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Content and Consistency in the Endogenous Depressive Pattern*

By SAUL H. ROSENTHAL and GERALD L. KLERMAN

I. Introduction

As currently used, the diagnosis of depression includes a wide range of clinical phenomena. This has not always been the case. Near the end of the 19th century, when the term depression began to evolve the meanings that it has today it was applied primarily to psychotics. The formulations of Freud in *Mourning and Melancholia* (1917), and of Kraepelin in *Manic Depressive Insanity* (1921) were based upon observations of patients who were both depressed and psychotic. In their work the contrast was between psychotic depression (or "melancholia") on one hand, and normal sadness on the other. In the succeeding half-century, however, as psychiatry has extended its boundaries, increasing attention has been focused on non-psychotic depressions, often called "neurotic" or "reactive." As these "neurotic" or "reactive" depressions reached public attention, a debate began over the way in which the depressive population should be described and the extent to which it should be subdivided. Critical and often sarcastic written battles were fought between the separatists and the unifiers during the 1920's and 1930's. These debates have been informatively chronicled by Partridge (1949). We have found it useful to divide these theorists into unifiers, dualists, and pluralists.

The underlying *unity* of the depressive illnesses has been advocated in America by the Meyerian school of psychiatry (Muncie, 1939; Ascher, 1952), and in England by the influential writings of Mapother (1926) and Aubrey Lewis (1934a, 1934b, 1936). The Meyerians see depressions as psychobiological reactions of the entire organism to stress (Meyer, 1917). American textbooks emphasize that "psychotic" depressions differ from neurotic depressions only by the legal and historical criteria of commitment and that hard and fast demarcations are not possible (Muncie, 1939; Ewalt and Farnsworth, 1963; Noyes and Kolb, 1963). Mapother's presentation of this point of view stirred up a storm of protest in England. He held that there was a complete gradation from major to minor disturbances and felt that he could find no reason for the distinction between neurosis and psychosis other than that of certifiability.

Others, especially European and some British writers, have proposed *dualistic* divisions of the depressive population. These writers reacted strongly against Mapother's thesis (Ross, 1926; Gillespie, 1926; Buzzard, 1926). Gillespie's paper, "The Clinical Differentiation of Types of Depression" (1929) proposed the distinction between "reactive" depressions on the one hand and "endogenous" or "autonomous" depressions on the other (with the involutional depressions as a separate "autonomous" group). This division has subsequently achieved wide acceptance in Europe and Canada (Astrup *et al.*, 1959; Roth, 1959; Kiloh and Garside, 1963; Hamilton and White, 1959; Mayer-Gross *et al.*, 1960a). It has achieved added importance because of a reported therapeutic discrimination, as patients with the endogenous pattern of symptoms have been reported to have better response rates to both ECT and imipramine than psychoneurotic patients (Kuhn, 1958; Kiloh *et al.*, 1962; Kalinowsky, 1959). Others have made the division into neurotic and psychotic depression (Rogerson, 1940; Foulds, 1960). Unfortunately this often seems to be used interchangeably with the endogenous-reactive

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dichotomy, although psychosis is not one of the necessary criteria of the endogenous depression pattern.

In addition to the unitary and dualistic groupings above, there have been other classifications based upon *pluralistic* views. For example, the current American Psychiatric Association classification (1952) includes no general category of "Depression" or "Affective Illness," and various affective disorders are listed as "psychoneurotic depressive reaction", "manic-depressive reaction", "psychotic depressive reaction", and "involutional psychotic reaction".

In recent years the problem of classification has acquired renewed interest because of two advances: first, the introduction of effective drug therapies; and second, the application of sophisticated statistical techniques, including factor analysis, to research on diagnosis and classification. With the availability of a number of partially effective anti-depressant treatments, including electroconvulsive therapy, imipramine, MAO inhibitors, and psychotherapy, the need for criteria which will predict differential responses to treatment has become increasingly appreciated. This has led to a renewed interest in the phenomenology of depression (Grinker *et al.*, 1961), and to efforts to delineate clinical groupings. Among the attempts to use factor-analytic methods to derive clinical groupings of depression has been the work of Hamilton (1960), Hamilton and White (1959), Overall (1963), Kiloh and Garside (1963), Friedman *et al.* (1963), and Grinker *et al.* (1961).

As a result of clinical and metabolic studies of depression, we have become interested in the concept of endogenous depression. This paper attempts to make explicit the components and assumptions of the endogenous depression concept and to investigate the clinical aspects of this concept by statistical means.*

We have used the term "endogenous depression" in this paper not with the intent of prejudging the establishment of the syndrome. We use it because the term "endogenous" is understood to refer to the specific clinical pattern that we are discussing, even by those who do not accept it as a separate syndrome.

* Preliminary findings of this study were presented at the "Conference on the Depressive Group of Illnesses", McGill University, 1965 (Rosenthal and Klerman, 1965).

