A Multifactorial Study of Life Events in Depressed Patients

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ABSTRACT

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The aim of this study was an attempted elucidation of the possible pathogenic role of life events in the onset and development of depression. Although several authors seem to agree that the impact of life events should be seen in relation to the person experiencing them, no comprehensive studies have been published so far where life events have been analysed in relation to the vulnerability of the individual who becomes depressed. The present study was inspired by Freud's concept of "Ergänzungsreihe", and was based on the general assumption that biological as well as psychological and social factors contribute greatly to modifying an individual's vulnerability to external events.

To test this hypothesis the occurrence of life events was studied by means of a semistructured interview in a consecutive series of 206 depressed patients of both sexes treated as in- or outpatients, and the results have been analysed in relation to a series of variables which could be assumed to be of importance in modifying the vulnerability of the patients. The main hypothesis was that the more vulnerable the individual was in relation to each of the investigated factors, the fewer events would be necessary to produce a depressive breakdown and the more negative would be the experience of such events. Biological, psychological and clinical variables were taken into account in different parts of the present study.

The results support the view that the impact of life events should be seen idiosyncratically and in relation to the specific vulnerability of each individual. Furthermore the study illustrates a fruitful approach for further studies aimed at a closer understanding of the role of external events in the development of a depressive illness.
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BY

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This dissertation is a summary of the following papers:


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INTRODUCTION

There are many ways in which normal human experience can become traumatic and the psychiatric and psychological literature described in detail the various stress situations which can lead to behaviour characteristic of adaption failure and even to a state of sickness. Those who work within health care services often find that the patient has been exposed to one or a series of other experiences just prior to sickness and it is in many cases assumed that these exert a certain influence on the patient's illness. However, the nature and extent of this influence are often not clearly defined. In modern approaches to depression, interest has been directed to the identification and evaluation of so-called "precipitating events" and attempts to map them systematically have been made.

In this paper a brief review will be presented initially which covers research relevant to a systematic account of life crises in terms of life events, its occurrence and further development and its application primarily to studies of depression. Subsequently an account of the particular studies of life events and depression which have been carried out at the Psychiatric Department, Umeå University, during the period 1977-1981, will be given.

The implications of the term "life events"

The term "life events" includes all types of events which are normally encountered in life and which, when they occur, produce some kind of change in the individuals usual routine, i.e. in what might be called his temporary homeostasis. Examples of life events are "getting married, becoming a parent, the loss of some close relative, becoming unemployed, etc." As seen from these examples the term does not refer to unpleasant events alone but includes those of a positive character, i.e. the concept of "life events" encompasses all those experiences which require the individual to adapt to a new situation.
HISTORICAL SURVEY

General

It has long been known that different experiences can affect the state of mind of the individual and the connection has been interpreted on the basis of the knowledge which existed at that particular time. Within psychiatry especially, the importance of a psychic trauma, triggered by a specific experience, for the development of various psychic syndromes has long been recognized. Such observations already appear in the psychiatric literature of the 19th century. Obersteiner and Griesinger, for example, both of whom were active in the 19th century, assigned great importance to psychic trauma for the occurrence of psychiatric illness. The mechanisms of such influences were explained by these authors in terms either of deficiencies in nutrient supply to the brain or of disturbances to the reflexes of the sympathetic nervous system.

Within the advent of Freud and psychoanalysis attention was paid to the possible symbolic importance of psychic traumas, an approach which opened the way to research aimed at assessing the relevance of specific experiences (in particular object loss) to the occurrence of psychic disturbances.

In psychology, on the other hand, interest for life-events as such has been limited. Studies have been directed rather to the way the individual copes with and adapts to different traumatic situations.

Psychophysiological research and development of the concept of stress

The modern studies of life events, which began in the 1960's, originated in the psychophysiological research of the 1930's. Cannon, one of the outstanding workers in this field (Dohrenwend 1974) laid the foundations of more systematic experimental research which showed that an emotionally charged stimulus produced changes in basal physiological processes. Such results provided a necessary link for substantiating the hypothesis that traumatic events can be damaging to health. The way in which these physiological changes progressed to pathological
states could not, however, be explained at that time. A theory, which later formed the basis for research into life events, gradually emerged from the work of Seyle who introduced the concept of "stress" and described the "General Adaptation Syndrome".

**Psychophysics**

Psychophysics, which was developed during the 1940's and 1950's, was of special importance for the later establishment of quantitative methods of measuring life events. Through studies of perception concerning the quality, quantity and intensity of physical phenomena, it became possible to demonstrate the ability of the individual to quantify a whole series of subjective experiences (Stevens and Galanter 1957; Stevens 1966).

On the basis of these discoveries it was assumed that the individual could not only quantify psychophysical phenomena but also those of psychosocial character, i.e. life events of different kinds (Holmes and Masuda 1974; Dohrenwend 1974).

**Biological and psychosocial approach**

The psychobiological approach, which appeared during the 60's and which was recommended by Adolf Meyer, a contemporary of Cannon, was of importance for research into life events. Meyer, who was a psychiatrist, proposed that the individual should be regarded from an overall perspective, where biological, sociological and psychological factors should be included. He constructed a "life chart" (Meyer 1951) for each patient where important events and experiences in the life of the patient were recorded in chronological order. In this way he obtained an overall picture of the relationships between different events and the state of health of the individual at different times which showed that life events were of importance for the occurrence of illness and that these events did not necessarily have to be bizarre or catastrophic to be pathogenic.

Later on, research into life events and illness comprised, initially, unsystematic observations of the types and numbers of events which oc-
curred in connection with sickness. From these studies it was concluded that a concentration of life events, from an etiological point of view was a necessary, though not sufficient prerequisite for illness (Holmes and Rahe 1967). More advanced theories and models for the relationship between life events and sickness were not available at that time.

The concept of stress

Modern research into stress, which began with the concept of stress presented by Seyle in 1956, is of fundamental importance for the growth of a theory for the link between life events and illness. This research developed from the knowledge accumulated in the 30's and 40's in the field of psychophysics and represents a milestone for a new approach concerning the inter-relation of man with his environment.

Seyle, in 1946, published a paper in which he described what he termed "The General Adaptation Syndrome" (GAS) by which he intended "the complete series of events that occur within the organism which is caused by the influence of long-term stress". Of special importance in this respect is that the sequence of responses is largely independent of whether physical or psychical stress factors are operative. The most important of the defense mechanisms of the organism are activated by the autonomous nervous system and by the endocrine glands. Under stress, the finely-tuned interactions which exist between different nervous and hormone functions are redistributed. In many cases, particularly where physical stimuli are involved, these reactions are completely functional whereas in some other cases the reaction corresponds poorly to the precipitating factor. The latter appears to be especially true for psychic stimuli.

From "the General Adaptation Syndrome" the concept of stress, with which Seyle implied, "the non-specific response of the body to any applied stimulus whatsoever", gradually emerged. Every factor which could produce stress was called by Seyle a "stressor". A "stressor" could include physical (bacteria, virus), psychical and social factors (hurry, grief, unsuitable work, lack of social contact). Later on, the concept of GAS especially as concerns the non-specificity of the response of the living
organism has been repeatedly criticized (Hinkle 1974; Lazarus 1974).

Also the term stress has not, however, been used consequently by later researchers. Some have defined it in terms of stimuli or "stressors" (e.g. electric shocks, loss of close relative) which produce changes in the organism (Basowitz et al. 1955; Gordon et al. 1961) while others have implied the results of such stimuli in their definitions (increased blood pressure, breakdown (Dohrenwend 1961)) or have meant the emotional condition which follows a change in the personal or social situation (e.g. anxiety, frustration (Barrabee 1953)).

A number of models exists which illustrate the reaction to stress and its role in the development of sickness. One example is that of Levi (1974) which rests on several hypotheses e.g. every psychosocial change can represent a stressor. As a response to such an exposure and in accordance with phylogenetic adaptation patterns, which modern man has in common with his prehistoric ancestors, the neuroendocrine system is activated to prepare the organism for physical activity, e.g. to fight or flight, even in situations where such reactions are inadequate. The resulting increase in stress can produce wear or damage in the organism which, in predisposed individuals, can lead to some kind of illness. Thus, research into stress is founded on the assumption that there exists a relationship between psychosocial stimuli and states of illness.

Methods of research into life events - SRRS-scale

Real research into life events began in 1967 when Holmes and Rahe presented their SRRS scale (Social Readjustment Rating Scale) which later formed the basis of most publications in the field. These authors, inspired by Meyer's "life charts", by Cannon's psychophysical experiments which demonstrated the ability of the individual to quantify subjective experiences, and from their own clinical observations and experiments, had produced a list - The Schedule of Recent Experience (SRE) - of 43 different events which they considered to be of special importance for most people. Subsequently, with a procedure similar to that used in psychophysics 394 persons (a heterogeneous group with regard to age, social status, race, religion, profession etc.) were asked to make subjective
assessments of the degree of adaptation which each event demanded, irrespective of whether it was positive or negative and without placing it in a definite context. One specific event was chosen as a reference (in this case "marriage" which was assigned a value of 500) with which all other events were to be compared. Average values were then calculated for each event and these were termed LCU values - Life Change Units.

Further development of the SRRS-scale

The scale has been subjected to a number of tests and revisions. It has been tested in different homogeneous groups with respect to sex, ethnic origin, age, education and social status. The results have shown that, in general, a common system of values exists for these groups but that significant differences are also evident (Ruch and Holmes 1971; Bramwell 1971; Coddington 1972; Rahe et al. 1971). The latter observation has led to several revisions of the scale, made with regard to the purposes to which it is to be used (Bramwell 1971). Lei and Skinner (1980) have questioned the need for a weighting procedure since they found from their studies that no additional information was gained in comparison with simple registration of events without weighting. The revisions to the scale proposed by Paykel et al. (1971) included a clarification of the events which were already present in the SRRS scale, the addition of several extra events and the adoption of a new assessment procedure. Subjects, to whom the scale was applied, were requested to assess events in terms of the degree of "upsettingness" they caused and to state which events they had personally experienced.

