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Coping Style and Cognitive Dysfunction in Schizophrenic Patients

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It is important to know how people with a schizophrenic disorder experience their cognitive vulnerability and how that experience affects their daily lives. Rehabilitation, as we understand it, has the aim of stimulating patients to make the best use of their residual capacities, especially in dealing with social complexity. Unfortunately, the rehabilitation approach in psychiatry still lacks a firm scientific basis. Strong links need to be developed between the practice of rehabilitation and theories of basic cognitive and behavioural dysfunction in schizophrenic patients (Watts & Bennett, 1983). It is a prerequisite that the subjective experiences of patients are included in this endeavour: schizophrenia is an 'I am' illness (Estroff, 1989).

The vulnerability of schizophrenic patients is generally supposed to be related to problems of cognitive information-processing which are often conceptualised in terms of attentional deficits. Various models have been developed along these lines, and a number of attentional tasks have gained a certain popularity among researchers of schizophrenia. Cognitive deficits, as measured by these tasks, are considered to be causal in relation to particular aspects of symptoms. Studies examining such associations have supported these assumptions, although the associations do not seem to be confined to schizophrenic patients and may include those with mood disorders. 'Attention', however, is a poorly defined concept, and supposedly objective measures of attention tend to have little common variance.

A related problem is the association between objective measures of attention and the subjective experience of attention. Both subjective and objective measures of cognitive abilities tend to be only weakly associated (e.g. Austin & Hemsley, 1978; Martin, 1983; Larrabee & Levin, 1986). This raises the question whether objective or subjective performance is more important for daily functioning. Broadbent *et al* (1986) suggest that self-reported cognitive failure accompanies a bias in favour of one strategy of operation, as opposed to another. When subjective attentional functioning is understood as the experience of the effectiveness of attentional strategies, an association with coping strategies seems likely.

Coping is a major component of the currently popular vulnerability model of schizophrenia. Schizophrenic patients are considered to be sensitive to both major and minor stressors in their daily natural environment, and to be deficient in general coping skills. This limits their adaptive capabilities, and may provoke psychotic symptoms. It seems unlikely that cognitive vulnerability and coping style are mutually independent: on the contrary, the development and the availability of a repertoire of coping skills will depend on cognitive skills and on their flexibility and adaptability. Coping with psychotic symptoms or with 'basic' disorders has received research attention (e.g. Falloon & Talbot, 1981; Cohen & Berk, 1985; Brenner *et al*, 1987; Tarrier, 1987; Carr, 1988), but general coping style in schizophrenic patients has hardly been studied in a systematic way (e.g. Thurm & Häfner, 1987).

Data are presented below from a study that examined the inter-relationships between general coping style and cognitive function, as measured by both subjective self-report and objective performance tasks, in schizophrenic patients and in control groups. We obtained measurements after one week and again after three months, but this first presentation of our findings is limited to the initial measurements.

Method

The study included four groups, classified according to DSM–III–R (American Psychiatric Association, 1987): schizophrenic patients ($n = 30$); depressive patients ($n = 19$); neurotic patients ($n = 25$); and a normal control group ($n = 21$). Exclusion criteria were substance abuse and evidence of organic brain dysfunction. The subjects consisted of 44 males and 51 females; there were no significant sex differences between groups ($\chi^2 = 5.47$, NS). Mean age was 32.8 years. The depressive patients (mean (s.d.) 43.1 (14.5) years) were significantly older than the other groups ($F = 7.00$, $P \leqslant 0.001$) (schizophrenics: 29.9 (8.8); neurotics: 28.9 (7.4); normals: 32.2 (8.3)). The average daily dosage of antipsychotic drugs in the schizophrenic group

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was 6.2 mg haloperidol equivalents (range 0–25 mg). Antipsychotic treatment is known to be associated with a limited normalisation on many psychological measures so that cognitive differences between schizophrenic and other patients were probably reduced to a limited extent (Spohn & Strauss, 1989).