II. The Concept of Endogenous Depression

The term "endogenous depression" has come to imply a relationship among three aspects of the depressive picture:

1. A particular pattern of manifest clinical *symptoms and signs* is expected to be present;
2. The *premorbid personality* is expected to be relatively stable and non-neurotic;
3. An apparent environmental or psychological *initial precipitant* is considered less likely to be found, and the patient is expected to show less *reactivity to the environment* during the course of the depression.

"Endogenous depression", through general usage, refers to depressive patients with the above combination of features. These patients may or may not be psychotic. Their depressions are thought of as having a genetic predisposition and as having either a somatic aetiology or as having a somatic process triggered by a psychological event which then continues autonomously. Patients with manic-depressive reactions and psychotic depressive reactions are usually felt to be examples of endogenous or autonomous depression, while involutional depressions may or may not be, and neurotic depressive reactions are felt to be non-endogenous.

In a secondary usage, "endogenous" is occasionally applied by the simple criteria of absence of apparent precipitant, irrespective of the symptom pattern and with the implication of aetiologic certainty. Gillespie and many others have noted that an initial precipitant may sometimes be present in patients with the "autonomous" or "endogenous" depression pattern and that differentiation is not made on this ground alone. This secondary usage is therefore less useful and often confusing.

III. Methodology

A. *Specific Aim of the Study*

The aim of the present study has been to employ quantitative rating scales and advanced

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statistical techniques to test this concept of "endogenous depression" as a three-part clinical pattern which is found consistently in different populations. This was done by:

1. The use of factor analysis to identify the cluster of *manifest clinical symptoms and signs* and to provide a system of quantitative scoring;
2. The correlation of *personality traits*, *apparent precipitant*, and *historical data* with the above cluster of symptoms and signs;
3. A comparison with similar studies using factor analysis (Hamilton, 1960; Hamilton and White, 1959; Kiloh and Garside, 1963) to examine *consistency of the clustering* and to examine whether the factors can be applied to other patient populations than those from which they were derived.

B. *The Setting and Patient Population*

This was a retrospective study of 50 consecutive depressed patients admitted to Ward I of the Massachusetts Mental Health Center from September, 1961, to August, 1964. Ward I is a clinical research ward which admits only female patients with moderate to severe depressions and excludes patients with evidence of organic brain disease or schizophrenic symptoms. Some of the characteristics of the patient population are listed below. The patients ranged in age from 22 to 70 years with a mean age of 49·4. Twenty per cent. of the patients were below 40, sixty per cent. between 40 and 60, and twenty per cent. over 60. Fifty-four per cent. of the patients had had one or more previous hospitalizations, the average age of first onset being 39 and the age range of first onset from 12 to 63. The first onset occurred below the age of 30 in thirty-two per cent., between 30 and 50 in forty per cent., and over 50 in twenty-eight per cent. Sixty-eight per cent. of the patients had had their depression less than six months when admitted. (See Table I.)

TABLE I

Characteristics of Patient Population

Age	
Range	22–70
Mean Age	49·4
Below 40 years	20%
40–60 years	60%
Above 60 years	20%
Age of First Onset	
Range of First Onset	12–63
Mean Age	39
Below 30 years	32%
30–50 years	40%
Above 50 years	28%
Duration of Illness Prior to Admission	
Less than 6 months	68%
Greater than 6 months	32%

C. *The Sources of Data*

The patients were rated on 42 clinical characteristics of the present illness, premorbid personality, personal history, and apparent precipitant. (See Table II.). Ratings were done on information recorded during the first week, before the administration of drugs or ECT. Except for items of age, the items were each scored on a 7-point scale on information obtained from the hospital case records and from psychiatric ratings. The patients had been assessed by their physicians on a modified Hamilton Rating Scale for Depression (Hamilton, 1960) during their first week in the hospital, and these assessments aided in rating 16 of the items.

IV. The Symptoms and Signs Comprising the Endogenous Depression Pattern

A. *Historical Background*

The symptoms and signs comprising the endogenous pattern include:

1. Lack of reactivity to environmental changes;
2. Severity of depressive affect;
3. Feelings of guilt, remorse and unworthiness (as opposed to self-pity and blaming the environment);
4. Insomnia, especially with middle of the night and early morning awakening;

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5. Diurnal variation with increased severity of the depression in the morning;
6. Retardation of speech, thought and motor activity;
7. Motor restlessness and agitation;
8. Visceral symptoms such as constipation, dry mouth, furred tongue, muscular aches and pains, anorexia, decreased growth of hair and nails;
9. Decreased sexual potency and desire; loss of menses;
10. Weight loss;
11. Loss of interest and general lassitude.

