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## Provoking agents, vulnerability factors and depression in an Italian setting: a replication of Brown and Harris's model

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### Summary

The aetiological model of depression proposed by Brown and Harris in 1978 was examined in a sample of 120 women in Milan, using the same method for the assessment of life stresses. The role of provoking agents (severe events and major difficulties) was found to be similar to that of the earlier study. There was some evidence that lack of an intimate relationship with a husband or a boyfriend acted as a vulnerability factor, increasing the risk of depression in the face of provoking agents. The overall results support the Brown-Harris aetiological model in a quite different cultural setting.

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**Key words:** Provoking agent; Life stress; Brown-Harris model; Italy

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### Introduction

One of the most interesting areas in psychiatric epidemiology in recent years has been the role of psychosocial factors in the onset and course of psychiatric disorders. In the last two decades the part played by life events in the onset of depressive disorders has received particular attention. In the first case-control study in 1969 Paykel found that depressed patients had significantly more 'exits' and undesirable events occurring in the 6 months prior to the onset of depres-

sion than did a control series; other studies, using the same method, confirmed these results (Paykel et al., 1975; Paykel and Tanner, 1976; Barrett, 1979). In 1978, as the result of two community surveys carried out in Camberwell between 1969 and 1975 on women aged between 18 and 65 and a series of comparable psychiatric patients, Brown and Harris published their influential book, *Social Origins of Depression*. The research was innovative in the measurement of life events, particularly in the way meaning was dealt with by contextual ratings of threat. Using the Life Events and Difficulty Schedule (LEDS) it was shown that only relatively rare events rated severe ('marked' or 'moderate' on the long-term contextual threat scale and focused on the subject)

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played an aetiological role. It was also suggested that major difficulties (rated 1–3 on a 6-point scale, lasting 2 years or more and excluding purely health problems) played a causal role, although one of lesser importance. At least one provoking agent (a severe event or major difficulty) was associated with depression in 75% of psychiatric patients, in 89% of community cases with a recent onset, but in only 30% of the remaining women once women with chronic depression were excluded. The basic findings have now been repeated on at least nine occasions, but all have been studies carried out in the UK, except one in English-speaking Canada (see Brown and Harris, 1989, table 2.1). Life-event research among patients using broadly the same approach has been less restricted to research in the UK and has by and large produced similar results to the Camberwell patient enquiry — that is, provoking agents are important, but are somewhat less so than in the general population (see Brown and Harris, 1989, table 2.2).

The research also emphasised the importance of vulnerability factors. For Brown and Harris these increased the risk of depression, but only in the presence of a provoking agent (Brown and Harris, 1978, 1986a, b, 1989).

The particular importance of the quality of a woman's tie with her partner has been largely confirmed in eight studies (Brown and Prudo, 1981; Costello, 1982; Campbell et al., 1983; Brown and Harris, 1986a, b; Brown et al., 1986; Martin et al., 1989; Parry and Shapiro, 1986); in only one study was an effect not found (Bebbington et al., 1984). Employment outside the home as a vulnerability factor in depression has been much more difficult to replicate, although a recent longitudinal study has suggested that part-time employment may be protective for women with children at home (Brown and Bifulco, 1990).

There are some reports confirming the presence at home of three or more children under the age of 15 as a vulnerability factor (Brown and Prudo, 1981; Campbell et al., 1983). However, there are other studies where too few women fall into the category to make an analysis worthwhile (Bebbington et al., 1984), or those that failed to repeat the Camberwell results (Brown and Bifulco, 1985).

The role of early maternal loss as a vulnerability factor has also proved difficult to interpret in replication studies where on occasions due to small numbers a trend has failed to reach statistical significance (e.g., Costello, 1982; Campbell, 1983). There is, however, evidence from two studies confirming its role as a risk factor in terms of prevalence of depression (Harris et al., 1986; Bifulco et al., 1987) and from a third study when re-analysed (see Tennant et al., 1981; Harris and Brown, 1985). It is therefore of interest to pursue the topic further.

Unfortunately, patient enquiries cannot strictly consider the critical issue of vulnerability to such provoking agents: for this it is necessary to have a population-based enquiry that provides data on those not developing depression. However, an indirect test is possible by comparing the proportion having a vulnerability factor among patients and those with depression in the general population. If there is an effect in the general population and the proportion of patients having the factor is broadly comparable to community onset cases, a *prima facie* case for the aetiological importance of the factor for patients can be made.

