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THE PROBLEM SOLVING SCALE IN A SAMPLE OF PATIENTS REFERRED FOR COGNITIVE THERAPY

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Abstract. The Problem Solving Scale (PSS) is a 15-item questionnaire measuring the problem solving component of self-control behaviours. It is derived from the 36-item Rosenbaum Self-Control Schedule. This paper presents some preliminary psychometric data on the PSS from a sample of 153 patients referred for cognitive therapy. The paper reports descriptive statistics, Cronbach's Alpha Correlations, correlations of the PSS with the Beck Depression Inventory and Beck Anxiety Inventory and results of a Principal Components Analysis. The PSS has good internal reliability and, like the Self-Control Schedule itself, seems to measure a dimension of coping that is independent of age, sex and diagnostic status. The PSS may prove a useful instrument both to measure change in problem solving in therapy and to predict outcome.

Keywords: Problem solving, cognitive therapy, depression, self-control, treatment outcome.

Introduction

The Problem Solving Scale (PSS; Center for Cognitive Therapy, 1988) is a 15-item self-report instrument that consists of the problem solving items from Rosenbaum's Self-Control Schedule. The Self-Control Schedule (SCS; Rosenbaum, 1980) is a 36-item self-report inventory designed to measure self-control behaviours. Rosenbaum considers

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individuals who endorse the coping behaviours described in the SCS to be high in "learned resourcefulness", a construct that is the opposite of learned helplessness (see Rosenbaum, 1990 for a review of studies that have used the SCS). Lack of learned resourcefulness is associated with a range of emotional and behavioural difficulties. For instance, learned resourcefulness predicts levels of alcohol consumption in college students (Carey, Carey, Carnrike, & Meisler, 1990), differentiates ex-smokers from current smokers (Katz & Singh, 1986), predicts successful maintenance of weight loss following a self-control programme (Kennet & Ackerman, 1995) and correlates with social loneliness in college students (McWhirter, 1997). Cognitive therapists have become interested in the SCS, since it might predict depressed patients who respond well to cognitive therapy. Simons, Lustman, Wetzel and Murphy (1985) found that high scorers showed a better response to cognitive therapy as measured by the Beck Depression Inventory, while low scorers responded better to a tricyclic antidepressant. Rehm, Kaslow and Rabin (1987) reported that subjects with initial high SCS scores improved the most over a course of self-control therapy for depression, and Burns, Rude, Simons, Bates and Thase (1994) found that high SCS scores predicted outcome of cognitive therapy for depression at 12 weeks. Other studies have failed to find this effect (Hoberman, Lewinsohn, & Tilson, 1988; Jarrett, Giles, Gullion, & Rush, 1991; Kavanagh & Wilson, 1989; Rude, 1986; Wetzel, Murphy, Carney, & Whitworth, 1992). The SCS covers four categories of self-control behaviours: (a) use of cognitions and self-statements to control emotional and physiological responses; (b) the application of problem solving strategies (e.g., planning, problem definition, evaluating alternatives, anticipation of consequences); (c) the ability to delay immediate gratification; and (d) perceived efficacy (Rosenbaum, 1980). Given the link that has been found between problem solving ability and depression (D'Zurilla, Chang, Nottingham, & Faccini, 1998) and the emphasis on teaching problem solving strategies in cognitive therapy, the problem solving items in the SCS might be responsible for the correlation between the SCS and response to cognitive therapy seen in some of these studies. It has been suggested that the problem solving subscale of the SCS might prove more robust than the full SCS in differentiating subjects who show a good outcome with cognitive therapy from those who show a good outcome with pharmacotherapy (Scott, Harrington, House, & Ferrier, 1996).

