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Development and validation of a social functioning scale, the Social Adaptation Self-evaluation Scale

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Abstract

The Social Adaptation Self-evaluation Scale (SASS) is a 21-item newly developed scale for the evaluation of patient social motivation and behaviour in depression. The scale was submitted to a validation procedure based on the data from a general population survey in 4000 individuals and from two controlled studies comparing the new selective noradrenaline reuptake inhibitor (NARI), reboxetine, with placebo and/or fluoxetine in 549 patients with major depression. The scale was shown to be valid, reliable and sensitive to change. The results of the multivariate analyses allowed the identification of three principal factors and five clusters. In view of its simplicity of use, and of its peculiar characteristic of investigating patient perspective on self and environment perception and on social motivation and behaviour, the scale represents a useful additional tool for the evaluation of social functioning in depression and will facilitate the development of new antidepressants with differential effects in this domain in depressed patients. © 1997 Elsevier Science B.V.

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1. Introduction

Historically, the development of social functioning scales was the result of the perceived need for extending the assessment of psychiatric patients from the specific clinical syndromes to the accompanying features in terms of community adjustment, and of the inadequacy of symptom scales to detect differences in outcomes between different treatment modalities (Weissman et al., 1974; Katz and Itil, 1974). Actually, the objective of these self- or hetero-evaluation scales was to pick up possible subtle differences between treatments on the dimension of social adaptation, that were not discernible in a global clinical or psychiatric assessment.

Several self- or hetero-social adjustment evaluation scales are available (Weissman et al., 1974, 1981; Weissman, 1975; Weissman and Bothwell, 1976; Keller et al., 1987). However, these scales are generally complex and time consuming, and their conceptual background is often unspecified (Weissman et al., 1981). Confronted with the need to identify adequate methodology in the context of the clinical development of a new antidepressant, reboxetine, it was therefore decided to develop an 'ad hoc' scale, aimed at meeting two requirements: simplicity of use and definite targeting at the measurement of social behaviour.

Few concepts provided the theoretical frame of reference for the development of the scale. According to behavioural models of depression (Libet and Lewinsohn, 1973; Coyne, 1976; Rehm, 1977; Lewinsohn et al., 1979; Seligman, 1981) depression is deemed to stem from limited access to actions leading to a boost (reward), perhaps because the individual is incapable of taking actions that would reap rewards, internal or external, and therefore sustain self-esteem. Depression would, therefore, be initiated by loss of boost or through experiencing punishment (negative boost). Persons with a limited behavioural repertoire would be at risk of depression when a particular type of behaviour is not followed by boost. Passivity would be prejudicial to the depressed person to the extent to which the opportunity to receive agreeable stimuli from the environment would be missed. As a consequence, the depressed person would engage in relationships with others less often, would fail to take the opportunity to encourage a favourable attitude from others,

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or would reduce the number of his interlocutors precisely when he is most dependent on social support.

The patient perspective on the disordered social functioning was considered more relevant than any other, and the self-evaluation method was chosen. As a consequence, the terms motivation and behaviour were preferred to adjustment, exactly because the subjective view had been preferred to an objective view of patient social functioning. In fact it is also true that while the main risk with the self-evaluation method is misrepresentation of the impairment by the patients, the main risk with hetero-evaluation is the bias introduced by the evaluator.

Finally, it was considered that a good tool for assessing social behaviour must not be influenced by the role, but by performance in the role, irrespective of life-related variables, such as age and social status, which evolve during life and entail a progressive change in individual aspirations.

On this basis, a social motivation and behaviour scale, the Social Adaptation Self-evaluation Scale (SASS) was developed, including 21 items, which explore the areas of work and leisure, family and extra-family relationships, intellectual interests, satisfaction in roles and patient self perception of his ability to manage and control his environment. The scale was validated in a survey, involving a representative sample of the universe, and in depressed patients participating in the clinical development of the new selective noradrenergic antidepressant reboxetine. Results of the validation process are reported and discussed in the present paper.

2. Experimental procedures

2.1. The SASS instrument

The SASS questionnaire includes 21 questions, exploring patient motivation and behaviour as for:

1. Job interest
2. Home work interest
3. Work enjoyment
4. Interest in hobbies
5. Quality of spare time
6. Family seeking behaviour
7. Family relationship quality
8. Gregariousness
9. Relationship seeking behaviour
10. External relationship quality
11. External relationship appreciation
12. Social attractiveness
13. Social compliance
14. Community involvement
15. Social inquisitiveness
16. Intellectual interest
17. Communication difficulties
18. Rejection sensitivity
19. Vainess
20. Difficulties in coping with resources
21. Control of surroundings

Each answer is scored from 0 to 3, corresponding to minimal and maximal social adjustment, with a total score range of 0 to 60. The SASS questionnaire is shown in Table 1. Questions 1 and 2 were preceded by a specification on the existence of an occupation; these questions were considered mutually exclusive, but pooled into a single answer/item (Q1/2, work interest) in the analysis.

2.2. Survey data

The survey on a representative national sample (France) of the general population was carried out by SOFRES. It involved 4000 individuals, 15 years and over, who received a SASS self-evaluation questionnaire by post.

In total, 3363 people (84%) returned the questionnaire. The same questionnaire was re-released some days later to 2000 people of the original sample of whom 1542 replied (77%) (103 of whom having replied to the second release only). The time elapsed between the response to the questionnaire when first released and the response to it after its re-release was, on average, 12.86 days (S.D. 5.29). Therefore, on the whole, 3363 subjects replied to the first release, and 3466 replied at least once. The total number of completed scales provided by the survey was 4905. The distribution by age class of the overall population (3363 observations) is described in Table 2. The average SASS total score of the survey population was 41.6 (S.D. 6.4). Seven socio–professional groups were analysed:

- salaried executives (executives);
- wage-earners other than executives (non-executives);
- self-employed workers (self-employed);
- students (students);
- unemployed persons (unemployed);
- retired persons (retired);
- other non-working people (other non-workers).

