Basic self-disturbances are associated with Sense of Coherence in patients with psychotic disorders

Ingrid Hartveit Svendsen, Merete Glenne Øie, Paul Møller, Barnaby Nelson, Ingrid Melle, Elisabeth Haug

Department of Acute Psychiatry and Psychosis Treatment, Division of Mental Health, Innlandet Hospital Trust, Reinsvoll, Norway, Faculty of Medicine, University of Oslo, Blindern, Oslo, Norway, Department of Psychology, University of Oslo, Oslo, Norway, Division of Research, Innlandet Hospital Trust, Brumunddal, Norway, Department of Mental Health Research and Development, Division of Mental Health and Addiction, Vestre Viken Hospital Trust, Drammen, Norway, Orygen, The National Centre of Excellence in Youth Mental Health, The University of Melbourne, Victoria, Australia, Centre for Youth Mental Health, The University of Melbourne, Victoria, Australia, NORMENT KG Jabsen Centre for Psychosis Research, Institute of Clinical Medicine, University of Oslo, Oslo, Norway, Division of Mental Health and Addiction, Oslo University Hospital, Oslo, Norway

* Ingrid.Hartveit.Svendsen@sykehuset-innlandet.no

Abstract

Background

The Sense of Coherence (SOC) theory gives a possible explanation of how people can experience subjective good health despite severe illness. Basic self-disturbances (BSDs) are subtle non-psychotic disturbances that may destabilize the person’s sense of self, identity, corporeality, and the overall ‘grip’ of the world.

Aim

Our objective was to investigate associations between BSDs and SOC in patients with psychotic disorders.

Design

This is a cross-sectional study of 56 patients diagnosed with psychotic disorders inside and outside the schizophrenia spectrum (35 schizophrenia, 13 bipolar, and eight other psychoses). SOC was measured using Antonovsky’s 13-item SOC questionnaire, and BSDs were assessed using the Examination of Anomalous Self-Experience (EASE) manual. Diagnosis, symptoms, and social and occupational performance were assessed using standardized clinical instruments.

Results

We found a statistically significant correlation (r = -0.64) between high levels of BSDs and low levels of SOC (p < 0.001). This association was not influenced by diagnostics, clinical symptoms or level of functioning in follow-up multivariate analyses.
Conclusion

A statistically significant association between BSDs and SOC indicates that the presence and level of self-disturbances may influence the person’s ability to experience life as comprehensive, manageable and meaningful. However, the cross-sectional nature of the study precludes conclusions regarding the direction of this association.

Introduction

The personal experience of health is complex and dynamic and relies on physical, social and mental factors [1]. According to the salutogenesis theory, an approach focusing on factors that support health and well-being, the experience of health is on a continuum from good health to poor health dependent on the individual’s internal and external coping resources [2]. Aron Antonovsky’s “Sense of Coherence (SOC)” theory is used to explain the apparent contradiction that people with severe illnesses report a subjective experience of good health.

According to this theory, the SOC comprises three theoretically separable but closely interwoven core components that include:

1) Comprehensibility: Refers to the extent to which a person perceives internal and external stimuli as rationally understandable and as information that is orderly, coherent, clear, structured rather than noise.

2) Manageability: Refers to the degree to which a person feels that there are resources at his/her disposal that can be used to meet the requirements of the stimuli that bombards him/her.

3) Meaningfulness: Refers to the extent to which a person feels that life has emotional meaning, that at least some of the problems faced in life are worth commitment and dedication, and are seen as challenges rather than as burdens [3].

These three core components can vary over time. A person can experience life as manageable but not explainable or meaningful, and later on as meaningful but not predictable and manageable [4]. A high SOC indicates the ability to make sense of the world, in a way that facilitates successful coping with the countless and complex stressors we confront throughout life [2].

Longitudinal studies of healthy teenagers [5], students [6] and unselected general population samples [7] show that a person’s SOC is relatively stable throughout life. A 13-year follow-up study of 552 individuals followed from childhood to adulthood, found that SOC tended to increase with age and was most stable in those with a high SOC at study baseline [8]. While SOC is not seen as a personality trait, it is closely related to other personal resources such as self-esteem [9, 10].

Both quantitative and qualitative studies support the notion that a high SOC contributes to a high subjective quality of life [11]. Good health, and in particular, good mental health is also related to a high SOC. The original SOC theory takes the possibility of people refusing to acknowledge facts into account; i.e. the possibility of having a “false” SOC [3]. Loss of insight, especially the lack of awareness of positive- and cognitive symptoms, is common in patients with schizophrenia [12, 13]. Loss of insight could thus influence the association between SOC and mental health in schizophrenia. However, a study of 136 patients with schizophrenia or schizoaffective disorder, showed a statistically significant association between a low SOC and a high level of negative symptoms [14]. Another study of 120 patients with schizophrenia and schizoaffective disorder, showed a statistically significant association between low SOC and...
high levels of positive, negative and affective symptoms including anxiety, guilt feelings, tension and depressive mood [15].

