Depression factors in depressed and in heterogeneous in-patient samples¹

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Lorr, Klett, and McNair (1963) noted that factorial studies limited to patients of one diagnostic category exhibited the 'effects of restriction in various sources of population variance and limitations on defining variables'. Factor analyses of depressive symptoms have for the most part utilized patients whose clinical diagnosis was depression (Hamilton and White, 1959; Hamilton, 1960; Overall, 1962; Kiloh and Garside, 1963; Rosenthal and Klerman, 1966; Raskin, Schulerbrandt, Reatig, and Rice, 1967). By limiting his sample to such subjects, Overall (1962) hoped to minimize any general depression factor and focus on individual differences among depressed patients. Hamilton (1960), whose goal was quantification of interview behaviour of depressed patients, felt that specific symptoms could not validly be interpreted or weighted apart from diagnostic context. In some instances, factor analytic method has been used to delineate in samples of depressed subjects behaviour patterns corresponding to aetiological concepts—that is, endogenous *vs.* neurotic or reactive depression (Hamilton and White, 1959; Kiloh and Garside, 1963; Rosenthal and Klerman, 1966).

Any investigator who has attempted to select a sample of depressed in-patients will attest to the prevalence of 'mixed pictures'. Depressive symptomatology often appears in a context of schizophrenia or other primary diagnosis (Hinsie and Campbell, 1960; Spitzer and Wilson, 1968).³ Objective measurement of such symptoms, wherever they may occur, is, nevertheless, basic to accurate appraisal of treatment effects. Behavioural rating

scales for depression are, in practice, applied to nosologically heterogeneous subjects. It is, therefore, of some pragmatic interest to determine effects of wider patient selection on the factor composition of one such instrument. In the present paper, results of a factor analysis of the Hamilton Rating Scale for Depression (Hamilton, 1960) based on a diagnostically heterogeneous sample of in-patients are compared with factors reported by Hamilton (1960), whose sample included only hospitalized depressed males.

METHODS

SUBJECTS The subjects were 158 newly hospitalized, acutely ill, psychiatric patients, white and non-white, of both sexes. Their ages ranged from 19 to 57 with a mean of 35.5 years. Alcoholics, narcotic addicts, cases of organic brain syndrome, patients on court orders, and those known to have been receiving ataractic drug treatment regularly before admission were excluded. Patients so selected were included in the analysis regardless of their specific diagnoses, the resulting sample being approximately 90% schizophrenic. The ratio of men to women was approximately 1:2 (54 men, 104 women), and of negro to white about 1:2.5 (41 negro, 116 white). In each case these were about the same proportions as those in total admissions. One patient was of Oriental extraction.

THE HAMILTON SCALE In 1960 Hamilton published a 17-item rating scale (the substance of which is presented subsequently in Table I) designed to assess affective disorder in patients already diagnosed as depressed (Hamilton and White, 1959; Hamilton, 1960; Lyster and Abbott, 1966). Product-moment correlations were computed for 49 male depressed patients; the resulting matrix was factored by the principal components method; and four factors, accounting for 51% of the total variance, were extracted. Three of the factors, rotated orthogonally, were defined by items as follows: factor 1: 'guilt', 'depressed mood', 'suicide', 'genital symptoms' (loss of libido), 'retardation', and 'loss of insight'; factor 2: 'somatic symptoms (gastrointestinal)', 'sleep disturbances', 'work and interests' (impaired ability to work and

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³Diagnostic nomenclature recently adopted by the American Psychiatric Association (1968) classifies involuntional melancholia and the various phases of manic depressive illness as 'Major affective disorders'. Psychotic depressive reaction is listed separately under 'Other psychoses'. 'Depressive', 'Cyclothymic', and 'Schizo-affective, depressed' are subcategories of 'Neuroses', 'Personality disorders', and 'Schizophrenia', respectively.

loss of interest in other activities), 'hypochondriasis', and 'loss of weight'; factor 3: 'psychic anxiety', 'agitation', and 'somatic anxiety'. The fourth unrotated factor could not be interpreted clearly. Factor 1 was thought to resemble retarded depression; factor 2 comprised, for the most part, somatic aspects of depressive illness, together with reduced social competence (impairment of work and interests and loss of insight); and factor 3 suggested an anxiety reaction.

Patients in the present study were evaluated by one of three clinical psychologists. Before data collection began, intraclass correlations (based on ratings of 20 patients, each seen by the three clinicians for a one-hour joint interview and rated independently) were computed for each Hamilton Scale item and for the total score. Reliabilities of individual scales are indicated in Table I.