This pattern of signs and symptoms has undergone little alteration since its crystallization by Gillespie in 1929, although some writers have considered endogenous depression as a separate disease entity (Buzzard, 1926, 1930; Ross, 1962; Riddoch, 1930; Crichton-Miller, 1930; Mayer-Gross *et al.*, 1960b; Kiloh and Garside, 1963), and others as a "pure" or "core" pattern at the end of a normal distribution. Muncie (1939) of the Meyerian school describing the "major reaction" "Depression" in his textbook gave an excellent description of the clinical pattern referred to by others as endogenous depression. Ewalt and Farnsworth (1963) and Noyes and Kolb (1963) in their textbooks consider the endogenous cluster of symptoms and signs under "acute" or "severe" depression, as lying on a severity continuum.

B. *The Statistical Analyses*

Of the 42 clinical items scored in our study, 25 symptoms and signs of the present illness were chosen for the factor analysis. These 25 items were correlated using the Pearson Product Moment Correlations, and the correlation matrix was then subjected to factor analysis extracting the principal axis solutions. The factor analysis was restricted to items of the present illness in order to derive *symptom patterns* from homogenous data. Items of history, personality, and precipitant were excluded, so that they could be independently correlated with the symptom patterns. Four additional items of the present illness were excluded because a

TABLE II
Clinical Items Rated

Symptomatology of Present Illness
* Rate of Onset of Present Illness
* Duration of Present Illness
* Weight Loss
* Suicidal Thought or Behavior
* Loss of Interest
* Reactivity of Depression
* Fluctuation of Illness
* Hypochondriacal Attitude
* Guilt and Self-Reproach
* Self-Pity
* Irritability and Hostility
* Anxiety—Psychic and Somatic
* Severity of Depressed Mood
* Retardation
* Visceral Symptoms
* Agitation
* Difficulty Falling Asleep
* Middle Insomnia
* Early Awakening with Difficulty in Falling Back Asleep
* Symptoms Increased in Morning
* Symptoms Increased in Evening
* Delusional Symptoms
* Obsessive Ruminations and Compulsive Acts
* Global Rating of Illness
* Feelings of Worthlessness
† Weight Gain
† Difficulty with Concentration
† Fatigue
† Quality of Depression
Historical
Present Age in Actual Years
Previous Episodes of Depression
Age of Onset of First Psychiatric Episode in Actual Years
Years Between First Psychiatric Episode and Present Hospitalization
Episodes of Mania or Excitement
History of Multiple Gyn. Concerns and/or Operations
Personality Features
Hysterical Features
Obsessionalism
Inadequacy
History of Emotional Reactivity
Apparent Precipitant
Rating of Apparent Precipitant Prior to Onset of Symptoms
Rating of Apparent Precipitant Prior to Admission
Contributing Menopausal Symptoms

* Items included in Factor Analysis.
† Excluded because a significant number of patients were unrateable retrospectively.

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significant number of patients were unrated on them. (See Table II). For interest the factors were also examined after being rotated by the Varimax method, but we have followed the lead of Hamilton and of Kiloh in restricting our consideration to the natural factors.

C. *Findings*

The first five factors extracted accounted for 93·6 per cent. of the variance and therefore can be assumed to account for all significant factors. This study concentrated on the first factor, which accounted for 35 per cent. of the variance.*

The items loading heavily (>·40) on our Factor I are a group of signs and symptoms which correspond closely to this classical pattern of "endogenous depression". (See Table III.)

TABLE III

Factor 1 with Item Loadings

Item	Item Loadings
Middle Insomnia	·70
Global Rating of Illness	·66
Severity of Depressed Mood	·65
Morning Insomnia	·59
Retardation	·55
Guilt and Self-Reproach	·50
Weight Loss	·45
Delusional Symptoms	·44
Visceral Symptoms	·44
Agitation	·44
Loss of Interest	·42
Early Insomnia—Difficulty Falling Asleep	·37
Feelings of Worthlessness	·35
Insidious Onset	·35
Long Duration	·31
Obsessive Ruminations and Compulsive Acts	·27
Anxiety—Psychic and Somatic	·17
Hypochondriacal Attitude	·10
Suicidal Thought or Behavior	·10
Symptoms Increased in Morning	·08
Fluctuation of Illness	·04
Symptoms Increased in Evening	−·13
Irritability and Hostility	−·20
Self-Pity	−·22
Reactivity of Depression	−·26

* The complete factor analysis can be obtained by writing to the authors.

These include especially middle of the night and early morning insomnia, severity of depressed affect and global rating of illness, retardation, guilt and self-reproach, weight loss, visceral symptoms, agitation and loss of interest. Delusional symptoms, while not defined as part of the endogenous pattern, also loaded highly (although uncommon in the patient population).

Items with intermediate loadings (·20–·40) were early insomnia, insidious onset, long duration, and obsessive and compulsive symptoms. Negative intermediate loadings included reactivity, self-pity, and irritability.

