The Zurich Study

XVI. Early Antecedents of Depression.
A Longitudinal Prospective Study on Incidence in Young Adults*

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Summary. The purpose of this study was to investigate antecedents of first incidence of major depressive disorder and recurrent brief depression with the help of a cohort of 20 year-old Swiss, who was interviewed four times up to age 30. Cases diagnosed as depressed at the third or fourth interview (age 28 or 30) were compared with never diagnosed controls for antecedents at the first and second interview (age 21 and 23). Besides retrospectively assessed childhood precursors, later depressives showed slight differences in their relationship to parents and friends and early symptoms of subclinical depression, persistent helplessness and a surplus of life events. These antecedents were mainly found in females. The most persistent antecedent of later depression for both sexes was a higher score than controls' on the SCL-90R ("negative affectivity"). Whether this finding signifies that proneness to the milder depressions in young adults is rooted in personality is subject to discussion.

Key words: Longitudinal study – young adults' first incidence – major depressive disorder – recurrent brief depression – antecedents – "negative affectivity"

1 Introduction

In 1978, Brown and Harris' study on "Social origins of depression" introduced a well defined and testable concept of vulnerability to depression by social adversity, which became both extremely influential and controversial. Particularly under the influence of Henderson·et al's (1981) findings that perceived lack of support preceded minor psychiatric symptoms, opposite causation models were constructed. Stressful life events and lack of social support were not considered as antecedents but rather as concomitants or even consequences of developing or present depression or of the behaviour and cognitions of a depression-prone personality (see Monroe and Steiner 1986 for a survey).

With their Life Events and Difficulties Schedule (Brown 1987) and with their "holistic judgement" of self-evaluation, the Bedford School used personality-specific concepts of provoking factors of depression and of emotional vulnerability (Brown 1987; Brown et al. 1990a). Over the years, the perspective increasingly moved towards a compromise with the theorists who believe personality itself to be the main cause of depression. By isolating strands of adversity that started with early bond disruption, the authors were able to conclude that a resulting negative evaluation of self ("characterological self blame", Harris et al. 1990) is the most important aspect of vulnerability (Brown et al. 1990b) and that "long standing features of personality may have contributed to continuous adversity" (Brown 1987).

The present prospective longitudinal study of young adults contributes to the search for antecedents of depression and to an evaluation of personality variables in this context. The following factors are known frequently to differentiate the actually depressed from controls, and being concomitants, are usually included in the search for antecedents (e.g. Lewinsohn et al. 1988): social stress (low income, education, socioeconomic status, being unmarried); dissatisfaction with work; interpersonal difficulties; specific cognitive patterns (low self-esteem, situational helplessness); negative affectivity and/or a high neuroticism score and a moderately increased number of life events of the "dictionary variety" (Brown and Harris 1986). These factors are included in our study as possible antecedents.

Quite a large number of studies have tried to isolate longitudinally the antecedents of depression (Table 1). Rather than being actual causes, antecedents may primarily be contributary conditions (Lewinsohn et al. 1988) or indicators of a disposition or vulnerability to depression with both, disposition and depression, depending upon a third factor (Duncan-Jones in Cooper 1987). Another possibility could be that antecedents are primarily

indicators of a chronic precursor state that has not yet reached the threshold of caseness but will do so in the presence of marked personalityspecific difficulties (Brown et al. 1986). It is well known that correlation does not prove causation, but unfortunately neither does antecedence.

2 Method

The subjects of this investigation were taken from the Zurich Study, a longitudinal epidemiological investigation of a cohort of young adults of the Canton Zurich in Switzerland. After the screening in 1978, a sample of 292 males and 299 females were selected according to scores on the 90-Items Hopkins Symptom Checklist (SCL-90R, Derogatis 1977): Two thirds of the sample scored above the 85th percentile. This stratified sample was interviewed in 1979, 1981, 1986, and 1988. At the third interview (1986) the dropout rate was 23 percent, at the fourth (1988) 28.3 percent (Fig. 1). The four interviews cover 10 years from age 20/21 to age 29/30. Probands were seen at their homes by trained clinical psychologists and psychiatric residents.