FACTOR ANALYSIS The 17 Hamilton Scale items were intercorrelated (Pearson *r*) over 158 subjects. The highest correlation of each variable, from among its correlations with all other variables in the matrix, was taken as an estimate of communality. A centroid analysis was performed and the resulting factors rotated by the varimax method. Factor extraction was stopped when the distribution of residual *r*s around zero approximated chance expectation. Ten factors were extracted, seven of which were rotated. None of the three discarded accounted for more than .01 of the total variance.

RESULTS

Rotated factors are presented in Table I. Inspection of correlations of individual scales with these factors suggested that rotation to oblique simple structure (Thurstone, 1947) would have yielded substantially intercorrelated primary factors. It is clear that certain symptom scales cannot unequivocally be

assigned to a single factor; for example, 'guilt' (variable 2) is associated both with agitated depression and with suicidal tendencies. A similar overlap in item content among factors was noted in Hamilton's (1960) sample of depressed patients. In Table II, all items which correlated significantly with a given factor have, therefore, been included in its description.

TABLE II
COMPOSITION AND IDENTIFICATION OF FACTORS

Factor	Var. No.	Description
A Insomnia	4	Insomnia, initial
	5	Insomnia, middle
	6	Insomnia, delayed
B Agitated depression	11	Anxiety, somatic
	1	Depressed mood
	2	Guilt
	7	Impairment: work and interests
	9	Agitation
	10	Anxiety, psychic
C Digestive disturbances	16	Insight retained
	11	Anxiety, somatic
	12	Somatic symptoms, gastrointestinal
D Hypochondriasis	17	Loss of weight
	11	Anxiety, somatic
	13	Somatic symptoms, general
	15	Hypochondriasis
E Suicide	1	Depressed mood
	2	Guilt
	3	Suicide
F Somatic symptoms	16	Insight retained
	1	Depressed mood
	12	Somatic symptoms, gastrointestinal
	13	Somatic symptoms, general
	14	Somatic symptoms, genital
G Retardation and apathy	7	Impairment: work and interests
	8	Retardation

TABLE I
ROTATED FACTORS

Variable	A	B	C	D	E	F	G	<i>h</i> ²
1 (.81) Depressed mood	.14	.61	.14	.07	.31	.35	.10	.67
2 (.83) Guilt	-.09	.49	.10	.10	.47	.04	.02	.51
3 (.75) Suicide	.08	.04	-.06	.01	.57	.17	.00	.37
4 (.82) Insomnia, initial	.64	.08	.03	.21	.15	.15	.07	.53
5 (.49) Insomnia, middle	.81	.14	-.01	.17	-.01	.16	.01	.75
6 (.66) Insomnia, delayed	.83	.03	.21	.03	.04	.02	-.03	.76
7 (.76) Impairment: work and interests	.14	.49	.20	.02	.09	.10	.44	.53
8 (.77) Retardation	.01	-.04	.02	-.01	.03	.03	.69	.49
9 (.56) Agitation	.06	.52	-.22	.19	-.16	.00	-.01	.40
10 (.43) Anxiety, psychic	.17	.75	.06	.12	.12	.03	-.13	.65
11 (.36) Anxiety, somatic	.31	.22	.33	.52	.09	-.01	-.17	.58
12 (.73) Somatic symptoms, gastrointestinal	.15	.06	.64	.24	.00	.42	-.01	.69
13 (.35) Somatic symptoms, general	.20	.21	.15	.30	.26	.51	.21	.59
14 (.50) Genital symptoms	.18	.04	.13	-.13	.20	.40	.00	.28
15 (.29) Hypochondriasis	.18	.14	.10	.61	-.02	.02	.06	.45
16 (.59) Loss of insight	-.21	-.28	-.20	.12	-.27	-.07	.23	.32
17 (.81) Loss of weight	.09	.01	.63	.08	.00	.03	.06	.43
Variance	.13	.11	.07	.06	.05	.05	.05	.51

Note. Intraclass correlations among raters are given in parentheses; loadings of variables used in identifying each factor are set in bold face. Factor coefficients of .27 or higher are significant at less than the 5% level, Harman's (1960) standard error approximation. The correlation matrix, unrotated factor matrix, and transformation matrix are available from the authors.

