British Journal of Psychiatry (1990), **157**, 853–859

The Social Functioning Scale

The Development and Validation of a New Scale of Social Adjustment for use in Family Intervention Programmes with Schizophrenic Patients

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Social functioning as an outcome variable in family interventions with schizophrenic patients has been a relatively neglected area. The requirements of a scale of social functioning to measure the efficacy of family interventions include: the measurement of skill/behaviour relevant to the impairments and the demography of this group; the ability to yield considerable information with an economy of clinical time; and the establishment of 'comparative' need through comparison between subscales and with appropriate reference groups. Results from three samples show that the Social Functioning Scale is reliable, valid, sensitive and responsive to change.

Within the last ten years, significant advances in the management of schizophrenia have come from studies of psychosocial intervention in the family environment in which the patient resides. These studies have largely focused on relapse as the major outcome variable; where social functioning has been measured, the results are equally favourable (Falloon *et al*, 1984).

This focus on relapse is surprising since impairment of social functioning is widespread in schizophrenia and may reflect a primary impairment as well as a secondary disability (Bellack *et al*, 1990). Deterioration in interpersonal relationships forms part of the defining characteristics of the syndrome and withdrawal and impairment in life-role functioning (social/recreation activity, independence/daily living skills, etc.) are listed as residual symptoms in DSM–III–R (American Psychiatric Association, 1987). The family interventions of Tarrier *et al* (1988) and Birchwood & Smith (1987) have directly targeted the raising of social functioning. These interventions require a comprehensive assessment of social functioning in which a direct comparison is made *between* its different components, and relative to established norms, in order to identify an individual's strengths and weaknesses.

The methods of assessing social adjustment have been reviewed by Weissman (1975, 1981). She indicates (1975, p. 1251) that many of the available scales have limitations for use with chronic disorders such as schizophrenia since this group may not be functioning in the roles that are assessed (e.g. current work, marital and parental roles). She advises that assessment of social functioning in a schizophrenic population should therefore assess more 'fundamental' characteristics, such as level of independence (competence and performance), social engagement/withdrawal, friendships/interpersonal functioning, and daily activities.

One particular limitation of available scales for family intervention is that they require a normative judgement by raters; for example, the Social Behaviour Schedule of Sturt & Wykes (1986) rates behaviour in terms of severity of problem. As Platt *et al* (1980) have pointed out, norms vary with characteristics such as age, sex, employment status, presence of disability, etc., and may lack external validity. In the case of schizophrenic patients who continue to live with their families, an unusual and difficult normative judgement about social adjustment will be required since this will refer to a 'disabled' group that will be largely unemployed, male and single. Furthermore, the judgements required in some scales refer to the presence of problems rather than strengths.

One further problem of many of the available scales for family interventions is the use of what can be a lengthy interview requiring trained raters (e.g. the SBAS; Platt *et al*, 1980). Those clinicians interested in implementing family interventions in a service will regard the investment of time required as excessive in the context of what is certain to be a treatment demanding of resources (Smith & Birchwood, 1990).

The ideal characteristics of a social adjustment scale for use with family interventions may therefore be summarised as follows:

(a) comprehensive and permitting comparisons between subscales
(b) sensitive to the likely level of impairment and relevant to the community tenure of this group
(c) independent of the normative judgement of 'independent' raters

(d) norms available for a population with a comparable age, sex and (un)employment structure
(e) able to yield considerable information with an economy of clinical time
(f) available in self-report or informant versions
(g) conforming to accepted criteria of reliability, validity and sensitivity.

The Social Functioning Scale (SFS) was constructed specifically to tap those areas of functioning that are crucial to the community maintenance of individuals with schizophrenia. In this respect, the content of the SFS was informed by the areas focused on in the successful psychosocial intervention programmes of Hogarty *et al* (1979), Paul & Lentz (1977), Stein & Test (1980), and the impairments and disabilities assessed by the Disability Assessment Schedule (World Health Organization, 1980). The seven areas selected are shown in Table IV and include:

(a) social engagement/withdrawal (time spent alone, initiation of conversations, social avoidance)
(b) interpersonal behaviour (number of friends/heterosexual contact, quality of communication)
(c) pro-social activities (engagement in a range of common social activities, e.g. sport)
(d) recreation (engagement in a range of common hobbies, interests, pastimes etc.)
(e) independence–competence (ability to perform skills necessary for independent living
(f) independence–performance (performance of skills necessary for independent living)
(g) employment/occupation (engagement in productive employment or structured programme of daily activity).