A semi-structured diagnostic interview SPIKE had been developed for the Zurich Study and was used in the present analysis. SPIKE collects information on socio-economic variables, childhood characteristics, and attitudes to work and leisure time. This instrument investigates psychiatric and somatic syndromes and the use and abuse of various substances. Symptoms, their duration and frequency, the degree of suffering, treatment, and eventual social consequences are assessed for each syndrome. The interview covers symptoms of the last twelve months before assessment. In 1986 and 1988 each year since 1978 was assessed for the presence of depression or treatment. In 1979, 1981 and 1988 lifetime depression and lifetime treatment were covered. Questions on the relationship to friends, family of origin or partners followed the Social Adjustment Scale by Weissman et al. (1977). "Close friends" were defined as persons one can go to with a personal problem. A Life Event Scale for the year before the interview was constructed according to Tennant et al. (1976, 1977) and Holmes and Rahe (1967) with events weighted according to the values given by a Swiss sample (Bischofberger and Thomaier 1982). Loss events were defined to involve failures, deaths or separations. A detailed inquiry into childhood behaviour and conditions took place in 1986 and 1988 (referred to as "childhood" data or variables below).

At each interview, the SCL-90R (Derogatis 1977) was given for self-assessment. Self-esteem and mastery were measured with the Scales of Pearlin and Schooler (1978).
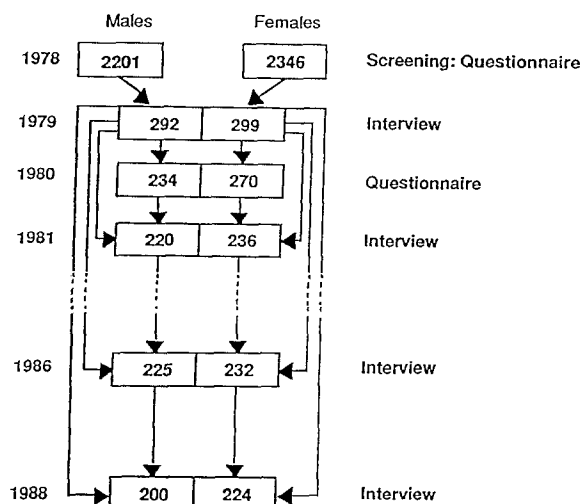

Fig. 1. Design of the Zurich Study

Table 1. Incidence group 1986 ($N = 52$) and 1986/88 ($N = 76$)

Diagnoses
- DSM-III major depression
- Recurrent brief depression:
  at least monthly recurrent depressive state with subjective work impairment

Criteria of incidence group (1986, 1986/88)
- Present at interviews 1979/81/86 and 88
- First diagnosis of depression 1986 or 1988
- No former lifetime depression
- No former treatment for depression
  (question asked at screening and all four interviews)
- No former diagnosis of panic

Criteria of control group
- Present at interviews 1979/81//86 and/or 88
- Never given a diagnosis of depression or panic disorder
- No lifetime depression
- No treatment for depression

Incidence group (N)

a) 1986: m = 22
          f = 30   52

b) 1988: m = 16
          f = 8   24

c) 1986/88: m = 38
            f = 38   76

Controls

For inception group 86: $N = 234$
For inception group 86/88: $N = 192$

(N of incidence group and controls may be lower if data are used that concern subgroups, e.g. probands with partners)

Two diagnoses were unified and used for a dependent variable: major depressive disorder according to DSM-III criteria (MDD) and recurrent brief depression (RBD) according to criteria by Angst et al. (1990). Subjects with probable first incidence of MDD and/or RBD were screened according to criteria in Table 1.

There are two incidence groups (Tab. 1):

a) 52 probands who, after having been present at least at three interviews (1979, 1981, 1986), received a diagnosis of depression for the first time in 1986.
b) 24 probands who after having been present at four interviews (1979, 1981, 1986, 1988) received a diagnosis of depression for the first time in 1988.

A control group consisted of all subjects who had never received a diagnosis (234 in 1986; 192 in 1988).

To describe *antecedents* of depression, we used the data of both groups a) and b) (N = 76) collected in 1979 and 1981. To describe *concomitants* of depression we used also data of both groups that were collected in 1986 with the exception of childhood data, which in part were collected in 1988. In 1986, group b) was still free from depression at most for the next two years. A comparison of the actually depressed group a) with the combined group a) + b) (which contained 24 subjects shortly to be but not yet depressed) revealed the following differences:

- in a larger number of persons in group a) had not terminated a vocational training in 1986 ($P \leq 0.01$);
- group a) described more often a conflictual relationship with a partner ($P \leq 0.03$) (the combined group showed a statistical trend in the same diretion).