2.3. Patient data

Patient data were derived from two prospective, double-blind, randomised, parallel-group, multicentre, and multinational trials (unpublished), carried out to assess the efficacy and tolerability of the selective noradrenaline reuptake inhibitor (NARI), reboxetine, in comparison with placebo and fluoxetine, or only with fluoxetine, in major depression. Admission to the study was open to patients of either sex, of any race, of age 18–65, and with a diagnosis of Major Depressive Episode unaccompanied by psychotic features (DSM-III-R) (American Psychiatric Association,

Table 1
Social adaptation self-evaluation scale: clinical study questionnaire

Do you have an occupation? Yes No		
If yes		
1. How interested are you in your occupation?		Job interest
3 — very	2 — moderately	
1 — a little	0 — not at all	
If no		
2. How interested are you in your home-related activities?		Home work interest
3 — very	2 — moderately	
1 — a little	0 — not at all	
3. Do you pursue this occupation, these activities with:		Work enjoyment
3 — a lot of enjoyment?	2 — some enjoyment?	
1 — only a little enjoyment?	0 — no enjoyment at all?	
4. Are you interested in hobbies/leisure?		Interest in hobbies
3 — very	2 — moderately	
1 — a little	0 — not at all	
5. Is the quality of your spare time:		Quality of spare time
3 — very good?	2 — good?	
1 — fair?	0 — unsatisfactory?	
6. How frequently do you seek contacts with your family members (spouse, children, parents, etc.)?		Family seeking behaviour
3 — very frequently	2 — frequently	
1 — rarely	0 — never	
7. Is the state of relations in your family:		Family relationship quality
3 — very good?	2 — good?	
1 — fair?	0 — unsatisfactory?	
8. Outside of your family, do you have relationships with:		Gregariousness
3 — many people?	2 — some people?	
1 — only a few people?	0 — nobody?	
9. Do you try to form relationships with others:		Relationship seeking behaviour
3 — very actively?	2 — actively?	
1 — moderately activity?	0 — in no active way?	
10. How — in general — do you rate your relationships with other people?		External relationship quality
3 — very good	2 — good	
1 — fair	0 — unsatisfactory	
11. What value to you attach to your relationships with others?		External relationship appreciation
3 — great value	2 — some value	
1 — only a little value	0 — no value at all	
12. How often do people in your social circle seek contact with you?		Social attractiveness
3 — very often	2 — often	
1 — rarely	0 — never	
13. Do you observe the social rules, good manner, politeness, etc.?		Social compliance
3 — always	2 — most of the time	
1 — rarely	0 — never	
14. To what extent are you involved in community life (such as club, church, etc.)?		Community
3 — fully	2 — moderately	
1 — slightly	0 — not at all	
15. Do you like searching for information about things, situations and people to improve your understanding of them?		Social inquisitiveness
3 — very much	2— moderately	
1 — not much	0 — not at all	
16. Are you interested in scientific, technical or cultural information?		Intellectual interest
3 — very	2 — moderately	
1 — only slightly	0 — not at all	
17. How often do you find it difficult to express your opinions to people?		Communication difficulties
0 — always	1 — often	
2 — sometimes	3 — never	
18. How often do you feel rejected, excluded from your circle?		Rejection sensitivity
0 — always	1 — often	
2 — sometimes	3 — never	
19. How important do you consider your physical appearance?		Vainness
3 — very	2 — moderately	
1 — not very much	0 — not at all	
20. To what extent do you have difficulties in managing your resources and income?		Difficulties in coping with resources
0 — always	1 — often	
2 — sometimes	3 — never	
21. Do you feel able to organise your environment according to your wishes and needs?		Control of surroundings
3 — very much so	2 — moderately	
1 — not very	0 — not at all	

You are asked to answer some simple questions, stating what your opinion is at this moment. Please answer all questions and circle one answer for each question. Thank you.

Table 2
Percent distribution of the overall survey population by age class

Age group (years)	≤25	>25≤30	>30≤35	>35≤40	>40≤45	>45≤50	>50≤55	>55≤60
% of total population	1	3	11	26	30	21	7	1

1987) with the current episode ongoing for 1–4 months and with a total pre-treatment score on the 21-item Hamilton Depression Rating Scale (HAMD) (Hamilton, 1960)≥22.

In the first-mentioned study 381 patients were randomised to treatment with either reboxetine ($n=126$), fluoxetine ($n=127$) or placebo ($n=128$). In the second-mentioned study 168 patients were randomised to treatment with either reboxetine ($n=79$), or fluoxetine ($n=89$).

Following an initial wash-out period, the patients received reboxetine 8 mg/day, fluoxetine 20 mg/day or placebo for 8 weeks. At the end of the 4th week of treatment the dose could be increased to 10 mg/day of reboxetine or 40 mg/day of fluoxetine up to the end of the study. Efficacy was assessed weekly by the investigators using the HAMD scale, the Montgomery–Asberg depression rating scale (Montgomery and Asberg, 1979) and the Clinical Global Impression scale (Guy, 1976). Patient self-assessments included a patient global impression scale, a newly developed quality of sleep evaluation questionnaire, and the SASS. A patient's self-assessment booklet was prepared. Translations into local languages (English, French, Italian, Portuguese, and Polish) were used. Observer and patient self-assessment were performed at baseline and at weekly intervals. On the whole, 496 patients participating in the two clinical studies provided 2262 completed SASS forms.

2.4. Data analysis

2.4.1. Survey data

To evaluate the internal structure of the SASS scale, item intercorrelation was studied by means of the Pearson correlation matrix (Pearson, 1901). To evaluate face validity, summary statistics (mean, standard error of the mean, median and percentiles) in homogeneous sub-samples of the survey population were calculated. To evaluate external validity, the mean values of the SASS total score in the different socio–professional groups were compared by the Student t test, while differences between the socio–professional groups in the distribution of the individual item scores were evaluated by means of the χ^2-test (Snedecor, 1946). To evaluate test–retest reliability, the mean values of the SASS total score and individual item scores following the initial release and the re-release were compared by the Student t test (Snedecor, 1946).

Internal consistency reliability was evaluated by means of the Pearson correlation and the α correlation coefficient (Cronbach, 1951). Construct validity was discussed on the basis of the Shapiro and Wilk (1965) test of the null hypothesis that the input data values are a random sample from a normal distribution.

2.4.2. Patient data

In order to evaluate the sensitivity to change of the scale, summary statistics of the total score values at initial and final examinations in the sub-populations of patients with a total score ≥25 in the active treatments and placebo groups were calculated.

