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# Sense of coherence among delusional patients: prediction of remission and risk of relapse

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**Abstract**

Delusional diseases are characterized by a remitting/relapsing course, which, in current studies, is not contextualized with experience and well-being. This study applied the salutogenic model in order to predict the course of delusional disease, using the "sense of coherence" (SOC) concept, which reflects patients' experiences of their disorder. In a prospective study, 48 delusional schizophrenic inpatients were interviewed, using self-report scales for delusions, SOC, depression and expressed emotion (EE), at 3 time points over a 1-year period, with an additional 6-month follow-up based on treatment staff reports and medical files. Sense of coherence was found to be strongly correlated with delusional symptoms over the study period. Higher SOC scores at the "acute delusional state" predicted better prognosis with regard to delusions. However, SOC was found to be lower during remission, suggesting decreased well-being during remission. Sense of coherence was found to be a stronger predictor of 1-year prognosis for delusions when EE or depression were high at the acute state. A complex relationship was found between delusions, SOC, depression, and EE, suggesting possible use of the SOC scale as a prognostic tool. In addition, the results stress the necessity of an integrative biopsychosocial treatment approach, which would include interventions aimed at enhancing elements of SOC, particularly during periods of remission. To the best of our knowledge, this is the first longitudinal study of SOC in delusional patients moving through remissions and relapses.


## 1. Introduction

### 1.1. The salutogenic approach and the sense of coherence

The salutogenic paradigm posits a continuum between the theoretical poles of health ease/disease and the dynamic positioning of individuals along this continuum [1,2]. It offers an alternative approach to the pathogenic paradigm, prevalent in health-related studies, which posits a dichotomy between health and disease. The salutogenic model stresses coping mechanisms, in addition to character traits which aid in the achievement of progress towards the health pole of the continuum.

To characterize individual resources for the maintenance of psychological health and well-being, Antonovsky [2] (p 19) developed the "sense of coherence" (SOC) concept, defined by him as "a global orientation that expresses the extent to which one has a pervasive, enduring though dynamic, feeling of confidence that (1) the stimuli deriving from one's internal and external environments are structured, predictable, and explicable; (2) the resources are available to one to meet the demands posed by these stimuli; and (3) these demands are challenges, worthy of investment and engagement." These dimensions were defined as the components of SOC: comprehensibility, manageability, and "meaning."

Antonovsky assumed that the manner in which people construct their reality is a crucial factor in coping and health, and that the feeling that emotional involvement and commitment are of value would be accompanied by a higher motivation to behave in a way which will enable successful coping with life's circumstances [2]. In accordance with this view, the SOC was hypothesized to be a protective factor, associated with movement towards the health pole of the

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health/disease continuum, a hypothesis which has found substantial empirical confirmation (see overview [3]).

The SOC has been widely regarded as a relatively stable orientation during adulthood [2,4]. Some test-retest studies have confirmed this view [5,6]; however, these have mostly been conducted over relatively short periods and have not taken into account the influence of major life events. Changes in SOC have been found in some studies, such as its becoming weaker with age [7] or stronger after therapeutic intervention [8].

The 3 dimensions of the SOC are theoretically well founded; however, they have been found to be highly interrelated. Antonovsky [9] warned against separating them, as he thought this would be impermissible on technical grounds. However, the empirical findings regarding separation of the dimensions is equivocal, and the findings of at least 1 study [10] suggest the SOC as being comprised of more than 1 factor, with factor analysis revealing factor division correlating closely with Antonovsky's theoretical components, especially meaning and comprehensibility. Therefore, it seems that the use of the separate components may be used cautiously as suggestions of trends which require further study, rather than as distinct factors that behave independently.

### *1.2. The SOC and delusional experiences*

Delusions are generally regarded as symptoms of disease, in accordance with the pathogenic paradigm. However, treatment often results in a remitting/relapsing course of disease. Applying the salutogenic approach to the study of delusions may represent an attempt to contextualize delusional symptoms within the subject's experience of the disorder to study effects of the delusional experience on the course of disease and to suggest more integrative directions for treatment.

The delusional experience has been widely described as a breakdown in the coherence of experience. For example, Garfield [11] has described the psychotic state as characterized by incoherence, in which the individual is left with inner destruction. Eigen [12] describes the psychotic experience as the recurrent dissolving of the sense of experience. Hatfield [13] has even referred specifically to the SOC construct, which she claims is severely weakened in the psychotic state, as a result of impairment of the sense of reality.

