



Research report

Selective optimization with compensation (SOC) competencies in depression

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ABSTRACT

Background: The metamodel of selective optimization with compensation (SOC) aims to integrate scientific knowledge about the nature of development and aging with a focus on successful adaptation. For the first time the present study examines how SOC competencies and depressive symptoms are associated. In particular, potential state or trait effects of SOC competencies are considered.

Methods: Fifty-three patients (31 women and 22 men), aged 21 to 73 years, suffering from depression, were interviewed twice during inpatient treatment, first on admission to hospital and later during remission or on discharge, to assess the severity of depression and differences in the SOC competencies using standardized scales. For comparison purpose, data from a population based survey in Germany were used.

Results: The SOC scores in the first interview were significantly lower than those of the comparison collective ($p < 0.0001$), but in remission there was no significant difference left. Younger and older patients showed no significant difference in their SOC competencies, neither regarding the severity of depressive symptoms on admission to the hospital, nor during remission.

Conclusions: These findings support the hypothesis that the SOC ability is dynamic and mood dependent (state effect). Otherwise, there is no hint of life-long reduced SOC competencies or a trait effect which would be associated with an increased vulnerability to the development of a depressive disorder. Regarding the high prevalence of depression especially in the elderly and physically ill patients, (gerontological) studies on SOC competencies should take depression into account.

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1. Introduction

Depression is a serious medical condition affecting, in its severe forms, about 5–10% of the population of Western Europe. The Global Burden of Disease Study predicts that by 2020 major depressive disorder will represent the largest medical burden of all, even surpassing coronary heart disease (Murray and Lopez, 1997). Additionally, it is to be noted that

at least 50% of presently existing depressive conditions are either not identified in primary care or treated inadequately (Gilbody and Whitty, 2002; Lépine et al., 1997).

The metamodel of selective optimization with compensation (SOC) developed by Baltes and Baltes (1990) outlines the processes which older people go through in order to cope actively with the various changes associated with aging. It posits that there are three fundamental processes of successful individual life management (including aging). These encompass the selection of functional domains on which to focus one's resources, the optimization of developmental potential (maximization of gains), and the compensation for losses (minimization of losses) to ensure the maintenance of functioning (Freund and Baltes, 2002).

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Earlier studies have examined the effects of condition-related losses on the application of the SOC strategies, for example, in the case of loss of vision or chronic osteoarthritis (Gignac et al., 2000, 2002; Ryan et al., 2003). Recently, the model has been extended to social aging and the mastery of demands posed by social relationships. This is likely to have implications for the interrelation between social support and the development of depression, especially in old age (Rohr and Lang, 2009). In addition, proactive strategies to promote SOC processes have also been encouraged as part of an optimal psychotherapy in the case of post-stroke depression (Aspinwall and Taylor, 1997; Broomfield et al., 2010; Ouwehand et al., 2007).

Interestingly enough, no study has yet focused on the interaction between psychiatric illness, especially affective illness, and “SOCability”. In view of the prevalence of depression this knowledge gap should be closed. SOC could be considered as a trait variable which may increase or decrease the risk of depression and/or relapse (Zuroff et al., 1999). Inversely, depression will modify SOC competencies (state effect). This hypothesis is based on empirical results showing that bereavement, new medical illness or physical impairment – which clearly challenge a person’s adaptive potential – are risk factors for depression in old age (Cole and Dendukuri, 2003). However, the success of chronic disease self-management programs, which make use of models of problem-solving and cognitive behavioral strategies, indicate that coping strategies can be strengthened and the development of depression prevented. These strategies show preliminary evidence of efficacy in reducing depressive symptoms (Birks et al., 2004; Chodosh et al., 2005).

Our study represents a pilot project carried out in the inpatient department of a university psychiatric clinic. Patients were examined both just upon admission and during remission. Particular attention was given to differences between younger (≤ 49 years) and older (≥ 50 years) depressive patients and to differences between several types of depressive disorder according to ICD-10.

2. Methods

The study took place in the Department of Psychiatry and Psychotherapy at the University Medical Center, Georg August University in Göttingen, Germany. The clinic is not part of the regional obligatory care system. In addition, there is no separation according to old age. Most patients are referred by their psychiatrists or family physicians, including some by compulsory admission, but also some who simply come on their own (including emergencies).

Patients were recruited from 5 different wards (2 closed and 3 open) with 16 beds each. Only patients admitted mainly for the treatment of a depressive syndrome were considered in the study. The depressive ailments included: depressive episode (F32), adjustment disorders (F43.2), recurrent depressive disorder (F33), post-traumatic stress disorder (F43.1), bipolar affective disorder (F31), and mixed anxiety and depressive disorder (F41.2) (WHO, (World Health Organisation), 2007). Exclusion criteria eliminated from consideration: dependence syndromes (F1X.2), persistent delusional disorders (F22), schizophrenia (F20), advanced organic, including symptomatic, mental disorders (F0X), or a lack of proficiency in German.