The SFS was designed with two requirements in mind. The first was to provide a detailed assessment of strengths and weaknesses, both to guide an intervention and to provide the clinician with some possible specific goals, subject to negotiation with the individual and relatives. Thus it was intended that the SFS would establish 'comparative' need (Bradshaw, 1972) based on comparison with reference groups as distinct from 'felt' or 'expressed' need (which requires negotiation/discussion with the individual) or action-based needs assessment (Brewin *et al*, 1987). The second requirement was the ability to synthesise such detailed coverage into coherent, reliable continua.

Assessing personal and social functioning is not straightforward. Some measures have assessed role functioning and require judgement about the extent to which an individual fulfils a social role (e.g. worker, parent). As indicated above, these assessments require a normative judgement, which may prove unreliable. The SFS uses a different approach by enumerating basic skills, social behaviour, etc. which informants record as present or absent, thereby avoiding 'evaluative' decisions. In this respect, the SFS has some similarities with the 'MRC Needs for Care Assessment' which was developed for the long-term mentally ill in residential settings (Brewin *et al*, 1987). The SFS also distinguishes lack of competence from lack of performance: lack of competence refers to the absence or loss of a skill; lack of performance refers to non-use or disuse of an available skill. This distinction was measured solely in relation to skills necessary for independent living, as it was felt that informants would have difficulty in achieving this distinction in other areas (e.g. social skills v. social performance). The SFS was developed by Birchwood (1983) and underwent extensive development through psychometric analysis before the final version was established.

The present study examined the reliability, validity, sensitivity and utility for family interventions of the SFS.

Method

Several distinct groups of subjects were recruited at different stages of this study.

A sample of 334 schizophrenic out-patients (Table I) all with a clinical diagnosis of schizophrenia and conforming to the broad CATEGO 'S' class including S+, S?, P+ and O (Wing *et al*, 1974) was a compendium taken from previous and ongoing research studies (Birchwood, 1983; Birchwood *et al*, 1989; Smith & Birchwood, 1987, 1990). Each of the samples of which this is a compendium were defined on the same clinical criteria, had been living (or were in daily contact) with their relative from the first or second episode, and were drawn from the same catchment area. All patients were in contact with the mental health services by virtue of their attendance at out-patient clinics, or referral to a community psychiatric nurse or the clinical psychology services. It should be noted that this sample was taken during a period of investigation into families' service needs (Smith & Birchwood, 1990), when the large majority of patients living with their families known to the service were approached. In the total sample 88% were taking oral or depot neuroleptics, and 24% were in productive paid employment. In keeping with other studies (e.g. Tarrier *et al*, 1988), the sample contained an excess of males. Two subgroups of this sample took part in reliability analyses: 30 sets of parents completed the SFS independently about their schizophrenic offspring; in a further 25 cases, relatives' data were compared with the SFS completed by 25 symptom-free patients.

A sample of 100 normal subjects were recruited via their relatives. Relatives were approached by interviewers in 'key sites' throughout the catchment area from which the patient sample was drawn (e.g. shopping and job centres), and requested to complete the SFS about an offspring or relative with whom they were in close contact. Interviewers were instructed to suggest a male relative or offspring in two out

TABLE I
Demographic characteristics of the samples

	Schizophrenic	*Community*	*Matched groups*	
			Schizophrenic	*Siblings*
Number	334	100	59	59
male	238	65	47	36*
female	96	35	12	23
Mean age (s.d.): years	30.8 (10.1)	30.5 (8.4)	29.6 (8.4)	30.5 (9.6)
Parental social class: %				
professional, clerical	39	38	68	68
skilled manual	33	39	20	20
semiskilled, unskilled manual	15	10	7	7
unemployed	13	13	5	5
Mean no. of previous admissions (s.d.)	3.2 (3.1)	-	3.7 (2.7)	-
Mean illness duration (s.d.): years	8.8 (7.4)	-	8.2 (8.2)	-

*$P<0.03$.

of every three interviews. The resulting sample had a similar sociodemographic distribution to the schizophrenics but somewhat more (60%) were employed.

In a further group, 59 relatives were requested to complete the SFS about their schizophrenic offspring. Thirty patients conformed to the above diagnostic criteria; a further 29 had a clinical diagnosis of schizophrenia and were recruited through the National Schizophrenic Fellowship. Each relative completed the SFS in respect of another, non-schizophrenic offspring, where possible of the same sex and similar age. Table I shows that the matched groups were of similar age but as the circumstances of sampling selected for males, the siblings had a greater proportion of females.

In order to study the relationship between SFS status and the presence of positive and negative symptoms, a subsample of 53 schizophrenics from the main sample (mean age: 24.2 years; mean illness duration 2.2 years) were administered the Present State Examination (PSE; Wing *et al*, 1974).