The patients were interviewed and rated on the Present State Examination (PSE; Wing *et al*, 1974). The CATEGO computer program calculated scores for four sections: delusions and hallucinations (psychotic symptoms); behaviour, speech and other symptoms ('observation' items); specific neurotic symptoms; and non-specific neurotic symptoms.

Objective cognitive measures were based on computerised versions of three well-known attentional tasks (e.g. Nuechterlein & Dawson, 1984; Balogh & Merrit, 1987; Asarnow *et al*, 1991): (a) A 3–7 version of the Continuous Performance Test (CPT), consisting of 600 stimuli, among which were 90 target stimuli and an equal number of single presentations of the digits 3 and 7. Interstimulus-intervals were 1 second, and stimulus durations were 100 ms. The analyses are based on hit-scores (percentage correct responses) and mean reaction times. (b) A forced-choice Span of Apprehension task: either a T or an A was briefly presented, along with other letters, for 80 ms. Target stimuli were embedded in arrays containing either 0, 2, 4, or 9 additional irrelevant letters. Subjects were administered equal numbers of these conditions during a total sequence of 40 trials of the four conditions in random order. Only the two most complex conditions are included in the present analyses. (c) A forced-choice Backward Masking task: either the letter T or the letter A was briefly presented during 20 ms, followed by a mask stimulus with a duration of 60 ms, after interstimulus intervals (ISI) of 600, 300, 120 or 60 ms, 10 trials each. Only the last two conditions are included in the present analyses. Subjects received short series of instruction trials before the tests.

Subjective cognitive measures include self-ratings on (a) the Cognitive Failures Questionnaire (CFQ; Broadbent *et al*, 1982) and (b) the Test of Attentional Style (TAS; Rombouts & van den Bosch, 1992). The CFQ is a 25-item self-rating questionnaire which asks subjects how often in the past 6 months they have experienced failures in perception, memory, and motor functions during everyday life. Typical items are: "Do you find yourself suddenly wondering whether you have used a word correctly?", or, "Do you find you forget appointments?" For the present purposes, only the response category "very often" was counted as cognitive failure.

The TAS is a self-report questionnaire measuring attentional characteristics; it is based on the first seven subscales of the Test of Attentional and Interpersonal Style (TAIS; Nideffer, 1976, 1977). The TAIS has been designed to provide information about people's ability to control attentional and interpersonal factors which relate to effective performance in various situations. The TAIS scales have, however, been defined in advance, rather than constructed on the basis of a factor analysis, and many items were too complicated for use in a psychiatric population. We decided to simplify the wording and to design a version of the attentional subscales based on factor analysis. A new and shorter scale was constructed, consisting of five independent sub-scales with Cronbach alphas above 0.90. These sub-scales are: (a) Distractibility (typical item: "When people talk to me, I find myself distracted by the sights around me."); (b) Overload (typical item: "Sounds come at me so rapidly, they make me dizzy."); (c) Processing capacity (typical item: "I am good at quickly analysing complex situations."); (d) Attentional control (typical item: "It is easy for me to direct my attention and focus on something."); (e) Conceptual control (typical item: "I need to have all the information before I say or do anything.").

Coping style was measured by a Dutch self-report coping questionnaire, the Utrecht Coping List (UCL; Schreurs *et al*, 1988). The UCL measures the way people generally react to problems or unpleasant situations, and consists of seven factor analytically derived scales: (a) Problem solving (quietly judging situations; being confident, and acting in a goal-directed way); (b) Palliative reaction (seeking diversion; arousal-reduction strategies); (c) Avoidance ('wait and see', escaping situations); (d) Seeking support (talking to people or asking for help and understanding); (e) Depressive reaction (being preoccupied with problems, worrying; feeling helpless); (f) Expressing emotions (work off one's emotions); (g) Comforting cognitions (reassuring oneself: 'After rain comes sunshine').

Both the questionnaires and the cognitive tests were presented by computer, using the testmanager CDL (Rombouts & Diekstra, 1987). The cognitive tests were administered by a clinician/rater.