Contemporary phenomenology distinguishes between the core- or basic self and the narrative self [16, 17]. The basic self is a pre-reflective level of selfhood. The basic self refers to the first-person quality of a person’s experiences and is entirely implicit in—and inseparable from—the act of experiencing in itself, i.e. all subjective experience implies a self who is having the experience [18]. The concept of a basic self derives from the given fact that there is an implicit "ownership" of experience and in other words comprises the tacit awareness that "this is my experience". As the term indicate, the basic self is the foundation upon which other aspects of the self, such as the narrative self, are based. The narrative self exists on a reflective and articulated level. The narrative self is the experience of the self as having particular characteristics, personality traits, values and history [19].

Basic self-disturbances are disturbances in the basic, pre-reflective self [19]. BSDs affect a person’s ability to have an adequate interpretation of his/her inner feelings and thoughts and diminish the feeling of ownership of one’s body, movements and personal history. BSDs will thus likely affect how a person experiences his/her existence as comprehensive, manageable and meaningful, i.e. influence the person’s SOC.

Both SOC and BSDs are closely linked to the clinical severity of mental illness [20–28], more knowledge about the relationship between SOC and BSDs give us insight into the challenges experienced by people with schizophrenia and other psychotic disorders. We here aim to investigate the relationship between BSDs and SOC in patients with psychotic disorders. To our knowledge, this is the first study that focuses directly this potential relationship. Our main hypothesis, as outlined above, is that patients with high level of BSDs will experience low SOC. Since high levels of BSDs are associated with high levels of symptoms and high levels of symptoms potentially associated with low SOC, we also investigate to what extent a putative association between BSDs and SOC is mediated by clinical severity, including the severity of symptoms of psychosis and functional loss.

**Material and method**

**Sample**

The current study is based on a seven-year follow-up of a cohort of first-treatment patients recruited in the period 2008–2009, in a sub-study of the Norwegian “Thematically Organized Psychosis” (TOP) study. The original inclusion criteria were: 1) Entering the first treatment for a broadly defined psychotic disorder a) schizophrenia, schizophreniform disorder or schizoaffective disorder (“SZspect”) or b) psychotic bipolar disorder PBD I, II and NOS or delusional disorder and psychosis NOS (“’non-SZspect”’). 2) Age between 18 and 65 years and 3) IQ >70. Ninety patients met the criteria at baseline, for details see Haug et al. [29]. All participants were able and willing to consent. Ability to consent was determined in the following way: The patients were referred to the study by their treating clinician, who made the first evaluation of their ability to participate. The consent form was presented in both written and oral form to the patient by the interviewer, and questions regarding the study was discussed to make sure that the participant understood its content. Finally, the results of the symptom interviews, in particular the levels of psychotic symptoms, insight and disorganization were taken into account. Of the initial 90 patients recruited at baseline, 56 (62%) provided informed consent to participate in the follow-up study. All 34 patients who did not participate were alive; 19 did not want to participate, and we were unable to contact another 15 despite several attempts. The study was approved by the Regional Committee for Medical Research Ethics, South-East Norway.
Assessments

All participants were evaluated with an extensive clinical assessment. Only the instruments relevant to this part of the study are presented below.

Assessment of Sense of Coherence (SOC). SOC was measured with the SOC-13, a self-report questionnaire comprising thirteen questions. Each question links to one of the core components of the SOC (i.e. comprehensibility, manageability, and meaningfulness) [4]. Studies of the psychometric properties of the SOC-13 scale have shown high levels of validity and reliability [30], and internal consistency is found to be very good with Cronbach’s alphas ranging from 0.70 to 0.92 in the 127 studies using SOC-13 [2, 31].

In the current study, we used a version of SOC-13 modified to make it easier to understand for patients with severe psychiatric problems and previously used in a study of patients in acute psychiatric units in Norway [32]. The modified questionnaire asks the same questions as the original version but includes predefined answers on 1–5 scale instead of the original 1–7 Likert scale. The possible range of the SOC-13 score is thus 13 to 65, with high scores indicating good SOC.

Assessment of basic self disturbances. BSDs were assessed with the Examination of Anomalous Self Experience (EASE) manual [30] by the first author (IHS). IHS was trained in the use of EASE by EH (a certified EASE instructor) and PM (one of the original EASE authors). The inter-rater reliability (IRR) for the EASE assessments in the study was good [33–35].

The EASE manual is usually employed to capture the lifetime experience of BSDs, but the time range can be adjusted to the aim of the study [33]. Since one of the original study aims was to assess changes in BSD over time, we here measured BSDs experienced over the last two years before follow-up.