However, we do not know of direct studies of SOC with acutely psychotic patients, apart from that of Bazynska et al [14], which found unsurprising lower SOC scores for adolescent psychotic inpatients compared to members of their families. The impairment of reality testing may not necessarily be relevant for the SOC, as it represents the *subjective* sense of the relationship to reality and the outlook on life. The process of internal and external reorganization by psychotic individuals, which enable them to give subjective coherence to their experiences of psychosis, has been demonstrated in a number of studies [15-17]. In addition, Antonovsky [18] has suggested that deep and clear beliefs may fulfill a similar function to that of the SOC. Although he referred to religious beliefs, it remains unclear whether delusional beliefs may similarly influence outlook on life, especially in light of findings which show high "meaning in life" scores among acutely delusional patients, similar to those of a control group of Anglican Ordinands [19]. Therefore, it may be reasonable to hypothesize the strengthening of SOC during delusional states, which may reflect impaired reality testing, although accompanied by a subjective sense of strong meaningfulness and purpose (even if of a persecutory or otherwise distressing nature). The findings summarized by Toshiko et al [20], where SOC scores of patients with schizophrenia were significantly higher than those in a neurotic level group, are somewhat suggestive of this, although the subjects they studied were past the acute phase and were ready for discharge from hospitalization, with no specific data regarding the effect of delusional symptoms. In any case, if the hypothesis regarding strengthened SOC during delusional states could be confirmed, it is unclear what effect this would have on the course of disease, especially if the prepsychotic state was characterized by lower SOC. This may be especially true of "remission" periods, in which "negative symptoms" may prevail, but which may nevertheless be considered remission from acute psychosis.

### *1.3. Depression, expressed emotion, the course of disease, and the SOC*

The course of psychotic disorders has been shown to be associated with depression [21,22], with remissions from delusional states being frequently associated with what has been described as "postpsychotic depression." This may be unsurprising, if remission from delusional states is accompanied by a reduction in the level of meaning and purpose (even if delusional in origin) [19], with a resultant decrease in psychological well-being [23]. In addition, depression has been shown to have a strong negative correlation with SOC [24-27].

Another variable found to have prognostic value for course of disease is expressed emotion (EE) [28-31], which reflects the social climate of the individual. We do not know of any studies combining SOC and EE; however, EE has been shown to be correlated with depression [32,33] and may add the perspective of the individual's sense of his/her social environment and/or support.

We therefore added these 2 variables to the study, in an attempt to extend the perspective on the delusional context, considering their known associations between themselves and with course of disease and SOC.

## 2. Method

### *2.1. Study sample*

The study sample included 48 psychiatric inpatients (30 men, 18 women), 21 to 58 years old, diagnosed with

paranoid schizophrenia according to *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (*DSM-IV*)criteria, with prominent delusional symptoms. This diagnosis was used to obtain a clinical state characterized by delusional symptoms of a more organized nature. The diagnosis was independently confirmed, using the Structured Clinical Interview for *DSM-IV* semistructured clinical interview [34]. Further criteria included delusional symptoms first diagnosed at least 2 years before the study, so as to avoid the different quality of the initial delusional breakdown before the subject "adapts" to the delusional illness; no known organic disorder, so as to avoid organic sources of psychosis; and no known drug or alcohol abuse in the 2 years before the study, according to self reports, so as to avoid the different pathways of generation of meaning associated with addictive behavior. Patients answering to inclusion criteria and who were hospitalized during the study period were approached randomly. Nine patients declined participation. Of these, 5 cited lack of concentration or energy as an explanation, the others did not offer an explanation. These patients were not distinct from the participating patients with respect to demographic data; however, it is likely their delusions tended to be of a more paranoid nature. In addition, severely thought disordered patients were not approached for practical as well as substantial reasons (difficulty in answering questionnaires as well as possible different quality of meaning generation). "Fine tuning" of this exclusion criteria was probably added through decline of participation by those patients complaining of concentration difficulties. In addition to delusional symptoms, hallucinations were reported by 19 of the 48 participants at the initial intake (all but one of these were auditory hallucinations, with the remaining subject reporting visual hallucinations). No follow-up was performed in subsequent interviews for hallucinatory symptoms; however, we found no difference between subjects with or without initial hallucinations with regard to remission/relapse rates, dropout from the study, or any of the study variables (SOC, level of expressed emotion [LEE], Beck, Peters et al [35] Delusion Inventory [PDI]) at any of the 3 time points.