New scales, based on SRRS, have been proposed by e.g. Cochrane and Robertson (1972), Brown and Harris (1978) and Jenkins et al. (1979).

Dimensions of life events

Tennant and Andrews (1976) constructed a scale based upon both Holmes and Rahe's SRRS scale and the related scale of Paykel et al. These authors had test-subjects to assess the same event on two separate occasions, firstly by the degree of "change" and secondly by the degree of "upsettingness". The results showed that the range order of the events
on the new scale was essentially the same on both occasions and when compared with both the original scales. On comparing the correlations between events for the new scale and for different occasions, however, it was found that very low correlations were obtained in certain cases, i.e. high "life change" score for a particular event did not necessarily correspond with a high "upsettingness" value. The authors concluded that "life change" and "upsettingness" measured two different aspects of a life event. Ruch (1977), in a later study, has pointed out that life events have at least 3 dimensions: the degree of change evoked, the desirability of the change, and the life area in which the event occurs. In addition to the fact that the life change data are multidimensional his analyses also indicated that the quantitative dimension (degree of change) is more primary than the qualitative dimensions (desirability of life change and area of life change).

Other authors who have tried to illustrate the dimensions of the term "life change" itself, have characterized life events in terms of "exit" from and "entrance" to the social field (Myers et al. 1972; Paykel 1974) in terms of "gain" and "loss" (Brown 1974; Gunderson and Rahe 1974) in terms of the "control" which the individual has over the event in question (Paykel 1974) and in terms of the "subjective" or "objective" perception of life change (Thurlow 1974).

In summary, the scale of Holmes and Rahe and its variants have been applied in several studies involving both somatic and psychiatric patients and comprehensive reviews are available (Dohrenwend and Dohrenwend 1974; Gunderson and Rahe 1974). Even though many questions concerning the interpretations of results on life events remain to be answered, the general conclusion that an accumulation of such events can be important for the occurrence of different disturbances seems to be valid.

DEPRESSION

The phenomenon of "depression" has been known for more than 2000 years but was originally called "melancholia". The term "depression" appears first in the middle of the 19th century when attempts were made by e.g. Kahlbaum (1863) to differentiate states of psychic disorder. The use of
the term "depression" as opposed to "melancholia" has been advocated by Adolf Meyer (1905). He considered that the concept of melancholia was too strongly linked with a certain etiology and a certain development and, for this reason, supported the use of a more neutral term. To him "depression" implied "maladaptive psychobiological reaction to stress" in that "all life is reaction either to stimuli of the outside world or of the various parts of the organism" and since etiology to mental illness involves both constitution and a precipitating factor it was his opinion that "the precipitating factor was of the greater importance". At present "depressed" has acquired a more general significance and in everyday language to describe despondent or sad. In consequence, opinions have been expressed during recent years that the term melancholia should be reintroduced to distinguish clearly between temporary depressive mood and a depression which has assumed the dimensions of sickness. Rafaelsen (1974), writes "the word depression has lost its fibre at the hands of enzyme chemists and pharmacologists, stockjobbers, and social reformers to the point it is now without distinct meaning". And he continues "in my view, manic-melancholic mode, pro tempore melancholia would be a more meaningful descriptive term for patients who are depressed ....". Ottosson (1980) in Sweden, has also advocated a return to the term "melancholia".

The greater the depth at which the problems of depression have been studied the greater the awareness has become of the complexity of this state. Although the older classifications of depression remain in use, new efforts are continuously being made to distinguish different subgroups. The premises in this respect have varied and in some cases etiological differences and similarities have provided the grounds for classification. In other instances descriptions of symptoms, course or response to different types of treatment, have been used as criteria for subdivisions. Nevertheless, it has become apparent that no single causal relationship exists and a multifactorial approach must be employed in such classification attempts.
Hypotheses on the origins of depression

Many hypotheses on the origins of depression have been formulated which reflect different theoretical approaches. For as long as depression had been regarded as part of the manic-depressive syndrome, the somewhat narrow opinion had prevailed that it was predominantly hereditary in nature. These ideas began to be questioned, however, following the birth and growth of psychoanalysis and, in particular, the pioneering work of Abrahams (1911, 1916, 1924) and Freud (1917). In addition, psychiatrists came more and more often in contact with depressed patients who could not be classified as manic-depressive. It was on the basis of these last-mentioned observations that Adolf Meyer recommended the term "depression" rather than the older term "melancholia" which was strongly linked with a biological (hereditary) etiology.

The original psychoanalytical hypothesis assumed depression to be an expression of introverted anger resulting from disappointment by or loss of an object, towards which ambivalent feelings were felt, at a very early stage of development. Even though later psychoanalysts have assigned less importance to introverted aggression and focused interest upon self-esteem instead, the conception of the importance of early object-loss has remained a cornerstone in psychoanalytical theories of the origins of depression. It has been assumed that the original trauma, which was caused by object-loss in early childhood could be re-activated later in life by new losses of real or symbolic objects (Mendelson 1974).

Other hypotheses have been based on cognitive, behavioural and learning theories such as, e.g. the reinforcement model (Blöschl 1978) which utilizes behavioural concepts. According to this hypothesis, depression is that behaviour which results from the loss of major sources of reinforcement followed by operant conditioning in the form of attention and sympathy. Depression, in this context, is linked to chronic frustration caused by stress from the environment which the individual cannot influence and which causes him to experience helplessness and to assume the sick-role (compare Seligman's learned helplessness (Seligman 1975)).
Beck (1967) considers depression to be the result of a primary disturbance of the thought processes, "the negative cognitive set". Such a negative thought pattern is assumed to produce the negative, or depressive emotion. This hypothesis has not, however, explicitly considered the causes of a "negative cognitive set" and has consequently been regarded as incomplete by modern psychoanalysts, e.g. Arieti (Arieti and Bemporad 1978).

Although it has long been assumed that depression arises from biological malfunctions in the organism it is only during recent years (Schildkraut 1965; Coppen 1967; van Praag 1973) that biological hypotheses on depression have become feasible, e.g. the biogenic amine hypotheses in which the proposed relationship is more specifically described. These hypotheses are based upon theories of changes in different transmitter systems within the brain, systems which have recently been shown to be connected with different biological processes which are changed during depression, e.g. arousal, sleep, appetite, sex drive and psychomotor activity. In this respect, interest, naturally, has also been directed to the enzyme systems, for example monoamine oxidase, which regulates nerve transmitter metabolism, and on their genetic control.

Hypotheses of a purely social nature are few (e.g. Becker 1964; Brown and Harris 1978) and have not, as yet, been subjected to extensive tests. They are not, however, less relevant.

Even though the researcher's choice of strategy for studying depression, which is normally influenced by the particular discipline which forms the basis of his professional work, may limit his research interests to only one of the above mentioned hypotheses, it appears to be generally accepted that each and every hypothesis proposed is able to explain only part of the complex psychic disturbance called depression.

Because of this it would be desirable in future research work to coordinate efforts within different basic disciplines, including natural, humanistic and social sciences.
RESEARCH ON LIFE EVENTS AND DEPRESSION

Early research

The existence of precipitating factors in connection with the occurrence of different depressive syndromes had been recognized and demonstrated already at the beginning of this century. In these studies however, no systematic surveys were made of all the possible events which might have occurred to the patients: only those factors or events which could be placed in immediate connection with sickness (psychic trauma, somatic complaints) were considered. Travis for example, reported in 1933 that precipitant factors had been found in all of the 70 manic-depressive patients which he had examined. Brew (1933) found that among 25 patients for whom precipitating factors were established, 23 complained more often of psychic rather than somatic factors.

The importance of psychic trauma for the occurrence of depression has been especially emphasized in Scandinavia where terms such as "reactive depressive psychosis" are frequently used.

The results of these early studies have provided a certain insight into the importance of external events for depression but they cannot be compared with later investigations where different measuring instruments for surveying life events have been employed.

Later studies

The more systematic studies of life events and depression can be divided into two large groups: 1) those where attention has been focused upon events occurring in early childhood which have been assumed to represent predisposing factors for depression; 2) those where attention has been paid mainly to the occurrence of life events, surveyed through special inventories, directly connected with the onset of depression.

Freud (1917) and Abraham (1924) had already emphasized the relationship between loss of a love object and depression. It was assumed further (Bowlby 1961; Brown 1961; Klein 1940) that the damaging effect of an object-loss in childhood could be re-activated by further losses occur-
ring later in life.

To test the first of these two proposals (i.e. that early parental loss could be a cause of depression) a number of research workers have compared the occurrence of early object loss, experienced as loss of or separation from either parent, in both depressed patients and different control groups. The results of these investigations (for recent reviews see Granville-Grossman 1968; Crook and Eliot 1980; Tennant et al. 1980; Lloyd 1980), showed a high occurrence of parental loss in childhood for the depressed patients, although depression could not be specifically attributed to this factor since early parental loss was found to be a common experience among other patient groups.

One finding which could be demonstrated in a series of studies of psychiatric patients was that early parental loss occurred more often for women than for men. Tennant et al. (1980) point out that most studies of depression involve hospitalized patients and thus the connection between early parental loss and psychic illness is more likely to be related to the tendency to seek help at a psychiatric service (Tennant et al. 1980). In our opinion another possibility is that early parental loss interacts with some, as yet, unknown factor which produces a higher vulnerability to depression in women. In fact Brown and his co-workers (Brown 1977; Brown and Harris 1978) found that early parental loss occurred more often in women who had experienced recent loss in connection with the onset of depression and these authors implied that depression arises only in the presence of a series of vulnerability factors. This conclusion has been supported by studies of Roy (1978) but has not been entirely unchallenged (Tennant and Bebbington 1980).