The aim of this study is to investigate Brown and Harris's model in a different cultural setting, but using the same measures.

## Method

Three distinct groups of women aged between 18 and 65 all living in a suburban district of Milan (Gallaratese, QT.8) have been studied. First, a group of in-patients was selected from consecutive admissions to the Psychiatric Division of the Policlinico General Hospital. Records of admissions were regularly screened to identify possible subjects whose most recent onset of depression had occurred within the prior 12 months. All possibly suitable women were interviewed by a research psychiatrist (A.L. or E.F.). Second, a series of out-patients were obtained by regularly contacting a number of psychiatrists at the Local Community Mental Health Centre to provide names of patients presenting with a depressive disorder with an onset in the previous year. Case records were checked and a research interview carried out if the women appeared suitable. Third,

a random sample of women of a similar age composition to the patient series was drawn from the household records of the local authority. Each selected woman received a letter explaining the nature of the project and inviting her to take part. In most instances women were first contacted by telephone and, if they agreed, interviewed soon afterwards. Sixty patients were interviewed and 38 were found to be suitable in that they had an onset in the prior year (eight in-patients and 30 out-patients) and 120 women in the general population. All psychiatric patients agreed to be interviewed. Thirty-one of the women in the general population were un interviewed giving a completion rate of 79.5% (120/151).

All 180 women were interviewed by one of two research psychiatrists to assess their mental state at interview and during the prior 12 months. The semi-structured diagnostic interview Schedule for Affective Disorders and Schizophrenia (SADS, Endicott and Spitzer, 1978) was used and a diagnosis made according to Research Diagnostic Criteria (RDC, Spitzer et al., 1978). The approach was used in a previous study carried out by the same research team and a high degree of inter-rater reliability for the diagnosis of affective disorders was obtained.

As with the original Camberwell study an attempt was made to date onset to a particular week; in the few instances where this was not possible an estimate was made with a range of uncertainty in its dating, which was never wider than one month.

The rest of the interview followed closely the original Brown-Harris enquiry (Brown and Harris, 1978). The semi-structured Life Events and Difficulties Schedule (LEDS) was used to obtain life events and difficulties in the study period. The same method of rating contextual threat was employed, with a severe event defined as any 'marked' event (the highest rating on a 4-point scale of threat or unpleasantness) or those 'moderately' threatening events which were focussed upon the respondent either alone or jointly. Minor events, and those 'moderate' events not focussed upon the subject (for example a mother's stroke with good prognosis) were thus not counted as severe. We distinguished 'independent' events

and difficulties (which could not be seen as the result of depressive disorder, because their source was outside the subject's agency), 'possibly independent' (which are not out of the subject's control, but about which there was no evidence to suggest they had been related to the psychiatric status of the subject) and 'dependent' events and difficulties (which could have been brought up by the onset of the disorder itself). The analysis of provoking agents was limited to those that were independent and possibly independent. Severely threatening events and major difficulties used to define the presence of a provoking agent. The events and difficulties were rated for threat without knowledge of the individual's psychiatric status. Following the London procedure the interviewer presented the material concerning events and difficulties to a consensus rating meeting of four raters (excluding the interviewer). These were blind to whether or not the person had been depressed and his or her response to the event or difficulty. (All trained in the use of the LEDS in London and one worker who carried out about one-third of the interviews was always present.) The occurrence of life events and difficulties was established for the year prior to the onset of depression or for the year prior to the interview in the case of women without psychiatric symptoms.

Similar background demographic-type material was collected to that of the London study. Questions were also asked about persons to whom the woman could talk about things that were troubling her in the period prior to any onset. The original 'intimacy' scale from the Camberwell enquiry was dichotomised at the same cut-off threshold as in that study: women on the highest point, 'a', were considered to have a close, intimate, and confiding relationship with a husband or boyfriend: all other women were classed as 'non-a'.