Four approaches were used in analysing the data: group differences were explored by analyses of variance (ANOVAs) with Scheffé *post-hoc* pairwise comparison tests; the Pearson correlations between the three domains – coping, cognitive functioning, and psychopathology – were examined; canonical correlation was used to explore which cognitive measures might be the best predictors of coping style, and stepwise multiple regressions clarified the non-overlapping predictive capacities of cognitive measures with each single coping measure in schizophrenic and non-schizophrenic patient groups. The depressive and neurotic groups were combined for these purposes.

Results

PSE

Psychotic symptom scores were significantly higher in the schizophrenic group than in other patients, but total symptom scores were higher in depressive patients; they received higher ratings than the other groups on specific (depressive and anxiety) symptoms as well as on non-specific neurotic symptoms (Table 1). Fifteen DSM–III–R schizophrenic patients qualified for the core schizophrenic syndrome of the PSE – the nuclear syndrome (NS+ patients).

Objective cognitive measures

The depressive group tended to perform worst of all on Span and Backward Masking tasks, whereas schizophrenic

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Table 1
PSE symptom ratings

	Schizophrenia mean (s.d.)	Depression mean (s.d.)	Neurosis mean (s.d.)	*F* (*P*)	Scheffé
Psychotic symptoms	3.5 (4.4)	0.3 (1.0)	0.0 (0.0)	12.16 (0.0000)	1 v. 2.3
Observation	2.3 (2.1)	0.8 (1.4)	0.1 (0.4)	14.97 (0.0000)	1 v. 2.3
Specific neurotic symptoms	4.5 (4.2)	10.9 (4.8)	5.2 (3.4)	15.34 (0.0000)	2 v. 1.3
Nonspecific neurotic symptoms	11.5 (8.1)	20.3 (6.4)	14.2 (6.9)	8.22 (0.001)	2 v. 1.3

Table 2
Objective cognitive functioning

	Schizophrenia mean (s.d.)	Depression mean (s.d.)	Neurosis mean (s.d.)	Normal mean (s.d.)	*F* (*P*)	Scheffé
CPT-hits: % correct	76.6 (21.0)	77.6 (22.2)	93.2 (5.5)	93.6 (11.0)	7.85 (0.0001)	1.2 v. 3.4
CPT-RT: ms	498 (83.0)	454 (84.0)	474 (96.0)	458 (72.0)	1.41 (NS)	-
Span 5 letters: % correct	85.2 (14.7)	74.9 (13.8)	85.8 (11.8)	92.6 (11.8)	6.11 (0.001)	2 v. 4
Span 10 letters: % correct	67.4 (11.5)	66.8 (12.3)	74.1 (12.9)	75.4 (11.3)	3.18 (0.03)	-
Backward masking 120 ms ISI: % correct	76.0 (16.3)	68.9 (21.1)	82.8 (19.7)	86.2 (12.4)	3.91 (0.01)	2 v. 4
Backward masking 60 ms ISI: % correct	53.0 (16.4)	48.9 (13.3)	63.2 (15.5)	63.8 (17.2)	4.88 (0.003)	2 v. 3.4

Table 3
Subjective cognitive functioning

	Schizophrenia mean (s.d.)	Depression mean (s.d.)	Neurosis mean (s.d.)	Normal mean (s.d.)	*F* (*P*)	Scheffé
Distractibility	24.3 (6.4)	24.2 (4.3)	24.6 (4.2)	18.3 (3.6)	8.33 (0.0001)	1,2,3 v.4
Overload	18.2 (5.0)	18.3 (3.9)	17.5 (3.9)	10.9 (2.7)	16.77 (0.0000)	1,2,3 v.4
Processing capacity	17.8 (5.2)	15.6 (4.6)	18.7 (3.1)	21.4 (3.3)	6.60 (0.0004)	1,2 v.4
Attentional control	15.0 (4.0)	13.3 (3.8)	12.5 (2.6)	16.4 (2.4)	6.39 (0.0006)	2,3 v.4
Conceptual control	18.6 (4.2)	18.6 (3.2)	17.8 (2.2)	19.0 (1.8)	0.57 (NS)	-
Cognitive failures	2.9 (4.0)	2.3 (2.7)	2.8 (2.9)	0.5 (1.0)	3.29 (0.03)	1 v. 4