Systematic studies of life events in connection with depression

Systematic studies of life events in connection with depression began following the introduction of the above mentioned SRRS scale by Holmes and Rahe. Several research groups have presented results within this field. Paykel and co-workers, for example, have examined the question of life events and depression from different points of view and Paykel (1973, 1974, 1978, 1979) has reviewed the results of these studies. The
principal results can be summarized as follows:

Earlier studies showed an increased occurrence of several events for depressed patients compared with a matched control group. The most common events were marriage problems, divorce or separation, changes in working environment, serious illness or death within the family etc. Events were also divided e.g. into those which could be regarded as "undesirable" or "exit from the social field" and it was found that depressed patients not only reported more events than the controls but also a greater number of "undesirable" events or events of the "exit" type. The authors also compared depressed patients with other patient groups (schizophrenic and suicidal patients) and found that all groups had experienced more events that had the control group. Mean values of events over a six months period for each group of patients were: attempted suicides 3.3, depressives 2.1, and schizophrenics 1.5. For the general population group the mean number of events was 0.8.

Studies of the distribution of events for the period investigated showed a marked increase under later months for the suicidal patients, only a slight increase for depressives and an even level of occurrence over the entire six-months for the control group. The earlier finding that "undesirable" and "exit"-type events occurred more often among depressed patients was confirmed in these studies.

Paykel and his collaborators also attempted, on the basis of life events to distinguish endogenous depression in which life events are assumed to play a subordinate role. It was estimated that in 15% of the cases depression was not anticipated by any life events.

When the fraction of endogenous depression was assessed on the basis of the occurrence of a certain "endogenous" psychopathology (a severe illness with a high degree of psychomotoric retardation) and premorbid personality (non-neurotic, obsessional or stable) no or only a slight connection appeared between stress (life events) and symptom-pattern.

Paykel et al. also found that the occurrence of life events was important not only at the first onset of depression but also for relapses.
From all their studies the authors conclude that although the majority of cases of depression is preceded by some type of stress, the latter contributes only marginally to a causal relationship. The deciding factor is stated to be that the life event "falls on some kind of fertile soil, and a host of factors modify the reaction to it". Paykel assumes that in every isolated case of clinical depression there exists a complex pattern of interactions between life events and a series of precipitating factors.

Thomson and Hendrie (1972) also attempted, in a study of life events, to distinguish two subgroups of depressed patients, those with reactive depression and those with endogenic depression. They anticipated a bimodal distribution of life events with a low "life change" score for patients with endogenic depression, which was assumed to depend upon a genetic component, and high "life change" scores for patients with reactive depression, which is characteristically caused by a collection of stress factors. The distribution of stress scores was found, however, to be unimodal: even though reactive patients showed higher values, the differences were not significant. The two groups could not therefore be distinguished on the basis of "life change score" and it was concluded that life events were important for all types of depression.

Cadoret et al. (1972) examined 100 patients who were divided into two groups, 1) patients with an early onset of depression (before 40 years of age and with a background of alcoholism and social apathy together with affective sickness in female relatives); 2) patients with late onset of depression (after 40 years of age and with hereditary affective illness in both male and female relatives).

When all the patients were compared with controls comprising relatives it was found that they had suffered a higher frequency of "loss events". Despite this observation, the authors found it unlikely that a causal relationship existed between events and depression. In fact, a closer analysis of the times at which events occurred and at which depression began showed that only five of 26 patients had experienced the "loss
"event" in question before the onset of depression. Only 7 patients showed symptoms at the same time as the event occurred while 14 patients showed depressive symptoms before the event had taken place. The time relationship between event and depression was evident in only 12 patients at most and 11 of these were first time cases. The conclusion was drawn that the patients experienced more events than the controls but that these events took place in general after the depressive symptoms had already appeared, so that no causal relationship was indicated.

Another research group that has shown great interest in life events and depression is that of Brown and his collaborators. Their results have been summarized in a number of review articles (Brown 1974; Brown et al. 1977) and in a recent monograph (Brown and Harris 1978).

In competent methodological studies, Brown et al. demonstrated an increased frequency of life events in depressed women in comparison with healthy controls. Brown and co-workers showed, in later studies, that life events, principally of the type recent losses were important for the onset of depressive syndromes particularly in women who had lost their mothers during childhood and who lived in a relatively difficult social situation (unemployed, with infants at home and entirely devoid of emotional support). They also found that early loss through death was related to psychotic depressive symptoms while other types of early loss were related to depressive symptoms of neurotic nature.

Hudgins et al. (1967) compared 34 depressed and 6 manic patients with 40 matched controls taken from a group of medical patients, but few differences between these groups were found. The psychiatric patients, however showed a higher frequency of changes in domestic environment and interpersonal conflicts.

Among these 40 patients, 10 had experienced a stressful event before sickness, 8 had shown symptoms before any serious event took place but had succumbed to illness within 6 months and 11 patients, who were already sick when a serious event occurred, showed a subsequent increase in symptoms. The authors concluded that when an affective illness occurred soon after exposure to a stressful agent, the temporary relation-
ship was purely coincidental. When the event took place during a continuing illness, on the other hand, an enhancement of symptoms resulted which predisposed the patient to seek treatment.

Fava et al. (1981) found, in a group of 40 first time patients, a statistically significant higher number of events of the type undesirable, exit, negative and independent from depression, compared with a matched control group.

In a further study, Benjaminsen (1981) compared hospitalized neurotic- and non-neurotic depressed patients with regard to the life events which had occurred within 6 months prior to illness. The results showed that both neurotic and non-neurotic patients had experienced a single stressful event but that the neurotics differed from non-neurotics in that they had experienced a significantly higher number of multiple stressful events. The latter were, however, interrelated.

The investigations summarized above together with a number of others where depressed patients have been included as one group amongst others (e.g. Lahniers and White 1976) or where special questions have been studied (Roy 1978; Paykel et al. 1980; Surtees and Ingham 1980) appear to support the hypothesis that life events can influence the origin and development of depression. The mechanism underlying the role of life events for depression remains, however, unclear. One particular difficulty encountered in understanding the pathogenic mechanism of life events arises because in many studies, especially the older ones, the theoretical frame of reference in which the investigations have been carried out has not been explicitly stated. The general impression is that a general stress model was adopted very early which became progressively focused upon specificities in the experienced life events relating to either psychodynamic theories (e.g. relationships between early and recent losses) or to individual vulnerability factors (e.g. Brown's assumption of the role of life events coinciding with a set of vulnerability factors).

Additional questions arise in defining the patient population which has been studied, in particular concerning diagnostic classifications and
the inconsequently applied procedure of distinguishing such events caused by depression from those (independent or fateful) which clearly cannot be a result of a depressive illness.

In spite of the fact that in many recent publications it has been pointed out that the role of life events must be seen in relation to the person actually experiencing them, no systematic study has yet been reported where life events have been examined with regard to the various factors which can make individuals more vulnerable to them.

PRESENT INVESTIGATION

General hypothesis

A multifactorial study of life-events has formed part of a broader investigation of depression which has been in progress at the Department of Psychiatry, Umeå University for a number of years.

The purpose of this study was to investigate various factors which might be of importance for a more complete understanding of the pathogenic role of life events in depression.

The starting point for our investigation was the biopsychosocial hypothesis of the origin of depression illustrated in Fig 1. As is seen in this figure, emphasis is placed, in this hypothesis, upon the concept of vulnerability. We assume that biological, psychological and social factors contribute jointly to the vulnerability of the individual. Within this general treatment of the origin of depression we consider life-events to become pathogenic only when they interact with the individual's specific vulnerability factors. This more general theory is based on the concept "Ergänzungsreihe" introduced by Freud in 1920, which implies that the more vulnerable is the individual the lower the degree of stress which is required to produce in him a psychic illness. This is consistent with views put forward by Adolf Meyer (1951) and by Beck (1967), Paykel (1978, 1979), Brown and Harris (1978).

In the investigations which will be summarized below, various factors which are assumed to increase vulnerability to depression have been exa-
Fig. 1. An individual's vulnerability for a life event is due to the outcome of the interaction between those specific biological, psychological and social factors which characterize him at a given time.
mined with relation to life events. The specific hypotheses which have formed the bases for the different investigations are described in connection with the summaries of these studies. More detailed accounts can be found in the original articles.

PATIENTS AND METHODS

The patients

The basic series comprised 206 depressed patients (77 men and 129 women) with a mean age of 46.1 years (range 21-67 years) who were treated as out-patients or as hospitalized patients at the Psychiatric Department in Umeå during the period 1977-1980. These patients were admitted consecutively. Patients older than 67 years, with alcohol or drug-problems as primary reason for treatment, with schizophrenia or cycloid syndrome, or where depression could be ascribed to diagnosed brain damage, were excluded. Otherwise all consecutively admitted patients were included as permitted by available research facilities; no additional selection has taken place.

All patients consented to participation in these studies which were planned within the framework of the larger project.

The longer study of depression includes various biological, psychological and sociological sub-investigations. Because of the capacity of the research team and because of uncontrolled events such as holidays, etc., some patients (not selected) have not participated in any of these studies. The investigations included, in addition, a number of questionnaires, which necessitated that the patients had sufficiently recovered from their depression to be able to complete these and therefore the risks that the results would be affected by the depression were minimized. For this reason, the number of participants in self-appraisal studies is less than the whole series.
Diagnostic classifications

The journals of all the patients included in the studies of depression were examined by two experienced psychiatrists who classified these patients according to the most usual systems of classification of affective disorders in addition to that system employed in Umeå for research purposes. The classification systems adopted were:

a) The classification of affective disorders used at Umeå. According to this classification the patients are divided into: bipolar, unipolar, and reactive-neurotic depression according to the definitions given elsewhere (Perris 1973; d'Elia et al. 1974). A fourth group "unspecified" depression comprises those patients who do not fulfil the criteria for inclusion in any other of the groups mentioned earlier.

b) The Multi-Aspects Classification Model (MACM). According to two of the axes of this model, described in detail in previous articles (Ottosson and Perris 1973; von Knorring et al. 1978; Eisemann et al. 1980) information is gathered according to whether the patient was psychotic or not at the time of the observation, and if the disorder suffered from the patients was a first episode or the recurrence of a previous disorder (of the same or of different type).

c) The ICD-9 of the World Health Organization (WHO 1978), according to the definitions given in its glossary.

d) The Feighner et al. (1972) diagnostic criteria.