All patients were approached for the initial interview during hospitalization and were therefore all receiving pharmacotherapy. Follow-up was mediated by treating staff, and all but one of the subjects (who dropped out by the third interview) were in treatment during follow-up and reported continuation of pharmacotherapy.

The initial interview was performed during hospitalization. It included independent confirmation of diagnosis using the Structured Clinical Interview for *DSM-IV*, followed by the questionnaires detailed below. These were repeated at 6- and 12- month follow-up. Additional information regarding remission stability was collected after 18 months from medical files and treating staff.

The subjects in the study participated voluntarily and signed informed consent forms, and the study was approved by Helsinki committees in both mental health centers in which the study took place.

### 2.2. Measures

All measures used in this study are standardized with proven psychometric properties.

#### 2.2.1. Delusional state

The PDI [35] is a 40-item inventory, with each item marked as having ever been experienced or not. The original inventory inquires about lifetime presence of each delusional item, whereas in this study, this was modified to the fortnight before the interview for the inventory to serve as a present-state measure. Positively endorsed items are further rated on 3 subscales: degree of distress, preoccupation, and belief, each receiving a score of 1 to 5. Responses were divided into 5 separate subscores: "number of delusions," corresponding to the number of positively-answered delusional items; the 3 delusional-dimension scores—corresponding to the total scores of the subscales; and "intensity of delusions," corresponding to the combined scores of the 3 dimensions, for all positively answered delusional items, divided by 15. The PDI scores of the first interview were used as a reference for acute delusional state. Remission was defined as a combination of reduction of at least 50% in intensity of delusions, with clinical assessment of the subject by treating staff. In the present sample, Cronbach $\alpha$ was found to be .952.

#### 2.2.2. Sense of coherence

The SOC scale [2] has 29 items rated on a 7-point Likert scale, yielding 4 separate subscores: total SOC and 3 subscores corresponding to the components of the SOC concept: comprehensibility, manageability, and meaning. In the present sample, Cronbach $\alpha$ was found to be .847.

#### 2.2.3. Depression

The Beck depression inventory [36] is designed to measure the severity of depressive symptoms over the previous fortnight, as rated by the subjects themselves. It includes 21 items on a 4-point Likert scale. In the present sample, Cronbach $\alpha$ was found to be .825.

#### 2.2.4. Expressed emotion

The LEE scale [37,38] assesses levels of EE from the subjects' perspective. It has been originally found to have a similar prognostic value to that of the Camberwell Family Interview), the original tool for assessing EE by directly interviewing the individual's relatives. Although the correlation of the LEE to the Camberwell Family Interview was recently found to be weak when assessed in relation to treating professionals, it has the advantage of assessing the individual's subjective sense of his/her social climate. The instrument contains 60 items (rated true/false) relating to the person deemed by the subject as the most influential over the past 3 months. The higher

the score, the worse the relationship between the subject and that person in terms of criticism, irritability, emotional overinvolvement, and emotional support. In the present sample, Cronbach α was found to be .927.

### 2.3. Statistical analyses

Paired and independent sample *t* tests and Spearman rank correlation were used to examine the data. The analyses were conducted using the SPSS version 10 for Windows (SPSS Inc, Chicago, Ill, 2000). Stepwise logistic regression was performed according to Cohen and Cohen [39].

## 3. Results

### 3.1. Participants and course of disease during follow-up

At the initial interviews, the 48 participants were hospitalized in an acute delusional state. Within the first 6 months, 29 (60.4%) entered remission, whereas 13 (27.1%) remained acutely delusional (Fig. 1A) (6 additional subjects left the study). Of the 29 patients who remitted within 6 months, 17 (58.6%) remained in remission after 1 year, whereas 4 (13.8%) relapsed and 8 (27.6%) discontinued follow-up. Of the 13 patients who remained delusional after 6 months, only 3 (23.1%) remitted within an additional 6 months, whereas 7 (53.8%) remained chronically delusional, and an additional 3 (23.1%) discontinued follow-up. Eighteen-month follow-up using medical files for 40 of the 42 patients who participated up to the second interview revealed that 11 (26.2%) achieved stable remission, 3 (7.1%) achieved late remission (remissed later than 6 months from initial interview, and therefore, the stability of the remission was unknown after 18 months), 17 (40.5%) achieved remission but relapsed, and 9 (21.4%) remained chronically delusional (Fig. 1B).