Table 4
Coping

	Schizophrenia mean (s.d.)	Depression mean (s.d.)	Neurosis mean (s.d.)	Normal mean (s.d.)	*F* (*P*)	Scheffé
Problem solving	17.0 (4.8)	15.0 (4.1)	16.1 (3.5)	20.2 (2.4)	6.92 (0.0001)	1,2,3 v.4
Palliative reaction	21.7 (10.4)	18.1 (3.8)	25.0 (13.2)	27.0 (13.6)	2.55 (NS)	-
Avoidance	19.6 (4.7)	17.8 (4.2)	17.4 (4.6)	15.4 (3.0)	3.96 (0.01)	1 v. 4
Seeking support	12.8 (3.8)	12.2 (3.5)	12.1 (4.5)	14.4 (3.0)	1.74 (NS)	-
Depressive reaction	16.6 (4.4)	17.4 (3.1)	17.3 (3.6)	10.1 (2.4)	20.56 (0.0000)	1,2,3 v.4
Expressing emotions	6.1 (2.1)	6.2 (1.8)	5.2 (1.6)	6.9 (1.3)	3.47 (0.02)	3 v. 4
Comforting cognitions	11.8 (2.3)	11.0 (2.5)	10.8 (2.6)	13.0 (2.6)	3.43 (0.02)	3 v. 4

and depressive patients obtained similar results with the CPT (Table 2). The CPT-hit score was significantly different between schizophrenic and depressive patients, and between neurotic patients and normals; NS+ schizophrenic patients were not significantly different from other schizophrenic patients.

Subjective cognitive measures

Self-rating scores on distractibility and overload were significantly higher in all patient groups, compared with normals; no significant differences were found between the various patient groups (Table 3). Processing capacity was rated lower by patients; schizophrenic and depressive patients were significantly different from normals. Attentional control was rated as relatively high by the schizophrenic patients, and depressive and neurotic patients were significantly different from normals. Conceptual control was not significantly different between groups. Self-report of cognitive failures was significantly higher in schizophrenic patients than in normals. NS+ schizophrenic patients were not significantly different from other

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schizophrenic patients, but compared with all other subjects they reported a higher overload score (20.1 v. 17.5, $P<0.05$).

Coping

Compared with normals, all patient groups rated themselves significantly lower on problem solving and higher on depressive reaction (Table 4). Schizophrenic patients reported a relatively high preference for avoidance; they were significantly different from normals. The NS+ schizophrenic patients were not significantly different from other schizophrenic, depressive or neurotic patients.

Because the depressive group was older than the other groups, and because in the total sample age correlated significantly, although not very highly (-0.25 to -0.33) with a number of objective cognitive variables, as well as with processing capacity, ANOVAs were computed with age as a covariate. The differences from the uncorrected ANOVAs were negligible, with one exception: backward masking (120 ms ISI) was not significantly different between groups ($F=2.00$) after correction for age.

Examination of the correlations in the total patient group between psychopathology, as measured by the PSE, and coping and cognitive measures revealed significant correlations for specific and non-specific neurotic symptoms and for total symptom scores, but not for psychotic symptoms or observation items (Table 5). Problem solving was negatively correlated with specific and non-specific neurotic symptom scores, and depressive reaction was positively correlated with both. The only significant correlation between objective cognitive measures and symptom scores was found between the CPT-hit score and specific neurotic symptoms. The subjective measures – distractibility, overload, processing capacity, attentional control, and cognitive failures – were significantly correlated with both specific and non-specific neurotic symptoms.