The study was approved by the Ethics Committee of the Georg-August-University in Göttingen.

All eligible patients were approached individually. After giving their informed consent, they were interviewed twice during inpatient treatment: first, on admission to hospital with their particular depressive symptoms, and later, during remission or at discharge. On both occasions the Montgomery Asberg Depression Rating Scale (MADRS) and the Selection, Optimization, and Compensation Questionnaire were used as rating instruments (Baltes et al., 1999a; Montgomery and Asberg, 1979). The personal history of the depressive disorder, the number of days spent annually in illness, and the number of hospitalizations were recorded as well as personal data such as age, sex, marital and family status, employment history and the current housing situation.

The primary focus of our study was to investigate whether there is any connection between depressive disorders and lower SOC-scores. Therefore, it did not seem necessary to have our own control group. However, for orientation and comparison purposes, we did use data from the project “Altern und Lebenserfahrung” (ALLEE), a representative population-based study conducted by an interdisciplinary German working group that examined 480 German participants 20 to 90 years of age (Lang and Carstensen, 2002). In the following we will refer to these data as coming from the control group.

The SOC questionnaires from the first and second interviews were independently analyzed and the results compared both with each other and with the control group. Due to the variation in the number of questions omitted by the patients in the first and second interviews, we calculated absolute and relative SOC scores, which were kept separate from each other to make the results more comparable. The relative SOC scores were calculated by dividing the sum of target answers, which was associated with high SOC competencies, by the number of answers given and then multiplying the results by the total number of questions, in this particular case 12 per subscale or 48 for the whole questionnaire.

Based on the results of the MADRS, the patient collective was divided into two groups: one with those patients who had already shown response (defined as a decrease in score of more than 50%); and another group whose depressive symptoms had improved only slightly. To determine the influence of age, the group was also divided into a younger group (≤ 49 years) and an older group (age ≥ 50 years).

For the data analysis we applied SPSS 10.0. The SOC results of the patient and the control group were compared using a one-sample t-test. The first and second interview SOC results were compared using a two-sample t-test. A comparison between the two age groups (young versus old) was carried out with a two-sample t-test and the chi-square test. Differences were regarded as statistically significant at a level of $p \leq 0.05$.

3. Results

3.1. Patients

Fifty-three patients (31 women and 22 men) participated in the study. They were between 21 and 73 years old. The

average age was 46.8 ± 13.8 years. The younger age group (≤ 49 years) consisted of 27 patients with a mean age of 35.2 ± 8.8 years and the older age group (≥ 50 years) of 26 patients aged, on average, 58.3 ± 6.19 years. Only 50 patients took part in both interviews. Three patients withdrew for various reasons. Detailed data are given in Table 1.

The participants showed six different diagnoses: bipolar affective disorder (F31), depressive episode (F32), recurrent depressive disorder (F33), post-traumatic stress disorder (F43.1), adjustment disorders (F43.2), and mixed anxiety and depressive disorder (F41.2) (according to ICD-10; WHO, (World Health Organisation), 2007). The two biggest groups were recurrent depressive disorder and depressive episode, making up 41.5% and 34% of all patients, respectively.

The duration of hospitalization ranged from 12 to 331 days, with an average of 59.8 days. Apart from one pregnant woman, all patients were treated with drugs: 68% with lithium, 51% with antipsychotics, 36% with benzodiazepines, 32% with tricyclic antidepressants, 26% with Zolpidem or Zopiclon, and 19% with selective serotonin reuptake inhibitors (SSRIs).

Just after admission to hospital patients rated a mean score of 31.8 ± 8.34 (range 14 to 49) points on the MADRS scale. During inpatient treatment 39 out of 50 patients achieved response or remission. The mean MADRS score in the second interview was 11.1 ± 8.64 points. There was no significant difference in the degree of severity between younger (≤ 49 years) and older (≥ 50 years) patients, but the percentage of non-responders was significantly higher (34.6 versus 8.3%) in the younger age group.

The relative mean scores of the SOC questionnaire increased significantly ($p < 0.0001$) during inpatient treatment, both in total and for all 4 subscales: Elective Selection, Loss Based Selection, Optimization, and Compensation (Table 2). This clearly indicates dynamic, mood-state-dependent influences on SOC competencies. Relative mean scores were applied because some questions were omitted by patients unable to decide how to answer (= missing value). In each of the 4

Table 1

Severity of depression at the time of hospitalization and during remission. Responders were defined by a reduction of the MADRS-score by 50% or more.