The EASE has 57 main items divided into five domains: (1) Cognition and stream of consciousness, (2) Self-awareness and presence, (3) Bodily experiences, (4) Demarcation/transitivism, and (5) Existential reorientation. BSDs is not conceptualized as discrete symptoms but as interconnected and highly overlapping aspects of a coherent Gestalt. Both items and domains are statistically highly inter-correlated because of overlap between single items and domains [23,28]. The items are scored using a 5-point scale (0–4), 0 = absent; 1 = questionably present; 2 = definitely present, mild; 3 = definitely present, moderate; 4 = definitely present, severe. The items were dichotomized into 0 (for absent or questionably present) and 1 (for definitely present comprising all severity levels) for the current analyses. Item 2.13 (anxiety) was not included in the analyses since this item is not a BSD per se [36] but primarily served as a contrast to the subsequent EASE-item (2.14), ontological anxiety [33].

Diagnostics and symptom evaluation. Diagnoses were ascertained by trained clinical psychologists or medical doctors using the Structured Clinical Interview for DSM-IV Axis I disorders (SCID module I, chapter A-E) [36]. An independent samples t-test showed no differences between the bipolar and other psychosis for the SOC score, the EASE total score or any EASE domain scores. These two participant groups were merged into one group, representing psychotic disorders outside of the schizophrenia spectrum (non-SZspect) for the statistical analyses.

Current symptom severity was measured with the Global Assessment Functioning Scale, Symptoms (GAF-S) [37, 38] and the Positive and Negative Syndrome in Schizophrenia Scale [39]. We used the Structured Clinical Interview for PANSS (SCI-PANSS) and report Wallwork’s five-factor model constituting positive, negative, disorganized, excitement and depressive symptoms [40]. PANSS item G12 (Lack of judgment and insight) was used as a measure of lack of clinical insight. Social functioning was assessed by the Global Assessment
Functioning scale, Function (GAF-F) [37, 38] and the Social Function Scale (SFS). The SFS covers the area of social contacts, independent living and vocational activities, with a high level of internal consistency for the scales and subscales [41–43]. The first author (IHS) conducted all assessments except the diagnostic interviews.

**Statistical analyses.** All analyses were done using SPSS version 23.0 (SPSS Inc., Chicago, IL, USA. In addition to investigate the primary research question of an association between EASE and SOC, we did follow up analyses exploring associations between their subdomains (five in EASE and three in SOC). The p value was thus preset to p< 0.01 to adjust for multiple testing. Means and standard deviations are reported for continuous variables and percentages for categorical variables. We used bivariate correlations (Pearson’s r) to evaluate associations. Finally, a multiple linear regression analysis was used to assess the influence of clinical symptoms on the association between SOC and BSDs. The effect of potential confounders we evaluated through their bivariate associations with SOC and EASE). Based on a total N = 56 we restricted the number of independent variables to 5–6. Due to the high degree of association between different measures of symptoms, and between different measures of functioning, we chose to represent the two areas by the GAF-S and GAF-F scores, respectively. Substituting these with PANSS or SFS scores did not change the main results. Violations of assumptions of normality, homoscedasticity, linearity and multicollinearity were investigated for the final model.

**Results**

Clinical and demographic data are shown in Table 1. The correlation matrix indicates a statistically significant correlation (p<0.01) between SOC and all clinical measures except PANSS NEG and PANSS DIS (Table 2). There were statistically significant differences (p < 0.01) in the EASE total score, GAF S, GAF F, PANSS POS and PANSS DIS between the two diagnostic groups, but no differences in the SOC-13 total score in bivariate analyses (Table 3).

There was a statistically significant (negative) correlation between the SOC-13 total score and the EASE total score (r-0.54, p<0.001) (Table 4). The follow-up analyses indicated statistically significant negative correlations between the main parts of the EASE domain scores and the SOC components, with the highest r’s for the associations between SOC and EASE domain 2, Self-awareness and presence (Table 4, in bold).

We then investigated if clinical characteristics mediated the association between SOC and BSDs (EASE total score) (Table 5).

The results of the regression analysis showed a statistically significant association between SOC and BSDs, in the direction that high levels of BSDs contributed to low levels of SOC. The analysis also indicated that the association between SOC and BSDs was independent of

| Table 1. Clinical and demographic data. |
|-----------------------------------------|
| N |                         |
|---|-------------------------|
| Male (N/%) | 56 | 28/50 |
| Age (mean/median/SD) | 56 | 32.2/29/7.4 |
| Sense of Coherence (SOC) total score (mean/SD) | 55 | 41.2/10.6 |
| Examination of Anomalous Self-Experiences * (EASE) total score (mean/SD) | 56 | 11.7/8.9 |
| Global Assessment Functioning Scale split version–Symptom (GAF-S) (mean/SD) | 56 | 57.2/16.8 |
| Global Assessment Functioning Scale split version–Function (GAF-F) (mean/SD) | 56 | 60.4/16.9 |
| Positive and Negative Syndrome Scale (PANSS) total score (mean/SD) | 56 | 50.7/13.5 |
| Social Functioning Scale (SFS) (mean/SD) | 53 | 107.6/10.4 |

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diagnostic group, and not mediated by levels of clinical symptoms or dysfunction. The level of clinical insight did not confound the analyses.