The Problem Solving Scale (PSS; Center for Cognitive Therapy, 1988) is specifically designed to measure the application of self-control methods to the solution of behavioural problems. As with the SCS, each item is scored from –3 (very uncharacteristic of me) to +3 (very characteristic of me). More positive scores are indicative of greater resourcefulness. While it has been recommended as a possible measure of problem solving relevant to depression (Williams, 1992), little psychometric data are available for the scale. Scott et al. (1996) administered the PSS together with the Sociotropy/Autonomy Scale (SAS; Beck, Epstein, & Harrison, 1983) and the Dysfunctional Attitudes Scale (DAS; Weissman, 1979) in 20 patients with Major Depressive Disorder and carried out follow-up interviews at 3 months and 6 months. Beck et al. (1983) suggested that two personality dimensions (sociotropy and autonomy) might be associated with different triggers, symptoms and clinical courses in depression: sociotropic individuals derive their self-esteem from others whereas autonomous individuals show greater self-investment and act to maximize control over their environment. Scott et al. (1996)

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found that greater self-control and problem solving abilities as measured by the PSS were correlated with higher levels of autonomy. The PSS also predicted both recovery status and symptom severity at 3 and 6 month follow-up. This provides evidence of construct validity for the PSS, since "autonomous" individuals would be expected to use more self-control strategies. The study also indicates that the PSS may be a good predictor of outcome in depression. PSS may therefore be of use to cognitive and behaviour therapists who wish to measure changes in personal problem solving abilities, and it may also have a use as an instrument to predict which patients would benefit most from this form of treatment. This paper reports some of the psychometric properties of this Problem Solving Scale in a sample of British psychiatric patients.

Method

Subjects

The sample of patients consisted of consecutive referrals to the City and Hackney Cognitive Therapy Service who attended for assessment and were seen by the first author (SM). Patients were referred by their general practitioners (37%), psychiatrists (47%), or other professionals (20%). One hundred and fifty-three patients were included in the study: 71 men and 82 women. The mean age of the sample was 36.9 years (*SD* 10.4). Seventy-nine (51.6%) patients were single, 30 (19.6%) married, 19 cohabiting (12.4%), 3 widowed (2%) and 22 (14.4%) divorced or separated. Forty-six (30%) patients were in social classes 1 and 2, 32 (21%) social class 3, and 12 (8%) classes 4 and 5. Forty-six (30%) were unemployed, 14 (9%) students, and 3 (2%) retired. Of the sample, 77% were white patients; the other 33% were Asian (2.0%), Black UK, African and Caribbean (3.9%) and other nationalities. Table 2 lists the Axis I and Axis II diagnoses for the sample.

Instruments

The Problem Solving Scale is a shortened version of the Self-Control Schedule (Rosenbaum, 1980). The scale (Table 1) contains items 1, 2, 7, 10, 11, 12, 20, 22, 26, 27, 28, 30, 32, 33, and 34 of the Self-Control Schedule.

The Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) is a widely used measure of the severity of depression. It is a 21-item self-report measure with good evidence of reliability and validity (Beck, Steer, & Garbin, 1988). The Beck Anxiety Inventory (BAI; Beck, Brown, Epstein, & Steer, 1988) is a more recently developed measure of symptoms of anxiety. It is a 21-item self-report measure with high internal consistency and concurrent validity.

Procedure

Patients were assessed for cognitive therapy by the first author. This consisted of a brief psychiatric interview and a problem-oriented assessment for cognitive therapy. The patient and assessor identified significant problems that were recorded in the assessment report. The assessment reports for all the patients were reviewed by SM

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Table 1. Problem-Solving Scale

Directions: Indicate how characteristic or descriptive each of the following statements is of you by using the code given below.

+3 very characteristic of me, extremely descriptive.
+2 rather characteristic of me, quite descriptive
+1 somewhat characteristic of me, slightly descriptive.
–1 somewhat uncharacteristic of me, slightly undescriptive
–2 rather uncharacteristic of me, quite undescriptive
–3 very uncharacteristic of me, extremely nondescriptive