Items with negligible loadings (<·20) include diurnal variation, both morning and evening, anxiety, spontaneous fluctuation, hypochondriacal attitude and suicidal behaviour.

It is to be noted that negligible loading of a trait does not imply that the trait is not seen with the pattern but rather that it is not distinctive to this pattern. For example, "diurnal variation with symptoms increased in the morning" is quite common in the patient population, but does not load, since it is found among patients both with and without the endogenous symptom pattern. On the other hand, delusional symptoms were relatively uncommon even among patients typical of the endogenous pattern, but nevertheless loaded fairly high. This is because, when present, delusional symptoms correlated with the endogenous symptoms.

To determine how well each patient corresponded to this pattern of symptoms, a "*factor score*" was calculated for each patient on Factor I. This was obtained by multiplying the adjusted loading of each item by the patient's rating on that item and summing these products.

Table IV gives the correlation between the ratings on the individual items and the resultant factor score. As expected, the correlations are approximately equal to the loadings, as the factor score represents the factor as a whole. The statistical significance of these correlations is also given.

For easier reference the factor scores are referred to below in terms of standard deviations from the mean. We chose not to use the raw scores since we felt that they would be less meaningful to others.

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TABLE IV

Correlations of Factor Score and Item Rating

Item	Correlation of Factor Score and Item	Significance of Correlation
Middle Insomnia	·76	P < ·01
Global Rating of Illness	·71	P < ·01
Severity of Depressed Mood	·68	P < ·01
Morning Insomnia	·62	P < ·01
Retardation	·59	P < ·01
Guilt and Self-Reproach	·54	P < ·01
Weight Loss	·47	P < ·01
Delusional Symptoms	·46	P < ·01
Visceral Symptoms	·47	P < ·01
Agitation	·46	P < ·01
Loss of Interest	·45	P < ·01
Early Insomnia—Difficulty Falling Asleep	·39	P < ·01
Feelings of Worthlessness	·34	P < ·01
Insidious Onset	·37	P < ·05
Long Duration	·32	P < ·05
Obsessive Ruminations and Compulsive Acts	·28	P < ·05
Anxiety—Psychic and Somatic	·17	N.S.
Hypochondriacal Attitude	·13	N.S.
Suicidal Thought or Behavior	·09	N.S.
Symptoms Increased in Morning	·08	N.S.
Fluctuation of Illness	·04	N.S.
Symptoms Increased in Evening	−·14	N.S.
Irritability and Hostility	−·21	N.S.
Self-Pity	−·24	N.S.
Reactivity of Depression	−·28	P < ·05

V. THE PREMORBID PERSONALITY

A. *Historical Background*

Many authors have held that patients with the endogenous pattern of symptoms tend to have a relatively well-adjusted premorbid personality, as opposed to patients with neurotic or reactive depressions. Gillespie (1926) referred to such premorbid traits as "energy", "ambition", "cheerfulness", "sociability", "vigorous", and "enterprising" in his autonomous patients, who also showed a relative absence of the character traits of the reactive group. In the latter the "personality defects" included "neurotic personalities", "alcoholism", "hysterical" and "hypochondriacal" symptoms, "worrying", "shyness", and "emotionality". For support, Gillespie cited Lange, of the Kraepelinian school, who had described simple syntonic and cycloid personalities in true melancholics as compared to a variety of psychopathic personality types in "psychically produced melancholias". Subsequently Lange (1928) again emphasized the preponderance of cycloid personality in manic-depressives.

Ross (1926), Buzzard (1930), and Crichton-Miller (1930) emphasized the well-integrated personality of depressives as compared to psychoneurotics (with mention of such traits as intellect, energy, conscientiousness, and sociability). Astrup *et al.* (1959), in a recent extensive study of 270 patients with manic-depressive and reactive affective psychoses followed up after 7–19 years, noted that manic-depressives, in contrast to reactive depressives and schizo-affectives, have predominantly "syntonic and well-integrated personalities" before and between attacks. Astrup also cited Lange and Kraepelin as noting that manic-depressives were "free of symptoms" between attacks. Roth (1959) in a paper on the phenomenology of the depressive states noted that endogenous depressives had well-adjusted premorbid character in contrast to the unstable or psychopathic personalities of

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neurotic depressives. In 1963 Kiloh and Garside found negative loadings on their endogenous factor of premorbid personality defects, especially hysterical character, implying that these characterological defects tend to be absent in patients with endogenous symptoms.

Ewalt and Farnsworth (1963) emphasize that patients with purely affective disturbances tend to recover rather fully between attacks, while milder depressions and those with neurotic symptoms may have been chronic before being seen and may tend to become more chronic afterwards. This chronic hypochondriacal pattern may be what is referred to as neurotic premorbid character by the European writers.

