THE ASSESSMENT OF ANXIETY STATES BY RATING

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In the last decade many scales have been devised for the assessment of psychiatric symptoms. Most have been designed for use with patients in mental hospitals and have therefore concentrated chiefly on behaviour in the ward and in hospital activities. Not many of the items are concerned with symptoms, and these are chiefly those of schizophrenia and the depressive psychoses. Even less attention is paid to neurotic symptoms, especially anxiety states, despite the fact that the scales are intended generally to cover the full range of psychiatric syndromes. These scales have been designed to enable the research worker to obtain a quantified measure of the patient's clinical status, e.g. for use in clinical trials of treatment. In them, the separate items are summed in groups and a set of scores or 'profile' is obtained for each patient. This 'profile' is often used as a diagnostic aid, although this is not the primary purpose of the scale. Users are generally warned not to use the scale for making a diagnosis.

In practice, these scales have two other functions of great importance. The first is that the investigator can describe precisely certain characteristics of his group of patients using the mean score and standard deviation. The description and definition of the population from which a sample is drawn is of fundamental importance and is one of the difficult problems that faces research in psychiatry. For this purpose diagnostic categories are notoriously unreliable and rating scales are invaluable. The second function is that they help to define syndromes and subsyndromes, and in a manner which permits of reproduction in another enquiry.

The present scale was designed along different lines. It is intended for use with patients already diagnosed as suffering from neurotic anxiety states, not for assessing anxiety in patients suffering from other disorders. Anxiety in greater or lesser degree is found in agitated depression and obsessional states particularly, and also in such states as organic dementia, hysteria and schizophrenia, but it must be clearly emphasized that the scale is not intended to cope with these conditions.

The usual methods for scale design were used. A series of symptoms were assembled which were considered to cover the condition adequately. These were then grouped together according to their nature, or where clinical experiences indicated that they were associated. It was decided that for practical purposes twelve groupings were sufficient. Together with the patient's behaviour at interview, these formed the thirteen variables of the scale. They are: anxious mood (a continued state of apprehension), tension (including irritability), fears (of specific or phobic type), insomnia, cognitive changes (difficulty in concentration and forgetfulness), depression, somatic symptoms of a general type, cardiovascular, respiratory, gastro-intestinal, genito-urinary, and general autonomic symptoms, the latter consisting chiefly of headaches and sweating. Each of the variables was defined in a series of brief statements, headed by the name of the variable, printed on a sheet which faced the interviewer during the interview with the patient (see Appendix 1).

Assessments were made on a five-point scale (see Appendix 2). In practice, the last grade is very rarely used for out-patients, and serves more as a marker, a method of delimiting

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the range, rather than as a grade of practical use. In order to determine the reliability of the scale the patients were seen by two interviewers simultaneously. The principal interviewer conducted the interview and endeavoured to obtain information regarding the patient's symptoms. The second interviewer made his ratings independently of the first and could add his own questions if he thought he had not had sufficient information.

Table 1. *Correlations and t tests between raters*

		Raters I	Raters II	Raters III	
I	*t* test	—	0·30	0·54	First interview
	Correlation	—	0·93	0·39	
	No. of subjects	—	8	8	
II	*t* test	0·07	—	0·63	
	Correlation	0·83	—	0·91	
	No. of subjects	8	—	10	
III	*t* test	0·64	1·30	—	
	Correlation	0·95	0·93	—	
	No. of subjects	8	10	—	
		Second interview			

The initial testing of the scale involved three psychiatrists. Preliminary discussions eliminated many of the difficulties in the first version of the definitions of the variables. The rating scale was then tried on a number of patients and the discrepancies and agreements between psychiatrists carefully considered in detail, in an endeavour to eliminate difficulties. The scale was then tried on a group of patients and this paper is concerned with the results. An identical procedure was followed throughout. Each patient was assessed by two raters and the results recorded. Afterwards the results were compared and any discrepancies noted and discussed. Nevertheless, once a rating had been made it was not altered. The measure of reliability was based on the sum of crude scores for each patient. Product-moment correlations were calculated between each pair of physicians, and since the patients were interviewed on two occasions for purposes of a drug trial, two such correlations between each pair of physicians is available. The results are to be seen in Table 1. The weighted mean of these correlations, using the z transformation, is 0·89. This is remarkably high and illustrates the reliability of psychiatric assessments under suitable conditions. Since the reliability coefficient does not give information on the bias of raters towards high or low scores, t tests were calculated between pairs of raters in the same way (see Table 1). The weighted mean of these t tests is 0·61 and shows that very little bias is to be found.

The relations between the variables were then examined. Product-moment correlations were calculated between the variables and the resultant matrix factor-analysed by the method of Simple Summation (the matrix of correlations is available on request). Communalities were estimated by five iterations of the process. This is very easily done using the shortened method of Burt (1949). A general and one bipolar factor were extracted. The general factor is clearly a general factor of anxiety and the bipolar divides the symptoms into two groups: The first contains psychic symptoms consisting of tension, fears, insomnia, anxiety, intellectual (cognitive) changes, depression, and behaviour at interview. This was contrasted with a group of somatic symptoms consisting of gastro-intestinal, genito-urinary, respiratory, cardiovascular, somatic general and autonomic symptoms (Table 2).