TABLE II
Reliabilities and intercorrelations of the SFS

	Full scale	*With-drawal*	*Inter-personal*	*Pro-social*	*Recreation*	*Independence-competence*	*Independence-performance*	*Employment occupation*
No. of constituent items	7	5	5	23	15	13	13	
Mean inter-item correlation	0.44	0.37	0.36	0.29	0.25	0.35	0.33	-
Mean item–total correlation	0.71	0.49	0.40	0.37	0.30	0.55	0.53	-
Reliability: alpha	0.80	0.72	0.71	0.82	0.69	0.87	0.85	-
Inter-rater reliability ($n=30$)	0.94	0.96	0.88	0.69	0.82	0.93	0.91	0.96
Rater self-report correlation ($n=25$)	0.78	0.62	0.69	0.63	0.65	0.69	0.70	0.99
Correlation with:								
Social engagement/ withdrawal	0.67							
Interpersonal	0.70	0.39						
Prosocial	0.75	0.47	0.63					
Recreation	0.71	0.29	0.43	0.52				
Independence–competence	0.63	0.42	0.27	0.23	0.39			
Independence–performance	0.80	0.48	0.41	0.45	0.58	0.61		
Employment	0.72	0.46	0.38	0.48	0.42	0.33	0.61	-

https://doi.org/10.1192/bjp.157.6.853 Published online by Cambridge University Press

Results

Reliability

The main results of the reliability analyses are shown in Table II.

Four aspects of reliability were studied. The coefficient alpha (Guttman, 1945) is based on a single administration of the test and rules out the possibility that any real changes in social functioning appear as low reliability, as might occur with the test–retest method. The alpha coefficients in Table II are uniformly high (a reliability coefficient when multiplied by 100 expresses directly the percentage of test score variance attributable to 'true' variance in the characteristic being measured). Inter-rater and rater self-report reliabilities confirm this impression and suggest that the SFS is measuring characteristics about which both the individual and relatives concur. No difference in SFS scores between rater and self-report was observed. Finally, since the SFS scales are obtained through summation of constituent items, it is desirable that part of the variance in response to individual items should be determined by the characteristic measured by the total scale (Cochrane, 1980). Item–total correlations for the scales show there is a high level of internal consistency in the SFS scales. The pro-social and recreation scales are somewhat weaker in this respect as might be anticipated, as these are not 'traits' in the usual sense but a compendium of activities.

Validity

Two methods of establishing validity were used: construct validity and the criterion group method.

With regard to construct validity, the question posed was whether the SFS scales were connected via a common factor or construct ('social adjustment'). Accordingly, a factor analysis was performed using the alpha method of factoring (Harman, 1967). This method was chosen as the variables were considered a sample from the universe of variables which might conceivably relate to the concept 'social adjustment'. After iterations, one single factor was extracted with an eigenvalue of 3.96, accounting for 57% of the variance. The factor loadings (Table III) represent the actual correlation between each item and factor scores; these are both uniform and high. Since this was undertaken with the schizophrenic ($n=334$) and normals ($n=100$) combined, and since it is possible that these two groups are at least quantitatively different in social functioning, this factor structure might be distorted. Two further factor analyses were undertaken within these two groups (Table III). These revealed a similar although marginally weaker factor structure. Interestingly, within the community group, there was no loading on independence (competence) as there was little variation on this scale for this group. This result, together with the high intercorrelation between the SFS scales, suggests that it is appropriate to obtain a mean score of the SFS scales ('full scale' in Table I).

As the scales have differing means and variances, each scale was standardised and normalised using a *'T'* transformation to a mean of 100, standard deviation of 15, using the unemployed schizophrenic group as the reference population (see below). The reliabilities for the 'full scale' (constructed after the transformation) are shown in Table II. The construction of the 'full scale' after transformation in effect assigns the subscales equal importance. Although there was no reason *a priori* to assume that they were not of equal importance, the substantial intercorrelation between subscales, the high average (corrected) subscale–full-scale correlation, and the extraction of a single strong factor loading uniformly across subscales all suggest that they are. There may of course be compelling *clinical* reasons to 'weight' certain subscales in the light of individual circumstances; in this sense the SFS requires careful interpretation, in keeping with other scales.