Table 2. Correlation between SOC-13, EASE, clinical measures.

| Measure                  | SOC-13 total score | GAF symptom | GAF function | PANSS POS | PANSS NEG | PANSS DEP | PANSS EXC | PANSS DIS | SFS total |
|--------------------------|--------------------|-------------|--------------|-----------|-----------|-----------|-----------|-----------|-----------|
| EASE total score         | -0.544* p<0.001 N55 | -0.516* p<0.001 N55 | -0.362 p = 0.007 N55 | -0.175 p = 0.201 N55 | -0.632* p<0.001 N55 | -0.393 p = 0.003 N55 | -0.037 p = 0.790 N55 | 0.483 p<0.001 N55 |
| GAF symptom              | -0.671* p<0.001 N56 | -0.425 p = 0.001 N56 | 0.633* p<0.001 N56" | 0.227 p = 0.092 N56 | 0.662* p<0.001 N56 | 0.481* p<0.001 N56 | 0.453 p<0.001 N56 | -0.468* p<0.001 N54 |
| GAF function             | -0.791* p<0.001 N56 | -0.694* p<0.001 N56" | -0.545* p<0.001 N56" | -0.425 p = 0.001 N56 | -0.370 p = 0.005 N56 | -0.459 p<0.001 N56 | -0.734* p<0.001 N54 |
| PANSS POS                | 0.245 p = 0.069 N56 | 0.486* p<0.001 N56 | 0.491* p<0.001 N56" | 0.529 p<0.001 N56 | 0.529 p<0.001 N56 | 0.729 p<0.001 N56 | -0.447 p = 0.001 N54 |
| PANSS NEG                | 0.229 p = 0.090 N56 | 0.09 p = 0.010 N56 | 0.499 p<0.001 N56 | 0.449 p = 0.001 N56 | 0.449 p<0.001 N56 | -0.695* p<0.001 N54 |
| PANSS DEP                | 0.422 p = 0.001 N56 | 0.159 p = 0.243 N56 | 0.290 p = 0.030 N56 | 0.290 p = 0.030 N56 | 0.290 p = 0.030 N56 | -0.228 p = 0.097 N54 |
| PANSS EXC                | 0.290 p = 0.030 N56 | 0.159 p = 0.243 N56 | 0.290 p = 0.030 N56 | 0.290 p = 0.030 N56 | 0.290 p = 0.030 N56 | -0.228 p = 0.097 N54 |
| PANSS DIS                | 0.290 p = 0.030 N56 | 0.159 p = 0.243 N56 | 0.290 p = 0.030 N56 | 0.290 p = 0.030 N56 | 0.290 p = 0.030 N56 | -0.228 p = 0.097 N54 |

* Correlation is significant at the < 0.001 level (2-tailed).

SOC, Sense of coherence; EASE, Examination of Anomalous Self-experience; GAF, Global Assessment Functioning Scale; PANSS, Positive and Negative Symptom Scale; POS, Positive; NEG, Negative; DEP, Depressive; EXC, Excitatory; DIS, Dissociative; SFS, Social Functioning Scale

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Table 3. Independent samples t-test between the diagnostic groups (SZspect and non-SZspect).

| Measure                  | SOC total score | EASE total score | GAF symptom | GAF function | PANSS POS | PANSS NEG | PANSS DEP | PANSS EXC | PANSS DIS | SFS total |
|--------------------------|-----------------|------------------|-------------|--------------|-----------|-----------|-----------|-----------|-----------|-----------|
| N                        | 34              | 35               | 35          | 35           | 35        | 35        | 35        | 35        | 35        | 35        |
| Mean                     | 40.9            | 14.7             | 51.2        | 55.1         | 8.1       | 12.4      | 7.9       | 5.4       | 3.3       |
| SD                       | 10.47           | 9.14             | 15.35       | 15.94        | 3.65      | 4.72      | 2.80      | 2.37      | 0.58      |
| t                        | -0.35           | 3.57             | -3.84       | -3.31        | 4.62      | 2.47      | 1.62      | 4.93      | <0.001    |
| p-value                  | 0.725           | 0.001            | <0.001      | 0.002        | <0.001    | 0.017     | 0.110     | <0.001    |           |

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Discussion

In line with our hypothesis, we found a statically significant association between SOC and BSDs, in the direction that patients with high levels of BSDs had low levels of SOC. The association was strongest for EASE domain 2: Self-awareness and presence. As expected, we also found associations between SOC, BSDs and clinical characteristics. However, the association between SOC and BSDs was not mediated by clinical symptoms, dysfunction, level of insight or diagnostic group.