Analyses of associations between coping and cognitive function were limited to the two most important coping dimensions: problem solving and depressive reaction. In the total group of patients, significant correlations were found between problem solving and depressive reaction and most of the subjective cognitive measures, but not with objective cognitive measures (Table 6). Distractibility, attentional control, and cognitive failures correlated with both coping dimensions; processing capacity and conceptual control correlated with problem solving, and overload correlated with depressive reaction.

Table 5
Significant correlations of coping and cognitive measures with psychopathology in the total patient group

	Specific neurotic symptoms	Nonspecific neurotic symptoms	Total symptom score
Coping			
Problem solving	−0.39**	−0.29*	−0.27*
Depressive reaction	0.41**	0.37**	0.44**
Cognitive functioning			
CPT-hits	−0.26*	–	–
Distractibility	0.26*	0.33*	0.35*
Overload	0.25*	0.31**	0.34*
Processing capacity	−0.41**	−0.33**	−0.33*
Attentional control	−0.40**	−0.34**	−0.31*
Cognitive failures	0.44*	0.38**	0.42**

* = $P<0.01$, ** = $P<0.001$.

These analyses were repeated within groups of both schizophrenic and non-schizophrenic patients, but, with few exceptions, the same patterns were found. The exceptions were the correlations of problem solving and CPT-hit score with neurotic symptoms in the schizophrenic group. These were non-significant. In addition, the correlations between cognitive failures and problem solving were non-significant within groups. The highest correlations were found between cognitive failures and both specific and non-specific neurotic symptoms in schizophrenic patients: 0.70 and 0.53 respectively ($P<0.01$), and between processing capacity and problem solving, also in schizophrenic patients (0.80, $P<0.01$).

To obtain a 'condensed generalisation' of the correlational pattern between coping and (subjective and objective) cognitive measures, canonical correlations were computed. The first two significant canonical correlations were relatively high (0.83 and 0.70 respectively), but the first one explained only a little more of the total coping variance than the single highest loading coping measure (problem solving – 18.7% v. 14.7%). The cognitive variance explained by both canonical variates was 12.9% and 7.9% respectively.

Table 6
Significant correlations between coping and cognitive measures

	Problem solving			Depressive reaction		
Patients	schiz.	non-schiz.	total	schiz.	non-schiz.	total
Distractibility	−0.42*	–	−0.31**	0.37*	0.51**	0.43**
Overload	–	–	–	0.39*	0.45**	0.41**
Processing capacity	0.80**	0.49**	0.65**	–	–	–
Attentional control	0.58**	0.45**	0.54**	−0.53*	−0.37*	−0.46**
Conceptual control	0.68**	0.33*	0.53**	–	–	–
Cognitive failures	–	–	−0.23**	0.40*	0.55**	0.46**

* = $P<0.05$, ** = $P<0.01$.

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Table 7
Significant multiple regressions of coping measures in schizophrenic and non-schizophrenic groups – stepwise procedure

Cognitive predictor variables	Coping variables	
	Problem solving	Depressive reaction
Schizophrenic		
Processing capacity	0.61	
Conceptual control	0.35	
Attentional control		−0.53
Multiple R	0.85	0.53
F	36.64	11.07
P	0.0000	0.003
Non-schizophrenic		
Processing capacity	0.51	
Span 10 letters	−0.39	
Conceptual control	0.28	
Cognitive failures		0.47
Overload		0.31
Multiple R	0.64	0.64
F	9.40	14.13
P	0.0001	0.0000

Finally, Table 7 presents the stepwise multiple regression analyses. Two significant regression equations were found in the schizophrenic group. Processing capacity emerged as the best single predictor of problem solving, followed by conceptual control. Depressive reaction was predicted by poor attentional control. In the non-schizophrenic group, problem solving was again predicted by processing capacity, followed by the span task (10-letter condition), with unexpected negative sign, and goal-directed thinking. Depressive reaction was predicted by cognitive failures and overload. In addition, palliative reaction was predicted by the 5-Letter span task and avoidance by cognitive failures.