Table 2. Antecedents introduced into discriminant analysis

Situative antecedents (two assessments: 1979 and 1981)
More conflict and/or stress with parents
More conflict and/or stress with partner
More conflict and/or stress at work
More feelings of isolation and/or for fewer confidants
More stressful life events
More sexual problems
More suicidal ideation
Lower mastery
SCL-90R total score "negative affectivity"
Risk score based on 1978 SCL-90R rating
More symptoms of depression

Retrospective childhood antecedents (assessed once in 1986 or 1988)
Conflicts within the family
Parents uncaring and/or punishing
Family isolated and/or not well regarded
Anxiety
Less popular than others
Truancy and/or frequent fighting
Psychiatric and/or school problems

Table 3. Childhood variables: incidence group 86/88 ($N = 76$)

	Cases $N = 76$ %	Controls $N = 192$ %	P	Phi
Education:				
Lower level of high school	75	67.2	0.05	−0.17
Relationship with parents:				
− Severe conflicts within the family	23.7	8.9	0.001	0.198
− Describes parents as uncaring	23.2	12.5	0.035	−0.13
− More severely punished than other children	26.1	7.8	0.000	−0.24
− Family not well regarded	14.5	5.7	0.02	−0.14
− Family isolated	13.2	2.1	0.000	0.224
− Age at leaving home (t-test)	17.6 years	20.1 years	0.10	−0.14
Emotional and behaviour problems:				
− Afraid of teacher	32.9	18.8	0.01	0.152
− Afraid of gymnastics	22.4	12.0	0.03	0.131
− More anxious than school mates	30.3	16.2	0.009	0.159
− Less popular	19.8	7.8	0.005	0.170
− Truancy	13.2	3.7	0.004	0.176
− Frequent fighting	14.5	3.7	0.001	0.195
Involvement of school psychiatrist/psychologist:				
− Seen by psychiatrist in adolescence	19.7	8.3	0.009	1.161
− Ever seen because of school problems	13.2	5.2	0.03	0.136

No difference between cases and controls:
− Not living with both parents up to age 16
− Financial hardship
− Chronic illness/handicap of parents/siblings
− Psychiatric illness of parents
− Parental discord
− Severe conflicts of siblings with parents
− Severe behaviour disorder (running away, repeated theft, police contacts)
− Treatment for behaviour disorder
− Special schooling

Because the concomitants of actual depression (group a) were not appreciably diluted by the inclusion of imminent depression (group b) we felt justified in using the combined group to define concomitants as well as antecedents of depression.

By excluding probands with life time treatment for depression or who reported to have suffered at any time before or between interviews from a depressive syndrome, we have endeavoured to create a group consisting of subjects with life-time first incidence of depression. The incidence group was compared with all subjects that were given a diagnosis of depression already in 1979 or 1981 in order to assess the possibility to generalize our results to persons who suffered depressions at a younger age.

2.1. Method of Discriminant Analysis

Because depression involves an intricate interplay between many, largely unknown, mutually interacting variables, it was decided to employ a competitive design based on multivariate discriminant analysis.

Of the 29 features selected for use as discriminating variables, 13 referred to information based on childhood experience only, but assessed during the year of, or two years before, the first incidence of depression 1986 or 1988. Another 16 features referred to premorbid situative information assessed in 1979, and again in 1981. In order to reduce the ratio of the number of variables to population size (76 index cases plus 192 controls), certain clinically meaningful combinations of features were used for analysis, thus reducing the overall number to 18:7 childhood plus 11 situative antecedent features assessed in 1979 and in 1981.

In contrast to univariate methods, discriminant analysis takes into account the mutual influences between variables: on the basis of the values of respective standardized discriminant coefficients, the relative importance of each variable in combination with the other variables can be judged. Accordingly, "non-salient" variables can be systematically eliminated between successive runs until some minimum number, yielding an acceptably large true-positive rate (= small false-negative rate), can be found. Such judgements, however, are very sensitive to the local characteristics of the sample. For this reason, it is important to apply a *repeated randomsplitting technique* within the context of an "average trajectory" approach to the data (Schmid et al. 1991). In our case, limi-

tations due to small learn- and test-sample size (38 index cases plus 96 controls in each sample) confined reproducible results to a maximum of 3 variables for discrimination between index cases and controls (Table 2).