BSDs comprises a disordered experience of thoughts, feelings, and sensations with consequential fundamental loneliness, despite access to relationships with others [26, 44, 45]. This counteracts trust in- and access to the person’s own and others’ resources and abilities, that are needed to handle difficult situations. The experience of loss of common sense makes everyday life appear as complicated and unnatural. Even trivial tasks have to be thought through in a deliberate and careful (rather than an automatic and intuitive) fashion [19, 46, 47], creating uncertainty around the performance of actions others take for granted. The experience that life is coherent, consistent and predictable is thus influenced in a negative way. BSDs also comprise a diminished first-person perspective, disrupting awareness of own actions and reducing the ability to be touched, moved or motivated by other people, events or situations [48]. This impaired awareness may weaken the experience of personal involvement in own life and the experience of life as meaningful.

In particular EASE domain 2 (i.e. self-awareness and presence) comprises changes in the experience of a normally tacit and pre-reflective self-presence. The items included in this domain are thus associated with diminished potentials for activity and pleasure, diminished

| Table 4. Correlations (Pearson’s r) between SOC-13 and EASE scores. |
|-------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|                         | EASE Total Score r/p-value | Domain 1 r/p-value | Domain 2 r/p-value | Domain 3 r/p-value | Domain 4 r/p-value | Domain 5 r/p-value |
| SOC components          |                   |                   |                   |                   |                   |                   |
| Comprehensibility       | -0.51/ <0.001     | -0.40/0.003       | -0.55/ <0.001     | -0.42/0.002       | -0.30/0.025       | -0.32/0.019       |
| Manageability           | -0.45/0.001       | -0.36/0.004       | -0.41/0.002       | -0.32/0.018       | -0.40/0.003       | -0.26/0.06        |
| Meaningfulness          | -0.46/ <0.001     | -0.28/0.04        | -0.54/ <0.001     | -0.35/0.009       | -0.19/0.16        | -0.35/0.009       |
| SOC-13 Total Score      | -0.54/ <0.001     | -0.41/0.002       | -0.55/0.001       | -0.42/0.002       | -0.33/0.014       | -0.36/0.007       |

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| Table 5. Multiple linear regression models with SOC-13 total score as dependent variable. |
|-------------------------------------------|------------------------------------------|------------------------------------------|------------------------------------------|
| Model 1                                  | Beta      | t           | p-value | 95.0% CI | Collinearity Statistics |
| (Constant)                               | 24.3      | < 0.001     | 44.76   | 52.803   | Tolerance | VIF |
| EASE total score                         | -0.544    | -4.72       | < 0.001 | -0.93    | -0.375    | 1.000 | 1.000 |
| Model 2                                  | 5.70      | < 0.001     | 34.54   | 72.12    | 4.19      | 3.11 |
| GAF-F                                    | 0.177     | 0.82        | 0.42    | -0.16    | 0.39      | 0.24  | 4.19  |
| GAF-S                                    | 0.079     | 0.43        | 0.67    | -0.19    | 0.29      | 0.32  | 3.11  |
| Insight                                  | -0.223    | -1.75       | 0.09    | -6.73    | 0.46      | 0.69  | 1.46  |
| Diagnoses                                | -0.344    | -2.81       | 0.006   | -12.79   | -2.11     | 0.74  | 1.35  |
| EASE total score                         | -0.498    | -3.32       | 0.002   | -0.96    | -0.24     | 0.50  | 2.01  |

CI indicates Confidence Interval; EASE, Examination of Anomalous Self-experience; GAF- F Global Assessment Functioning scale, Symptom; GAF-S, Global Assessment Functioning scale, Function; Insight, PANSS item G12 (Lack of judgement and insight); Diagnoses, SZspect vs. Non-SZspect

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engagement in the world and experiences of alienation [33]. The SOC concept includes predictability, manageability and meaningfulness. It is difficult to experience life as predictable in the context of experiencing the world as unnatural and strange, to experience life as manageable in the context of actively monitoring inner life and external reality and to experience meaningfulness in the context of severe estrangement.

Significant associations between two apparently different concepts can be based on overlapping criteria. There are, however, major differences in the way BSDs and SOC are assessed. The EASE manual is a comprehensive, in-depth interview made to elicit information about BSDs as complex, and often unexpressed, experiences or phenomena. The interviewer explores these phenomena together with the patient beyond the immediate answer to the question. The use of a particular word or metaphor is examined to grasp the patient’s interpretation of the underlying phenomenon that can be literal, concrete or outside of the usual understanding of a concept [33]. The SOC-13, on the other hand, is a short self-report questionnaire assessing the person’s global experience of comprehensibility, manageability and meaningfulness [4]. The self-report form precludes any further exploration of the answers, and mainly captures the person’s immediate response to the question. There are questions in the SOC-13 and EASE-interview that appear closely related at first glance. SOC: "How often do you have the feeling that you are in an unfamiliar situation and do not know what to do?" EASE: "Have you ever experienced that you no longer understand natural things in life, that it is difficult to understand situations, people and objects?" The follow-up clarifications in the EASE interview, however, counteract the use of overlapping criteria.