For special purposes, the Winokur's classification of unipolar primary affective disorders (Winokur 1979) was also employed. Finally, it was assessed for each patient whether he or she fulfilled the Kendell's criteria for depression (Brockington and Leff 1979).

The composition of the series is given in Table 1, 2 and 3a, b, c, in which some of the relevant comparisons among different classification systems are also given.
### TABLE 1. THE DISTRIBUTION OF THE SERIES ACCORDING TO AGE-GROUP AND SEX

<table>
<thead>
<tr>
<th>Sex</th>
<th>21-30</th>
<th>31-40</th>
<th>41-50</th>
<th>51-60</th>
<th>61-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>15</td>
<td>12</td>
<td>13</td>
<td>27</td>
<td>10</td>
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<tr>
<td>Female</td>
<td>24</td>
<td>28</td>
<td>25</td>
<td>29</td>
<td>21</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>40</td>
<td>38</td>
<td>56</td>
<td>31</td>
</tr>
</tbody>
</table>

\[x^2 = 4.24; \ fg 4; \ p < .37\]  

### TABLE 2. DISTRIBUTION OF THE SERIES ACCORDING TO SEX AND THE UMEA CLASSIFICATION

<table>
<thead>
<tr>
<th>Sex</th>
<th>Unipolar</th>
<th>Bipolar</th>
<th>Reactive neurotic</th>
<th>Unspecified</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>21</td>
<td>6</td>
<td>31</td>
<td>19</td>
<td>77</td>
</tr>
<tr>
<td>Female</td>
<td>37</td>
<td>10</td>
<td>49</td>
<td>31</td>
<td>127</td>
</tr>
<tr>
<td>TABLE 3 a, b, c. THE SERIES: DIAGNOSTIC DISTRIBUTION ACCORDING TO DIFFERENT DIAGNOSTIC SYSTEMS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Umeå Classification</td>
<td>DSM-III Classification</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>296.2</td>
<td>296.3</td>
<td>296.5</td>
<td>296.8</td>
<td>300.4</td>
</tr>
<tr>
<td>Unipolar</td>
<td>2</td>
<td>52</td>
<td>-</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>Bipolar</td>
<td>-</td>
<td>1</td>
<td>10</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Unspecified</td>
<td>9</td>
<td>20</td>
<td>-</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Reactive neurotic</td>
<td>9</td>
<td>25</td>
<td>-</td>
<td>23</td>
<td>11</td>
</tr>
<tr>
<td>b. Umeå Classification</td>
<td>ICD-9 Classification</td>
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<td></td>
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<tr>
<td></td>
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<td>296.3</td>
<td>296.5</td>
<td>296.8</td>
<td>300.4</td>
</tr>
<tr>
<td>Unipolar</td>
<td>48</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>8</td>
</tr>
<tr>
<td>Bipolar</td>
<td>-</td>
<td>12</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Unspecified</td>
<td>4</td>
<td>1</td>
<td>19</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Reactive neurotic</td>
<td>1</td>
<td>-</td>
<td>2</td>
<td>1</td>
<td>59</td>
</tr>
<tr>
<td>c. Umeå Classification</td>
<td>Classification according to the Feighner criteria</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Primary</td>
<td>Secondary</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Definite</td>
<td>Probable</td>
<td>Definite</td>
<td>Probable</td>
<td>Not depressed</td>
</tr>
<tr>
<td>Unipolar</td>
<td>43</td>
<td>9</td>
<td>-</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>Bipolar</td>
<td>9</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>Unspecified</td>
<td>18</td>
<td>9</td>
<td>8</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Reactive neurotic</td>
<td>20</td>
<td>24</td>
<td>8</td>
<td>5</td>
<td>24</td>
</tr>
</tbody>
</table>
Assessment of life events

A. The development of the life events inventory.

With reference to the criticisms which have appeared in the literature (for recent review see Dohrenwend and Dohrenwend 1974; Sarason 1975) concerning already existing inventories of life events we decided to develop a new questionnaire in which the different questions were adapted to Swedish conditions and in which corrections for the deficiencies recognized in other inventories were attempted. We endeavoured to prepare an inventory where not only the occurrence of different life events at various times prior to the onset of illness could be recorded but where additional relevant aspects coupled to these events could be included, e.g., whether the event in question was expected or not or whether the respondent regarded it as controllable or not. Further, we required the patient to assess the experience of each event on a 5-point scale from very positive (=1) to very negative (=5). Finally we were also interested in obtaining information on the degree of difficulty which the patient encountered in adapting to each life event.

B. Testing of the preliminary version

A preliminary version of the questionnaire which was later used, containing a list of 65 events, was tested on 30 volunteers taken from the staff of the clinic. The test persons completed the forms themselves as is usual in life event studies. The results of this pilot study revealed unclarities in certain statements and the difficulties in assessing the time required for adaptation to events. Several questionnaires were also wrongly completed despite instructions and replies to some questions had been omitted.

From the experience gained in this pilot-study a new version was constructed where the number of events was reduced to 55 and where an additional variable was included in order to register possible events not specified on the list. In addition the assessment of adaptation to the events was limited to the alternatives "easy" or "difficult". The list of events is presented in Appendix A.
C. Procedure in applying the life event inventory

In their investigations both Brown and Paykel stress the importance of not allowing the patients to complete the questionnaire themselves but to use the questionnaire as the basis of a semi-structured interview.

Experience from our own pilot-study supported this recommendation and the life event inventory has been used throughout as the basis for a semi-structured interview with each patient. To reduce the possibility that the answers could be influenced by the depression the interview was carried out only when the condition of the patient had markedly improved. An advantage of this procedure was that the interviewer had been able to establish contact with the patient in connection with the other investigations completed within the wider project at an earlier time.

In the life event interview the patient was questioned on each event in the list separately and was required to specify whether the event took place during the 3 month or 4-12 month periods prior to sickness.

Although we were interested in trying to establish a possible collection of events shortly before sickness we recognized the difficulties the patient might have in estimating the time of onset of depression. A period longer than 3 months was therefore considered.

"A priori" classification of life events

Several authors have classified life events in different ways, e.g., in terms of "life area" (Myers et al. 1971; Paykel 1974) "social desirability" (Dohrenwend 1973; Gersten et al. 1974; Myers et al. 1974; Myers et al. 1974; Paykel 1974), "entrances" to and "exits" from the social field (Myers et al. 1971; Paykel 1974) "controllable vs uncontrollable" (Paykel 1974; Johnson et al. 1978).

In accordance with the procedures of earlier authors, the life events included in the present inventory were classified into different subgroups before analysis, as follows:
a. Whether the events could be regarded as "negative", "positive", or "ambivalent" according to common sense;

b. Whether the events could be regarded as "controllable", "uncontrollable" or "ambivalent" according to common sense.

c. Whether the events represented an "entrance" to or "exit" from the social field;

d. Whether the events reflected the occurrence of a "conflict" in a social relation;

e. Whether the events represented an "object loss" (for example death of a relative);

f. Finally, taking into account the criticism suggesting that many events taken into account in life events inventory might be confounded by the illness itself (Tennant et al. 1981; Fairbank and Hough 1979) a sublist comprising 32 events which could be logically regarded as completely independent of the depressive symptomatology and not confounded by it has been taken into account (independent or fateful events).

Distribution of the 55-events included in LEI according to the above classification is reproduced in Appendix B.

Rating patients

All patients included in the investigation were assessed with the Comprehensive Psychopathological Rating Scale, CPRS (Asberg et al. 1978) on admittance. CPRS has earlier been shown to be highly reliable (Perris 1979). In connection with the present study of depression a new reliability test was carried out in which all members of the research team took part (Perris et al. 1979). In addition, continuous reliability assessments have been carried out informally during the entire study. For studies of possible correlations between life events and the degree of depression measured on the CPRS scale (paper III) a partial scale, earlier employed by Perris and Eisemann (1980), was adopted. This partial scale included the following items:
Sadness
Inner tension
Hostile feelings
Inability to feel
Pessimistic thoughts
Hypochondriasis
Worrying over trifles
Indecision
Lassitude
Concentration difficulties

Failing memory
Reduced appetite
Reduced sleep
Reduced sexual interest
Autonomic disturbances
Aches and pains
Apparent sadness
Reduced speech
Slowness of movements
Agitation

Family study

The family study which has been the basis for a division of the patients into those with a positive family loading for affective disorders and those without any heredity of psychiatric disorders used in paper IV has been carried out in a previous occasion and the results have been published (in part) elsewhere (Perris et al. 1981). Information was gathered about all the first degree relatives of the patients, and morbidity risks were calculated according to current procedures.

Determination of platelet MAO-activity

Determinations of MAO-activity in platelets were carried out by Prof. Oreland at the Pharmacological Institute, University of Umeå. Blood samples were taken, with consent, from each patient and stored at -70° after which they were analysed as a complete batch. Analytical methods are described in paper V.

Perceptual reactance

As far as the capacity of the neurophysiological unit of the Psychiatric Department allowed, neurophysiological investigations of the patients to assess their reactivities to visual stimulations of different intensities were carried out. On the basis of these studies, the patients were divided into "augmenters", i.e. those who showed increases in amplitude of their visual evoked potentials (VEP) with stimuli of increasing intensity, and "reducers", i.e. those who showed reductions in amplitude despite increases in stimulus intensity.
The method employed in this study has been described in detail elsewhere (von Knorring 1975; von Knorring et al. 1978) and is repeated briefly in paper VI.