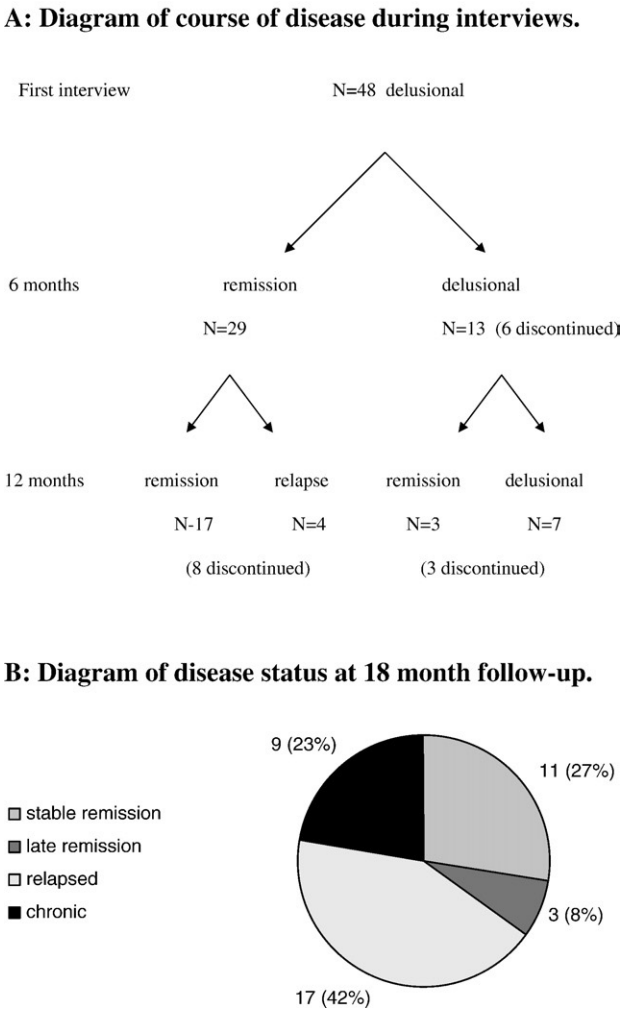


Fig. 1. A, Diagram of course of disease during interviews. B, Diagram of disease status at 18-month follow-up.

### 3.2. Sense of coherence among participants

The average SOC score rated in the initial acute delusional state, as well as its internal reliability, was found to be similar to that rated among a sample of the population at large [2]: 134.5 (SD, 26.7; α = .847) in the delusional sample, compared with 136.5 (SD, 19.8; α = 0.837) for the general population sample, with no significant difference found between the samples in a t test for comparison of independent samples ($t_{343}$ = 0.12, *P* = NS).

In the initial interview, SOC was found to be negatively correlated with intensity of delusions (*r* = −.304, *P* < .05). Further correlations were found, and these appear in Table 1. At 6-month follow-up, the SOC scores of patients who achieved remission decreased, whereas those of patients who remained delusional remained stable (Fig. 2). This finding contradicted common assumptions about breakdown of coherence of experience during chronic psychotic states and will be discussed below.

In spite of these results, SOC scored during the acute delusional state was found to be strongly negatively correlated with levels of delusions found after 1 year among patients who entered remission during this time (Table 1B). No similar significant results were found for the patients who remained chronically delusional. These findings suggest a complex relationship between the SOC (which reflects both subjective well being and internal resources for coping with stress) and delusional symptom formation and relief, as patients entering remission seem to report lowering of SOC scores; however, at the same time, those with initial high SOC scores (at the acute delusional state) demonstrate remissions which are more symptom-free after 1 year. These complexities may be explored by looking at the various SOC subscale correlations discussed below.

### 3.3. Sense of coherence and EE

Significant negative correlations were found between SOC and EE (Table 2). Expressed emotion was also found

Table 1
Correlations between delusions and SOC (with subscales), expressed emotion and depression, at the first (acute delusional state) and third (1-year follow-up) interviews