The findings also support the notion that BSDs and SOCs relate to different types of self-awareness: While BSDs are associated with the basic level of the self, SOC is associated with the narrative level. This assumption is the basis for interpreting BSDs as independent contributors to poor SOC, in patients with psychosis. The results of the multiple linear regression analyses also indicate that the association between BSDs and SOC is not confounded or mediated by clinical symptoms or social dysfunction. However, the correlational nature of this study precludes firm conclusions regarding the direction of the associations, or causality. SOC theory is used to explain the apparent contradiction that people with severe illnesses have a subjective experience of good health. In this study, there was a negative association between the level of symptomatology and the level of SOC. It is also of interest that lack of clinical insight contributed to a lower SOC, and did not influence the association between BSDs and SOC. Also, while some participants reported both high symptom levels and high SOC, this discrepancy was not explained by a lack of insight.

Experience of health is linked to personal history and influenced by access to resources and the impact of illness. Both BSDs and SOC captures subjective experiences and needs to be specifically explored by clinicians wanting to understand the subjective world of their patients. By taking a salutogenic position, the clinician and the patient can explore how different challenges in life, including the presence of BSDs, impact the experience of health and coherence. This exploration can serve as the basis for identifying resources and initiating interventions that strengthen the patient’s experience of health.

Strengths of this study include: That the sample was broadly recruited from the Norwegian national health service offering public mental health care to all individuals with mental illness with few exclusion criteria. The participants represent a comprehensive, near to epidemiological sample.

Limitations include: While the current SOC-13 form is thought to be easier to use for patients with mental disorders, the use of the original form with a seven-point Likert scale could potentially give richer data through a wider range of scores. In addition, the study has
no explicit measure of the subjective experience of health, which could have strengthened the study.

**Conclusion**

This study is the first to demonstrate a statistically significant association between BSDs and SOC. The association is particularly high between SOC and the EASE domain 2, self-awareness and presence. The association is not influenced by diagnostic category, clinical symptoms and social dysfunction. Further research exploring this relationship, including the direction of the association, potential indications of causality and implications for treatment is needed.

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**Author Contributions**

**Formal analysis:** Ingrid Hartveit Svendsen, Ingrid Melle, Elisabeth Haug.

**Investigation:** Ingrid Hartveit Svendsen.

**Methodology:** Ingrid Melle.

**Project administration:** Elisabeth Haug.

**Supervision:** Merete Glenne Øie, Ingrid Melle, Elisabeth Haug.

**Writing – original draft:** Ingrid Hartveit Svendsen.

**Writing – review & editing:** Ingrid Hartveit Svendsen, Merete Glenne Øie, Paul Møller, Barnaby Nelson, Ingrid Melle, Elisabeth Haug.

**References**

1. Huber M, Knottnerus JA, Green L, van der Horst H, Jadad AR, Kromhout D, et al. How should we define health? BMJ. 2011; 343:d4163. https://doi.org/10.1136/bmj.d4163 PMID: 21791490

2. Antonovsky A. The structure and properties of the sense of coherence scale. Social Science & Medicine. 1993; 36(6):725–33.

3. Mittelmark MB, Sagy S, Eriksson M, Bauer GF, Pelikan JM, Lindström B, et al. The Handbook of Salutogenesis2016.

4. Antonovsky A. Unraveling the mystery of health: how people manage stress and stay well. San Francisco: Jossey-Bass; 1987.

5. Honkinen PL, Suominen S, Helenius H, Aromaa M, Rautava P, Sourander A, et al. Stability of the sense of coherence in adolescence. International journal of adolescent medicine and health. 2008; 20(1):85–91. https://doi.org/10.1515/jamh.2008.20.1.85 PMID: 18540287

6. Virtanen P, Koivisto A. Wellbeing of professionals at entry into the labour market: a follow up survey of medicine and architecture students. Journal of Epidemiology & Community Health. 2001; 55(11):831–5.

7. Hendrikx T, Nilsson M, Westman G. Sense of coherence in three cross-sectional studies in Northern Sweden 1994, 1999 and 2004—patterns among men and women. Scandinavian Journal of Public Health. 2008; 36(4):340–5. https://doi.org/10.1177/140349808089560 PMID: 18539687

8. Hakanen JJ, Feldt T, Leskinen E. Change and stability of sense of coherence in adulthood: Longitudinal evidence from the Healthy Child study. Journal of Research in Personality. 2007; 41(3):602–17.

9. Hobfoll SE. Social and psychological resources and adaptation. Review of general psychology. 2002; 6(4):307–24.
10. Pallant JF, Lae L. Sense of coherence, well-being, coping and personality factors: further evaluation of the sense of coherence scale. Personality and individual differences. 2002; 33(1):39–48.

11. Eriksson M, Lindström B. Antonovský’s sense of coherence scale and its relation with quality of life: a systematic review. Journal of Epidemiology & Community Health. 2007; 61(11):938–44.