Personality assessment

The personality inventory used in the present study is the KSP developed by Schalling (1978). It is an inventory including 135 items which are grouped in 15 subscales referring to various aspects of personality. The subscales are:

1. Somatic anxiety (SA)  
2. Psychic anxiety (PA)  
3. Muscular tension (MT)  
4. Social desirability (SD)  
5. Impulsiveness (I)  
6. Monotony avoidance (M)  
7. Detachment (D)  
8. Psychasthenia (Ps)  
9. Socialization (So)  
10. Aggression (indirect) (IAg)  
11. Aggression (verbal) (VAg)  
12. Irritability (Irr)  
13. Suspicion (Su)  
14. Guilt (G)  
15. Inhibition of aggression (Inhib)

From this scale three aggression factors are obtained namely:

Aggression (10, 11, 12), Hostility (13, 14), Inhibition of aggression (15)

The format is that of a four-point response. The KSP is assumed to measure relatively stable personality traits in the individual.

In an earlier investigation (Perris et al. 1980) we have demonstrated that results obtained from this scale are relatively stable and independent of the degree of illness (measured with a rating scale). The scores of the aggression variables, in particular, which are considered in paper VII, have been found to remain unchanged in a group of depressed patients which form part of the present study and who completed the inventory on the first occasion when ill and on a second occasion when they had recovered from depression. The patients who took part in studies of life events and personality first completed the inventory when they were about to be discharged.
Parental rearing practice

The assessment of how the patients had perceived the rearing practices of their parents has been made by means of a special instrument - the EMBU - developed during the course of the larger study of depression (Perris et al. 1980; Jacobsson et al. 1980). At the beginning of the study a simpler version of this questionnaire, inspired by that used by Jacobsson et al. (1980) had been used as a guideline for a semistructured interview. However, since it was felt that this early instrument was not adequate for covering all rearing aspects, a special self-rating instrument was developed and tested in a large sample of healthy controls. A detailed description of the EMBU, now available in different languages, and currently used by different groups of research workers, has been given in the original papers mentioned above. In brief, the instrument allows an assessment to be made, separately for the fathers and the mothers, of the following dimensions of rearing practice: Abusive, Depriving, Punitive, Shaming, Rejecting, Overprotective, Overinvolved, Tolerant, Affectionate, Performance oriented, Guilt engendering, Stimulating, Favouring siblings, Favouring subject.

Statistical analysis

The frequency of life events, in accordance with the different classifications, has been calculated for patients in different sub-groups both for the period of 12-4 months and the period of 3 months prior to the onset of illness. Inter-group differences have been tested for significance. The average number of events in the different categories has also been computed for the various groups of patients. Where necessary, correlations between life event variables and other variables examined have been measured.

Multiple regression methods have been applied in instances where age-differences might introduce disturbing factors. All statistical analyses were performed with standard computer programmes (SPSS) at the Computer Centre of Umeå University (UMDAC). A level of significance of 5% has been used throughout.
RESULTS

Paper I. Life events and depression. 1. Effect of sex, age and civil status

In most epidemiological studies of depression it has been consistently pointed out that depressive disorders occur more frequently in women than in men, that their frequency increases with increasing age, and that a lack of social support is an important factor for the occurrence of depression (Sørensen and Strömgren 1961; Silverman 1968; Weissman and Klerman 1977; Brown and Harris 1978; Helgason 1979; Surtees 1980; Boyd and Weissman 1981). For this reason it was fair to assume that just these variables of sex, age and lack of social support might be some of the most elementary factors which might influence an individual's vulnerability for depression. Thus, it was hypothesized that women would need less stressful events to develop a depression, that older people require less stressors to become depressed, and that people living alone were more vulnerable to depression than people living in close relationships.

These assumptions were tested in a series of 204 consecutively admitted patients, 77 men and 127 women treated as either in- or out-patients at the Department of Psychiatry, Umeå University.

The results of this study did not support the hypothesis that a lower number of events could be expected in women, who had been assumed to be more vulnerable for depressive disorders. In fact, there was no difference in the mean number of events totally experienced by patients of the two sexes in the different periods preceding the onset of depression taken into account in the present study. On the other hand, a closer analysis of the type of life events experienced by the patients showed that significantly more events "independent" of depression had occurred to female than to male patients in the period 12-4 months prior to onset of depression. In line with our hypothesis, younger patients had consistently experienced significantly more events than older patients, both on the whole, and when only "independent" events were analysed separately.
The third hypothesis, concerning a possible difference between patients living alone and patients living in marriage or partnership was not verified in this study. In fact no differences in the total number of events in any period, or differences in the number of "independent" events were found in this series. The only inter-group differences concerned events classified as "exit" from the social field, and "conflict" in a social relation, which had occurred more frequently in the group of patients living alone. However, since those very events could be assumed to be responsible for the condition of living alone, at least for a large proportion of patients, the results in this respect could be no more than a contamination between the variables.

Paper II. Life events and depression. 2. Results in diagnostic subgroups and in relation to the recurrence of depression

Although there is evidence that the occurrence of stressful life events might be important for the onset and development of depression, it is still unclear whether differences occur in diagnostic subgroups of depressed patients, or in relation to type of episode, i.e., whether the first ever or a relapse of a depression with recurrent course. The present study was carried out to investigate those issues in more detail. 206 depressed patients were classified into bipolar, unipolar, neurotic-reactive, and unspecified subgroups according to the definitions used at the Department of Psychiatry of the Umeå University. Using results from the application of a Multi-Aspects Classification Model (MACM), also developed at Umeå, the patients were further classified into those suffering from a first episode and those suffering from recurrent depression. The distribution of life events into different categories were investigated in each of the subgroups.

Unipolar and bipolar patients proved to have experienced significantly fewer events, also of the "fateful" type (i.e. independent from depression) than the neurotic-reactive patients. Among this last group, patients with pure reactive depression had experienced more events independently of categorization than pure neurotics and patients classified as mixed neurotic-reactive.
In a previous paper (no I) it had been found that younger patients had experienced more events than older ones. It was also found that neurotic-reactive patients were significantly younger (mean age 39.2, SD 13.5 years) than uni- and bipolar patients (mean age 50.4, SD 12.1, t=5.37 p< .001). Since it could be suspected that the differences found in the present study between neurotic-reactive and uni- and bipolar patients could be due to the age differences, a multiple regression analysis was carried out. The results showed that both age and diagnosis contributed to the difference in life events. Surprisingly good agreement was found between the distribution of events appraised by the patients as "negative", and the distribution of events categorized "a priori" as "negative" by the investigator which seemed to exclude a distorted perception of the events by the patients. Patients with recurrent depression showed only small differences as compared with patients at their first episode. Those differences were consistently in the direction of a fewer number of events in patients with recurrent depression.

Paper III. Life events and depression. 3. Relation to severity of the depressive syndrome

Although an increased number of life events prior to the onset of depression has been reported from many sources, information as to whether stressful events also contribute to the severity of the depressive syndrome following them is still scanty. To contribute to the clarification of this issue it was planned to study whether any relation occurs between well defined life events and severity of depression in patients who have experienced them.

206 depressed patients of both sexes in the age-range 21-67 years consecutively treated at the Department of Psychiatry, Umeå University were investigated as concerns the occurrence of life events within defined time limits, and the severity of their depressive syndrome. Three different criteria were used to divide up the patients according to severity - whether they were in- or outpatients, whether or not they were psychotic according to a classification model (MACM) used at Umeå, and finally, according to the clinical ratings received by those admitted
to the hospital. The average number of events experienced by the patients within the time limits set by the study was similar in each of the subgroups taken into account. Only a weak, but statistically significant relation was found between a negative experience of the events and the total score obtained at the ratings. The occurrence of events "independent" from depression did not distinguish between the groups. Thus, the results of this study do not support the opinion maintained by some authors that there is a sizeable positive relation between magnitude of life events and seriousness of illness.

Paper IV. Genetic vulnerability for depression and life events

There is a large amount of evidence suggesting that a heredity loading for affective disorders increases the risk of an individual becoming depressed. Thus genetic factors may be regarded as important contributors to the individual's vulnerability to depression.

Taking into account our general hypothesis about a possible interaction between external, stressful events and individual vulnerability to depression a decision was made to investigate the occurrence and distribution of life events in depressed patients divided, according to Winokur into those suffering from "Depression Pure Disease" (i.e. those with a family loading for affective disorders, n=48) and those suffering from "Depression Sporadic Disease" (i.e. those without any heritage of affective disorders, n=80). This subdivision of the depressed patients comprised in the present investigation was based on a previous genetic study of the same patients, reported elsewhere (Perris et al. 1981). The occurrence of life events was assessed for each patient while in hospital by means of a semistructured interview. The mean number of events experienced by the patients in the two groups proved to be similar in any of the time periods taken into account, and the mean number of events per patient was similar to that found by other authors who have studied life events and depression. None of the categorizations used to group the life events differentiated between the groups.
Evidence in the literature suggests that a genetically based low MAO activity might represent a vulnerability factor in psychopathology which might possibly interact with other factors in the development of psychopathological disorders. The occurrence of life events is also assumed to be relevant as a contributory factor in the occurrence and development of psychopathological conditions. The present study was planned to investigate whether any correlation could be found between platelet MAO activity and life events in depressed patients. In particular, working from the general hypothesis that the impact of life events should be seen against the background of an individual's vulnerability, it was assumed that more vulnerable low MAO patients would need fewer events before developing psychopathology, and that they would experience more negatively those events that occurred to them.

127 inpatients of both sexes (50 male and 77 female), suffering from different kinds of depressive disorder participated in the study. There were 39 unipolars, 11 bipolars, 43 patients suffering from neurotic-reactive depression and 34 patients suffering from unspecified depressive disorders. Platelet MAO activity was measured using both phenylethylamine and tryptamine as substrate and the occurrence of life events prior to the onset of depression was independently assessed by means of a specially constructed life events inventory used as a guideline for a semistructured interview. The interviews took place when each patient had clearly improved to avoid distortions due to the depressive illness.

Females showed a slight but not significantly higher MAO activity than males. No statistically significant differences in MAO activity were found among patients in different age groups or in any of the diagnostic subgroups. However, there was a weak positive correlation between MAO activity and age.
As expected, low MAO patients experienced fewer events than patients in the highest MAO quartile, and experienced the events which occurred more negatively, regardless of their categorization.

Paper VI. Reactivity to incoming stimuli and the experience of life events

Among the characteristics of an individual which might contribute to determining a psychological vulnerability to life events, the proneness to augment or reduce incoming signals of increasing intensity should be taken into account.