In the heterogeneous sample, depression and guilt were associated with agitation rather than with retardation. Factor B (Table II), tentatively identified as 'agitated depression', was defined by depression, guilt, agitation, anxiety, occupational impairment, and restriction of interest. In Hamilton's (1960) study of clinically diagnosed depressed males, 'retarded depression'—comprising depressed mood, guilt, retardation, suicidal tendencies, disturbances in sexual functioning, and loss of insight—accounted for a higher percentage of the variance than did any other factor. Hamilton and White (1959), Kiloh and Garside (1963), and Rosenthal and Klerman (1966) related this or an essentially similar pattern to the aetiological concept of endogenous depression. 'Agitated depression' was not clearly delineated in Hamilton's (1960) analysis; conversely, a factor of 'retarded depression' was not isolated in the present study, although doublet factor G—characterized by 'retardation' and 'impairment of work and interests' suggests such a pattern.

Generally speaking, both physical symptoms and sleep disturbances tended to appear in a more varied behavioural context in Hamilton's (1960) factors than in those of the present study. Except for the correlation of 'depressed mood' with factor F, psychosomatic patterns (factors C, D, and F) included only items measuring physical symptoms, somatic concern, or preoccupation with body functions. In the depressed sample, gastrointestinal symptoms and loss of weight were associated in factor 2 with hypochondriasis, insomnia (initial, middle, and delayed), agitation, impairment, and loss of insight. Genital symptoms helped to define factor 1, 'retarded depression'. General somatic symptoms were most highly correlated with 4, which was not interpreted. In the heterogeneous sample, sleep disturbances also tended to occur independently of other symptoms. Insomnia of all types, together with somatic anxiety, defined factor A of the present analysis, which accounted for a greater percentage of the total variance than did any other factor. In the depressed sample (Hamilton, 1960), initial, middle, and delayed insomnia were associated with physical symptoms and impairment in an 'objective' symptom factor, factor 2; while middle insomnia, but neither of the other sleep disturbances, occurred with general somatic symptoms and somatic anxiety in factor 4.

An interesting similarity between Hamilton's (1960) syndromes and those reported here is perhaps worth noting: suicide was not associated with anxiety, agitation, or impairment in either set of factors. In the present study, factor E, with which the suicide item was most highly correlated, was defined by 'suicide', 'depressed mood', and 'guilt'.

This pattern differed from factor B, 'agitated depression', in that outward signs of anxiety were not represented.

DISCUSSION

Although depression is a recognized clinical entity, prominence and patterning rather than mere presence of depressive symptoms are usually the determining factors in clinical diagnosis. (By contrast, a single clearly schizophrenic symptom may be sufficient to establish that diagnosis.) Classification of symptoms of depression is, then, peculiarly dependent on their context. Symptom clusters which appear to behave as a 'functional unity' in heterogeneous subjects may in a depressed sample (upon application of narrower classificatory principles) be found to include two or more sub-patterns.

The familiar clinical syndrome agitated depression, for example, has not usually been found in factorial studies of depressed subjects rated in symptoms associated with their illness. Hamilton's (1960) analysis yielded an 'anxiety reaction' factor which could not confidently be termed 'anxious depression', despite the fact that it occurred in a depressed sample, because of negative correlation (-0.31) with the scale item measuring depressed mood. Friedman, Corvitz, Cohen, and Granick (1963) and Overall (1962) similarly isolated separate dimensions of anxiety and depressed mood in interview ratings of their respective samples of clinically depressed subjects. Other analyses more directly comparable with the present study, in that they were based on interview ratings of newly hospitalized depressed patients, have also yielded anxiety factors which lacked a depressive component: 'anxiety-phobic reaction' (Raskin *et al.*, 1967) and a syndrome 'describing characteristics of free anxiety' (Grinker and Nunnally, 1965). In the latter study, items measuring depressed feeling tone appeared as a separate factor; in the former, depression as a disturbance in mood—that is, apart from guilt feelings and suicidal preoccupation—was not among interview factors.

Factor analyses in which agitated depression has appeared as an interview factor have typically involved either a diagnostically heterogeneous sample or a scale designed to measure general psychopathology or both of these elements (Lorr, O'Connor, and Stafford, 1960; Lorr and Klett, 1966; Michaux, Vander Zwaag, and Kurland, 1967). It would seem that, when anxiety and depressed mood are considered in the context of a depressed sample, these symptoms tend to be perceived separately; whereas, when the rater's frame of reference is one of general psychopathology, a