2.4.3. All data

For the evaluation of factor validity, a Principal Component Analysis (PCA) was performed (Rao, 1964). In this analysis, the specification about the existence of an occupation was used in the calculation procedure, to preserve the complete information from the scale, since the answer to questions 1 and 2 could be dependent upon the given specification.

In order to identify different SASS respondent classes, a Multiple Correspondence Analysis (MCA) (Benzécri, 1973) was performed on a Burt table (Burt, 1950), crossing all item scores. Finally, a hierarchical (Ward, 1963) cluster analysis (Sokal and Michener, 1958) was performed on the first component coordinate of all item modalities.

3. Results

3.1. Internal structure

The evaluation of item intercorrelations resulted in correlation coefficients ≥0.40 for the items listed in Table 3.

The results of the analysis showed limited correlation between items and suggested that the questionnaire items are not redundant but complementary. The highest correlation coefficient (0.55) is between two successive questions which are very close in meaning.

3.2. Principal component analysis

The results of the 7167 available completed scales (4905 from the survey and 2262 from the clinical study) were submitted to standardised PCA (Rao, 1964). Three main factors have been evaluated (see Fig. 1).

The first factor accounts for 32% of total variance, the second factor for 8%, and the third for 5%. There is a highly significant linear correlation between the SASS total score and the first is factor score. Accordingly, factor 1

Table 3
Item intercorrelation analysis: Items correlated with correlation coefficient values≥0.40

Correlated items		Correlation coefficient
Control of surroundings Q21	Work interest Q1/2	0.44
	Interest in hobbies Q4	0.41
	Quality of spare time Q5	0.44
	Family relationship quality Q7	0.40
	External relationship quality Q10	0.46
	Rejection sensitivity Q18	0.46
	Family relationship quality Q7	0.51
Rejection sensitivity Q18	External relationship quality Q10	0.48
	Social attractiveness Q12	0.46
	Social compliance Q13	0.45
	Communication difficulties Q17	0.48
	Control of surroundings Q21	0.46
	Work interest Q1/2	0.41
Quality of spare time Q5	Interest in hobbies Q4	0.52
	External relationship quality Q10	0.45
	Control of surroundings Q21	0.44
	Gregariousness Q8	0.54
Relationship seeking behavior Q9	Interest in hobbies Q4	0.40
External relationship qualitity Q10	Quality of spare time Q5	0.45
	Family relationship quality Q7	0.43
	External relationship appreciation Q11	0.44
	Social attractiveness Q12	0.50
	Rejection sensitivity Q18	0.48
	Control of surroundings Q21	0.46
	Interest in hobbies Q4	0.43
Intellectual interest Q16	Social inquisitiveness Q15	0.55
	Rejection sensitivity Q18	0.45
Social compliance Q13	Vainness Q19	0.45

encapsulates the essence of the SASS measurement of social behaviour. Every item on the scale has a positive coordinate with respect to the first factor and, equally, they are all incident on the total score value. Nevertheless, the coordinate value of each item with respect to the first factor, which is an indication of its incidence on the total score, is not the same for all items. In other words, a low value for item *x* in respect of factor 1 very often corresponds to a low total score (see Fig. 2).

The second factor is of lesser importance, accounting for just 8% of total variance. It sheds some interesting light, however, on the social functioning components. This axis brings a number of items related to self-image and self-control into opposition with items related to group activity and contacts: rejection sensitivity is opposed to relationship seeking behaviour, family relationship quality to gregariousness, family seeking behaviour to external relationship appreciation. This axis might be defined as 'harshness–tolerance' or 'self-centred–group centred behaviour'.

The third factor accounts for a little over 5% of total variance. It brings social inquisitiveness and intellectual interest into opposition with social attractiveness and gregariousness. This axis could be called 'social inquisitiveness–social interaction' or 'introvert–extrovert'.

The arrangement of the items in the space defined by these three axes reveals a number of groupings of items. In Fig. 3, showing all items on the map defined by axes 2 and 3, the thickness of the arrows depends on the respective item's coordinate on the first axis. The thicker the arrow, the greater the value of the coordinate on the first axis.

On the right of the graph there is a compact group of items between difficulties in coping with resources and communication difficulties which express individual aspects of social behaviour: the patient's feelings about himself, about his self-respect, and about his ability to manage his own life. Control of surroundings contains an individual component and an inquiry/learning component. It is positioned just between axes 2 and 3. Rejection sensitivity is very close to family relationship quality. This feeling seems to appear when family relationships are deteriorating. The position of the item family seeking behaviour is not far from these. These three items are just half-way between the individual aspect expressed by axis 2