The concept of "augmenting-reducing" was originally formulated by Petrie (1967) who, using a kinesthetic figural after-effect test, was able to show that each individual has a characteristic perceptual reactance with a tendency to diminish what is being perceived - reducers - or to enlarge the perception of stimulation - augmenters. According to Petrie's original formulations, augmenters and reducers differ in their ability to handle the environment and also in their ability to endure painful stimulation and sensory deprivation.

Several investigations from our group (von Knorring 1975; von Knorring et al. 1978) also suggest that a study of visual evoked potentials (VEP) can provide information about proneness to augment or reduce similar to that obtained by using a kinesthetic figural after-effect test.

The following hypotheses were tested in 60 patients from whom VEP could be obtained during their stay in the hospital.

Augmenters who experience both physical stimuli and psychological events more strongly could be expected to experience the more ordinary situations as important life events, and could thus be expected to experience life events more strongly, to report more life events as extremely difficult and also to report that the adjustment to the event was more difficult.
<table>
<thead>
<tr>
<th>Category of events occurred within one year prior to onset of depression</th>
<th>Augmenters</th>
<th>Reducers</th>
</tr>
</thead>
<tbody>
<tr>
<td>All events</td>
<td>4.9 3.4</td>
<td>4.4 3.2</td>
</tr>
<tr>
<td>Negative</td>
<td>2.7 1.7</td>
<td>2.4 2.0</td>
</tr>
<tr>
<td>Independent, fateful</td>
<td>2.4 1.9</td>
<td>2.3 1.9</td>
</tr>
<tr>
<td>Exit</td>
<td>0.7 0.7</td>
<td>0.6 0.6</td>
</tr>
<tr>
<td>Entrance</td>
<td>0.3 0.5</td>
<td>0.2 0.5</td>
</tr>
<tr>
<td>Conflict</td>
<td>0.7 0.9</td>
<td>0.6 0.8</td>
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</tbody>
</table>
Augmenters reported slightly more events than reducers. However, from calculations made in 70 patients (23 male and 47 female), after the publication of the article no significant difference in the number of life events, however categorized, emerged between augmenters and reducers (Table 4). On the other hand, augmenters, as expected, were found to report more life events as extremely difficult, and to report that adaptation after the life event was difficult.

Paper VII. Life events and personality characteristics in depression

If particular personality characteristics increase an individual's vulnerability and predisposition to a depressive breakdown then it could be assumed that the perception of and reaction to external stressful events are modulated by the personality structure of the person experiencing the event.

To test such an hypothesis 138 depressed patients of both sexes with a mean age of 45.2 ± 1.2 years participated in a study of life events and personality traits. In particular, the possible interaction of aspects of aggression with the occurrence, and perception of external stressful events was tested. As expected we found that there is a positive relationship between aggression and stressful events and a negative one between life events and inhibition of aggression. If life events are seen as one of the necessary causes, but not sufficient in themselves, of the occurrence of depression, then it seems that the more vulnerable inhibited patients require fewer external events to become depressed than the less vulnerable persons characterized by (outdirected) aggression.

As might be expected, it was found that events reflecting a deterioration in a social relationship were closely related to personality characteristics.

The results of the present study add support to the general hypothesis suggested by Kendell that aspects of aggression might be relevant for the occurrence of depression in an interaction with external factors.
Paper VIII. Deprivation in childhood and life events in depression

Within the framework of a multifactorial study of life events and depression, based on a general hypothesis that the impact of stressful events should be idiosyncratically understood in relation to the vulnerability of the subject experiencing them, several factors which might increase an individual's vulnerability to depression have been taken into account in relation to the occurrence of stressful events prior to onset of depression.

Childhood deprivation, understood either as the lack, loss or absence of an emotional relationship prior to adolescence or as the actual loss of a parent during childhood, are assumed to be factors which contribute to increasing the risk of depression later in life. Eighty-three inpatients, consecutively admitted to the Department of Psychiatry, Umeå University, also participated in a study of parental rearing practices and of life events in relation to the onset of depression. From these patients information was also obtained concerning the loss of a parent before the age of 15. In the present study, patients who had been reared by rejecting mothers were compared with patients reared by stimulating mothers regarding the occurrence of life events. These contrasting rearing practices were chosen since these two variables proved to belong to opposite poles of the same factor (Table 5). It was hypothesized that rejected patients would have suffered fewer stressful events than stimulated patients before becoming depressed.

Although falling short of significance, the results were as expected. In fact the rejected patients had consistently experienced fewer events, however categorized, than the stimulated ones. Eleven patients in this series had lost one or other parent before the age of 15. No significant or otherwise consistent differences were found between those patients with and those without parental loss during childhood. A previous study by our group had shown the occurrence of relationships between parental rearing practices and personality characteristics. It is suggested that the impact of rearing practices on personality characteristics might be a link between those practices and vulnerability to stressful events later in life.
TABLE 5. COMPOSITION OF FACTOR 2 FOR MOTHERS OBTAINED IN A NOT YET PUBLISHED FACTOR ANALYSIS OF THE EMBU IN DEPRESSED PATIENTS. THE VARIABLES TAKEN INTO ACCOUNT IN THE PRESENT STUDY ARE INDICATED BY *.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Factor loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abusive</td>
<td>-.09</td>
</tr>
<tr>
<td>Depriving</td>
<td>-.28</td>
</tr>
<tr>
<td>Punitive</td>
<td>.17</td>
</tr>
<tr>
<td>Shaming</td>
<td>.15</td>
</tr>
<tr>
<td>Rejecting</td>
<td>-.63 *</td>
</tr>
<tr>
<td>Overprotective</td>
<td>-.34</td>
</tr>
<tr>
<td>Overinvolved</td>
<td>-.05</td>
</tr>
<tr>
<td>Tolerant</td>
<td>.56</td>
</tr>
<tr>
<td>Affectionate</td>
<td>.86</td>
</tr>
<tr>
<td>Performance oriented</td>
<td>-.60</td>
</tr>
<tr>
<td>Guilt engendering</td>
<td>.03</td>
</tr>
<tr>
<td>Stimulating</td>
<td>.82 *</td>
</tr>
<tr>
<td>Favouring siblings</td>
<td>.23</td>
</tr>
<tr>
<td>Favouring patient</td>
<td>.00</td>
</tr>
</tbody>
</table>
SOURCES OF ERROR

All research focusing on retrospective data from patients is plagued by forgetfulness, falsifications and other alterations of information that intrude into the reporting process. These sources of error in studies of life events are frequently mentioned in the literature. For example, Schmid et al. (1981), who used a short version of the life events inventory developed by Brown, reported a regular decrease of about 10% for the reported frequency of events from the 3rd to the 21st week covered by the study which they attribute to forgetfulness. Brown and Harris (1981) however, criticized the results obtained by Schmid et al. which they regard as more interviewer- than respondent-based. Besides finding a much more modest fall-off in their repeated studies, Brown and Harris point out that problems of recall might be more relevant for non-severe rather than for severe events. Poor reliability of life events reporting is more likely to occur if the life events inventory has to be completed by the respondent rather than if the life events inventory is used as a guideline for a semistructured interview by a well-trained interviewer. In the present study, the assessment of life events has been made in the course of an interview that took place when a contact had already been established between the interviewer and the patient. The latter had collaborated in previous parts of a large study of depression, of which the assessment of life events covered but one aspect. One way to control forgetfulness or other distortions of information would be to interview another informant close to the patient. This procedure has been used by different authors with contrasting results. In fact, Yager (1981) in a study of male patients, male controls and their partners, in which he used the Holmes and Rahe SRE-scale, found that perfect agreement was reported for only one third of the responses. They found, however, that with disagreements, index persons were more likely than their partners to report that an event had occurred. Moreover, they found that agreement was higher for clearly worded than for vaguely worded items. Quite different results are reported by Brown and Harris (1981) who found a 78% agreement between separate respondents about the occurrence of particular events which had been reported to have occurred in the 12 months before admission. The agreement increased
to 91% when only severe events were taken into account. Thus, once again it seems that differences in the procedure for recording life events might be important for obtaining higher reliability. Furthermore, the use of separate respondents might be less appropriate if one wants to record how each event has been experienced by the patient.

Since the present study is mainly concerned with intergroup comparisons and since the recording of events was made in the course of semistructured interviews, this source of error is less likely to have influenced the results in a systematic way.

Perhaps a more important source of error when studying depressed patients is the risk that depressives exaggerate their appraisal of the events they have experienced in an effort to rationalize their illness. We also have no reason to suspect that this source of error occurred systematically, especially because our division of patients in subgroups crosses the boundaries of diagnoses, sex, age, etc. Moreover, it was possible in this study to have some control over this source of error, especially as concerns the patients' appraisal of the events. In fact, when reporting an event the respondent had to specify his appraisal of the event as negative, positive or ambivalent (according to a 5-point scale). Prior to the analysis of the results events were categorized in different ways and also into negative, positive and ambivalent on a common sense basis. The results of one comparison between the patients' appraisal of the events and the distribution of the events according to the "a priori" categorization have been reported in paper II. These results, given in Table 6 show a very good agreement between the patients' appraisal of the event and its place in the categorization.

A further check of this kind, this time as to whether an event was felt to be controllable or not, was made in patients with parental deprivation during childhood (paper VIII). In this case too (Table 7), the results showed a satisfactory agreement between the "a priori" categorization of the events and the patients' appraisal.

Finally, if social desirability is assumed to reflect willingness to admit frailties, conformity strivings and a tendency to be dishonest...
TABLE 6. EVENTS EXPERIENCED AS "NEGATIVE", "POSITIVE" OR "AMBIVALENT" BY THE PATIENTS AND EVENTS CATEGORIZED BY THE INVESTIGATOR AS "NEGATIVE", "POSITIVE" OR "AMBIVALENT" (MEAN VALUES AND STANDARD DEVIATION) THE WHOLE PERIOD.