| | PDI1 | iPDI1 | dis1 | pre1 | bel1 | PDI3 | iPDI3 | dis3 | pre3 | bel3 |
|---|---|---|---|---|---|---|---|---|---|---|
| *A. For the total participants (no. of participants in parentheses)* | | | | | | | | | | |
| SOC1 | NS | −.304 * (47) | −.445 ** | −.335 * (47) | NS | −.488 ** (31) | −.547 ** (31) | −.564 ** (31) | −.568 ** (31) | −.482 ** (31) |
| C1 | NS | −.340 * (47) | −.415 ** (47) | −.373 ** (47) | NS | −.432 * (31) | −.481 ** (31) | −.505 ** (31) | −.505 ** (31) | −.409 * (31) |
| ME1 | NS | NS | NS | NS | NS | −.426 * (31) | −.496 ** (31) | −.506 ** (31) | −.502 ** (31) | −.453 * (31) |
| MA1 | −.219 (47) | −.321 * (47) | −.453 ** (47) | −.356 * (47) | NS | −.416 * (31) | −.455 * (31) | −.464 ** (31) | −.477 ** (31) | −.400 * (31) |
| LEE1 | NS | NS | .422 * (27) | NS | NS | .450 * (20) | .488 * (20) | .508 * (20) | .480 * (20) | .446 * (20) |
| LEE3 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| Beck1 | NS | .365 * (45) | .461 ** (45) | .358 * (45) | NS | .482 ** (31) | .553 ** (31) | .564 ** (31) | .553 ** (31) | .511 ** (31) |
| Beck3 | NS | NS | .369 * (31) | NS | NS | .460 ** (31) | .542 ** (31) | .567 ** (31) | .563 ** (31) | .469 ** (31) |
| *B. For the subjects entering remission within 6 months of initial interview (no. of participants in parentheses)* | | | | | | | | | | |
| | PDI1 | iPDI1 | dis1 | pre1 | bel1 | PDI3 | iPDI3 | dis3 | pre3 | bel3 |
| SOC1 | NS | NS | −.458 * (29) | NS | NS | −.726 *** (26) | −.697 *** (26) | −.686 *** (26) | −.687 *** (26) | −.698 *** (26) |
| C1 | NS | NS | NS | NS | NS | −.628 ** (26) | −.595 ** (26) | −.595 ** (26) | −.594 ** (26) | −.582 ** (26) |
| ME1 | NS | NS | NS | NS | NS | −.520 ** (26) | −.524 ** (26) | −.507 ** (26) | −.498 ** (26) | −.551 ** (26) |
| MA1 | NS | −.420 * (29) | −.559 ** (29) | −.431 * (29) | NS | −.709 *** (26) | −.665 *** (26) | −.654 *** (26) | −.666 *** (26) | −.658 *** (26) |
| LEE1 | NS | .590 * (16) | .683 ** (16) | .530 * (16) | NS | .838 *** (13) | .788 ** (13) | .772 ** (13) | .756 ** (13) | .816 ** (13) |
| LEE3 | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| Beck1 | NS | .477 ** (29) | .565 ** (29) | .434 * (29) | NS | .819 *** (22) | .846 *** (22) | .855 *** (22) | .819 *** (22) | .842 *** (22) |
| Beck3 | NS | NS | NS | NS | NS | .639 ** (22) | .606 ** 22 | .591 ** (22) | .561 ** (22) | .645 ** (22) |

iPDI indicates intensity of delusions; dis, delusional distress; pre, delusional preoccupation; bel, delusional belief; C, comprehensibility; MA, manageability; ME, meaning.
* $P < .05$.
** $P < .01$.
*** $P < .001$.

to be negatively correlated with levels of delusional symptoms during follow-up, consistent with previous EE studies.

In addition, an interaction was found between SOC, EE (in the acute phase), and PDI (after 1 year) (Fig. 3) only among patients entering remission during this time. This was expressed in the disappearance of the negative correlation between SOC in the acute delusional state and the level of delusions after 1 year in patients reporting low EE levels. However, when EE was high, reflecting high levels of environmental stress, this negative correlation remained strong.

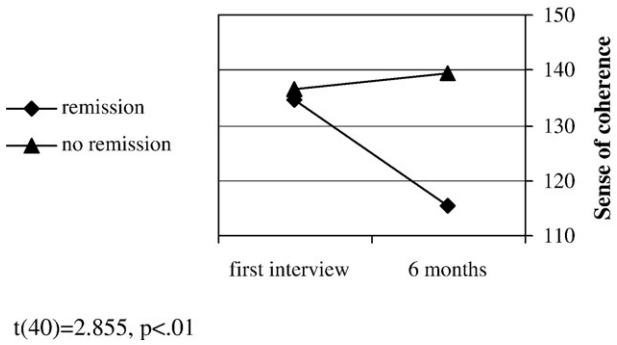


Fig. 2. Sense of coherence of patients who entered remission within 6 months of initial interview, compared to that of patients who remained delusional at this time ($t_{40} = 2.855$, $P < .01$).