3 Results

3.1 Comparison with Subjects Diagnosed in 1979 and 1981

Our incidence group was compared with those who were given a diagnosis of depression already in 1979 and/or

Table 4. Presence of partner

Year of interview	1979	1981	1986
Year of first incidence	1986/88	1986/88	1986/88
Subjects	N = 76	N = 76	N = 76
	(%)	(%)	(%)
Married			
Cases	5.3	16.4	19.7
Controls	2.6	11.2	33.3
P	ns	ns	0.03
Phi			−0.13
Has no partner			
Cases	44.7	34.3	30.26
Controls	43.7	35.4	16.67
P	ns	ns	0.01
Phi			−0.15
Living with partner			
Cases	13.2	29.9	48.7
Controls	12.5	31.1	63.0
P	ns	ns	0.05
Phi			−0.11

Table 5. Quality of close relationship

Year of interview	1979	1981	1986
Year of first incidence	1986/88	1986/88	1986/88
Subjects	N = 76	N = 76	N = 76
	(%)	(%)	(%)
Emotionally stressed			
Cases	12.5	26.1	38.7
Controls	8.6	23.4	21.3
P	ns	ns	0.004
Phi			0.18
Feeling dominated by partner			
Cases	15.6	20.9	23.1
Controls	18.4	18.3	7.5
P	ns	ns	0.002
Phi			0.21

1981 in terms of sex, diagnosis, education, and socio-economic variables. Our incidence group contained more males (65.4 percent vs 50 percent; $P = 0.02$) and fewer subjects suffering from a combination of MDD and RBD (10.5 percent vs. 25.1 percent; $P = 0.007$). There was a trend for the incidence group to consist of more subjects with primary school education only ($P = 0.10$). Otherwise the variables indicating socio-economic status in 1986 did not differentiate between the groups (position in work hierarchy, income, vocational education, social class).

3.2 Comparison with Control Cases (N = 76)

3.2.1 Childhood Variables

The incidence cases differed from controls, who had never received a diagnosis of depression, by a slightly lower level of education and by describing a more conflictual family life, less care and more punishment by parents and a sense that the family was isolated and not well respected. The subjects left home in adolescence at an earlier age than controls. They described themselves in childhood as more anxious and more given to truancy and fights than controls and as more often in contact with school services. Several severe childhood risk factors did not differentiate between incidence cases and controls, nor did severe behavior disorder or special schooling (Table 3).

3.2.2 Socio-Economic Variables

Incidence cases did not differ from controls in social class of origin. In 1986 subjects tended to earn less than controls.

3.2.3 Marital Status and Presence of Partner

Incidence cases got married at the same rate as controls. In 1986, however, they were loss often married (divorce:

12% vs 3% of controls). There was no difference in the presence of children in the household between incidence cases and controls; and none for the group of 38 women. in 1979 and 1981 the incidence group did not differ from controls in the presence of a partner or of cohabiting. In 1986, the probands were more often living alone or had no partner at all (Table 4).

3.2.4 Work Satisfaction

At no time did incidence cases deviate from controls in conflict or emotional stress at their place of work, in interest in work, or in satisfaction with leisure time.

3.2.5 Relationship with Friends

In comparison with controls, the incidence cases tended to indicate already in 1981 a lower number of persons in whom they were able to confide when in trouble. They consistently reported in a slightly larger number than controls feelings of isolation.

3.2.6 Relationship with Parents

The incidence group reported in slightly higher numbers stress in the relationship with parents.

3.2.7 Quality of Close Relationship

Difficulties with partner did not precede but were mainly restricted to the period of actual or imminent depression. Cases in the incidence group reported unwanted dominance by their partner as well as a stressful relationship (Table 5). An analysis by sex revealed that these concomitants of depression were restricted to females, while men did not feel affected in their relationship with partner.

3.2.8 Sexual Problems

Sexual problems appeared in the incidence group five to seven years before the onset of depression (Table 6). The deviation from controls increased sharply in 1986 with actual and imminent depression.

3.2.9 Depressive Cognitions

Self-esteem and mastery were used as indicators of self-

Table 6. Sexual problems

Year of interview	1979	1981	1986
Year of first incidence	1986/88	1986/88	1986/88
Subjects	$N = 76$	$N = 76$	$N = 76$
	(%)	(%)	(%)
Sexual problems present			
Cases	17.6	18.46	34.2
Controls	13.2	8.9	14.06
P	ns	0.04	0.000
Phi		−0.14	−0.23