<table>
<thead>
<tr>
<th>Diagnostic Group</th>
<th>Negative according to patient</th>
<th>Negative according to categorization</th>
<th>Positive according to patient</th>
<th>Positive according to categorization</th>
<th>Ambivalent according to patient</th>
<th>Ambivalent according to categorization</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( \bar{x} ) ( \text{SD} )</td>
<td>( \bar{x} ) ( \text{SD} )</td>
<td>( \bar{x} ) ( \text{SD} )</td>
<td>( \bar{x} ) ( \text{SD} )</td>
<td>( \bar{x} ) ( \text{SD} )</td>
<td>( \bar{x} ) ( \text{SD} )</td>
</tr>
<tr>
<td>Unipolar n=58</td>
<td>2.3  2.0</td>
<td>2.1  1.5</td>
<td>0.8  0.9</td>
<td>0.3  0.5</td>
<td>0.6  0.8</td>
<td>1.3  1.4</td>
</tr>
<tr>
<td>Bipolar n=16</td>
<td>2.3  1.7</td>
<td>2.4  1.6</td>
<td>2.0  1.7</td>
<td>0.5  0.6</td>
<td>0.5  0.6</td>
<td>1.9  1.2</td>
</tr>
<tr>
<td>Unspecified n=51</td>
<td>2.2  1.6</td>
<td>2.1  1.9</td>
<td>1.0  1.3</td>
<td>0.3  0.5</td>
<td>0.7  0.9</td>
<td>1.5  1.6</td>
</tr>
<tr>
<td>Neurotic reactive n=18</td>
<td>3.4  2.3</td>
<td>3.1  1.9</td>
<td>1.4  1.7</td>
<td>0.6  0.8</td>
<td>0.9  1.0</td>
<td>2.1  1.8</td>
</tr>
<tr>
<td>F (3/202)</td>
<td>5.26</td>
<td>5.26</td>
<td>3.83</td>
<td>2.68</td>
<td>2.13</td>
<td>3.29</td>
</tr>
<tr>
<td>p</td>
<td>.002</td>
<td>.002</td>
<td>.01</td>
<td>.05</td>
<td>n.s.</td>
<td>.02</td>
</tr>
<tr>
<td>No of events categorized as uncontrollable</td>
<td>No of events subjectively perceived as uncontrollable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>------------------------------------------</td>
<td>-----------------------------------------------------</td>
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<td>0</td>
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<tr>
<td>2</td>
<td>6 1 1 2</td>
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<tr>
<td>3</td>
<td>2 2 3</td>
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<td>4</td>
<td>1 1</td>
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<td>5</td>
<td></td>
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</tbody>
</table>

Lambda .39
or denying in self-reports (Schalling et al. unpublished manuscript) then it might have been expected that distortions in the reporting of life events would correlate with scores in the variable "social desirability" in the personality inventory used in our studies (paper VII). Actually, no correlation whatsoever (coefficients around 0) were found between life events and social desirability. Thus, the results of the different controls reported above support our assumption that the patients did not exaggerate in their judgement of the events which occurred to them.

Another source of error in studies of life events and depression is the confusing factor that the event reported could be the result of the morbid condition and not something preceding the onset of it. One way to avoid the possible effect of this confusing factor is to analyse separately those events ("fateful" events) which logically cannot be the result of a depressive syndrome (for example, the death of a close relative). A separate analysis of "independent", "fateful" events has been consistently carried out in the course of the study reported here.

GENERAL DISCUSSION AND CONCLUSIONS

Several reports in the literature support the view that the occurrence of life events might be an important factor for the onset and development of depression. From a recent review of the relevant literature (Perris 1981) two main issues appear to stand out. First, the question as to whether depressed patients experience more events before the onset of depression than do controls who do not become depressed. Second, what is the pathogenic role of life events in depression. As concerns the first issue, evidence seems to suggest that some depressives might, in fact, experience on average more events than matched controls before becoming depressed. Such results, however, imply that there can be subjects who become depressed after experiencing as many, or probably even fewer, events than controls. As to the second question, it has been repeatedly pointed out that the events occurring prior to the onset of depression are, on the whole, of an everyday quality rather than catastrophic. Since such events are common in the general population, and do not in most cases lead to overt illness requiring psychiatric care,
it remains to explain why they have a pathogenic role in some subjects but not in all. Judging from literature, it seems that opinions about the pathogenic role of life events, especially as concerns the occurrence of depression have shifted from a rather general theory of life events as stress-provoking agents to a more idiosyncratic view in which the interaction of life events with characteristics peculiar to the subject experiencing them is taken into account.

In fact, several authors have presented complex models for the understanding of the role of life events in the development of illness in general (Rahe 1972; Levi 1974), and depression in particular (Paykel 1979; Brown 1979). In a recent article, in fact, Paykel (1978) stated that an event is only in part responsible for the onset of illness, and that it must be regarded as interacting with a host of other factors in determining whether the outcome is an illness, and which specific illness. Among those modifying factors, Paykel takes into account both varying qualities in the event itself, and personal factors, both genetic and environmental which might modify an individual's vulnerability to events.

Although there seems to be an increasing awareness that the impact of life events should be viewed against the specific background of the subjects experiencing them, no comprehensive studies of the factors which can influence the individual reactivity to life events have been carried out to date in large populations of patients. A few exceptions are those studies in which the occurrence of particular events has been analysed in relation to single variables in the background (for example, studies of bereavement, and recent loss in relation to parental loss during childhood). A notable exception is represented by the studies by Brown and his group. Brown and Harris (1978) in fact tried to identify sets of vulnerability factors which might be suspected of interacting with stressful life events to provoke the outbreak of depression. According to Brown and his associates, who studied mostly females, the loss of the mother before the age of 11, the presence of small children at home, unemployment and the lack of an emotionally sustained relationship constitute one such vulnerability set, which in interaction with
life events leads to depression.

Since multifactorial studies of depressed patients, where different factors which might increase an individual's vulnerability to life events - thus contributing to the outbreak of depression - have not yet been published, the present investigation was planned with the aim of trying to elucidate some of the factors which might be considered likely to increase the vulnerability to life events in a population of depressed patients.

The main hypothesis, beyond the study reported here, has been that an individual's adjustment to life events is related to his vulnerability, and is inspired by Freud's (1920) concept of "Ergänzungsreihe". Moreover, it was assumed that such vulnerability is mediated by genetic predisposition and biologic make-up, past history, personality characteristics and current life situation.

Sex and age are among the most elementary variables which are assumed to increase the risk of depression, and which could hypothetically increase the vulnerability to life events. In fact, it has been maintained that females experience life events as being more stressful than do males (Horowitz et al. 1977). In the present study, however, it was found that women who are treated for a depressive illness in fact, experienced more stressful events than men. Thus it seems that the opinion that women are more vulnerable than men to life events was not supported by the results of the present study. However, the possibility cannot be excluded that life events might have an influence on illness behaviour and care-seeking behaviour in females. As expected, older patients were found to have experienced fewer events than younger ones before the onset of depression.

Civil status did not differentiate among patients as concerns vulnerability to events, the assumption being that people living alone were more vulnerable than those living together with a partner. The only difference between the group of patients who were unmarried, separated, divorced or widowed in comparison with that of patients living together
with a stable partner was that the former group had a higher number of events in the category "conflict". This difference was regarded as being spurious and due to a confusing effect of the criterion for dividing the patients, and unrelated to vulnerability. It is very likely that civil status "per se" is too a coarse variable for exploring the possible impact of social support in the environment on the vulnerability to events, and that in future studies the quality rather than simply the occurrence of a partnership must be taken into account.

The occurrence of life events does not seem to be important for the severity of the depression following them, nor it seems to be relevant for the type of treatment, as in- or outpatient - received by the patient. In fact, no relation whatsoever was found between number and category of events and severity of depression as assessed both clinically, and by means of a rating scale. Furthermore, it could be shown that life events could be important both at the first episode of depression and on the occasion of recurrent episodes.

In line with recent reports in the literature (Matussek 1981) neurotic-reactive patients were found to have experienced more events than patients with a diagnosis of unipolar or bipolar depression. However, a separate study of patients with a family loading for depression compared with those without any loading for psychiatric illnesses did not show any difference in the occurrence of quality of life events. Several reports in the literature suggest that MAO activity in platelets might be an indicator of individual vulnerability, those with a low activity being more vulnerable (Buchsbaum et al. 1976). The results of this part of the study seem to confirm this assumption. In fact, low MAO patients were found to have experienced fewer events before becoming depressed, and to have experienced them more negatively than high MAO patients. Also, an individual's reactivity to incoming stimuli could be assumed to be an important variable for the experience of life events (Petrie 1967; Buchsbaum and Silverman 1968; von Knorring et al. 1975). The study of perceptual reactance, carried out within the framework of the present investigation has enabled us to show that patients with an augmenting response in their VEP to stimuli of increasing intensity report-
ed more events, more events as extremely difficult, and reported adap-
tion after the life event as difficult, compared with reducers.

There is general agreement that personality characteristics are one of
the most powerful factors contributing to how a subject experiences,
elaborates and reacts to external events. For this reason, a separate
study of personality characteristics was felt to be particularly im-
portant in the present patients population. The results of this part
of the study showed that patients with high scores in outward aggression
had experienced significantly more, and patients who scored high on in-
hibition of aggression had experienced significantly fewer events. The
last mentioned group had also experienced life events more negatively.
The results were as expected and suggest that outward aggression might
be a protective factor against depression. Events reflecting conflicts
in a social relationship were, as expected related to such personality
characteristics as for example impulsiveness, hostility and aggression.
Weak, but statistically significant correlations were also found bet-
ween the patient's negative appraisal of the events and personality
traits of suspicion and hostility.