### 3.4. Sense of coherence and depression

No significant differences were found for depression levels between the group of patients who remitted within 6 months and the group which remained delusional. Sense of coherence in the initial interview (acute delusional state) was found to be strongly and negatively correlated with the Beck

Table 2
Correlations between SOC

| | LEE1 | LEE2 | LEE3 | Beck1 | Beck2 | Beck3 |
|---|---|---|---|---|---|---|
| *A. In the acute delusional state with expressed emotion and depression, for the total participants (number of participants in parentheses)* | | | | | | |
| n | 27 | 20 | 18 | 45 | 41 | 31 |
| SOC1 | −.487 * | −.560 * | NS | −.719 *** | −.542 *** | −.713 *** |
| C1 | −.392 * | −.501 * | NS | −4.59 ** | −.339 * | −.539 ** |
| ME1 | NS | NS | NS | −.680 *** | −.581 *** | −.771 *** |
| MA1 | −.597 ** | −.585 ** | NS | −.646 *** | −.454 ** | −.575 ** |
| *B. With EE and depression, for the subjects entering remission within 6 months of initial interview. (number of participants in parentheses)* | | | | | | |
| n | 16 | 14 | 15 | 29 | 28 | 22 |
| SOC1 | −.633 ** | −.573 * | NS | −.757 *** | −.542 ** | −.746 *** |
| C1 | NS | NS | NS | −.444 * | NS | −.548 ** |
| ME1 | NS | NS | NS | −.746 *** | −.565 ** | −.790 *** |
| MA1 | −.643 ** | −.557 * | NS | −.709 *** | −.469 * | −.623 ** |

* $P < .05$.
** $P < .01$.
*** $P < .001$.

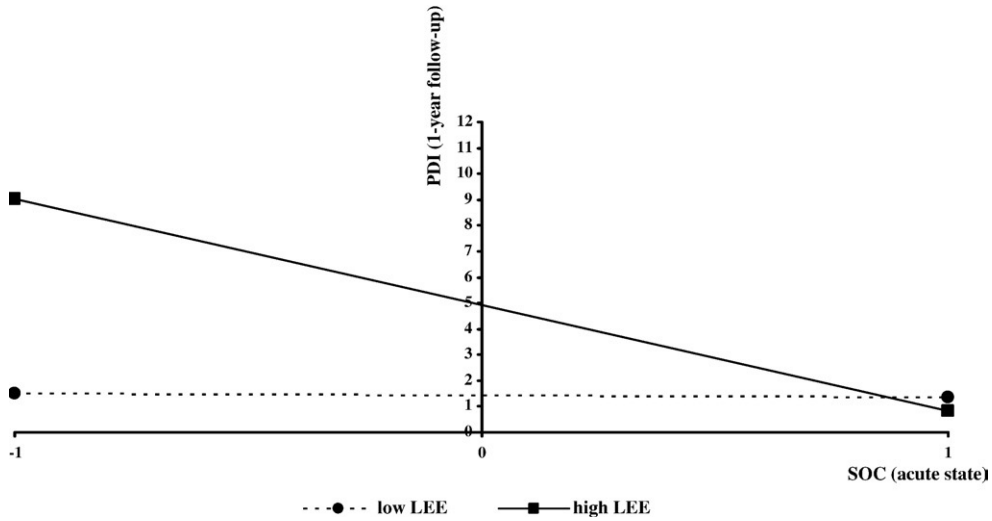


Fig. 3. Interaction between SOC and LEE in the acute phase in their relationship with number of delusions at 1 year follow-up among patients entering remission.

scores in the 3 time points of the first year (Table 2), in line with previous studies [24-27]. In addition, Beck scores were significantly correlated with PDI at all 3 time points for both groups (remitting/nonremitting). However, in the remission group, there were markedly stronger correlations between Beck scores in the acute phase and PDI after a year than in the entire sample, suggesting a possible stronger prognostic effect of depression in the acute delusional state for the quality of remissions.

In addition, an interaction was found between SOC, Beck (in the acute phase), and PDI (after 1 year) (Fig. 4), only among patients entering remission during this time. This is expressed in the disappearance of the negative correlation between SOC in the acute delusional state and the level of delusions after 1 year in patients reporting low depression levels. However, when Beck scores were, high this negative correlation remained strong.