TABLE III
Factor analysis of the SFS scales

	Factor loading		
	All subjects (n = 434)	*Schizophrenic (n = 334)*	*Community (n = 100)*
Social engagement/ withdrawal	0.76	0.63	0.80
Interpersonal	0.76	0.65	0.62
Independence–competence	0.69	0.62	0.04
Independence–performance	0.78	0.75	0.62
Recreation	0.76	0.60	0.71
Pro-social	0.79	0.65	0.71
Employment	0.72	0.60	0.63
Eigenvalue	3.90	3.48	3.33
% variance	57	49	41

The criterion groups were as follows. The schizophrenic group was contrasted with the community sample as it was anticipated that the schizophrenics should have lower scores in view of their well documented social impairments (World Health Organization, 1980). As these groups showed different frequencies of unemployment, employment/unemployment was extracted as a factor in a group × employment factorial ANOVA. The results (Table IV) revealed that these criterion groups are distinguished to a highly significant degree across all SFS scales.

Of particular interest was that the interaction of schizophrenia and unemployment is not a pernicious one in terms of social functioning (Table IV column 3). The significant interaction on the recreation variable was due to an elevation in recreation scores among the employed normals ($P<0.01$). The significant interaction on the employment scale arises because unemployed normals were rated as being in more active pursuit of work compared with unemployed schizophrenics ($P<0.05$).

The contrast between schizophrenics and their siblings provides a further validity check (but keeps 'rater' and 'environment' constant). Table IV shows that the groups are discriminated on all SFS scales to a highly significant degree.

Descriptive statistics for the criterion groups on the full-scale SFS (Table V) show the high degree of discrimination achieved.

https://doi.org/10.1192/bjp.157.6.853 Published online by Cambridge University Press

TABLE IV
ANOVAS for the main groups on the eight SFS scales

	Schizophrenic v. normal (d.f. 1,406)	*Employed v. unemployed (d.f. 1,406)*	*Interaction: schizophrenic × employment (d.f. 1,406)*	*Schizophrenic v. sibling (d.f. 1,117)*
	F	*F*	*F*	*F*
Social engagement/withdrawal	37.5*	58.8*	<1	96.0*
Interpersonal	52.5*	27.3*	<1	81.4*
Pro-social	98.8*	37.9*	2.0	64.3*
Recreation	60.5*	48.2*	11.5*	84.3*
Independence-competence	54.6*	6.6***	2.9****	68.5*
Independence-performance	31.3*	18.5*	<1	78.7*
Employment	<1	118.4*	5.0**	86.8*
Full scale	95.6*	100.6*	<1	119.3*

*$P<0.001$, **$P<0.025$, ***$P<0.05$, ****$P<0.1$.

TABLE V
Means, s.d.'s and confidence intervals of the main contrast groups on the mean SFS

	Schizophrenic		*Non-schizophrenic*		*Matched groups*	
	Employed	*Unemployed*	*Employed*	*Unemployed*	*Schizophrenic*	*Siblings*
No. of subjects	80	254	60	40	59	59
Mean full-scale SFS score	111.3	100.0	124.6	112.2	102.2	123.8
s.d.	9.1	10.0	5.0	7.6	12.5	6.6
95% CI	109–114	98–102	123–126	110–115	99–106	122–126

The relationship between social functioning and positive/negative symptoms was studied in the subsample of 53 patients referred to above. Patients were assigned to a 'non-negative' group if they scored '0' on 'blunted affect', 'loss of interest' and 'withdrawal'. Subjects scoring 1 or more on one or more of these items were assigned to a 'negative' group. The point-biserial correlation coefficient between presence/absence of negative symptoms and full-scale SFS was $r=0.44$ ($P<0.01$). A 'positive' and 'non-positive' group was similarly identified based on the presence of hallucinations, delusions and disorders of thinking (thought insertion, echo, etc.). The point-biserial correlation with mean SFS was $r=-0.46$ ($P<0.01$). The multiple correlation of positive *and* negative symptoms with SFS was $R=0.55$.

Sensitivity

Sensitivity refers in part to the extent to which a scale can respond to differences in the characteristic being measured. This is an important feature of the SFS since it is designed to be used as a continuous measure (as opposed to a way of identifying 'cases'). One indirect method of assessing sensitivity is via the distribution and range of scores on the SFS. Table VI shows the distribution of scores for the community sample and the schizophrenic main sample. This shows a considerable range for the schizophrenic group; the community group showed a distribution around a higher mean with a moderate positive skew (both groups passed the Kolmogorov-Smirnov 'goodness-of-fit' test for a normal distribution). It is of interest to note that scores in excess of 115 are occupied by 74% of the community sample in contrast to 14.4% of the schizophrenics.