All 38 patients satisfied Research Diagnostic Criteria for unipolar depression, including major and minor. (A further 22 with a condition lasting more than 1 year were excluded.) In the community sample eight of the 120 women were identified as having suffered onset of depression in the year; 74 community women, who were not cases of either depression or any other psychiatric dis-

orders, formed the 'non-depressed' comparison series. The remaining 38 women showed some other kind of psychiatric disorder: 16 had anxiety conditions, 15 suffered from chronic depressive disorders, and seven were diagnosed diversely. There were therefore 46 women with onset of depression in the year (eight community cases and 38 patients). Of the 46 depressed women, 63% satisfied the criteria of probable or definite major depressive disorder and 37% of probable or definite minor depressive disorder in terms of RDC. Depressed and non-depressed were quite similar in terms of age, social class, employment and marital status, but not in education (depressed women had a lower educational standard).

Cross-tabulated data were analysed using chi-square with Yates' correction and Fisher's exact test, with a *t*-test for frequency data.

## Results

For all patients (38) and those women in the general community with an onset of depression the 12 months before onset were covered for information about experience of life events and difficulties. Most of the women had an onset within a few months of interview so that in practice it was never necessary to cover a period of more than 18 months. For the purpose of this study a period of 12 months before onset has been taken and a comparable period before interview for those without onset of depression.

### Provoking agents

For the Milan women with depression severe events were closely associated with onset: for example, 87% of those with an onset experienced at least one severe event in the year before onset compared with 19% among non-depressed women in the year before interview (see Table 1A). There was also a much higher rate of severe events among the depressed (Table 1B). They also had a greater proportion experiencing two or more severe events: 46% (21/46) compared with 3% (2/74) among the non-depressed. Severe events were usually quite closely juxtaposed with onset: many (40%) with a severe event had one within 9 weeks, and most (75%) within 6 months of onset.

TABLE 1

LIFE EVENTS IN THE 12 MONTHS BEFORE ONSET OF DEPRESSION OR AT INTERVIEW FOR THE NON-DEPRESSED

	Depressed	Non-depressed	
(A) Proportion of women with at least one severe event.			
	87% (40/46)	19% (14/74)	$\chi^2 = 50.34$ , 1 <i>df</i> , $P < 0.001$
(B) Rate per 100 of severe and non-severe events			
Severe	145.6 (67/46)	21.6 (16/74)	$P < 0.001$
Non-severe	117.4 (54/46)	206.7 (153/74)	$P < 0.001$ ( <i>t</i> -test used)

Severe events were classified in terms of six types of loss: (1) separations or threats of separation, including deaths; (2) unpleasant revelations about someone close, which were sufficient to force a major reassessment of a person or relationship; (3) a life-threatening illness to someone close; (4) a major material loss or threat of loss; (5) an enforced change of residence or the threat of this; and (6) a miscellaneous group of crises involving some element of loss. About three-quarters of the severe events occurring to depressed women had loss as a central feature (see Table 2). If only severe events involving loss were utilised much the same result emerged as obtained with severe events as a whole: 74% (34/46) of the depressed compared with 8% (6/74) of the non-depressed had experienced a severe event involving loss ( $P < 0.0001$ ) (see Table 2).

While there were no differences in the rate of minor difficulties, major difficulties (those severe difficulties lasting at least 2 years and not health

TABLE 2

SEVERE EVENTS AND THE EXPERIENCE OF LOSS

Depressed	Non-depressed	
(A) % severe events involving loss		
73 (49/67)	38 (6/16)	$\chi^2 = 5.82$ , 1 <i>df</i> , $P < 0.05$
(B) % with a severe loss event among those women experiencing a severe event		
85 (34/40)	43 (6/14)	$\chi^2 = 7.52$ , 1 <i>df</i> , $P < 0.01$

TABLE 3

VARIOUS TYPES OF DIFFICULTY IN THE 12 MONTHS BEFORE ONSET OF DEPRESSION OR INTERVIEW FOR NON-DEPRESSED

	Depressed	Non-depressed	
(A) Proportion of women with at least one difficulty			
(1) Major difficulty	54 (25/46)	15 (11/74)	$\chi^2 = 19.22, 1 \text{ df}, P < 0.001$
(2) Marked health difficulty	41 (19/46)	7 (5/74)	$\chi^2 = 19.06, 1 \text{ df}, P < 0.001$
(3) 1 or 2	85 (39/46)	13 (10/74)	$\chi^2 = 56.72, 1 \text{ df}, P < 0.001$
(B) Rate per 100 of various types of difficulty			
(1) Major difficulty	63.0 (29/46)	14.8 (11/74)	$P < 0.001$
(2) Marked health difficulty	47.8 (22/46)	10.8 (8/74)	$P < 0.001$
(3) 1 or 2	110.8 (51/46)	25.6 (19/74)	$P < 0.001$
			( <i>t</i> -test used)