Analytically orientated writers, following the classical paper of Abraham (1924), have emphasized obsessive-compulsive features in the premorbid personality of melancholics. The endogenous feature of a well-adjusted personality before and between attacks includes such non-pathological but obsessive traits as "ambition, industry, conscientiousness", etc. (and those who successfully use these adaptive obsessive traits are considered "well-adjusted").

B. *Methodology*

The patients were rated on premorbid hysterical personality, obsessionalism, inadequacy and emotional reactivity. These premorbid personality traits, which were independent of the factor analysis, were then correlated with the factor scores which had been calculated for each patient. Hysterical personality was found to correlate significantly at the ·05 level with the factor scores. The other personality traits did not correlate significantly.

For the purpose of this study, hysterical personality was defined thus:

> "The hysterical personality is egocentric, exhibitionistic, and overdramatic, sometimes to the point of lying. Affect is labile, as she goes through the motion of feeling. Although there is provocative sexual behaviour, there is a fear of sex. She is immature sexually and otherwise. The typical hysteric is usually suggestible, and is often demanding and dependent."

This definition was taken from Lazare and Klerman (1964), who had reviewed the psychiatric literature.

C. *Findings*

The factor scores correlated negatively (−·28) with hysterical premorbid personality.

To test the correlation further, the patients were divided into three groups, by their rating on "hysterical personality". These groups were: "barely or not at all hysterical", "somewhat hysterical", and "very hysterical". The mean of the factor scores for each group of patients was calculated, and the results can be seen in Table V. The "barely or not at all hysterical" patients averaged ·81 S.D.'s higher on Factor I than the rest of the patients, implying that those *non-hysterical* patients tend to have depressions which are more typical of this symptom pattern.

TABLE V

Correlation of Factor Scores with Hysterical Character

Patients Grouped by Presence or Absence of Hysterical Character	
Patient Group	Mean Factor Score of Group (S.D.'s)
Barely or not at all Hysterical (N=25)	+·41
Somewhat Hysterical (N=12)	−·40
Very Hysterical (N=10)	−·40

(Three Patients Unrated)

VI. Apparent Precipitants and Reactivity to Environmental Change

A. *Historical Background*

The depressed patient's initial reaction to the environment (apparent precipitant of the depression) and his subsequent reactions to it (reactivity) are related items and must be considered together. Gillespie considered the reactivity of the depression to environmental change his cardinal point in the differentiation of reactive and endogenous depression. He noted that the endogenous depressions had "at most" an initial precipitant but later seemed to proceed autonomously without regard to environmental change. Even this initial precipi-

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tant, however, was less likely to be found in the endogenous group. Gillespie cited the previous distinction of the Kraepelineans Lange and Cimbal between melancholia and "psychogenic or psychoneurotic depressions" and Lange's finding that in melancholia there is a lack of reactivity of the depression to the environment.

Ross (1926), Crichton-Miller (1930) and Buzzard (1930), as well as Mayer-Gross *et al.* (1960c) and Kiloh and Garside (1963) more recently, have all referred to reactivity as an important distinction between reactive and endogenous depression. Muncie (1939) noted that pathological depression differed from "normal depression" by its greater fixity (less reactivity) and disproportion to the causative factors.

Lange had recognized a "psychically produced melancholia" with similar symptoms to endogenous melancholia but precipitated by some external event. While there is a consensus that there is *less likelihood* of finding an apparent precipitant in "endogenous" patients, most writers agree with Gillespie that *a precipitant may be found.* Many note, however, that when a precipitant is found it often appears inadequate to explain the depth of the depression. Riddoch (1930), while acknowledging that an apparently causeless onset is common, emphasized that this is not invariable and that there are sometimes precipitants. Astrup *et al.* (1959) found that the first attack is often precipitated but that in later relapses it is often difficult to find a precipitant. Roth (1959) felt that endogenous depression may follow misfortune but that the depression is out of proportion to the stimulant. Mayer-Gross *et al.* (1960d) noted that "causes" may actually be symptoms or results of the onset of the illness. They believed, however, that there are sometimes real precipitants but that the responses are of abnormal intensity and duration and future attacks in the same patient may be without precipitant. Kiloh and Garside (1963), in a factor-analytic study, found heavy negative loadings of apparent precipitant and reactivity on their "endogenous" factor, while Hamilton and White (1959) found that patients with no obvious precipitants scored high on their retarded depression factor. Both of these findings imply that precipitants are unlikely to be found in patients with the endogenous symptom pattern. Only Crichton-Miller (1930) took the stance that environment had no effect at all and that any effects seen were "lay misinterpretations". Ewalt *et al.* (1963) and Noyes *et al.* (1963), on the other hand, feel that there is always a psychological triggering (in a genetically predisposed personality). They note, however, a decreased reactivity to the environment in "acute" or "severe" depressions once the process has begun.

B. *Methodology*

The patients had received ratings on "apparent precipitant prior to onset of symptoms", "apparent precipitant prior to admission" and "contributing menopausal symptoms". These ratings were correlated with the factor scores and "apparent precipitant prior to onset of symptoms" was found to correlate significantly at the ·05 level.