pattern of anxious or agitated depression is more likely to emerge. There is some evidence that this distinction may represent not so much an actual separation as, perhaps, a semantic one. Raskin *et al.* (1967) noted that self-ratings of depressed patients yielded a factor of anxious depression not present in psychiatric ratings of the same subjects in the same instrument, a modification of the 'Symptom Distress Scale' (Frank, Gliedman, Imber, Nash, and Stone, 1957). These investigators suggested that, although clinicians, when requested to do so, could distinguish conceptually between anxiety and depression, the two symptoms were not clearly separated in the experience of the subject. Results of analyses based on intercorrelations among patient profiles support such an interpretation. In a sample of hospitalized depressed subjects, Overall, Hollister, Johnson, and Pennington (1966) isolated a patient type termed 'anxious-tense depression' which included more than three-fifths of their sample. Grinker and Nunnally (1965) reported a type of patient in which hopelessness, guilt, and low self-esteem were associated with agitation and clinging demands for attention.

Syndromes identified as 'depressed mood' by Overall (1962) and 'mood depression' by Friedman *et al.* (1963) include not only items descriptive of feeling tone but also ideational symptoms associated with classic concepts of affective disorders: rumination, suicidal preoccupation (Overall, 1962); doubt and perplexity, guilt (Friedman *et al.*, 1963). Both factors closely resemble 'feelings and concerns' factor I reported by Grinker, Miller, Sabshin, Nunn, and Nunnally (1961), characterized by these investigators as 'the essence of depression'. Such a pattern of 'core' symptoms of depressive illness has in some studies been associated with retardation, as in the case of Hamilton's (1960) 'retarded depression' factor, and has been related interpretively to the concept of endogenous depression (Hamilton and White, 1959; Kiloh and Garside, 1963; Rosenthal and Klerman, 1966). A comparable syndrome would not be expected in diagnostically heterogeneous subjects, whose depressive symptoms may be associated with any of a number of psychiatric conditions. We are inclined to allocate factors of the present study to the diagnostic class, 'reactive depression', rather than to the traditionally alternate 'endogenous depression'. As noted by Rosenthal and Klerman (1966), the former category includes (in addition to simple 'reactive depression') a variety of disorders in which depressive features are present.

The finding that factors comprising psychosomatic symptoms and sleep disturbances, respectively, were more narrowly defined in the heterogeneous than in the depressed sample is understandable in view of the

fact that certain relationships between physical symptoms and other manifestations of depression are implicit in classical concepts of depression and of specific kinds of depressive illness (Henderson and Gillespie, 1947). For example, disorders of sleep and emaciation are said to occur together in manic depressive psychosis. The combination of hypochondriacal ideas or delusions with agitation is important in the diagnosis of involutional depression. These interrelationships among symptoms, inherent in selection criteria for depressed subjects, would not be expected in a heterogeneous sample.

Although the finding that suicidal tendencies were not accompanied by agitation, anxiety, or impairment may at first seem surprising, it is consistent with recent reports from the Center for Studies of Suicide Prevention, National Institute of Mental Health. Shneidman and Mandelkorn (1967) described behaviour of the potentially suicidal individual as follows: 'Of course, there are less pointed behavioural clues to suicide. . . . Once a person has finally decided to kill himself, he begins to act "differently". He may withdraw to become almost monklike and contemplative. He may drastically reduce eating or refrain from conversation and ignore normal sexual drives. He may either sleep more soundly or suffer from insomnia.' These authors also noted depressed mood and verbalized guilt as warnings of suicidal intent: 'They (people who are suicidal) feel hopeless about the direction of their lives and helpless to do anything about it. Under the mammoth weight of their own pessimism, they sink to their death. . . . Dejected or angry asides such as "I want to die. This is the last straw . . . my family would be better off without me . . . I won't be around much longer for you to put up with", all are real clues to suicide, and too seldom taken as such.'

SUMMARY

Newly hospitalized, functionally ill psychiatric patients ($N = 158$) were evaluated in the Hamilton (1960) Rating Scale for Depression. Single item scores were intercorrelated; a centroid factor analysis and varimax rotation were completed. The resulting factors—'insomnia', 'agitated depression', 'digestive disturbances', 'hypochondriasis', 'suicide', 'somatic symptoms', and 'retardation and apathy'—were compared with factors reported by Hamilton (1960), based on ratings in the same items of depressed male in-patients. In diagnostically heterogeneous subjects, depression and guilt were found to be associated with agitation rather than with retardation, as in the case of depressed patients. Both specific physical symptoms and various types

of sleep disturbances tended to appear in a more varied behavioural context in depressed than in heterogeneous subjects. In both samples, suicide was associated with depression and guilt but not with anxiety, agitation, or impairment.

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