Table 7. Depressive cognitions

Year of interview	1979	1981	1986
Year of first incidence	1986/88	1986/88	1986/88
Subjects	$N = 76$	$N = 76$	$N = 76$
	(%)	(%)	(%)
Self-esteem			
Cases	14.7	14.6	14.8
Controls	14.6	14.8	15.7
Wilcoxon test P	ns	ns	0.005
Mastery			
Cases	13.7	14.1	13.8
Controls	14.4	15.1	15.9
Wilcoxon test P	0.10	0.025	0.000

Table 8. Symptoms of depression

Year of interview	1979	1981	1986
Year of first incidence	1986/88	1986/88	1986/88
Subjects	$N = 76$	$N = 76$	$N = 76$
	(%)	(%)	(%)
Number of depressive symptoms			
Cases	2.45	1.39	8.84
Controls	2.24	0.79	2.13
t-Test P	0.05	0.02	0.000

Table 9. Life events and losses

Year of interview	1979	1981	1986
Year of first incidence	1986/88	1986/88	1986/88
Subjects	$N = 76$	$N = 76$	$N = 76$
	(%)	(%)	(%)
Life event score			
Cases	216.11	191.24	168.0
Controls	167.01	164.2	129.1
P	0.002	0.04	0.002
Loss score			
Cases	2.63	2.18	1.70
Controls	2.18	1.63	1.21
P	ns	0.03	0.02

Table 10. SCL-90R scores

Year of interview	1979	1981	1986
Year of first incidence	1986/88	1986/88	1986/88
Subjects	$N = 76$	$N = 76$	$N = 76$
	(%)	(%)	(%)
Depression			
Cases	0.89	0.81	1.03
Controls	0.67	0.50	0.46
Wilcoxon test P	0.01	0.0000	0.0000
Interpersonal sensitivity			
Cases	0.93	0.82	0.85
Controls	0.74	0.52	0.44
Wilcoxon test P	0.08	0.0001	0.0000
Anxiety			
Cases	0.59	0.55	0.61
Controls	0.55	0.34	0.36
Wilcoxon test P	ns	0.0009	0.0001
Anger/hostility			
Cases	0.70	0.60	0.76
Controls	0.54	0.41	0.39
Wilcoxon test P	0.04	0.0008	0.0000
Somatization			
Cases	0.52	0.50	0.51
Controls	0.47	0.31	0.34
Wilcoxon test P	ns	0.0000	0.0008
Total score			
Cases	0.71	0.63	0.70
Controls	0.56	0.39	0.37
Wilcoxon test P	0.02	0.0001	0.0000

evaluation. In the incidence group scores on mastery − not, however, on self-esteem − were tendencially lower than in the control group, already in 1979 and, more so, in 1981. A low score on mastery indicates feelings of helplessness. Both measures of self-evaluation were strongly affected by actual and imminent depression (Table 7).

3.2.10 Prodromal Symptoms of Depression

At each interview the number of reported depressive symptoms − not suficient for a diagnosis of depression − was higher among the later depressives. As to be expected, with actual and imminent depression the subjects deviated strongly from controls (Table 8) on the number of depressive symptoms.

3.2.11 Life Events

At each interview, life events over the past 12 months were more frequent in the incidence group. The loss

score already showed a difference in 1981, i.e. five to seven years before the onset of depression. With approaching and present depression, the incidence group reported life event and loss scores than were lower than in 1979 and 1981, but still significantly higher than for controls (Table 9).

3.2.12 Negative Affectivity

The most consistent difference between incidence subjects and controls appears on various scales of the *SCL-*

Table 11. Antecedents of depression by sex

Year of interview	1979	1981	1986
Year of first incidence	1986/88	1986/88	1986/88
Subjects	$N = 76$	$N = 76$	$N = 76$
	(%)	(%)	(%)
Life events			
Women:			
cases	231.6	175.9	145.9
controls	178.7	133.6	111.32
Kruskal-Wallis P	**0.01**	**0.01**	**0.07**
Men:			
cases	200.6	207.1	190.2
controls	158.4	187.1	142.1
Kruskal-Wallis P	**0.07**	ns	**0.006**
Symptoms of depression			
Women:			
cases	2.55	1.68	10.26
controls	2.36	0.93	2.79
Wilcoxon P	ns	**0.07**	**0.0000**
Men:			
cases	2.34	1.09	7.42
controls	2.15	0.68	1.65
Wilcoxon P	ns	ns	**0.0000**
Self-esteem			
Women:			
cases	14.7	14.7	14.9
controls	14.8	14.8	15.8
Wilcoxon P	ns	ns	**0.05**
Men:			
cases	14.7	14.6	14.8
controls	14.5	14.8	15.6
Wilcoxon P	ns	ns	**0.04**
Mastery			
Women:			
cases	13.3	13.8	13.6
controls	14.8	14.7	16.0
Wilcoxon P	**0.007**	**0.08**	**0.0002**
Men:			
cases	14.2	14.4	14.0
controls	14.0	15.3	15.8
Wilcoxon P	ns	ns	**0.004**