C. *Findings*

The factor scores were found to correlate negatively (−·29) with "presence of apparent precipitant prior to onset of symptoms". This supports the observation that patients without an apparent precipitant are more likely to be found with this cluster of symptoms, and therefore to score high on the factor. While statistically significant, however, this correlation is relatively low and tends to reinforce the feeling that absence of a precipitant, while more likely, is *not* a prerequisite for the endogenous pattern.

We again divided the patients into three groups, this time by their rating on apparent

TABLE VI

Correlation of Factor Scores with Presence of Apparent Precipitant

Patients Grouped by Presence of Apparent Precipitant	Mean Factor Score of Group (S.D.'s)
Patient Group	
Precipitant Absent (N=10) ..	+·45
Precipitant Doubtful (N=17) ..	−·08
Precipitant Present (N=20) ..	−·26

(Three Patients Unrated)

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precipitant. These groups were: "precipitant absent", "precipitant doubtful" and "precipitant present." The mean of the factor scores was calculated for each group of patients and the results can be seen in Table VI. They showed the patients with absent precipitant to average ·71 S.D.'s higher on Factor I than those with precipitant present.

VII. Age

Increased age correlated +·31 with the factor scores. When the patients were divided into age groups, it became evident that the mean of the factor scores of patients under 40 years old was strongly negative, while that of patients between 50 and 60 years old was the most positive. These results can be seen in Table VII.

Table VII

Correlation of Factor Scores with Age

Patients Grouped by Age	
Age Group	Mean factor Score of Group (S.D.'s)
<40 (N=10)	−·65
40–50 (N=10)	+·06
50–60 (N=20)	+·30
>60 (N=10)	−·02

The influence of age on endogenous and reactive depressions has far less discussion in the literature than that of precipitant and premorbid personality, although Kiloh found a correlation between age over 40 and his endogenous factor. It is generally felt that manic-depressives often have their first onset before forty. In our population, however, it was clear that patients below 40 were unlikely to have this group of symptoms, while patients between 50 and 60 were more likely to have it.

VIII. Comparison with Other Studies Using Factor Analysis

A. *Introduction*

Max Hamilton (1960) and his colleagues (1959) in a series of two papers applied factor-analytic methods to symptom patterns in depression. Hamilton rated 49 male patients on 17 items by two raters. (Note that our patients are all female.) Four factors with a total variance of 51 per cent. were discussed. The first factor, which was called "retarded depression", largely corresponds with the endogenous depression pattern and is similar to our Factor I. Heavily loading items on this factor were severity of depressed mood, guilt, retardation, loss of insight, suicidal tendencies, loss of libido and loss of interest. Hamilton and White obtained a factor score for each patient on this first factor. Then, as we have done, they compared this symptomological classification with the classification obtained by rating the patients on presence or absence of precipitant. They divided their patients into four groups ranging from "no psychological precipitating factors" through two "doubtful" categories to "obvious precipitating factors". The group mean scores became progressively higher going from the group with obvious precipitants to the group with no apparent precipitants, implying that the patients without apparent precipitants were more typical of this factor. Our findings coincide with this finding of a correlation between the absence of an apparent precipitant and the patient's score on an "endogenous" factor.

Kiloh and Garside (1963) applied factor analysis to 35 characteristics rated on 143 depressed patients. Their sample was made up of mixed males and females, with females predominating in a 5:2 ratio. Simple summation factor analysis was carried out. Two factors were derived. The second factor was felt by the authors to differentiate "between neurotic and endogenous depression". The heaviest loadings were on early awakening, retardation, and diurnal variation with symptoms increased in the morning while there were heavy negative loadings on reactivity of the depression, presence of an apparent precipitant, and premorbid hysterical character. The factor was bipolar (that is, with both negative and positive loadings) and from this a division of the sample into two independent groupings was inferred. There is no information, however, as to the actual distribution of the patient sample on factor scores derived from this bipolar factor.

Other factor-analytic studies by Grinker *et al.* (1961), Friedman *et al.* (1963), and Overall (1963) did not produce factors similar to ours.

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TABLE VIII

Loadings on Hamilton Factor I and Rosenthal-Klerman Factor I

	Loadings on Hamilton Factor I	Loadings on Rosenthal-Klerman Factor I
Items Loading > ·40 on Hamilton Factor I		
Severity of Depressed Mood	·76	·66
Guilt and Self-Reproach	·73	·50
Retardation	·68	·55
Suicide	·53	·10
Loss of Interest	·46	·42

TABLE IX

Loadings on Kiloh-Garside Factor II and Rosenthal-Klerman Factor I

	Loadings on Kiloh-Garside Factor II	Loadings on Rosenthal-Klerman Factor I
Items Loading > ·40 on Kiloh-Garside Factor II		
Early Insomnia—Difficulty Falling Asleep	·69	·59
Retardation	·55	·55
Symptoms Increased in Morning	·53	·08
Items Loading < − ·40 on Kiloh-Garside Factor II		
Reactivity of the Depression	− ·60	− ·26
Apparent Precipitant	− ·48	− ·28*
Hysterical Character	− ·41	− ·29*

* These scores are correlations with the factor scores.