related) were four times more common among depressed women than normal women (Table 3). Fifty-four per cent of the depressed women and 15% of the normals had at least one major difficulty ( $P < 0.001$ ). Marked health difficulties (those rated on the top three scale points) lasting at least 2 years are also more frequent (Table 3). However, because of the considerable correlation between major difficulties and severe events, taking account of both (i.e., the provoking agents of the Camberwell study) does not add to the association with onset based on severe events alone (see Table 4). Nor did marked health difficulties add to the severe event association: only two of the depressed and three of the non-depressed had one without also experiencing a severe event.

The proportion with a provoking agent did not differ with type of depression: 88% of minor depressives and 89% of major depressives had

experienced at least one provoking agent in the year.

#### *Vulnerability factors*

Vulnerability in the original Camberwell enquiry was defined as any factor that increased risk of onset only in the presence of a provoking agent and not separately on its own. It is necessary to establish the proportions developing depression for the following four groups: (1) provoking agent and vulnerability factor, (2) provoking agent alone, (3) vulnerability factor alone, and (4) neither. The relevant hypothesis is that there will be a higher rate of onset in group 1 than would be expected from combining the rates in groups 2 and 3, i.e., that there will be additive interaction.

All four Camberwell vulnerability factors were examined: lack of an intimate confiding relationship with husband or boyfriend, early maternal loss (either through death or through separation for a year or more) before the age of 11 (later amended to 17), and lack of paid employment. Whilst six patients and five non-depressed women had three or more children under 14 at home, none in the depressed community sample did so; therefore, the findings fall to replicate the role of this as a vulnerability factor.

Table 5A gives the results for intimacy in the general population and shows the vulnerability model is upheld. Only 6% (2/31) developed depression where neither provoking agent nor lack of intimacy was present and only 5% (2/44) when either a provoking agent or a vulnerability factor

TABLE 4

PROPORTION OF DEPRESSED AND NON-DEPRESSED WOMEN EXPERIENCING A SEVERE EVENT OR MAJOR DIFFICULTY (I.E., A PROVOKING AGENT)

	Depressed % (n)	Non-depressed % (n)
Only severe events	35 (16)	5 (4)
Severe events and major difficulty	52 (24)	14 (10)
Only major difficulty	2 (1)	1 (1)
No severe event/major difficulty	11 (5)	80 (59)
Total	100 (46)	100 (74)

TABLE 5  
PROPORTION DEVELOPING ONSET OF DEPRESSION  
IN TERMS OF THE PRESENCE OF A PROVOKING  
AGENT AND LACK OF INTIMACY ('non-a')

Provoking agent	Intimacy		<i>P</i> = 0.08 (Fisher's exact test)
	No	Yes	
(A) Community sample (% onset)			
Yes	57 (4/7)	15 (2/13)	
No	0 (0/31)	6 (2/31)	
(B) Psychiatric patients (number)			
Yes	31	4	
No	3	0	

occurred alone (2/13 + 0/31). But there is a marked additive interactive effect (57%, 4/7) when both are present. Although these results are comparable to many that have been obtained (Brown and Harris, 1986b), because of small numbers the difference in the top row does not reach statistical significance (Fisher's exact test,  $P = 0.08$ ).

The data for patients cannot give an unequivocal test of vulnerability as there is strictly no group not developing depression. However, in the light of the sampling procedure, it does not seem unreasonable to assume that the denominators involving those not depressed would be broadly of the same order as these obtained in the general population sample. If this is accepted and given that the great majority of patients have *both* provoking agent and lack of intimacy (31/38, 82%; Table 5B), the results are clearly highly supportive of the vulnerability model irrespective of details of the non-depressed lacking in the table.