When the factor saturations are plotted it may be seen that the vectors lie almost completely within a right angle. In other words it is possible to rotate the saturations to give two orthogonal group factors. The variance of the general factor constitutes 27 %, of the bipolar 18 %, giving a total of 45 % of the total variance. This total was probably reduced by selection.

Table 2. *Saturations for centroid and rotated factors*

	G	BP	I	II
Tension	0·60	0·26	0·36	0·54
Fears	0·29	0·37	0·04	0·46
Insomnia	0·79	0·32	0·48	0·70
Anxious mood	0·43	0·75	−0·06	0·86
Cognitive changes	0·56	0·07	0·42	0·37
Depression	0·38	0·52	0·02	0·64
Behaviour	0·37	0·22	0·18	0·39
Gastro-intestinal symptoms	0·41	0·00	0·34	0·22
Genito-urinary symptoms	0·43	−0·34	0·55	−0·05
Respiratory symptoms	0·31	−0·54	0·56	−0·27
Cardiovascular symptoms	0·34	−0·62	0·62	−0·33
Somatic (general) symptoms	0·48	−0·31	0·57	0·01
Autonomic symptoms	0·56	−0·10	0·52	23
Communality	2·93	2·09	—	—
Communality as percentage	23	16	—	—

DISCUSSION

This particular matrix of correlations can be resolved either into a general factor of anxiety and a bipolar factor of psychic versus somatic symptoms, or alternatively, into two orthogonal group factors of 'psychic anxiety' and 'somatic anxiety'. Since both factorizations give orthogonal factors, there is no advantage in one over the other. On general grounds, we know that had there been less selection of subjects, so that they extended through the full range from those with trivial symptoms to those severely ill, then in the centroid analysis, the general factor would have had a greater variance, the bipolar factor still being orthogonal to it. In the group factor analysis, the two group factors would have been positively correlated, this implying a general second order factor. The British school of factorists, following Burt, emphasize the value of orthogonality. The American school, following Thurstone, emphasize the value of being able to identify the same factors regardless of the problems introduced by selection. In this particular case, the group factor analysis has the advantage of orthogonality as well.

Despite the apparent advantage of the group factor approach over the general factor approach, it must not be forgotten that mathematically, the two have an equivalence, since the one can be converted into the other by a simple transformation, in this case, the simplest of all, an orthogonal rotation. No new information can appear from such a transformation. (In fact, factor analysis, except for the method of principal components with full variance, actually loses information. Its great advantage is that it makes information clearer and more comprehensible.) The choice between general and group factor analysis must depend on other considerations.

In this case, the selection of patients is based on the fact that they all suffer from anxiety neurosis, and this condition shows itself as a general factor, i.e. a dimension to which all the variables are positively correlated, or on which they all have positive non-zero projections. It may be that, in other circumstances, the division into group factors may be preferred. For example, the response to treatment, or the effects of some drug, may show as a change in one or other of the group factors. Even if this should be so, it would only mean that whereas for such a situation, the group factor is appropriate, for the present situation, i.e. for diagnosis, the general factor is the appropriate one.

It is interesting to compare this rating scale with the factor analysis of the Taylor scale by O'Connor, Lorr & Stafford (1956). Although the present scale is concerned with general symptoms, whereas the Taylor scale deals with specific statements, the two factors A and B correspond roughly with the present general and bipolar factors. Factors A and B correlate 0·068, so they too are orthogonal.

Both the Taylor scale and the scales of Dixon, de Monchaux & Sandler (1957*a*, *b*) differ from the present one in that they are concerned with the content of the patient's

symptoms, rather than the form. This is also true of the Taylor scale. Although in the course of treatment the specific nature of a patient's fears and anxieties may change, it does so much less readily than the intensity. The assessment of both these kinds of changes is of practical and theoretical importance, and therefore the two kinds of scale are complementary.

The present scale obviously invites comparison with that designed by Buss, Wiener, Durkee & Baer (1955). It is important to recognize the difference between the two. The present scale is designed for the rating of anxiety neurosis as a syndrome, not for the rating of anxiety. Until the contrary is proved, it must be regarded as invalid for the rating of anxiety in any other setting. This limits the range of usefulness of the scale but, within these limits, patients can be compared meaningfully. It places great emphasis on the patient's subjective state. (This follows from the medical bias of the author, for in treatment the patient's subjective state takes first place both as a criterion of illness, which brings the patient for treatment, and as a criterion of improvement.) The various symptoms are rated separately, the somatic ones being given equal place with the psychic. This is because in outpatient practice patients place great emphasis on somatic symptoms, and a large number go first to the general medical departments for investigation of these. The scale of Buss *et al.* was used for rating anxiety on all types of patient except those suffering from cerebral damage. It therefore has a wider range of application. This is counter-balanced by the fact that the comparison of scores for anxiety, e.g. schizophrenia, depression and anxiety neuroses, has no clear meaning. It assembles symptoms into fewer groups. It gives less weight to somatic symptoms, or alternatively, gives more weight to psychic symptoms. Both scales group many single items under a limited number of headings, and it would be clearly desirable to investigate the appropriateness and usefulness of this procedure. Both show high reliability in use. I do not intend to suggest that either scale is better than the other. Only practical use will determine which is the more useful, and it is to be hoped that both will be superseded by something better.