B. *Comparison of the Items Comprising the Three Factors*

Our Factor I was now compared with Hamilton's Factor I and Kiloh and Garside's Factor II. The items loading on the factors were compared first. Those items loading heaviest on Hamilton's Factor and Kiloh's Factor which also correspond to items scored in our study are presented in Table VIII and Table IX. Also presented are the corresponding loadings of the items on our factor (or the correlations of the items with our factor scores). There is considerable apparent similarity between the items which loaded heavily on these two factors and those which loaded heavily on our own factor. This kind of comparison, however, could only be an approximation, as the number and content of the items included in the three factor analyses were not entirely identical.

C. *Correlations Among the Factor Scores*

A more significant comparison was made after scoring our patients on these factors. Our patients were scored on Hamilton's Factor and on Kiloh's Factor by using *their* factor loadings with *our* patient's item ratings. We used those items which corresponded to items rated in our study, using the eight items which loaded heaviest on Hamilton's Factor and the eighteen heaviest on Kiloh's Factor to calculate factor scores. Occasional items such as "loss of insight" from Hamilton's study and "quality of the depression" from Kiloh's study had to be omitted, as we did not have ratings on them.

Thus each of our patients was given a score on our factor, on Hamilton's Factor, and on Kiloh's Factor. These three sets of scores were correlated using the Spearman Rank-Order Correlation Coefficient. The factor scores on our factor were found to correlate + ·80 with

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the factor scores on Hamilton's Factor, and +·68 with the factor scores on Kiloh's Factor. The correlation between the factor scores on Hamilton's Factor and those on Kiloh's Factor was +·60. The Kendall Coefficient of Concordance among the three sets was +·80. All these correlations are significant at the ·01 levels. (See Table X).

TABLE X

Correlation of Patient Factor Scores on Rosenthal–Klerman Factor I, Hamilton Factor I, and Kiloh-Garside Factor II

Our Factor with Hamilton's Factor	·80
Our Factor with Kiloh–Garside's Factor ..	·68
Hamilton's Factor with Kiloh–Garside's Factor	·60

(All significant to $P < ·01$)

IX. Discussion

A. *General Implications*

This factor-analytic study attempted to test the concept of endogenous depression as a three-part pattern consisting of a particular clinical picture of depressive symptoms and signs, a relatively well-adjusted premorbid personality, and less likelihood of an apparent precipitating event prior to onset. The study is limited, being a retrospective case record study of a fairly small sample of 50 female patients. As is commonly found in retrospective studies, the patients' physicians did not always record all the items that were being rated. It may also be objected that these ratings are based on information recorded by psychiatrists who presumably had read the textbooks and had certain expectations of symptom clustering.

Within these limitations we find some interesting and potentially important results, and a partial validation of the consistency of the three-part endogenous pattern.

The items loading on our first factor largely correspond to the clinical symptoms and signs commonly associated with endogenous depression. Factor scores derived from this factor correlated negatively with hysterical premorbid personality and with presence of an apparent precipitant prior to onset, items which were independent of the factor analysis. These correlations are not high, however, and while statistically significant, only imply a tendency for hysterical character and apparent precipitant not to be found in patients with high factor scores. These findings lend support to the three-part definition of the endogenous syndrome.

The comparisons of our Factor I with Hamilton's Factor and Kiloh's Factor were of considerable interest. In so far as the items which were rated corresponded from study to study, the heavily loading items were found to be similar on each of the three factors. More importantly, scoring our study patients on the three factors allowed us to demonstrate highly significant correlations and concordance between the three sets of factor scores. This is especially encouraging when one considers that these three factors were originally derived from different populations with different sex ratios, indeed in different countries. These results lend support to the concept that our principal factor replicated Hamilton's Factor and Kiloh's Factor. It also appears that not only is such a factor applicable to the population from which it was extracted but it can be used to group other populations of depressed patients. This also would imply that the endogenous pattern is not sex-determined, nor specific in one locality.

It must be emphasized that item loadings should not be considered a description of the clinical picture. The loading for each item is approximately equivalent to the *correlation* of that item with the entire pattern. Therefore a negligible loading does not imply that the item is uncommon in any segment of the population, but only that it is evenly distributed. Correspondingly, a high loading does not imply the frequent presence of the symptom but that its presence (when present) correlates highly with the rest of the pattern. Thus, in summary, the loading is a measure of how well the item discriminates this pattern of symptoms, rather than a measure of its frequency or its presence in a clinical syndrome or type (i.e., fever is part of the clinical picture of pneumonia but does not discriminate it from other infections). What are presented here are symptoms and signs which are found to be covariant.