Table 12. Discriminant analysis

a) *Discriminance with 7 childhood and 22 situative variables*
1979 data:
Average true-positive rate = 66%
Childhood family isolated and/or not well regarded
More stressful life events 1979
Childhood anxiety

1981 data:
Average true-positive rate = 66%
Childhood family isolated and/or not well regarded
More conflict and/or stress with parents 1981

b) *Discriminance with 7 childhood variables only*
1986 assessment:
Average true-positive rate = 66%
Childhood family isolated and/or not well regarded
Childhood truancy and/or frequent fighting
Childhood anxiety

c) *Discriminance with 11 situative variables only*
1979 data:
Average true-positive rate = 62%
More stressful life events 1979

1981 data:
Average true-positive rate = 66%
More conflict and/or stress with parents 1981
More feelings of isolation and/or fewer confidants 1981
SCL-90R total score 1981

90R. Already in 1979 there were significant deviations from controls on depression, anger/hostility, and total score as well as a tendency to increased interpersonal sensitivity. In 1981, five to seven years before the onset of depression, very significant differences in interpersonal sensitivity, anxiety, and somatization appeared as well. With actual and imminent depression, the incidence group deviated strongly from controls on all scales (Table 10).

3.2.13 Antecedents of Depression by Sex
While women started at a higher level of reported life events than men, between 20 and 30 years of age this level decreased more quickly. At each interview the fe-

male incidence cases reported significantly more life events than controls. The persisting difference in life events between incidence cases and controls is mainly due to the female cases. This is also true for reporting prodromal depressive symptoms: The difference between incidence cases and controls is the consequence of female cases reporting more symptoms of depression already in 1981. While in men and women self-esteem varies with present or imminent depression, feelings of helplessness (low mastery) appear in women already seven to nine years before the onset of depression, while in men feelings of helplessness are mere concomitants (Table 11).

3.2.14 Results of Discriminant Analysis
Discriminant analysis (Table 12) shows
(i) only a small set of at most 3 features proved to be reliable as premorbid discriminators of depression;
(ii) the true positive rate of discrimination obtained with this set was, at best, marginal (60–70%);
(iii) childhood variables overshadowed situative variables in relative importance as discriminators;
(iv) the most important childhood variable in this regard was reported poor esteem for, and isolation of, the family of origin;
(v) there was a shift in the relative importance of situative variables as premorbid discriminators over a time span of two years from 1979 to 1981;
(vi) this shift was away from life events and toward interpersonal conflicts, feelings of isolation, and "negative affectivity" (Table 12).

4 Discussion

The incidence cases reported a more stressful childhood, less success at school, and more anxiety, more fighting and less popularity than controls. As childhood variables were extensively investigated only in 1986 and 1988, incidence cases' reports may be coloured or distorted by actual depression. The childhood descriptions did not differ from those given by controls in ascertainable facts such as loss or chronic illness of parents or financial hardship, but mainly in perception of the family atmosphere and reported parental treatment. The latter — parents being described as uncaring and punishing — corresponds to Parker's (1983) "affectionless control". So the question immediately arises whether these differences are to be taken as antecedents of depression or as the consequence of a present set of depressive cognitions (Lewinsohn and Rosenbaum 1987). Several studies, however, have found retrospective childhood data of later depressives confirmed by relatives (see Birtchnell 1985 for a survey). Our incidence cases' leaving home for good at an earlier age and having been seen by school psychologists and psychiatrists more often than controls, confirm — by a report on contemporaneous behaviour — that their childhood was more difficult, and that being anxious, unpopular and frequently involved in fights may be a precursor of later depression (Angst et al. 1990).

By the time they had reached the age of thirty, the incidence cases had not been significantly less successful than controls in terms of getting married and entering a partnership; but their marriages had broken down more often and, approaching age thirty, they had less often a partner and lived more often alone.