Sensitivity to change cannot be inferred from sensitivity to individual differences however. Evidence for sensitivity to change comes from a study of expressed emotion (EE) and family intervention, by Barrowclough & Tarrier (1990). They report significant elevations in SFS scores in their high-EE intervention group and low-EE control group but not the high-EE control group. These changes were in line with changes in relapse. They also report that the 64 patients from the high-EE group had significantly lower scores on

TABLE VI
Frequency (%) of scores on the mean SFS scale for schizophrenics and non-schizophrenics

SFS score	*Schizophrenics (n = 334)*	*Community (n = 100)*
55– 65	0.3	0
66– 75	0.3	0
76– 85	5.0	0
86– 95	21	1
96–105	30	6
106–115	29	19
116–125	13	42
126–135	1.4	32

https://doi.org/10.1192/bjp.157.6.853 Published online by Cambridge University Press

the SFS than the 19 in the low-EE group on the two independence scales, the recreation scale, and the full-scale score. Similar differences have been reported elsewhere (Brown *et al*, 1972).

Discussion

The study has provided strong support for the reliability and validity of the SFS. In terms of reliability, the SFS itself gives rise to minimal measurement error as shown by the high internal reliabilities (coefficient alpha) and that both informants and patients concur in their observations. Regarding validity, the criterion groups were strongly differentiated and SFS scores correlated with the presence of both negative ($r = -0.44$) and positive ($r = -0.46$) symptoms. It is generally accepted that negative symptoms contribute to deficits in social functioning (e.g. Wing & Brown, 1990; Bellack *et al*, 1990); however, the correlation with positive symptoms was considered unusual. Data from two well known follow-up studies seem in fact to confirm this finding. Strauss & Carpenter (1977) in their five-year follow-up of schizophrenics in the International Pilot Study of Schizophrenia (World Health Organization, 1979) report a significant correlation between positive symptoms and quantity and quality of social contacts ($r = 0.62$) and employment ($r = 0.47$). Shepherd *et al* (1989) report that the presence of first-rank symptoms after five years was strongly associated with depressed social outcome using a χ^2 analysis ($P < 0.001$).

These results then show that the SFS fulfil essential psychometric criteria (Weissman, 1981). These data notwithstanding, what assurance is there that the SFS is measuring the human characteristics it purports to?

First, each scale has overwhelming face validity: the recreation scale inquiries about common recreations; the independence scale inquiries about the ability/opportunity to perform daily living skills; the social engagement/withdrawal scale inquiries about social avoidance, and so on. The scales themselves are detailed and sample widely within each characteristic. Second, the high internal coherence of these scales (item–total correlations) suggests that the scale totals reliably summarise the concepts contained in each. Third, the factor analysis yielded a single, powerful factor accounting for nearly 60% of the variance. This factor loaded uniformly and strongly across the constituent scales. It is concluded, therefore, that this factor corresponds to a generalised construct best described as 'psychosocial functioning'. The overall full-scale score, which gives equal weight to constituent scales, has a close correspondence with this statistical factor, thereby adding weight to its validity.

The SFS is intended to measure a continuous characteristic; it is clearly able to discriminate criterion groups but its ability to discriminate lesser differences is crucial. In other words, are two individuals with different SFS scores of differing social adjustment? The wide range of (normally distributed) scores and the observation that individuals and informants are clearly making reliable and fine discriminations in their social behaviour (about which they concur) would indicate that different SFS scores are associated with perceived differences in social behaviour and skill.

The SFS has certain advantages for the clinical setting in that it requires little professional time, it is acceptable to patients and their families, and it yields a great deal of information about an individual's abilities and activities which can be summarised and interpreted through the derivation of the scales. Comparisons may be made between the scales and relative to the norms of a comparable community group, to identify strengths and weaknesses. The SFS has been employed in this way by the authors in their family intervention study (Birchwood & Smith, 1987) and also by Barrowclough & Tarrier (1990). As indicated above, Barrowclough & Tarrier (1990) found that the SFS was responsive to change (in line with improvements in relapse) and discriminated the EE groups.

It is concluded that the SFS is a reliable, valid and sensitive measure of social functioning relevant to the impairments and needs of individuals with schizophrenia and of use to researchers and clinicians concerned with this variable in family (or indeed other psychosocial) interventions.

Acknowledgements

We wish to acknowledge the help and support provided by the management and members of the National Schizophrenia Fellowship and the sufferers and relatives who took part in the family intervention programmes at All Saints' Hospital. We thank Dr Fiona MacMillan for reviewing a draft of this paper, Christine Barrowclough and Dr Nick Tarrier for supplying data on the SFS from their family intervention, and Jacqueline Tame and Beverley Silvera for their assistance in the preparation of the manuscript. The research reported in this paper was supported in part by a grant from the Mental Health Foundation.

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