12. Poussa E, Ochoa S, Cobo J, Nieto L, Usalli J, Gonzalez B, et al. A deeper view of insight in schizophrenia: Insight dimensions, unawareness and misattribution of particular symptoms and its relation with psychopathological factors. Schizophr Res. 2017; 189:61–8. https://doi.org/10.1016/j.schres.2017.02.016 PMID: 28237605

13. Mintz AR, Dobson KS, Romney DM. Insight in schizophrenia: a meta-analysis. Schizophr Res. 2003; 61(1):75–88. https://doi.org/10.1016/s0920-9964(02)00316-x PMID: 12648738

14. Witkowska-Łuć B. Schizophrenia and sense of coherence. Psychiatria Polska. 2018; 52(2):217–26. https://doi.org/10.1016/j.pspol.2017.04.001 PMID: 29975362

15. Bengtsson-Tops A, Hansson L. The validity of Antonovsky’s Sense of Coherence measure in a sample of schizophrenic patients living in the community. Journal of Advanced Nursing. 2001; 33(4):432–8. https://doi.org/10.1046/j.1365-2648.2001.01692.x PMID: 11251730

16. Gallagher S. Philosophical conceptions of the self: implications for cognitive science. Trends Cogn Sci. 2000; 4(1):14–21. https://doi.org/10.1016/s1364-6613(99)01417-5 PMID: 10637618

17. Zahavi D. Subjectivity and selfhood: investigating the first-person perspective. Cambridge, Mass: MIT Press; 2005.

18. Zahavi D. First-person thoughts and embodied self-awareness: Some reflections on the relation between recent analytical philosophy and phenomenology. Phenomenology and the Cognitive Sciences. 2002; 1(1):7–26.

19. Sass LA, Parnas J. Schizophrenia, Consciousness, and the Self. Schizophr Bull. 2003; 29(3):427–44. https://doi.org/10.1093/oxfordjournals.schbul.a007017 PMID: 14609238

20. Bengtsson-Tops A, Brunst D, Raask M. The structure of Antonovsky’s sense of coherence in patients with schizophrenia and its relationship to psychopathology. Scandinavian Journal of Caring Sciences. 2005; 19(3):280–7. https://doi.org/10.1111/j.1471-6712.2005.00342.x PMID: 16101857

21. Ristkari T, Sourander A, Ronning J, Helenius H. Self-reported psychopathology, adaptive functioning and sense of coherence, and psychiatric diagnosis among young men. Social Psychiatry and Psychiatric Epidemiology. 2006; 41(7):523–31. https://doi.org/10.1007/s00127-006-0059-x PMID: 16568249

22. Raballo A, Preti A. Temporal stability of self-disorders and longitudinal unfolding of symptom dimensions: A complementary analysis. Schizophr Res. 2017.

23. Raballo A, Parnas J. Examination of anomalous self-experience: initial study of the structure of self-disorders in schizophrenia spectrum. The Journal of nervous and mental disease. 2012; 200(7):577–83. https://doi.org/10.1097/NMD.0b013e31825bfd6f PMID: 22759933

24. Haug E, Meile I, Andreassen OA, Raballo A, Bratlien U, Oie M, et al. The association between anomalous self-experience and suicidality in first-episode schizophrenia seems mediated by depression. Compr Psychiatry. 2012; 53(5):456–60. https://doi.org/10.1016/j.comppsych.2011.07.005 PMID: 21871617

25. Haug E, Oie MG, Andreassen OA, Bratlien U, Romm KL, Møller P, et al. The association between anomalous self-experiences, self-esteem and depressive symptoms in first episode schizophrenia. Front Hum Neurosci. 2016; 10.

26. Haug E, Oie M, Andreassen OA, Bratlien U, Raballo A, Nelson B, et al. Anomalous self-experiences contribute independently to social dysfunction in the early phases of schizophrenia and psychotic bipolar disorder. Compr Psychiatry. 2014; 55(3):475–82. https://doi.org/10.1016/j.comppsych.2013.11.010 PMID: 24378241

27. Nordgaard J, Nilsson LS, Saebye D, Parnas J. Self-disorders in schizophrenia-spectrum disorders: a 5-year follow-up study. Eur Arch Psychiatry Clin Neurosci. 2018; 268(7):713–8. https://doi.org/10.1007/s00430-017-0837-3 PMID: 28865064

28. Eriksson M, Lindström B. Antonovský’s sense of coherence scale and the relation with health: a systematic review. Journal of Epidemiology & Community Health. 2006; 60(5):376–81.