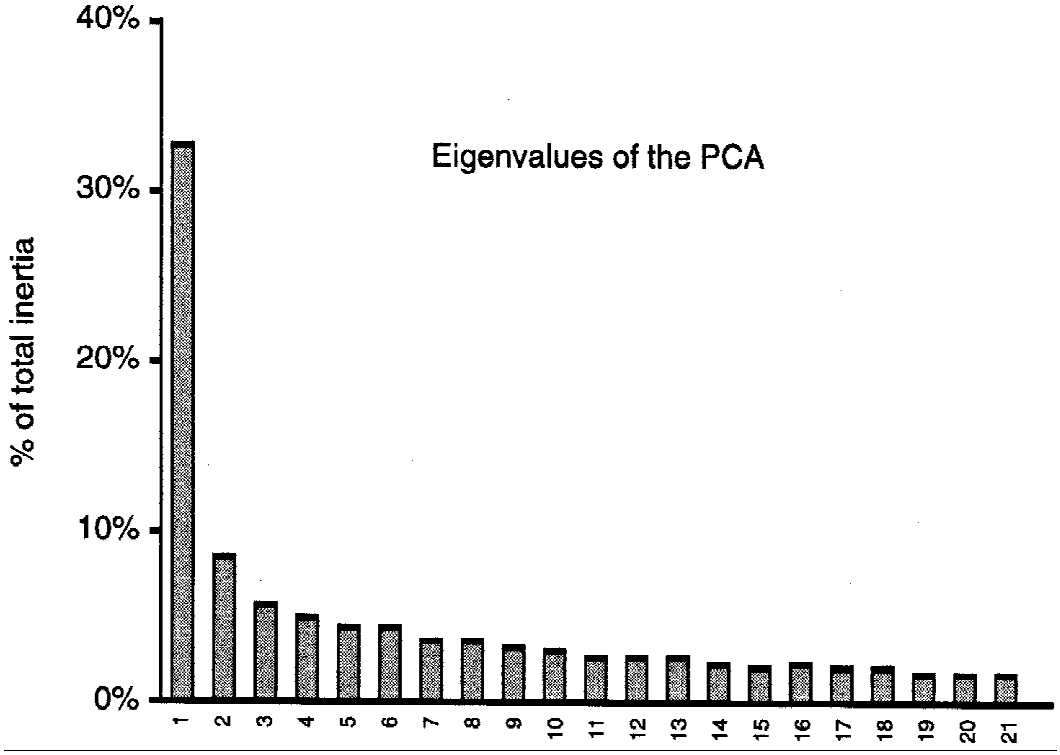


Fig. 1. Eigenvalues of factors from principal component analysis.

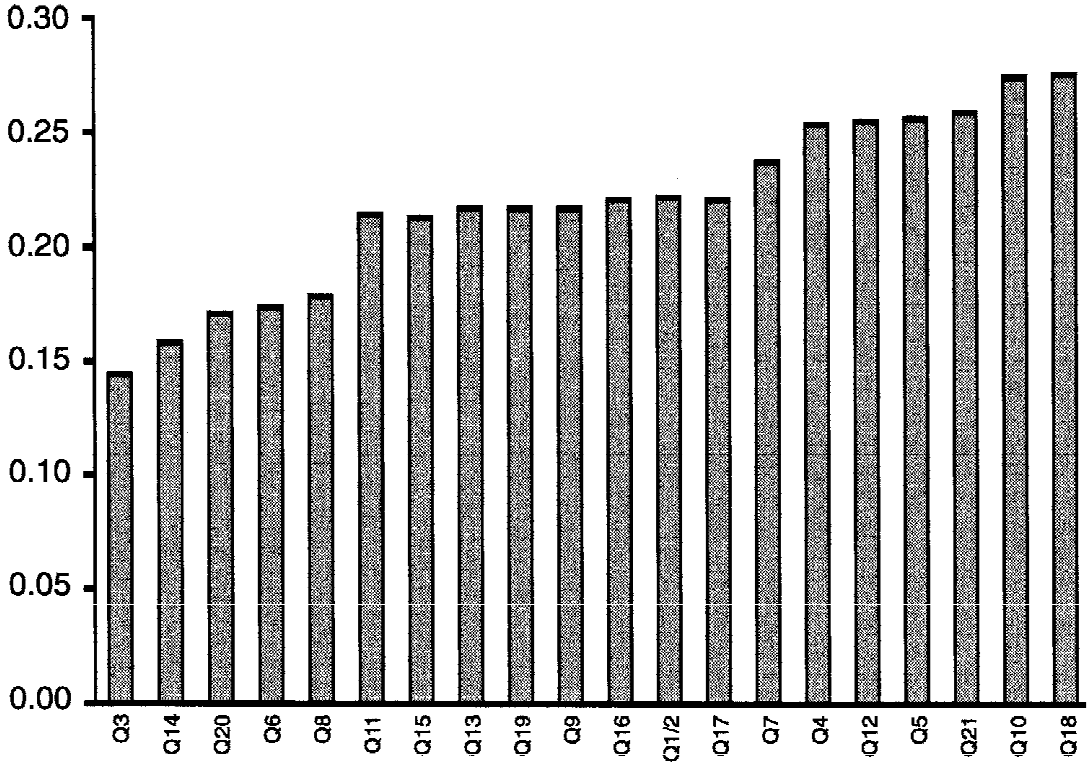
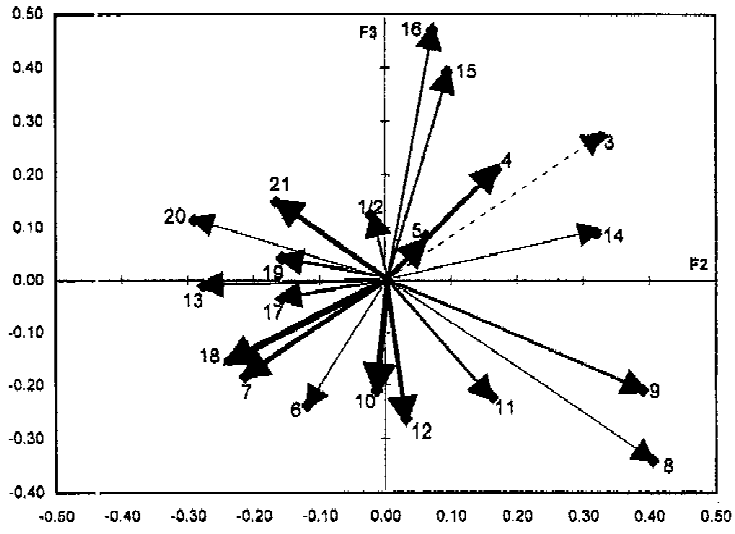


Fig. 2. SASS items ranked on the first factor coordinate value.



Item legenda:

Q1/2 Work interest
Q3 Work enjoyment
Q4 Interest in hobbies
Q5 Quality of spare time
Q6 Family seeking behaviour
Q7 Family relationship quality
Q8 Gregariouness
Q9 Relationship seeking behaviour
Q10 External relationship quality
Q11 External relationship appreciation
Q12 Social attractiveness
Q13 Social compliance
Q14 Community involvement
Q15 Social inquisitiveness
Q16 Intellectual interest
Q17 Communication difficulties
Q18 Rejection sensitivity
Q19 Vainness
Q20 Difficulties in coping with resources
Q21 Control of surroundings

Fig. 3. Factor map of the first three factors from the principal component analysis.

and extroversion expressed by axis 3. External relationships quality and social attractiveness express extroversion, i.e. the ability to establish exchange through extra-family relationships.