PSS item	SCS item	Questions
1	1	When I do a boring job, I think about the less boring parts of the job and the reward that I will receive once I am finished.
2	2	When I have to do something that is anxiety arousing for me, I try to visualize how I will overcome my anxieties while doing it.
3	7	When I am faced with a difficult problem, I try to approach its solution in a systematic way.
4	10	When I find that I have difficulties in concentrating on my reading, I look for ways to increase my concentration.
5	11	When I plan to work, I remove all the things that are not relevant to my work.
6	12	When I try to get rid of a bad habit I first try to find out all the factors that maintain this habit.
7	20	When I find it difficult to settle down and do a certain job, I look for ways to help me settle down.
8	22	First of all I prefer to finish a job that I have to do and then start doing the things I really like.
9	26	When I feel that I am too impulsive, I tell myself "stop and think before you do anything".
10	27	Even when I am terribly angry at somebody, I consider my actions very carefully.
11	28	Facing the need to make a decision I usually find out all the possible alternatives instead of deciding quickly and spontaneously.
12	30	When I realise that I cannot help myself but be late for an important meeting, I tell myself to keep calm.
13	32	I usually plan my work when faced with a number of things to do.
14	33	When I am short of money, I decide to record all my expenses in order to plan more carefully for the future.
15	34	If I find it difficult to concentrate on a certain job, I divide the job into smaller segments.

and patients allocated to one of three diagnoses on the basis of the presenting symptoms. These three diagnostic groups (depression, anxiety and obsessive compulsive disorder) were chosen to give a reasonably comparable number of subjects in each category for the purposes of analysis. Following the assessment interview, patients were given a set of questionnaires as part of the intake evaluation. The questionnaires were taken away to be filled out at home and returned by post. Approximately 80% of patients completed and returned the questionnaires.

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Table 2. DSM IIIR diagnoses for sample

Axis I diagnosis		Axis II diagnosis	
No diagnosis	14 (9.2%)	No personality disorder	126 (82.4%)
Depression	44 (28.8%)	Personality disorder not otherwise specified	8 (5.2%)
Bipolar disorder	4 (2.6%)		
Agoraphobia	5 (3.3%)	Schizoid	3 (2.0%)
Social phobia	12 (7.8%)	Antisocial	1 (0.7%)
Panic disorder	9 (5.9%)	Borderline	4 (2.6%)
Generalized anxiety disorder	8 (5.2%)	Histrionic	1 (0.7%)
Obsessive compulsive disorder	12 (7.8%)	Narcissistic	2 (1.3%)
Adjustment disorder	2 (1.2%)	Avoidant	3 (2.0%)
Post traumatic stress disorder	4 (2.6%)	Dependent	1 (0.7%)
Other	39 (25.5%)	Obsessional	4 (2.6%)

Results

Descriptive statistics

The mean score for the problem solving scale was 4.89 (*SD* 15.95). Although the mean scores for women (6.68; *SD* 16.796) were higher than those for men (3.66; *SD* 14.795), the difference was not statistically significant.

The mean BDI score was 21.12 (*SD* 11.14), which is in the moderate range for depression. The mean BAI score was 17.47 (*SD* 10.73) which is in the mild-moderate range for anxiety.

Cronbach's Alpha

Cronbach's Alpha was 0.81. This compares favourably with Rosenbaum's results with five samples given the SCS, where the alpha coefficient ranged from 0.78 to 0.84, and represents a level of reliability considered satisfactory for experimental purposes (Nunnally, 1967).

Correlations of the PSS with other variables

PSS scores were not correlated with age. No relationship was found between PSS scores and marital status or education. The correlations between the PSS and the Beck Inventories were also non-significant (BDI = –0.13; BAI = –0.03). Using a median split the PSS scores for high and low scorers on the BDI (Mean PSS = 3.44 v 7.73t = –1.47p = .14) and the BAI (Mean PSS = 3.15 v 4.93t = –.59 p = .56) were compared. While the high scorers on both instruments had lower mean PSS scores, this difference was not statistically significant. Comparisons were made between the mean PSS scores of patients who had received CBT, dynamic and supportive psychotherapy in the past, and again no significant differences were seen. Finally, patients were divided into three groups on the basis of diagnosis. The mean PSS scores were as follows: depression 3.10 (*SD*14.90; n = 39), anxiety disorder 6.89 (*SD* 15.19; n = 28), and obsessive compulsive disorder 6.60 (*SD* 18.20; n = 10). There were no statistically significant differences between these diagnostic groups.