The scale can by no means be considered to be in its final state. Ideally, each of the items listed under the heading of a variable should be handled separately for purposes of full item analysis. The sheer labour of doing this in a rating scale (as opposed to a questionnaire) will delay this for a long time. Some of the variables are obviously a rag-bag of oddments and need further investigation. Further work is being done in which the general somatic symptoms are separated into two variables: muscular and sensory.

Experience has shown that grade 2 can be split up into two grades without increasing the difficulty of rating. In practice, grade 4 is almost never used because the rater is reluctant to give the maximum score to subjects who could obviously be much worse. An additional grade would probably be rarely or never used, but would encourage the rater to subdivide grade 3, shifting some of his ratings to the higher grade.

Summary

A rating scale for the symptoms of anxiety neurosis has been prepared as an aid to the quantification of symptoms. It was used on thirty-five patients by three physicians working in pairs. The reliability of the scale, as shown by correlations and *t* tests between raters, is high. The correlations between variables can be factorized into a general factor of anxiety and a bipolar factor contrasting psychic with somatic symptoms; or into two orthogonal group factors of 'psychic' and 'somatic' anxiety.

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APPENDIX 1

Symptoms of anxiety states

Anxious mood
- Worries
- Anticipation of the worst
- Apprehension (fearful anticipation)
- Irritability

Tension
- Feelings of tension
- Fatiguability
- Inability to relax
- Startle response
- Moved to tears easily
- Trembling
- Feelings of restlessness

Fears
- Of Dark
- Strangers
- Being left alone
- Large animals, etc.
- Traffic
- Crowds

Insomnia
- Difficulty in falling asleep
- Broken sleep
- Unsatisfying sleep and fatigue on waking
- Dreams
- Nightmares
- Night terrors

Intellectual (cognitive)
- Difficulty in concentration
- Poor memory

Depressed mood
- Loss of interest
- Lack of pleasure in hobbies
- Depression
- Early waking
- Diurnal swing

General somatic (muscular)
- Muscular pains and aches
- Muscular stiffness
- Muscular twitchings
- Clonic jerks
- Grinding of teeth
- Unsteady voice

General somatic (sensory)
- Tinnitus
- Blurring of vision
- Hot and cold flushes
- Feelings of weakness
- Pricking sensations

Cardiovascular symptoms
- Tachycardia
- Palpitations
- Pain in chest
- Throbbing of vessels
- Fainting feelings
- Missing beat

Respiratory symptoms
- Pressure or constriction in chest
- Choking feelings
- Sighings
- Dyspnoea

Gastro-intestinal symptoms
- Difficulty in swallowing
- Wind
- Dyspepsia:
  - pain before and after meals
  - burning sensations
  - fullness
  - waterbrash
  - nausea
  - vomiting
  - sinking feelings
- 'Working' in abdomen
- Borborygmi
- Looseness of bowels
- Loss of weight
- Constipation

Genito-urinary symptoms
- Frequency of micturition
- Urgency of micturition
- { Amenorrhea / Menorrhagia / Development of frigidity
- { Ejaculatio praecox / Loss of erection / Impotence

Autonomic symptoms
- Dry mouth
- Flushing
- Pallor
- Tendency to sweat
- Giddiness
- Tension headache
- Raising of hair

Behaviour at interview (general)
- Tense, not relaxed
- Fidgetting: hands, picking fingers, clenching, tics, handkerchief
- Restlessness: pacing
- Tremor of hands
- Furrowed brow
- Strained face
- Increased muscular tone
- Sighing respirations
- Facial pallor

Behaviour (physiological)
- Swallowing
- Belching
- High resting pulse rate
- Respiration rate over 20/min.
- Brisk tendon jerks
- Tremor
- Dilated pupils
- Exophthalmos
- Sweating
- Eye-lid twitching

APPENDIX 2

Date				
Anxious mood				
Tension				
Fears				
Insomnia				
Intellect				
Depressed mood				
Somatic general (muscular and sensory)				
Cardiovascular system				
Respiratory system				
Gastro-intestinal system				
Genito-urinary system				
Autonomic system				
Behaviour at interview				

Grades
0 is none
1 is mild
2 is moderate
3 is severe
4 is very severe, grossly disabling

General comments:

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