Items 8 (gregariousness), 9 (relationship seeking behaviour) and 11 (external relationship appreciation) reflect interest in extra-family contacts, and the item external relationship appreciation (item 12) incorporates the idea of exchange into these contacts. These items are brought into opposition with items expressing self-management and respect. Individuality is portrayed as the anti-thesis of the quest for social contacts. Work enjoyment, interest in hobbies and quality of spare time entail a learning component and a social component. Quality can be related to some kind of effectiveness in hobbies, home- or job-related activities. Accordingly, we may infer that the need for individual improvement in activities and the existence of social contacts promote quality of activity. This quality is brought into opposition with items 18 (rejection sensitivity) and 7 (family relationship quality). Accordingly, poor quality of family relationships and rejection sensitivity fit in with job- or home-related activities of poor quality.

Item 14 (community involvement) is clearly correlated with group activities and is brought into opposition with communication difficulties and social compliances. Items 15 and 16 define the social inquisitiveness/intellectual interest interaction side of axis 3. The item quality of spare time is important for the total social adaptation score but its projection on the 2–3 map is not significant. Similar is the case of interest in job- or home-related activities, which is less important for the total score.

Fig. 4 provides the value of the three factors in representative examples of unemployed people with poor or excellent total SASS score, and the average score in the total population. The three factors show different ability to discriminate between different levels of SASS total score. The first factor provides the same information as the total SASS score. Factor 2 cannot discriminate poor total scores from the average ones, but can discriminate excellent scores from the others. Factor 3 cannot discriminate between these three conditions. Note that unemployed people with maximal value of factor 2, i.e. who pursue many group activities, record a better total SASS score than the others.

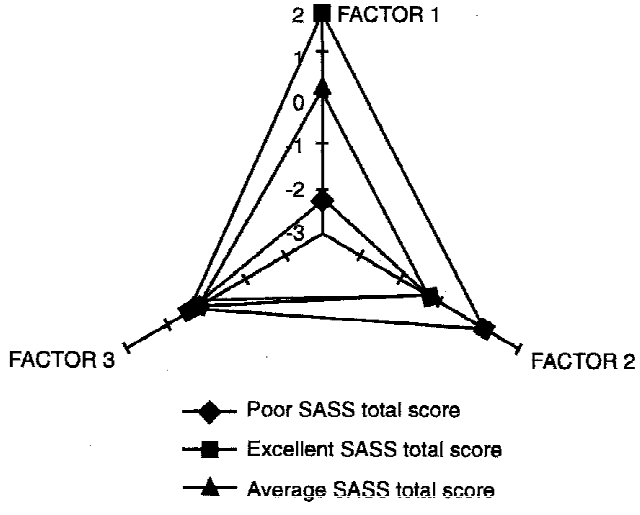


Fig. 4. Pattern of the three main SASS factors in representative examples of unemployed people with poor (18) or excellent (56) total SASS score, compared with the average score (40).

Table 4
Mean SASS total score and number of subjects in each socio–professional category

Socio–professional status	Executives	Retired	Other non-workers	Students	Non-executives	Self-employed	Unemployed
Mean score	43.9	42.1	41.6	41.5	41.5	40.9	39.7
n	183	894	362	306	1231	112	230

3.3. Face validity

In this validation step, the aim is to verify that all patients have the same understanding of the questionnaire. The analysis was carried out in four particular subgroups representative of the population sample. These groups must be fairly homogenous. If not, and there is notable variance in the total score, it is impossible to disentangle if this is due to the scale or to the membership of the group itself. The groups selected were as follows:

- Retired people living in small towns (2000–20 000 inhabitants; $n=171$). The distribution of the total SASS score is normal with a 5% error risk. Mean and median=42 and standard error is 0.4. Selected quantiles are: 10%=36; 25% (Q1)=38; 50%=42; 75% (Q3)=46; 90%=50. The range Q3–Q1 scores 8 points.
- Unemployed people who undertook short technical studies ($n=116$). The mean and median equal 41 and standard error is 0.6. Selected quantiles are: 10%=33; 25%=37; 50%=41; 75%=44.5; 90%=51. The range Q3–Q1 scores 7.5 points.
- Students living outside the capital city ($n=161$). The mean and median equal 46 and the standard error is 0.4. Selected quantiles are: 10%=39; 25%=41; 50%=46; 75%=49; 90%=53. The range Q3–Q1 scores 8 points.
- Artisans, tradespeople or businessmen in a country district ($n=51$). The population follows a normal distribution, with a 5% error risk level. The mean and median equal 45 and the standard error is 0.8. Selected quantiles are: 10%=37; 25%=42; 50%=46; 75%=49; 90%=52. The Q3–Q1 range scores 7 points.

In all four different subgroups the standard error of the mean is less than 1 point, so that the dispersion of scores is quite limited. Moreover, the 25th to 75th percentile range is between 7 and 8 points. It seems realistic to believe that on the basis of an average score and a degree of dispersion a specific population may be defined. External validation will verify that possibility.

3.4. External validity

The mean SASS total score in subjects of the different social categories replying to the first SASS release is shown in Table 4. The mean score varies between socio–professional groups. Significant differences were present between executives and each of the other groups as well as the unemployed group and each of the others (except for self-employed workers). Therefore the scale shows sensitivity to social categories.

Frequency distributions of item scores were significantly different between socio–professional groups (χ^2-test) for all items, except for interest in hobbies, social attractiveness, and communication difficulties.

The frequency distribution of all subjects from each socio–professional group replying to SASS release at least once is grouped by SASS total score class in Table 5. The 0–15 score level includes one person with a score of 13. This case was deleted because it contributes nothing of interest to the frequency analysis. Those people with a total score between 16 and 20 include over 42% of self-employed workers. Others with this score level are people in some of the non-working groups (retired persons, students).

No unemployed person records a score of over 55 or a

Table 5
Percent frequency distribution of socio–professional groups in each SASS total score class

% SASS	Executives	Non-executives	Students	Unemployed	Self-employed	Retired	Other non-workers	*n*
16~20	0.00	0.00	12.33	0.00	42.58	17.90	28.00	10
21~25	35.10	0.00	10.40	0.00	26.27	19.33	8.64	30
26~30	25.76	4.09	11.31	11.96	12.67	14.41	19.79	118
31~35	21.11	7.54	13.06	12.87	18.49	14.45	12.48	388
36~40	18.52	10.58	15.74	15.82	12.75	12.06	14.53	879
41~45	13.62	17.22	14.89	14.16	13.92	12.72	13.47	1022
46~50	3.27	19.07	13.79	16.85	13.26	17.90	15.86	720
51~55	13.73	19.62	12.39	9.57	15.20	17.84	11.66	228
56~60	0.00	30.61	10.68	0.00	15.81	16.92	25.99	25
n	189	1264	323	239	122	912	371	3420

score below 26; 31% of non-executives have a score over 55 and none has a score below 26. Other non-working people represent 28% of the poorest case (16–20) and 26% of the best case (56–60).

