophrenia patients' performing more poorly in comparison to the nonpsychotic depressives across all 4 of the follow-up periods (Newman–Keuls test, $p < 0.01$). In addition, the schizophrenia patients demonstrated poorer work functioning than the other psychotic patients at the 7.5 and 10 yr follow-up periods (Newman–Keuls test, $p < 0.01$). In a separate look at the 10 yr follow-up, the means and standard deviations for work functioning are presented for each of the 3 diagnostic groups separated according to patients who were psychotic at follow-up versus without signs of psychosis at follow-up (Table 1).

2.3. Correlations between work functioning and psychosis

Spearman Rho correlations were used to examine

Table 1
Means and SDs of Work Functioning (work functioning data based on SCS) in Patients with and without Signs of Psychosis at the 10 yr follow-up

	Psych mean (SD)	Non psych mean (SD)
SZ	0.7(1.31)	2.25(1.76)[a]
OP	2.42(1.81)	2.90(1.59)
DP	1.80(2.04)	3.50(1.01)

[a] $p < 0001$.

the association between work functioning (using the SCS) and *severity* of psychosis (according to the SADS) across each of the 4 follow-up periods.

Among patients with schizophrenia, there was a significant relationship between severity of psychosis and impairment in work functioning across all four of the follow-up periods ($F1$ $r = 0.33$, $F2$ $r = 0.39$, $F3$ $r = 0.43$, $F4$ $r = 0.43$; all $p < 0.01$). Regarding the other psychotic patients, the relationship between psychosis and work functioning was only significant at the 4.5 yr follow-up ($r = 0.40$, $p < 0.01$).

2.4. Other factors affecting work functioning

Multiple factors in addition to psychosis affect work functioning among psychiatric patients. Using Spearman–Rho rank–order correlations premorbid work functioning at the index hospitalization was also found to modestly correlate with subsequent work performance across the 2 yr ($r = 0.26$, $p < 0.001$), 4.5 yr ($r = 0.4026$, $p < 0.001$), 7.5 yr ($r = 0.39$, $p < 0.001$), and 10 yr follow-up periods ($r = 0.39$, $p < 0.001$) across all the diagnostic groups. Among the schizophrenia patients, a separate 2X2 analyses of variances (psychotic/nonpsychotic by negative symptoms/no negative symptoms) did not show a significant relationship between negative symptoms and work impairment at the 10 yr follow-up ($p = 0.8$) contrary to psychosis ($p < 0.001$).

When the data on the relationship between *delusions* and work functioning were looked at separately, the results were similar to those on overall psychosis. Thus, the relationship between delusions and work functioning for the schizophrenia patients was significant at all 4 follow-up periods over the 10 yr ($p < 0.01$). There was a significant relationship between delusions and work functioning for the other psychotic patients; however, this only occurred at the 4.5 yr follow-up.

3. Discussion

The present research was designed to assess the relationship between psychosis and potential work impairment in psychiatric patients with a particular focus on schizophrenia. The research design had the advantage of allowing the assessment of the consistency of this relationship with a large sample of early

young patients studied at four successive follow-up periods over ten years. The data suggest a significant relationship between psychosis and work functioning among psychiatric patients, with this relationship being most prominent among schizophrenia patients.

3.1. Work functioning in schizophrenia patients

When the results for schizophrenia patients are examined more closely they indicate that those patients who are psychotic are less likely to be working effectively than those who have not experienced any signs of psychosis within the prior year. The data on diagnosis also indicate that schizophrenia patients in general tend to have poorer work functioning than the group of other psychotic patients and nonpsychotic depressive patients. A number of potential variables may contribute to the poorer work functioning of schizophrenia patients. These can include factors such as neurocognitive deficits (Breier et al., 1991; Green, 1996; Lysaker et al., 1995a; Reed et al., 1999), thought disorder (Lysaker et al., 1995b; Perry et al., 1995; Racenstein et al., 1999), and negative symptoms (Mueser and Bellack, 1996; Mueser et al., 1990).