In comparison with controls, slightly more of the later depressed felt isolated and stressed by the relationship with parents already years before the onset of depression. This was less the case with husband/wife or partner relationships: here stress and a feeling of being dominated were associated with present and imminent depression and with female sex. Since more incidence cases than controls were already divorced or separated and more were without a partner in 1986, a deterioration of the husband/wife or partner relationship must in many cases have begun before 1986, i.e. before the earliest onset of depression.

Antecedents of depression become more visible when psychological factors are considered. Years before the onset of depression, the later cases reported more sexual problems and a larger number of depressive symptoms which, however, were not sufficient to fulfil diagnostic criteria. The latter difference appeared more strongly in females. According to Brown (1987) "subliminal depression" is one of the main psychological vulnerability factors found in later female depressives.

Low self-esteem does not appear as an early antecedent of depression in either sex, although in women a feeling of helplessness (low mastery) precedes depression by years.

Another early antecedent of depression is an increased reporting of life events and — two years later — of loss

events. The difference in comparison with controls in the number of experienced life and loss events thus remains constant over many years. Again the difference with regard to controls is mainly due to women (Harwood et al. 1986; Monroe et al. 1986). Indeed it was recently shown that reporting a large number of life events runs in families (McGuffin et al. 1988). Both, later cases and controls and either sex, reported fewer events and fewer losses in their late than in their early twenties.

According to our univariate analyses the most consistent early psychological antecedent of depression were the SCL-90R scores, which measure minor symptoms of mental distress. In antecedent "negative affectivity", no sex difference appeared. While the whole longitudinal sample was weighted for a high SCL-90R score, an inspection of Table 12 shows that controls' symptom scores undergo the expected regression to the mean, while the incidence cases tend to continue at the same level of symptoms as at age 20/21.

The survey of the literature on Table 13a and b shows that early precursors of later depression are mainly found in the realm of psychological background factors.

Some of these follow-up studies (part a) are not incidence studies sensu proprio but rather consider the part of the variance in symptoms of depression or other milder disorders at T_2, which is explained by life events, social support and by symptoms at T_1. As a rule, symptoms at T_1 explain most of the variance, and the effects of life events and social support decrease when previous symptoms are partialled out.

Data on "pure" incidence cases (Table 13b) does not affect this conclusion. Diagnoses of depression are best predicted by former diagnoses of depression, by scores on depression scales, by neuroticism, or by symptoms of mental distress.

Both parts of Table 13 confirm Depue and Monroe's (1986) opinion that "in every case in which it has been asserted in a longitudinal prospective design with at least two measurements $(T_1 + T_2)$, the level of prior disorder (T_1) has proven to be the most powerful predictor of subsequent disorder (T_2) accounting for as much as 30–40 percent of the total variance of disorder up to 1 year later", while life events and social support account for up to 10 percent. This statement is also true for the present prospective study, which spans seven to nine years, and it is true for women as well as for men, who report fewer early depressive symptoms, fewer feelings of helplessness, and fewer life events.

If the milder disorders in the general population are best predicted be previous disorder or previous disturbance, their course must very often be chronic or recurrent. A recent survey (Angst 1990) confirms this: in prospective community studies — some of them spanning many years — a frequently recurrent or chronic course is found in about 50 percent of depressives.

High chronicity of the milder depressions raises the question of personality as antecedent or even as an important aetiological agent. The SCL-90R, which in our univariate study appeared — together with symptoms of depression — as the strongest predictor of incidence, assesses symptoms of distress merely over the past four

Table 13. Longitudinal epidemiological studies on risk factors of depression and neurotic symptoms

Author	Subjects	T_1-T_2	Criteria or symptom scale at T_2	Main influence at T_1 on symptoms at T_2
a Statistical separation of antecedents				
Eaton (1978)	General population	2 years	Gurin-scale	Depressive symptoms
Warheit (1979)	General population	3 years	18-items depression scale	Score on 18-item depression scale
Williams (1981)	General population	1 year	Mental Health Index	Score on Mental Index
McFarlane et al. (1982)	General practice attendants	18 months	Langner scale	Score on Langner scale
Aneshensel and Frerichs (1982)	General population	3 years	CES-D	Prior depression
Husaini and von Frank (1985)	General population	7 months	CES-D	Score on CES-D
Monroe (1982)	Housewifes	1 year	Hopkins Symptom Check list	Score on Hopkins Symptom Check list
Kaplan et al. (1987)	General population	9 years	18-item depression scale	Score on 18-item depression scale
Fichter et al. (1988)	General population	5 years	ICD	Score on PERI-scale (demoralization)
b Studies on "real" incidence				
Andrews (1981)	General practice attendants	8 months	GHQ	Score on GHQ
Lin and Ensel (1984)	General population	1 year	CES-D	Score on GHQ
Henderson et al. (1981)	General population	1 year	GHQ	EPI neuroticism score
Monroe et al. (1986)	Housewifes (subsample)	1 year	Hopkins Symptom Check list	Score on Hopkins Symptom Check list
Kaplan et al. (1987)	General population	9 years	18 item depression scale	− poor health − low income − isolation − uncertainty
Lewinsohn et al. (1988)	Found in general population by announcement	8 months	SADS RDC CES-D	Previous depression Score on modified SCL-90
Boyce et al. (1991)	Primiparae (NHS)	6 months	Edinburgh postnatal depression scale	a) EPI neuroticism score b) Score on interpersonal sensitivity scale