Among those with a high score, i.e. 56–60, there are no executives or unemployed people; 31% are non-executives and 26% are other non-working people. Others in this category include students (11%), retired people (17%) and self-employed workers (16%).

3.5. Internal validity

The linear correlation between the total SASS score and the same total less one item always exceeds 0.98, irrespective of which item is deleted. Cronbach α-coefficient (Cronbach, 1951) equals 0.74 when calculated on non-standardised initial data (Table 6). Therefore, the internal consistency reliability of SASS is good.

3.6. Test re-test reliability

The results are derived from the sample of 1439 individuals who replied to both first and second SASS release. The mean SASS total score for the first and second release was of 41.9 (S.D.±6.5) and 42.2 (S.D.±6.6), respectively, the difference being not significant ($P>0.05$). Similarly, no between-release differences of the mean SASS total score were apparent within each socio–professional group.

As for individual items, only three questions show evidence of variation between the first release of the questionnaire and its re-release with an α error level of 0.05, and the difference is very limited: quality of spare time, family seeking behaviour, quality of external relationships (data not given).

Table 6
Cronbach α coefficient for each of the individual items

Question No.	Item	α-coefficient
Q1/2	Work interest	0.74
Q3	Work enjoyment	0.73
Q4	Interest in hobbies	0.73
Q5	Quality of spare time	0.73
Q6	Family seeking behaviour	0.74
Q7	Quality of family relationships	0.73
Q8	Gregariousness	0.72
Q9	Relationship seeking behaviour	0.72
Q10	Quality of external relationships	0.73
Q11	Appreciation of relationships with others	0.73
Q12	Social attractiveness	0.73
Q13	Social compliance	0.74
Q14	Community involvement	0.73
Q15	Social inquisitiveness	0.73
Q16	Intellectual interest	0.73
Q17	Communication difficulties	0.74
Q18	Rejection sensitivity	0.73
Q19	Vainness	0.74
Q20	Difficulty in coping with resources	0.74
Q21	Control of surroundings	0.73

Table 7
Summary statistics of SASS total score at initial and final assessments in the fluoxetine-treated patients

Assessment	Mean	S.D.	10%	25%	50%	75%	90%	*n*
Initial	29.65	8.73	19	23	29	36	41	121
Final	37.56	8.22	27	32	38	43	49	107

3.7. Sensitivity to change

The sensitivity to change of SASS was evaluated in the sub-population of patients with a total score ≥25, in order to minimise the impact of depressive illness on the results. For each patient, data from day 0 or 7 assessment were used as initial evaluation, while data from the last available assessment, between the end of weeks 6–8, were used as final evaluation.

In the fluoxetine-treated patients (Table 7), an improvement of the mean and quantile score of approximately 8 points was seen, with stable S.D.: a global shift of the population towards improvement was apparent.

In the reboxetine-treated patients (Table 8), an improvement of the mean score of approximately 9 points was seen, with a marginal increase of the S.D.. The improvement seems to be greater for the 50th and 75th percentiles, while, for the remaining percentiles, the extent of improvement is similar to that found in the fluoxetine group.

As for the placebo group (Table 9), summary statistics at initial evaluation are very similar to the corresponding values in the active-treatment groups. At final evaluation the improvement is limited: the mean improvement is of approximately 5 points, with the 75th percentile of 40 corresponding to the 50th percentile in the reboxetine group.

Therefore, it can be concluded that the SASS total score

Table 8
Summary statistics of SASS total score at initial and final assessments in the reboxetine-treated patients

Assessment	Mean	S.D.	10%	25%	50%	75%	90%	*n*
Initial	29.61	8.89	19	22	29	36	41	113
Final	38.96	9.65	26	32	40	46	50	103

Table 9
Summary statistics of SASS total score at initial and final assessments in the placebo-treated patients

Assessment	Mean	S.D.	10%	25%	50%	75%	90%	*n*
Initial	27.33	8.34	19	21	26	33	40	68
Final	32.6	9.28	21	25	32.5	40	44.5	50

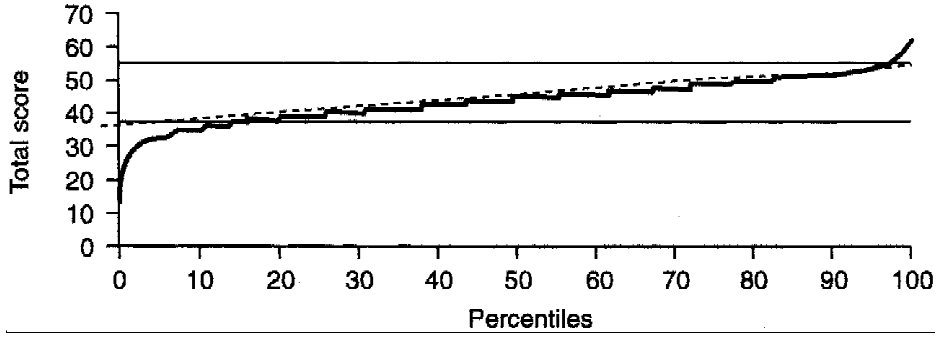


Fig. 5. Cumulative distribution of the SASS total score in the general population sample.

changes with patient status and is sensitive to active-treatment effect.

3.8. Construct validity

The general population sample (when the questionnaire was first released) had a mean, median and mode SASS total score of 43.5, 44 and 41, respectively, with a S.D. of 6.4 and a S.E. of 0.1. The distribution was not normal, the population with 'normal' social behaviour being over-represented in this sample. However, the distribution was found to be normal within specific groups, for whom social adaptation is a characteristic feature of their status, such as e.g. unemployed people. For the same reason, the SASS total score in the sample of depressed patients was not normally distributed, because people with serious social maladjustment are over-represented.