	Patients ≤ 49 years	Patients ≥ 50 years
MADRS	MADRS-scores	MADRS-scores
1. Interview	30.0 ± 7.5 (n = 27)	33.8 ± 9.0 (n = 26)
2. Interview	12.4 ± 9.3 (n = 26)	9.8 ± 8.0 (n = 24)
Degree of severity at admission	Percentage [%]	Percentage [%]
Mild depression (12–20 points)	18.5 (n = 5)	7.7 (n = 2)
Moderate depression (20–25 points)	11.1 (n = 3)	11.5 (n = 3)
Severe depression (>25 points)	74.1 (n = 20)	77 (n = 20)
Responder	65.4 (n = 17)	91.7 (n = 22)
Non-responder	34.6 (n = 9)*	8.3 (n = 2)*

MADRS = Montgomery and Asberg Depression Rating Scale.

* The difference between younger and older patients was significant ($p = 0.035$).

Table 2

Relative SOC scores of the first and second interview.

	SOC	ES	LBS	O	C
Mean score					
1. Interview	19.9 ^a	4.7 ^a	5.2 ^a	4.6 ^a	5.3 ^a
2. Interview	30.7 ^a	6.9 ^a	8.3 ^a	7.4 ^a	8 ^a
Maximum					
1. Interview	36.8	12	12	9.8	10
2. Interview	48	12	12	12	12
Minimum					
1. Interview	3	0	0	0	0
2. Interview	6.9	2	1	1	1
Standard deviation					
1. Interview	7.9	2.6	2.7	2.7	2.6
2. Interview	9.5	2.6	2.9	3.1	2.8

SOC = Selection, Optimization, and Compensation, total score.

ES = Elective Selection.

LBS = Loss-Based Selection.

O = Optimization.

C = Compensation.

^a Significant difference in means ($p < 0.0001$).

subscales, 28 to 34 items in the first and 16 to 23 items in the second interview were left out by the participating patients. The SOC scores from the first interview were significantly lower than those of the control group ($p < 0.0001$), but in remission there was no significant difference between patient and control groups.

Viewed in the context of the depressive syndrome concerned, the two biggest groups, recurrent depressive disorder (22 patients) and depressive episode (18 patients), did not show any significant differences in the SOC scores resulting from the two interviews.

We had divided the patient group into two age groups. In both the first and second interviews there were no significant differences between the younger and the older age groups. In the younger age group, SOC and MADRS scores did not correlate significantly (Table 3). In the older age group, the overall SOC and MADRS scores correlated significantly only due to the highly negative correlation coefficient between MADRS and the optimization subscale.

Table 3

Correlation coefficients between MADRS and SOC in the first interview.

	Young patients (≤ 49 years)	Old patients (≥ 50 years)
SOC	0.018	-0.397 ^a
ES	0.157	-0.294
LBS	0.127	-0.116
O	-0.183	-0.446 ^b
C	-0.067	-0.327

MADRS = MontgomeryAsberg Depression Rating Scale.

SOC = Selection, Optimization, and Compensation, total score.

ES = Elective Selection.

LBS = Lost Based Selection.

O = Optimization.

C = Compensation.

^a Significant difference in means ($p = 0.045$).

^b Significant difference in means ($p = 0.022$).

4. Discussion

This study demonstrates the significant decrease of SOC competencies associated with the presence of depressive symptoms. On admission to hospital, patients had significantly lower SOC scores compared with scores from the second interview during remission or to the control group. At the end of hospitalization, the SOC scores of the patient group did not differ significantly from those of the control group.

These findings support the assumption that the ability to select, optimize, and compensate is a dynamic, mood-dependent factor (state effect). Beyond this, there is no evidence of life-long reduced SOC competencies which, according to the state-trait model, would be associated with an increased vulnerability for developing a depressive disorder. Therefore, a trait effect could not be demonstrated. However, it still remains to be clarified in further studies, if the re-completion of the SOC questionnaires itself can affect the answering behavior, for example, a decrease in omitted questions. In addition, one could argue that psychotherapy provided during inpatient treatment might have activated or strengthened the SOC competencies. This could also be a focus for future investigations.

In current research, potential trait effects or residual symptoms associated with depression, which can also affect SOC competencies, are being widely discussed. Scientifically proven reasons for reduced SOC competencies or increased vulnerability for depression are motivational deficits, a decreased ability to manage failures, and a loss of resources—which can affect sensorimotor functions, milieu, psychomotor speed or cognition (Austin et al., 1992; Baltes and Lang, 1997; Bazin et al., 1994; Channon and Green, 1999; Elliott and Green, 1992; Elliott et al., 1996; Landrø et al., 2001; Mialet et al., 1996; Ravnkilde et al., 2002; Stordal et al., 2004; White et al., 1997; Winokur et al., 1969). The causal relationships between the impairment of cognitive functions and depressive symptoms are largely unresolved. And it is unexamined, how SOC competencies could be affected (Baltes et al., 1999b). Thus, it is unclear whether the one causes (trait effect) or depends on (state effect) the other.