It can be objected that the "endogenous" pattern could be interpreted primarily as a

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more severe depression, as held by many American authors (Ewalt and Farnsworth, 1963); Noyes and Kolb, 1963). The pattern (factor score) does correlate with severity of depressed mood and global rating of illness. There are, however, patients with low severity scoring high on the pattern and conversely patients with high severity scoring low on the pattern, and it thus does not seem to be a function of one variable alone. The American authors do describe under "acute depression" a pattern very similar to the one referred to as endogenous depression. While the description is the same, the interpretation given is different. If the existence and consistency of the pattern is agreed upon, the question becomes whether this pattern represents one end of a distribution along a severity continuum or whether it defines a distinct group of patients. This difficult question has not yet been answered.

An explanation of this pattern on a neurotic-psychotic basis does not seem adequate. Historically, patients who were hospitalized tended to be, *ipso facto*, considered psychotic. Few of our hospitalized patients were demonstrably psychotic however, and even those varied during the course of the illness.

B. *Problems of Aetiology*

The existence of this clinical pattern is frequently interpreted as presumptive evidence for an organic or metabolic aetiologic viewpoint. This is reinforced by the use of the designation "endogenous" depression which has been adopted through common usage. We do not consider however, that an organic or metabolic aetiology for this pattern has been established at present. There is a suggestion that patients who are typical of the "endogenous pattern" are patients (perhaps with a genetic predisposition) in whom a depressive process may begin either with or without an initial precipitant, and then run its course autonomously, largely independent of environmental influences, unless interrupted by ECT or antidepressive medication. This is however only a suggestion, and our discussion of a clinical pattern of signs and symptoms, premorbid personality and apparent precipitant does not imply any theory of aetiology, but is presented as an empirical finding.

C. *Differential Response to Treatment*

Patients scoring high on this pattern of symptoms should be tested for differential therapeutic responses. There has long been a clinical impression that patients with "retarded" or "endogenous" depressions have better responses to ECT than more "neurotic" patients. When imipramine was introduced as an antidepressant drug the early papers by Kuhn noted that patients with "endogenous depressions" tend to react more consistently than other depressive patients, including those with "reactive depressions". (Kuhn, 1958). This finding has subsequently been repeatedly confirmed (Kiloh *et al.*, 1962; Leyberg and Denmark, 1959). The definition of "endogenous" which was used was sometimes unclear, however, and further investigation will be useful.

D. *Further Research on Classification*

We do not hold a dualistic view of depressive illness. Whether this depressive pattern constitutes a specific illness or the end of a spectrum is not determined. If, however, this pattern does define a group of patients with a specific illness, there is no reason to consider the remainder of the depressive population a homogeneous group of "reactive depressions". In addition to simple "reactive depressions" the remainder of the depressive population may include such varied illnesses as involutional and post-partum depressions, as well as depressions in patients with character disorders, hysterical characters and chronic depressed characters. Clearly, further study of these multiple aspects of depression is necessary.

X. Summary

The concept of endogenous depression was examined, and it was found to consist historically of three elements: a particular clinical picture, a relative absence of environmental influence on the precipitation or subsequent course of the

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illness, and a relatively well-adjusted premorbid personality.

To examine the consistency of this concept a factor-analytic study was undertaken on 50 hospitalized depressed women. These patients were retrospectively rated on 25 clinical symptoms and signs and these ratings were then correlated and factor analyzed.

Our results showed a strong first factor which corresponds closely with the classical symptoms and signs of "endogenous" depression. The factor scores on this factor correlated negatively with presence of apparent precipitant and negatively with hysterical character to suggest confirmation of the other two aspects of the "endogenous" pattern.

It is shown that corresponding factors in other studies approximately reproduce the items loading on this factor. When applied to our patients these factors produce factor scores which correlate highly with our factor scores and select substantially the same patients in the same distribution.

Our study has attempted to place emphasis in the following areas:

1. The importance of correlating patient scores on a clinical factor with ratings on independent characterological, historical and aetiological data;
2. The testing of consistency of factors from study to study;
3. The information presented in this paper does not necessarily imply the existence of a distinct group of patients with these endogenous characteristics. It does, however, imply that these characteristics are covariant and tend to be found together. Before speaking of a distinct "type of depression" from a factor, it is necessary to examine the distribution of factor scores and the discriminating characteristics of the proposed group.

We expect to examine this endogenous pattern in several ways. It will be investigated for therapeutic discrimination with imipramine and placebo and perhaps used to select patients for biochemical studies. We expect the current study to lead to a clinical study in which we will examine a larger population with rater reliability studies. We will further evaluate characterological data at this time.

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