The cumulative distribution of the SASS total score in the general population sample is given in Fig. 5. The 'normal score range' is usually defined by the limits including 80% of the general population. On this basis, a SASS total score between 35 and 52 should be considered 'normal'.

The item profile in the 'normal' population defined above, i.e. with a total SASS score between 35 and 52 is shown in Fig. 6.

3.9. Determination of clusters from multiple correspondence analysis

The results of the 7167 available completed scales (4905 from the survey and 2262 from the clinical study) were submitted to MCA and the coordinates of all item scores were divided into five clusters. Their average position is shown in Fig. 7. Table 10 shows how the different item modalities are spread out in the different clusters.

On the basis of the item profile typical of each cluster, the five groups or clusters can be described as follows:

- Perfectly-adapted person (cluster no. 1), with a mean score of 49;

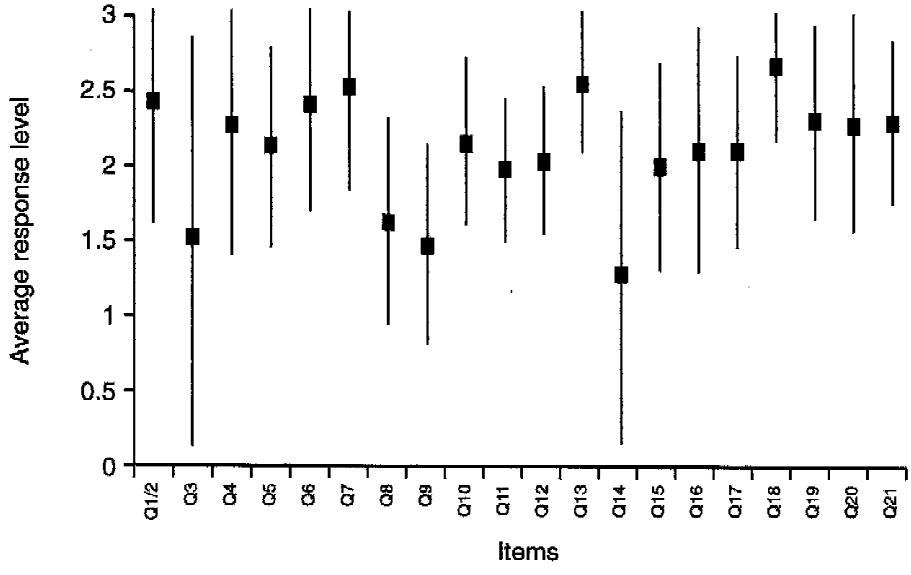


Fig. 6. Mean values and S.D. of individual items in the 'normal' sub-sample (total SASS score 35–52) of the general population.

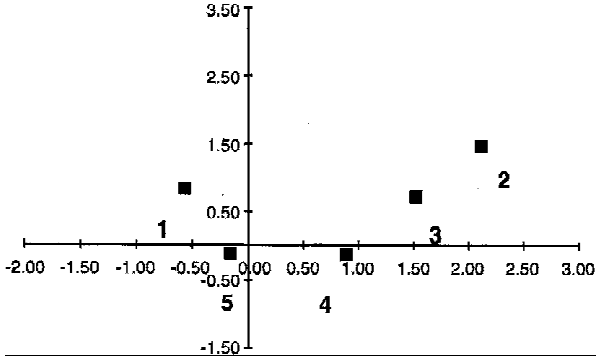


Fig. 7. Cluster average position on the MCA factor map.

- Person integrated through his/her family relationships (cluster no. 5), with a mean score of 42;
- Person integrated through his/her work (cluster no. 4) with a mean score of 32;
- Excluded person (cluster no. 3), with a mean score of 25;
- Socially disaffected person (cluster no. 2), with a mean score of 22.

The perfectly-adapted person has a very important extra-family network. He/she draws satisfaction from it and continually seeks to develop it. He/she is interested both in cultural activities and in leisure. Such a person is very good at organising their personal milieu.

The person integrated through his/her family activity has fewer extra-family relationships that are a lot less gratifying. The desire to progress, to challenge the 'givens' in his/her life, is far weaker. Adherence to the group, however, remains secure. He/she is respectful of others. Anything undertaken, is undertaken avoiding any excess or intensity of feeling. The exception in this connection is his/her heavy commitment to the family cell, and this is the principal process of identification for him/her.

The person integrated through his/her work shows little cultivation of extra-family relationships, without particular expectations in this respect. The person experiences some

Table 10
Clusters calculated on MCA coordinates

Cluster no. 1 Characteristic of the perfectly adapted subject		Cluster no. 5 Characteristic of the subject integrated by its family activity		Cluster no. 4 Characteristic of the subject integrated by the work		Cluster no. 3 Characteristic of the excluded subject		Cluster no. 2 Characteristic of the socially disaffected subject	
item	value	item	value	item	value	item	value	item	value
3	3	1/2	2	1/2	1	1/2	0	6	0
4	3	1/2	3	3	1	4	0	8	0
5	3	3	0	4	1	5	0	10	0
8	3	3	2	5	1	7	0	11	0
9	3	4	2	6	1	9	0	12	0
10	3	5	2	7	1	13	1	13	0
11	3	6	2	10	1	16	0	15	0
12	3	6	3	11	1	17	0	18	0
14	3	7	2	12	1	18	1		
15	3	7	3	15	1	19	0		
16	3	8	1	16	1	20	0		
17	3	8	2	17	1	21	0		
21	3	9	1	19	1				
		9	2	20	1				
		10	2	21	1				
		11	2						
		12	2						
		13	2						
		13	3						
		14	0						
		14	1						
		14	2						
		15	2						
		16	2						
		17	2						
		18	2						
		18	3						
		19	2						
		19	3						
		20	2						
		20	3						
		21	2						

communication difficulties and is poorly informed about his/her milieu. He/she has little curiosity and no enjoyment from the few activities he/she takes part in. Family relationships are treated with a certain indifference. The person has difficulties in managing the resources, and no longer succeeds in securing for him/her self a sphere of personal freedom.

The excluded person does not try to draw on extra-family relationships and does not have expectations from the social group. This person is little concerned by the social rules, organisation of resources or environment, is no longer committed to any activity and pays no attention to him/herself. The family cell no longer meets the expectations, and the person suffers from a feeling of exclusion.