29. Haug E, Lien L, Raballo A, Bratlien U, Oie M, Andreassen OA, et al. Selective aggregation of self-disorders in first-treatment DSM-IV schizophrenia spectrum disorders. The Journal of nervous and mental disease. 2012; 200(7):632–6. https://doi.org/10.1097/NMD.0b013e31825bf6d6 PMID: 22759943

30. Eriksson M, Lindström B. Validity of Antonovský’s sense of coherence scale: a systematic review. Journal of epidemiology and community health. 2005; 59(6):460–6. https://doi.org/10.1136/jech.2003.018085 PMID: 15911640
31. Nordgaard J, Parnas J. Self-disorders and the schizophrenia spectrum: a study of 100 first hospital admissions. Schizophr Bull. 2014; 40(6):1300–7. https://doi.org/10.1093/schbul/sbt239 PMID: 24476579

32. Gråwe RW, Hatling T, Ruud T. Akutpsykiatriisk behandling i Norge-resultater fra en multisenterstudie. SINTEF: 2006. Report No.: 8214040221.

33. Parnas J, Moller P, Kircher T, Thalbitzer J, Jansson L, Handest P, et al. EASE: Examination of Anomalous Self-Experience. Psychopathology. 2005; 38(5):236–58. https://doi.org/10.1159/000088441 PMID: 16179811

34. Moller P, Haug E, Raballo A, Parnas J, Melle I. Examination of anomalous self-experience in first-episode psychosis: interrater reliability. Psychopathology. 2011; 44(6):386–90. https://doi.org/10.1159/000325173 PMID: 21847006

35. Nelson B, Thompson A, Yung AR. Basic self-disturbance predicts psychosis onset in the ultra high risk for psychosis "prodromal" population. Schizophr Bull. 2012; 38(6):1277–87. https://doi.org/10.1093/schbul/sbs007 PMID: 22349924

36. First M, Williams JB, Spitzer R, Gibbon M. Structured Clinical Interview for DSM-IV Axis I Disorders, clinician version (SCID-CV). Arlington, VA: American Psychiatric Publishing Inc 1996.

37. Endicott J, Spitzer RL, Fleiss JL, Cohen J. The Global Assessment Scale: A Procedure for Measuring Overall Severity of Psychiatric Disturbance. Archives of General Psychiatry. 1976; 33(6):766–71. https://doi.org/10.1001/archpsyc.1976.01770060086012 PMID: 938196

38. Pedersen G, Hagtvet KA, Karterud S. Generalizability studies of the Global Assessment of Functioning-Split version. Compr Psychiatry. 2007; 48(1):88–94. https://doi.org/10.1016/j.comppsych.2006.03.008 PMID: 17145287

39. Kay SR, Fiszbein A, Opler LA. The positive and negative syndrome scale (PANSS) for schizophrenia. Schizophr Bull. 1987; 13(2):261–76. https://doi.org/10.1093/scdbull/13.2.261 PMID: 3616518

40. Wallwork RS, Fortgang R, Hashimoto R, Weinberger DR, Dickinson D. Searching for a consensus five-factor model of the Positive and Negative Syndrome Scale for schizophrenia. Schizophr Res. 2012; 137(1–3):246–50. https://doi.org/10.1016/j.schres.2012.01.031 PMID: 22356801

41. Hellvin T, Sundet K, Vaskinn A, Ueland T, Andreassen OA, et al. Validation of the Norwegian version of the Social Functioning Scale (SFS) for schizophrenia and bipolar disorder. Scandinavian Journal of Psychology. 2010; 51(6):525–33. https://doi.org/10.1111/j.1467-9450.2010.00839.x PMID: 20642739

42. Iffland J, Lockhofen D, Gruppe H, Gallhofer B, Hanewald B. Validation of the German Version of the Social Functioning Scale (SFS) for Schizophrenia. PLoS One. 2015; 10(4):e0121807. https://doi.org/10.1371/journal.pone.0121807 PMID: 25837711

43. Birchwood M, Smith J, Cochrane R, Wetton S, Copes take S. The Social Functioning Scale the Development and Validation of a New Scale of Social Adjustment for use in Family Intervention Programmes with Schizophrenic Patients. British Journal of Psychiatry. 2018; 157(06):853–9.

44. Kean C. Silencing the Self: Schizophrenia as a Self-disturbance. Schizophr Bull. 2009; 35(6):1034–6. https://doi.org/10.1093/schbul/sbp043 PMID: 19478239

45. Skodlar B, Parnas J. Self-disorder and subjective dimensions of suicidality in schizophrenia. Compr Psychiatry. 2010; 51(4):363–6. https://doi.org/10.1016/j.comppsych.2009.11.004 PMID: 20579508

46. Parnas J. A Disappearing Heritage: The Clinical Core of Schizophrenia. Schizophr Bull. 2011; 37 (6):1121–30. https://doi.org/10.1093/schbul/sbr081 PMID: 21771902

47. Sass LA, Parnas J. Thought Disorder, Subjectivity, and the Self. Schizophrenia Bull. 2017; 43(3):497–502.

48. Stephensen H, Parnas J. What can self-disorders in schizophrenia tell us about the nature of subjectivity? A psychopathological investigation. Phenomenology and the Cognitive Sciences. 2018; 17(4):629–42.
Author/s: 
Svendsen, IH; Oie, MG; Moller, P; Nelson, B; Melle, I; Haug, E

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