## 4. Discussion

### *4.1. Remitting/relapsing course of delusional symptoms*

The remission/relapse course was monitored over the study period, using a combination of the PDI and clinical assessment of treating staff, in accordance with the recommendations of Linszen et al [40]. We found this combination to be necessary for assessment, as it was clear from the PDI scores that remission did not involve the total disappearance of delusional symptoms. All participants reported a number of persistent delusional symptoms on the PDI while being assessed clinically as being in remission. As some of the participants reported only a small number of delusional symptoms (though of high intensity) in the initial acute phase, we chose a reduction of 50% in intensity of delusions as one of the remission criteria, although most of the participants demonstrated a much higher reduction (when

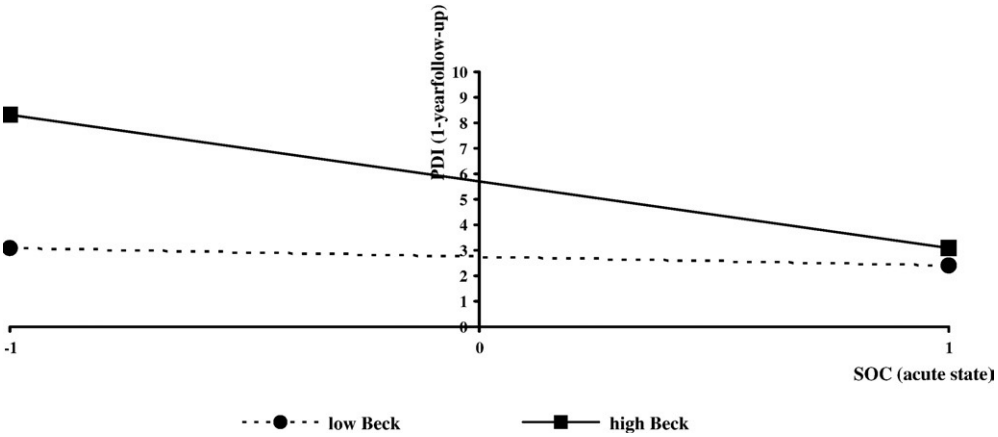


Fig. 4. Interaction between SOC and Beck in the acute phase in their relationship with number of delusions at 1 year follow-up among patients entering remission.

the number of delusions in the acute phase was higher). Because of this "delusional persistence," clinical assessment was added to ensure a significant qualitative difference between acute and remitting states.

### 4.2. Relationship between SOC and delusional symptoms

Sense of coherence was found to be negatively correlated with intensity of delusions, a finding expected according to previous studies, reporting salutogenic factors (such as the SOC) as protective in relation to various symptoms [9,41]. However, other findings of the study suggest a more complex relationship between the variables. Some of these involve studying the differential effects of the separate components of the SOC, which should be cautiously viewed as exploratory, due to equivocal data regarding independence of these components from the concept of a single SOC factor [9,10].

Sense of coherence among acutely delusional participants was found to be similar to that found in the population at large, contradicting the "common-sense" assumption of reduction in SOC in psychotic states [13]. In addition, the negative correlation found between SOC and delusions was not found for the SOC subscale of meaning, suggesting that the subjective experience of meaning may remain intact or, perhaps, may even be enhanced during acute psychosis, in line with findings of Roberts [19,42], who reported high levels of meaning in life for acutely delusional patients. The absence of a negative correlation between SOC and *number* (as opposed to *intensity*) of delusions suggests a similar conclusion: "intensity of delusions" is a combined factor, which includes all 3 delusional dimensions examined in the PDI. The number of delusions may be seen to reflect the complexity and pervasiveness of the delusional system. Therefore, increased number of delusions may reflect a more elaborate delusional system, which may be associated with enhanced meaning in life.

The findings of follow-up lend further support to the suggestion of psychosis, possibly *enhancing* SOC—participants entering remission exhibited *reduction* in SOC at remission, in contrast to those remaining acutely delusional, whose SOC scores remained mostly stable. In addition, SOC in the initial (acutely delusional) interview was more strongly negatively correlated with delusional intensity at 1-year follow-up among remitting patients, suggesting a stronger protective effect of SOC during a fluctuating delusional course. The findings relating to nonremitting patients pointed to absence of significant correlations between SOC at the acute state and delusions at follow-up, although these should be viewed with caution due to the sample size. Yet, even among these participants, a significant strong negative correlation was found for the meaning subscale of SOC at the acute state, with delusional distress and preoccupation at follow-up. These findings suggest the influence of the meaning factor on the course of the delusional symptoms (and will be discussed further below).