As the current data suggest, psychotic symptoms also interfere with occupational functioning. Thus, for the schizophrenia sample, the data indicate that the relationship between psychosis and work impairment was significant throughout the 10 yr period studied. Furthermore, throughout the early course of schizophrenia this association persisted, with the relationship being significant across each of the four successive follow-ups, and even increasing after the first 5 yr.

Several other studies of schizophrenia patients have found a significant relationship between psychosis and work impairment. In a longitudinal study of relatively young, chronic schizophrenia patients Breier et al., 1991 found a significant association between *both* negative and positive symptoms and functional outcome. Additional studies have shown that under some circumstances thought disorder and negative symptoms are significantly associated with work impairment (Herbener et al., 2001; Racenstein et al., 1999).

Our findings also support schizophrenia patients' accounts of the various factors interfering with

occupational performance. Westermeyer and Harrow (1987) administered patients semi-structured interviews, which explored their explanations for work impairment. One of the primary reasons for their work difficulties included 'distrust of other people'. Thus, study findings also appear to have ecological validity with respect to patients' accounts of how their symptoms of psychosis interfere with occupational performance.

3.2. Psychosis and work functioning in non-schizophrenia patients

The data indicate that the relationship between psychosis and poorer work adjustment is not unique to schizophrenia patients, and extends to nonschizophrenia patients. These findings replicate other studies, which have demonstrated a link between psychosis and functional outcome in psychiatric patients with affective psychosis (Rosen et al., 1983). The correlational data suggest the possibility of a stronger and more consistent relationship between psychosis and work impairment for schizophrenia patients; however, since the ANOVAs did not show a significant interaction these results need further replication. A significant relationship between psychosis and work impairment was only found at the 4.5 yr follow-up among the other psychotic patients. Similarly, there was a significant relationship among two of the four follow-up periods for the nonpsychotic depressive patients. In comparison, there was a significant relationship at all four follow-up periods for the schizophrenia patients. It is possible that there is some type of interaction between major features of schizophrenia and work adjustment, such that schizophrenia patients with signs of psychosis are more likely to be affected by the interplay of psychosis and other aspects of their disorder (e.g. negative symptoms, neuropsychological deficits), leading to even poorer work adjustment.

3.3. Diagnosis as a factor in work functioning

The data also indicate the influence of diagnosis-related factors on work functioning. Thus, the findings demonstrate support for *both* diagnostic category (schizophrenia patients showed poorer work functioning) and psychosis having a strong association with work impairment. At 4.5, 7.5 and 10 yr follow-up periods, schizophrenia patients demonstrated the most impairment in work functioning. At those same follow-up periods, the more severely psychotic individuals demonstrated significantly more impairment in work functioning, irrespective of diagnosis.

3.4. Psychosis and chronicity

As noted previously, individuals with schizophrenia exhibited the most consistent relationship between psychosis and work impairment over time. The data suggests that, over time, the schizophrenia patients who are psychotic are less likely to return to the work force. For example, of the 25 schizophrenia patients who showed signs of psychosis at both the 2 and the 7.5 yr follow-ups none of them were working full time at the 7.5 yr follow-ups. Similarly, of the 20 schizophrenia patients who demonstrated signs of psychosis at both the 2 and 10 yr follow-up periods only 2 (10%) were working full-time at the 10 yr follow-up. Thus, across follow-up periods, the percentages of schizophrenia patients *with psychosis* working effectively decreased over time. Notably, there was a trend suggesting that the schizophrenia patients' overall psychosis worsened over time, therefore, it is possible that this was also a contributory factor in their difficulty returning to the workforce.

One outlook concerning these data would be that during the first few years after an initial psychotic break some psychotic schizophrenia patients are able to work. However, five or more years later, as psychotic schizophrenia patients become more chronic, fewer of them will be able to work effectively. This appears to be independent of the percentage of schizophrenia patients with psychosis, as the number of schizophrenia patients without signs of psychosis, who are working effectively, essentially remained stable throughout the first 10 yr of the disorder. This is also likely to be a reflection of the chronicity of the schizophrenia illness, which may involve a worsening of psychosis, and is often accompanied by other detrimental factors (e.g. neurocognitive deficits, negative symptoms, and impaired social skills) that have also been found to interfere with occupational functioning.

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