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Principal components analysis

A principal components analysis was carried out using the 15 items of the PSS. Four factors were extracted that explained 56% of the variance. Items 3, 5, 8, 13, 14 and 15 loaded on factor 1, items 4, 6, 10 and 11 on factor 2, items 2, 7, and 12 on factor 3, and 1, 2, and 9 on factor 4. Factor 1 seemed to relate to "task management", with items such as "When I plan my work, I remove all the things that are not relevant to my work" and "If I find it difficult to concentrate on a certain job, I divide the job into smaller segments." Factor 2 contained items that reflected consideration of the task or problem, such as "Even when I am terribly angry, I consider my actions very carefully", and "When I try to get rid of a bad habit, I first try to find out all the factors that maintain this habit." Factors 3 and 4 did not seem to contain any particular themes.

Two subscales were computed, using the items loading high on factors 1 and 2. There were no significant correlations between these subscales and age, sex, BDI, BAI, education or marital status.

Discussion

The PSS measures the problem solving component of learned resourcefulness. As such, the questionnaire is particularly relevant to clinicians using problem-focused interventions. The reduction of the scale from 36 to 15 items also makes the scale easier to use in the clinical setting. The shortened scale has good internal reliability and, like the SCS, seems to measure a dimension of coping that is independent of age, sex and diagnostic status. Although there were differences between the mean scores for some of these variables, they were not statistically significant, and the size of the standard deviations indicates a wide individual variation of PSS scores. The patients in this study constituted a very different sample from the Scott et al. (1996) study. Scott's patients all met criteria for major depressive disorder and were receiving antidepressant medication, whereas the patients in our study were all referred for psychological treatment. Nevertheless, the mean PSS scores for Scott's sample (+3.6, *SD* not reported, $n = 20$) was remarkably similar to the mean for the "depressed" patients in the present study (+3.10, *SD* 14.90, $n = 39$).

Some researchers have reported small but significant correlations between the SCS and the Beck Depression Inventory. Burns et al. (1994) found correlations of –0.24 ($p = .05$) between these variables in a depressed sample. This correlation did not hold for our own heterogeneous group of patients. When this group was subdivided according to diagnosis, no diagnostic group showed any correlations between the PSS and the BDI or BAI. The lack of association between the PSS scores and markers of psychopathology requires comment, since problem solving deficits have been implicated in both depression and suicidal behaviour (e.g. D'Zurilla et al., 1998, Orbach, Bar-Joseph, & Dror, 1990). Although there were only small correlations between mood and problem solving, there was a suggestion that when high and low scorers on the BDI and BAI were compared, there were differences in mean PSS scores. These did not reach statistical significance. It is possible that the large variance in the PSS scores prevented a real difference in problem solving ability becoming statistically significant. If this is the case,

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the variability in PSS scores reduces the usefulness of the instrument. Another possible explanation is that the form of problem solving measured by the PSS is not related to mood. D'Zurilla and Nezu's model (D'Zurilla & Nezu, 1982) defines problem solving as the cognitive-affective-behavioural process by which a person attempts to cope with problematic situations encountered in everyday life. This process consists of a general motivational component (problem orientation) and a set of four problem solving skills (problem definition and formulation, generation of alternative solutions, decision making and solution implementation and verification). The Social Problem-Solving Inventory (SPSI; D'Zurilla & Nezu, 1990) has two main subscales to measure these two components. Studies have shown that it is the Problem-Orientation Subscale that is associated with depression rather than the Problem-Solving Skills Subscale (Haaga, Fine, Roscow Terrill, Stewart, & Beck, 1995; D'Zurilla et al., 1998). A similar pattern is seen with generalized anxiety disorder (Ladouceur, Blais, Freeston, & Dugas, 1998). Since the PSS measures the self-control component of problem solving it is probably tapping into problem-solving skills rather than problem-orientation. As such, the lack of correlation with the BDI is understandable, and the PSS may prove to be a mood independent predictor of response to cognitive therapy. Comparisons of the PSS with the two PSSI subscales will help to clarify which aspect of problem solving it is measuring.

The PSS is an acceptable, brief instrument with good internal reliability. Given the inconsistent results when the 36-item SCS has been used to predict outcome with CBT, the PSS may prove a useful instrument in assessing the problem-solving component of learned resourcefulness. Further work is needed on the test-retest reliability and validity of this instrument.

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