### 4.3. Relationships between EE, SOC, and course of delusional symptoms

Level of expressed emotion in the acute delusional state was found to be positively correlated with levels of delusional symptoms during follow-up, in line with previous studies demonstrating predictive power of EE in schizophrenia, in which higher EE is correlated with increased relapse rates [28-31]. In addition, LEE was found to be negatively correlated with SOC. This finding in itself is to be expected, as SOC may be seen as reflecting coping capabilities, which are likely to relate negatively with perceived stress. However, the negative correlation between LEE and SOC was found to be stronger among participants who experienced remission during the study, suggesting a stronger relationship between the variables (LEE, SOC, and delusional symptoms) when fluctuations are present in the delusional state, as opposed to a stable and chronic course.

The interaction found between the 3 variables demonstrate that the strong negative correlation between SOC in the acute delusional state and intensity of symptoms during follow-up almost disappears when LEE is low—suggesting the correlation between SOC and course of symptoms to be related to coping capabilities in the presence of perceived environmental stress. These suggest the role of the "external variable" of environmental support as providing protective properties to be similar to that of the "internal variable" of coping mechanisms reflected in the SOC, with relation to course of delusional symptoms.

### 4.4. Relationships between depression, SOC, and course of delusional symptoms

Beck scores were found to be negatively correlated with SOC, as reported in previous studies [24-27]. In addition, depression was found to be correlated with delusional symptoms at all time points, although correlations were weaker at remission, suggesting a "lingering" depressive effect of the acute delusional state. Depression at the acute delusional state was also correlated with worse prognosis for delusions within a year. These relationships suggest interactions between SOC, depression, and delusions, which were indeed found: the negative correlation between SOC in the acute delusional state and intensity of delusions upon 1-year follow-up was greatly reduced when depression was low. This interaction resembles that found for expressed emotion, described in the previous section, again suggesting the effects of stress—whether "internal/emotional" or "external/environmental"—to be moderated by coping capacities such as represented by the SOC.

### 4.5. Delusions and the "background of meaning"

The findings suggest a complex relationship between delusional symptoms and SOC. In spite of the consistent negative correlation between delusions and SOC, reduction in delusional intensity is accompanied by reduction in SOC. This implies that although a stronger SOC may be a

mitigating factor for psychosis, the presence of a delusional system may provide what may be called a background of meaning, leading to reduction in SOC upon entry into remission. This is supported by the absence of a negative correlation between delusions and the meaning subscale of SOC (in contrast to total SOC and the other SOC subscales). However, upon entry into remission, the meaning subscale manifests the strongest reduction.

The undermining of the (psychotic) background of meaning may also be associated with the frequently observed phenomenon of postpsychotic depression [21,22]. This association is also implied by the findings regarding the interaction between SOC, depression, and delusions, according to which when depression levels are lower, SOC is seen to be a weaker prognostic factor for delusional intensity at follow-up, suggesting the protective mechanism to involve the association of SOC with depression (keeping in mind the strong negative correlation between these 2 variables).

The delusional experience undoubtedly involves acute distress. The negative correlations between SOC and delusional distress at the various time points of the study are stronger than those found with the other delusional dimensions of the PDI. Hence, stronger SOC is associated with reduced distress. However, there is no discernible difference between the various delusional dimensions with regard to the prognostic value of the SOC. A context for this could be a possible reduction in SOC at a given time point reflecting delusional distress, caused by the content of the delusions and the difficulties in coping with reality, with a simultaneous increase in SOC reflecting the reprieve gained by meaning provided by the delusional system. This would be compatible with previous findings, which suggested a connection between delusional content and emotional distress [43].

These findings imply the need for a treatment approach that addresses the complex relationship between delusional symptoms and more subjective variables of well-being within a biopsychosocial treatment model [44]. The sense of meaning associated with delusional states seems especially relevant for therapeutic attention, when one of the obvious goals of treatment is the eradication of delusional symptoms. An integrative approach to treatment could include psychopharmaceutical treatment focused on the psychotic symptoms, accompanied by psychotherapy focused on the exploration of the background of meaning.

Because of the limited sample size, it was not possible to assess causal relationships between the variables. In addition, longer-term follow-up may reveal additional effects of the relationships between these variables and the course of disease. Nevertheless, the effects demonstrated in the study suggest possible applications. These include the use of the SOC scale as a prognostic tool in delusional states and possible improvement of prognosis by therapeutic interventions aimed at enhancement of SOC components during acute delusional state. Moreover, it may be used to screen patients most likely to benefit from a combined treatment approach, especially in public services in which resources and the availability of psychotherapy are limited.

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