weeks. None the less this short time span may be sufficient to reflect also personality traits.

Duncan-Jones et al. (1990) assume that minor psychiatric symptoms fluctuate around a stable and characteristic level. They have been able to support their assumption by statistical model-fitting. The personality trait of neuroticism "may be little more than a subject's stable level of minor symptomatology". Our incidence cases showed a consistently high level of minor symptoms at three measurements starting nine to seven years before the onset of depression. Duncan-Jones et al's (1990) theory also explains "symptoms of depression" as an antecedent: By nature and nurture a subject may be particularly affected by minor depressive symptoms. If these pass a certain threshold the subject becomes a case of depression, and a dimension is changed into two categories (case/non-case).

Repeated measures of "negative affectivity" (Watson and Clark 1984; Watson and Tellegen 1985) or "demoralization" (Dohrenwend et al. 1990) or "low mood" (Williams 1981) are strongly correlated with personality measures of neuroticism (Costa and Mc Crae 1980; Duncan-Jones et al. 1990), a finding which supports Duncan-Jones et al's (1990) above assertion. An assessment of 1162 Swiss inductees with the SCL-90R and the Freiburg Persönlichkeitsinventar (FPI) resulted in a correlation of the SCL-total score with neuroticism of 0.45 (Angst unpubl). Andrews et al. (1990) found, in a large Australian

twin study, evidence for a general liability to neurosis that was defined by neuroticism and lack of mastery. If we replace neuroticism by "a persistent high score of minor psychiatric symptoms", Andrews et al's result is confirmed by the prospective Zurich study partially for men and completely so for women.

Thus, a general, ever present and personality-rooted liability to negative affectivity and − in women − to a surplus of life events could explain the chronicity and recurrence of the milder depressions, which is found in longitudinal epidemiological studies (Depue and Monroe 1986; Duggan et al. 1990; Angst 1990). A word of caution is, however, necessary: the heritability of minor disorders, in particular of the milder depressions, is about 50 percent or less (Propping 1990). Negative affectivity may manifest in full strength for the first time in adolescence. It is likely, that a less than satisfactory childhood environment plays a major role in the development of this liability. So while milder depressions certainly do not have a wholly "social origin" in the sense of Brown and Harris (1978), *social factors may be important for the aetiology of their main precursor.*

In comparison with the results of univariate analysis those of discriminant analysis are rather disappointing. It is evident that the distinct individuality of antecedent patterns found in our sample essentially speaks for sample-dependence. Also the relatively modest discrimination obtained between the incidence and control groups − no matter when (1979 or 1981) or how (childhood + situative variables, childhood variables only, situative variables only) variables were analysed − was to be expected: multivariate discriminant analysis in combination with a random-splitting technique is a very powerful tool. It can only lead to reproducible results of high performance if data are sufficiently homogenous, that is, sample-independent, with respect to the underlying multivariate structures under study (in our case, antecedent patterns of depression). Only with unrealistically large sample size could intrinsic structures be revealed and then confirmed by the randomsplitting technique. On the other hand, if a very good discrimination performance were to turn up with the help of as few as reproducible three variables, as in the present case, the results would probably be so obvious that researchers could justly ask why clinicians had not already on their own been able to come up with the same conclusions. The importance of "negative affectivity" as a vulnerability factor for depression, which is strongly supported by the literature and thus may be more than a sample-specific finding, is lost by using a too stringent method on relatively small groups of subjects.

The *limitations* of the study are the following: the antecedents we found may be valid only for depressives with first onset in their late twenties; childhood was retrospectively assessed and the findings are not very robust.

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