In several reports in the literature the hypothesis has been tested
that parental loss during childhood represents an important factor in
predisposition to depression later in life. However, the results of
those studies have been conflicting and the specificity of the relation-
ship between parental loss during childhood and later depression has
been challenged (Tennant et al. 1980). More recently, interest has been
centred not only on parental loss but also on disturbing, mostly de-
priving parental rearing practices during childhood. In fact, it has
been maintained (Jacobson et al. 1975) that childhood deprivation should
be understood as the loss or lack of loving care and of a stimulating
education towards self-realization more than the actual loss of a parent.
To investigate the extent to which depriving rearing practices contri-
buted to increasing a person's vulnerability to life events, the pati-
ents in the present study have been divided into those who had received
a rejecting parental education and those who had received a stimulating
education on the basis of the results obtained by means of an inventory
developed by our group to investigate the perception of rearing prac-
tics (Perris et al. 1980). Patients reared by rejecting mothers were contrasted with patients reared by stimulating mothers. Although falling short of statistical significance, the results went in the predicted direction, i.e. that the less vulnerable patients reared by stimulating mothers had experienced more events than those reared by rejecting mothers. A few patients had lost a parent during childhood. No differences in life events were found in the patients bereaved early compared with those who had not lost a parent during childhood.

A general survey of the main results of the present study is presented in Table 8. From an analysis of these results a general conclusion about the relationship of life events to depression can be drawn. Namely, that a conception of life events as generally stress-provoking agents in the causation of depression is untenable and the alternative hypothesis, which looks at life events in an idiosyncratic way against the vulnerability background of the person experiencing them, finds support. The results of the present multifactorial study suggest that several biologic, psychological and social factors might be important in modifying an individual's vulnerability to life events. It is not the author's contention that all the variables have been explored which might be relevant in influencing an individual's vulnerability. Furthermore, it is not maintained that all the factors which have been taken into account in the present study are of importance for each person who becomes depressed. It can be assumed that certain factors might represent a necessary prerequisite for depression whereas others are important exclusively for certain subjects and in an interaction with yet other factors. In future studies it will be important to try to identify further variables which can reduce an individual's resistance to external events and also to try to chart the relative contribution that each of those factors makes to increasing vulnerability.
<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEX</td>
<td>No sex difference in the mean number of events. Female patients slightly more events of the &quot;independent&quot; (fateful) type in the period 12-4 months prior to depression.</td>
</tr>
<tr>
<td>AGE</td>
<td>Patients in the younger age groups have experienced significantly more events, also of the &quot;fateful&quot; type than older patients.</td>
</tr>
<tr>
<td>CIVIL STATUS</td>
<td>No significant differences between patients living alone and patients married or living together, but for those events (e.g. &quot;conflict&quot;) which might have been the reason for divorce or separation.</td>
</tr>
<tr>
<td>CLINICAL DIAGNOSIS</td>
<td>Neurotic-reactive patients have experienced significantly more events, also of the fateful type than unipolar and bipolar patients. Among the neurotic-reactive group, pure reactive patients have experienced more events than pure neurotic or mixed neurotic-reactive patients. The difference between diagnostic groups proved to be independent of age.</td>
</tr>
<tr>
<td>TYPE OF EPISODE</td>
<td>Patients with recurrent depression have experienced fewer events than patients at their first episode, especially during the last three months prior to the onset of the episode.</td>
</tr>
<tr>
<td>SEVERITY OF DEPRESSION</td>
<td>No significant differences between in- and out-patients. No significant differences between patients classified as psychotic or non-psychotic. No relation of life events to the severity of the depressive syndrome as assessed by means of a rating scale. However, a slight, statistically significant relationship between a negative appraisal of the experienced events and the total score at the rating.</td>
</tr>
<tr>
<td>FAMILY LOADING FOR DEPRESSION</td>
<td>No statistically significant differences between patients suffering from Depression Pure Disease (i.e. with a positive family history for affective illness), and patients suffering from Sporadic Depression (i.e. without cases of affective disorders among their first degree relatives).</td>
</tr>
<tr>
<td>VARIABLE</td>
<td>RESULTS</td>
</tr>
<tr>
<td>-----------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>PLATELET MAO-ACTIVITY</td>
<td>Patients with low MAO-activity experienced life events more negatively. They experienced also fewer &quot;exit&quot; and fewer &quot;uncontrollable&quot; events than patients with high MAO-activity.</td>
</tr>
<tr>
<td>PERCEPTUAL REACTANCE</td>
<td>Patients with an augmenter response in VEP reported more events, more events as extremely difficult, and reported adaptation after the life-event as difficult.</td>
</tr>
<tr>
<td>PERSONALITY TRAITS</td>
<td>Patients with high scores in outward aggression experienced significantly more and patients who scored high on inhibition of aggression experienced significantly fewer events. The latter had also experienced life events more negatively. Events reflecting conflicts in social relation were related to such personality characteristics as impulsiveness, hostility, and aggression. Weak, but statistically significant correlations were found between the patients' negative appraisal of the events and personality traits of suspicion and hostility.</td>
</tr>
<tr>
<td>CHILDHOOD DEPRIVATION</td>
<td>Patients reared by rejecting mothers were contrasted with patients reared by stimulating mothers. Although falling short of statistical significance the results were in the predicted direction, i.e. that the less vulnerable patients reared by stimulating mothers had experienced more events than those reared by rejecting mothers. A few patients had lost a parent during childhood. No differences in life events were found in the patients bereaved early compared with those who had not lost a parent during childhood.</td>
</tr>
</tbody>
</table>
ACKNOWLEDGEMENTS

A lot of people have contributed to the accomplishment of this work in one way or another and I am very grateful to all of them.

I am especially grateful to Professor Carlo Perris who inspired me to start this work and from whose competent guidance I have benefited throughout the writing of this thesis, as before during the whole of my research work. I am certainly glad that besides our marital connection we have succeeded in collaborating even professionally without any major problems.

Secondly I would like to thank our children for their constant patience during the time this work has been in progress. Without their consideration and encouragement I would never have been able to finish this work which in the beginning seemed an almost impossible task.

I am also grateful to Professor Lars Oreland, to Associate Professor Lars von Knorring and to Professor Lars Jacobsson for their stimulating collaboration in parts of this study.

I would also like to express my gratitude to my colleagues and members of the research-team I am a part of. First of all Martin Eisemann who with his great sense of responsibility has been an invaluable resource, helping me to code all the data and to prepare and complete the final statistical analyses. In this last respect I have had the great luck to know and get help from Bengt Hållberg, Ph.D. whose statistical competence I really needed to bring order to all the data this investigation generated.

I would also like to thank other members of my group, Ulla Eriksson and Sonja Holmgren for their friendly collaboration throughout this study.

My thanks also to Doris Cedergren, the clinic's secretary, who has always willingly fulfilled my requests.
My thanks to Pat Schrimpton and Michael Sharp who have kindly helped me with the English translation.

Lastly I will direct my gratitude to all those people whose sufferings this investigation is based upon. Perhaps it is presumptuous to hope that this thesis will somehow contribute to the understanding of a psychic state which has caused so much suffering - but I really hope it will.

My research work has been supported (in part) by a grant from the Swedish Medical Research Council (grant no 5244) and by grants from the Medical Faculty, Umeå University.
REFERENCES


THE FINAL LIST OF EVENTS IN THE INVENTORY

1. Started working
2. Changed profession
3. Stopped working
4. Had a baby
5. Changes in working time
6. Changes in working responsibility (more resp)
7. Changes in working responsibility (less resp)
8. Trouble with boss
9. Trouble with co-workers
10. Unemployed more than 1 month
11. Other changes in working conditions
12. Changed place of employment
13. Started or finished extra-work
14. Participated in courses or studies connected with profession
15. Started a new course of training
16. Finished course of training
17. Been forced to stop a free-time activity
18. Started a new free-time activity
19. Major change in financial state
20. Been heavily in debt
21. Other important changes in the financial state.
22. Married or started living together
23. Break-up of marriage or separation
24. Divorce
25. Change in number of arguments with spouse
26. Other types of trouble within the family e.g. with children
27. Separated from family more than 1 month
28. Spouse started or stopped working
29. Adopted a child
30. Changes in sexual habits
31. Menopause
32. Spouse severely ill
33. Spouse died
34. Child severely ill
35. Child died
36. Parent severely ill
37. Parent died
38. Pregnancy
39. Still birth or abortion
40. Close relative severely ill
41. Close relative died
42. Close friend severely ill
43. Close friend died
44. Moved to another house
45. Moved to another flat
46. Somebody moved into your house
47. Somebody moved from home
48. Major changes in home conditions due to damage, repair etc.
49. Changes in social activities
50. Religious conversion
51. Physical injury
52. Somatic illness or operation
53. Involved in violence
54. Driving licence withdrawn
55. Met with an accident
56. Others
CATEGORIZATION OF LIFE EVENTS *)

INDEPENDENT:  1, 4, 6, 10, 11, 14, 15, 16, 22, 26, 28, 29, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 51, 53, 55.

ENTRANCE:  1, 2, 4, 22, 29, 46.

EXIT:  3, 23, 24, 33, 35, 37, 39, 41, 43, 47.

CONFLICT:  8, 9, 23, 24, 25, 26.

OBJECT LOSS:  33, 35, 37, 39, 41, 43.

POSITIVE:  1, 2, 4, 14, 15, 16, 18, 22, 29.

NEGATIVE:  3, 5, 8, 9, 10, 17, 20, 23, 25, 26, 27, 30, 31, 32, 33, 34, 35, 36, 37, 39, 40, 41, 42, 43, 51, 52, 53, 54, 55.

AMBIVALENT:  6, 7, 11, 12, 13, 19, 21, 24, 28, 38, 44, 45, 46, 47, 48, 49, 50.

CONTROLLABLE:  1, 2, 4, 5, 8, 9, 13, 14, 15, 16, 17, 18, 20, 22, 23, 24, 25, 26, 29, 38, 44, 45, 46, 49, 50, 54.

UNCONTROLLABLE:  3, 11, 28, 30, 31, 32, 33, 34, 36, 37, 40, 41, 42, 43, 51, 52, 53, 55.

AMBIVALENT:  6, 7, 10, 12, 19, 21, 27, 39, 47, 48.

*) The numeration of the events is the same as in Appendix A.