In the socially disaffected person social exchange procures no return. This person is outside the social group and no longer acknowledges the rules. The family cell has collapsed. He/she feels totally excluded.

4. Discussion

The central position of social relationships in clinical psychiatry is well recognised (Henderson et al., 1980). In particular, in depressive illness, the severity of social dysfunction is influenced by the clinical form of depression: double depressives were found to be significantly more impaired in overall social functioning than dysthymics or episodic major depressives (Leader and Klein, 1996), the main differences being present in the relationships with the extended family and in social/leisure pursuits. According to Stefos et al. (1996), low level of social support, maladjustment in social and leisure activities, and poor quality of relationships with extented family predict the recurrence of a major affective episode. Interestingly, the protective effect of social contacts has been confirmed in animals, in a rodent model of depression (Dourish et al., 1989).

In depressed patients, the effect of different treatment modalities on social dysfunction has been demonstrated long ago (Weissman et al., 1974). Recent confirmation of a positive effect of drug treatment on social functioning derives from studies designed to evaluate the quality of life of depressed patients, which suggest superiority of fluoxetine over the tricyclic antidepressants (TCAs) clomipramine and amitriptyline in the areas of general health perception and of physical and social function (Souêtre et al., 1996).

The measurement of social consequences of pharmacological antidepressant treatment is, therefore, of obvious interest. We pursued this objective by developing a tool for the evaluation of social motivation and behaviour that is easy to use in data collection from large multicentre antidepressant drug trials. According to the target, the patient perspective and the self-assessment method were chosen, which had been found to be sensitive to change in previous studies (Weissman and Bothwell, 1976).

The validity and reliability of the newly-developed rating scale have been evaluated with different analyses carried out on the data from a large general population survey, involving 4000 individuals. The sensitivity to change of the scale was studied on the data collected in two controlled clinical trials comparing the NARI, reboxetine, with the selective serotonin reuptake inhibitor (SSRI), fluoxetine, one of which included a negative control group, treated with placebo (unpublished). Multivariate analyses, including factor and cluster analysis, were carried out on the overall information collected.

The evaluation of item intercorrelation showed a limited correlation among the different items, and indicated that the 21 items are more complementary than redundant. This was confirmed by the PCA carried out to evaluate factor validity, which indicated three main factors, accounting for 32%, 8% and 5% of the total variance, respectively, and showed that all items are of relevance within the most important factor, and incident on the SASS total score value.

An interpretation of the psychosocial content of the factors shown by the PCA could be attempted based on the cognitive models of depression, and in particular on Beck's cognitive theory of depression (Beck, 1964, 1976) and on Young's concepts of domains of necessity and maladjustment diagrams (Young, 1990).

The first to be considered is factor 3, which accounts for 5% of variance and affords no capability of differentiating between social subgroups. It matches individual initiative against interdependence with the group, and is related to people's ability to meet everyday demands. This factor is bound up with the individual's personality. It is the most weighted in terms of cognitive function according to Beck, through notions such as abstraction and interpretation, and is a counterpart to Young's notion of emotional insufficiency.

Factor 2, accounting for 8% of the variance, is characterised by its failure to differentiate people with a poor score on the SASS scale from those with an average score. It opposes life within the primary group to life within the secondary group, that is family life to extra-family life. It reflects the importance of social networks, supporting the view that when social difficulties are encountered, the nature of the individual is realised within the family cell. It represents, therefore, the autonomy of the individual through his/her relationships with the family or with the extra-family group. It also represents self-image and self-control, acceptance of responsibilities, and ability to enjoy personal satisfactions.

Factor 1, representing 32% of the variance, is a resultant of all the items and is a pointer to the total score. Among all these items, however, some are more fully represented in this factor. Organisation of leisure activities, control of the environment, and satisfaction from social contacts are

all indicators of contented self-acceptance and joy of living. The positive image of the family and of the extra-family network converges with the individual self-awareness and satisfaction and results in a stable world view, and a sense of being able to rely on others' support.

In addition to factor validity, the scale was found to possess face validity, since the variability of responses in terms of total score within homogeneous sub-sets of the survey population was very limited, and the differences among sub-populations as for summary statistics were marginal. Moreover, external validity was confirmed by the demonstration of the sensitivity of the scale to socio–professional categories, in terms of differences among both mean values and frequency distributions of SASS total score in the various social groups participating in the survey. However, the extent of the differences between the mean SASS total score of different social categories was minimal, corresponding to a maximum of 4.2 points.

The reliability of the scale was found to be high, when both the internal consistency and the test–re-test reliability were evaluated. From the distribution of total SASS scores in the survey population, it was possible to define 35–52 points as the 'normal range', i.e. the range corresponding to 80% of the population, with patent social maladjustment corresponding to total scores of less than 25.

Moreover, the results of the cluster analysis allowed the identification and description of five groups or clusters, characterised by a typical item pattern, from the perfectly-adapted person with a mean total score of 49, to the socially disaffected person with a mean total score of 22.

Finally, the scale's sensitivity to change was evaluated in patients with major depression during placebo treatment or active antidepressant treatment with the selective noradrenergic agent, reboxetine, or the selective serotonergic agent, fluoxetine. In order to minimise the impact of the modifications of the clinical state on the SASS pattern, the analysis was carried out after exclusion of cases with most severe impairment of social functioning, as measured by the SASS total score. In this sub-population, while the three groups were similar at the initial evaluation, both active treatment groups showed a more pronounced improvement than the placebo group at the final evaluation. Similar results had been obtained in the overall population from the placebo-controlled study (Dubini et al., 1997), where the SASS total score at last assessment differentiated both active treatments from placebo. This sub-population analysis seems to suggest that the scale is sensitive to active treatment effect quite independently from the level of impairment of social functioning induced by the acute depressive illness, an intriguing result which needs further investigation.

In conclusion, the newly-developed scale appears to be valid, reliable and sensitive to change. The results of the multivariate analyses allowed the identification of SASS principal factors and clusters that need to be confirmed in further studies in depressive illness. However, in view of its simplicity of use, and of its peculiar characteristic of investigating patient perspective on self and environment perception and on social motivation and behaviour, the scale represents an useful additional tool for the evaluation of social functioning in depression and will facilitate the development of new antidepressants with differential effects in this domain in depressed patients.

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