According to the vulnerability model, specific lifelong personality traits make patients more vulnerable to a depressive disorder (Bagby et al., 1995). High levels of neuroticism, low frustration tolerance and self-confidence, an increased emotional rigidity, and dysfunctional pattern of behavior (e.g. social retreat) seem to be strongly associated with the development of depressive symptoms and lower SOC competencies (Hecht et al., 1998; Ormel et al., 2004; Rohr and Lang, 2009; Zuroff et al., 1999). In this approach, residual symptomatology is considered to be rather a return to the pre-depressive personality with its specific traits.

Another opinion states that residual symptoms are only a more moderate form of the previous depressive episode when full remission could not be achieved (Paykel et al., 1995).

Finally, the scar hypothesis posits that depression itself can spark a lasting personality change which goes hand in hand with an increased probability of experiencing a further episode (Shea et al., 1996).

Due to progressive losses in different areas of life accompanying aging, the necessity to adapt and consequently

to enhance SOC competencies increases steadily. This process of life management is complicated, especially since the loss of resources is threatening SOC competencies (Baltes, 1993, 1997; Baltes and Carstensen, 1996; Rohr and Lang, 2009; Schaie, 1993). It could be shown, that SOC competencies are a precondition of successful aging.

In the Berlin Aging Study, for instance, Freund and Baltes (1998) found a significant negative correlation between age and SOC competencies for old and very old (72–102 years) patients, regardless of their health status. In another study, in which SOC strategies of young and old workers were compared, a decrease of SOC competencies with age could not be demonstrated (Abraham and Hansson, 1995). It even showed that old workers profited more from the application of SOC. Regarding the use of SOC strategies, an interesting result was effected by dividing the participating collective into a young (<43 years), medium (43–67 years), and an old (>67 years) group. SOC strategies were applied best by the medium group. They improved from the young to the medium group and got worse from the medium to the old group (Freund and Baltes, 2002). In this study, the SOC competencies of the two age groups did not differ significantly, but the differences in the age group classifications between our study and that of Freund and Baltes (2002) have to be considered.

There was a significantly higher percentage of non-responders (34.6–8.3%) in the young age group of this study. Recent research has found inconsistent results in regard to the prognosis of young and old patients. In an earlier study, findings also showed significantly more younger patients (25–14.3%) did not respond to treatment (unpublished except for abstract publication, Sehmer, 2002). Other studies seem to point to an influence of comorbidity and social circumstances rather than age per se on the outcome and prognosis of depressive disorders (Mitchell and Subramaniam, 2005).

Based on increasing restraints that are dependent on the degree of severity of depression, a correlation between SOC and MADRS scores was predicted and seemed likely at the outset of our study. However, apart from the optimization subscale in the old age group, SOC and MADRS scores did not correlate significantly. By examining the validity of the SOC questionnaire in older Chinese persons, Chou and Chi (2001) could demonstrate a significant negative correlation between depressive symptoms, measured with the CES-D-Scale (Center for Epidemiological Studies of Depression), and the ability for selective optimization with compensation. But due to a potential selection bias, these results were meaningful only in a limited way and could only be interpreted as a potential indicator.

5. Conclusion

The model of Selective Optimization with Compensation (SOC) is considered to be one of the leading psychological models of successful aging. While striving for personal goals, the SOC processes are aimed at maximizing gains and minimizing losses. SOC contributes not only to successful aging, but also to success in adjusting to difficult life situations and managing social relations.

In our study the participating depressed inpatients had significantly lower SOC scores on admission compared to their scores during remission or to the scores of the control collective. Although we had no comparative group of our own – clearly a limitation of the study – we could show that SOC scores improved during inpatient treatment and did not differ significantly from those of the (external) control group. And this was a population based study. According to the state-trait model a trait effect could be assumed. However, at least these first results indicate that generally restricted SOC competencies which are independent of the presence or absence of a depressive condition (trait effect) could not be demonstrated. At the same time, due to our mixed collective, we cannot exclude that some subtypes of depression might be connected with a reduced SOC competence. In addition one might argue that the SOC could play a role in the prevention of chronic depression. This should be another focus of further studies.

Regarding the high prevalence of depression especially in the elderly and physically ill patients, studies on SOC competencies should take depression into account. This holds especially true for gerontological studies in so called healthy collectives, since depression is not only frequent but also often unrecognized.

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There was no financial support (requested) except for the employment of the authors at the study centers. The study center had no influence on study design, data collection, analysis and interpretation of the data.

Conflict of interest

All authors disclose any actual or potential conflict of interest including any financial, personal or other relationships with other people or organizations within three years from the beginning the work submitted that could inappropriately influence, or be perceived to influence, their work.

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