Discussion

Our results indicated that schizophrenic patients do not rate themselves significantly differently from other patients on the coping dimensions. Differences in psychopathology, whether indicated by DSM-III-R diagnosis or by PSE ratings, do not reflect themselves in different self-reports of general coping style. The impression that emerges from our data is that psychiatric patients in general are deficient in using effective coping styles (especially in problem solving), and use more ineffective coping styles (like depressive reaction). These two coping styles seem to be related to the neurotic symptoms, rather than to psychotic symptoms or to the general level of psychopathology.

Cognitive functioning, as indicated by supposedly trait-related performance on attentional tasks, could not predict coping style. More or less objective measures of cognitive performance do not seem to be of much importance to the way patients cope with daily stressors. However, we know that performance on cognitive tasks is not entirely independent of the clinical state, and repeated measurements during a remitting phase of the disorder might clarify the real pattern. These longitudinal data have yet to be examined. The subjective experience of cognitive functioning, however, does predict coping in both schizophrenic and other patients. Between groups of patients, the differences in correlational patterns between the subjective cognitive domain and the coping domain are not very impressive; furthermore, like the objective cognitive measures, subjective cognitive dysfunction is not limited to schizophrenic patients or even to schizophrenic and depressive patients. The finding that psychiatric patients in general, compared with normal controls, describe themselves as more easily distracted and more overloaded is in agreement with the results which DePalma & Nideffer (1977) obtained using the TAIS. In addition, our findings suggest that poor processing capacity, poor attentional control, and cognitive failures are related to neurotic rather than to psychotic symptoms.

It is notable that distraction, overload and cognitive failures, which comprise the 'negative' dimension of subjective cognitive functioning, do not contribute very much to the relationship with problem solving in the schizophrenic group. Subjective problems with attentional control, processing capacity, and conceptual control are more important in this respect. These measures comprise the 'positive' dimension. The multiple regression analyses confirmed the predictive capacity of processing capacity and conceptual control with regard to problem solving in schizophrenic as well as non-schizophrenic patients. They also pointed to poor attentional control, overload, and cognitive failures as subjective experiences relating to depressive reaction in both groups of patients. Subjective attentional limitations seem to be associated with poor problem solving skills and depressive reaction in schizophrenic, as well as in non-schizophrenic patients.

Our results suggest that problem-solving abilities are related to the experience of cognitive function in psychiatric patients, whether schizophrenic or not. The role of attention in the coping behaviours of schizophrenic patients has been described, e.g. by Carr (1988). Problem solving seems closely associated with confidence in one's attentional competence: schizophrenic patients report problems in this area, as do other patients. The cognitive dysfunction which patients experience in their daily lives relates to problem solving and depressive reactions, in a way that suggests a helplessness effect.

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On the other hand, many cognitive difficulties reported by these patients may be primarily due to persistent affective disturbances, as expressed by their neurotic symptoms. Our results do not support the assumption that cognitive dysfunctions, whether subjective or objective, are specific to schizophrenic patients, although longitudinal analyses may clarify differences that are not apparent in the present cross-sectional data.

We agree with Strauss (1989) that the subjective experiences of schizophrenic patients merit closer attention, in order to understand better the psychological regulatory mechanisms that influence the course of the disorder. Subjective experiences of basic dysfunctions have been conceptualised in terms of 'basic' disorders. Unfortunately, instruments for measuring these experiences are psychometrically weak and lack a sound empirical foundation (e.g. Süllwold & Huber, 1986; Liddle & Barnes, 1988). The concept of basic disorders, although intuitively appealing, is probably too heterogeneous; scales based on empirically derived independent dimensions of attentional functioning may offer better perspectives. This study shows that the subjective experience of their cognitive and attentional abilities is related to the way patients describe their habitual coping behaviour. Acknowledging and exploring this mediating role is important for constructing psychoeducational programmes and for the development and implementation of rehabilitation strategies aimed at helping patients to improve the efficacy of their coping mechanisms.

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