The number of women with loss of mother before age 17 was too small (11) to allow a reasonable task of a vulnerability effect. However, it is relevant that the patient series had a higher rate of loss of mother before the age of 17 than the non-depressed women in the general population: 32% (12/38) vs. 12% (9/74),  $\chi^2 = 5.00$ , 1 *df*,  $P < 0.03$ . Furthermore, the result in the general population, although based on small numbers, is consistent: 25% (2/8) versus 12%

(9/74). This suggests the possibility that a larger general population study might reveal a vulnerability effect.

Results concerning employment were different from London in the sense that employed women were more (and not less) likely to have had an onset in the presence of a provoking agent: of those employed 44% (4/9) of those with a provoking agent developed depression compared with 5% (2/37) without; for those in employment comparable figures were 18% (2/11) and 0% (0/25) respectively. Therefore, we were unable to repeat the original Camberwell results in terms of an increased risk of depression for women without employment outside the home or with three or more children under age 15 at home.

## Discussion

There are some differences between Brown and Harris's study and that reported here. Firstly, since the size of the Camberwell community sample was five times greater than ours, the analysis of vulnerability factors could be carried out more effectively. The small size of this sample also prevents any conclusions being drawn about the prevalence of depression in the general population. Secondly, we used a SADS-RDC system for diagnosis. It was originally developed on hospital in-patients and later applied to community samples in New Haven (Weismann and Myers, 1980) and in Edinburgh (Dean et al., 1983).

Ten studies in the general population utilising the LEDS showed that the proportion of women that experienced provoking agents prior to the onset of depression ranged from 62% to 94% (Brown and Harris, 1989). In Milan 89% of the depressed women experienced a provoking agent. However, since all but one of the depressed women with a major difficulty also had a severe event it is only possible to argue for the aetiological role of severe events.

While Brown and Harris (1978) found no relationship between marked health difficulties and depression, Murphy (1982) underlined the importance of health difficulties in an elderly depressed sample. In Milan there was a remarkably high number of marked health difficulties among the depressed women who were all under 65. How-

ever, given their considerable overlap with the presence of a severe event again a case cannot be made for an aetiological role.

There was no difference between major and minor affective disorders in terms of the presence of an aetiological agent: 90% (26/29) for major and 88% (15/17) for minor affective disorders. Our material confirmed the results of Brown and Harris (1978), Paykel (1974) and Bebbington et al. (1988) that it is not possible to divide depression into diagnostic types in terms of the presence or absence of provoking agents (see also Katschnig, 1986; Paykel, 1974).

There has been some controversy about the most suitable statistical model for testing the interaction between provoking agents and vulnerability factors. While the original Camberwell analysis utilised an additive model of interaction, other authors such as Tennant and Bebbington (1978), Costello (1982), and Parry and Shapiro (1986) evaluated interaction in a multiplicative way, using loglinear models or logistic regression. While there is no consensus of opinion as to which of the two formulations more accurately describes the causal processes at work in observed data, Brown and Harris (1986b) have argued that additive interaction is a sensible way in which to view such phenomena and in our study, whose aim was the replication of the Camberwell study, we chose the same statistical approach.

Of the four vulnerability factors examined, the results for confiding and intimacy followed closely those obtained in the original Camberwell population survey. Because of the small sample size the result was not statistically significant; however, the patterning of results was as predicted, and the fact that the majority of depressed patients had both low intimacy and a provoking agent suggests that the results as a whole can be seen as a replication.

There is a possibility of confounding here. Since the rating of intimacy is based on the situation before onset it is possible a low-intimacy situation could have been produced by the provoking crisis itself, such as the death of an intimate tie.

Among the depressed women nine severe events concerned important interaction changes with a close tie and 10 the death of a close tie.

But only six deaths and two interaction changes involved a confidant and provoked the loss of the intimate relationship. For 21% (8/38) of women developing depression the low intimacy was possibly related to the confidant's death/separation; but in most cases the low intimacy involved in the vulnerability was due to the pre-existing lack of intimacy.

Another explanation lies in the association found in the Islington survey between low intimacy and provoking agents (Brown et al., 1986); negative interaction in marriage and poor parental care in childhood were both associated with a higher rate of provoking agent. However, in both instances there was also an increased risk of depression after a provoking agent — that is, negative interaction in marriage and early poor parental care were vulnerability factors as well.

These results, therefore, partially support data collected in studies that focussed on the lack of a close and supportive relationship as a crucial vulnerability factor in depression. As focussed above, Brown et al. (1986b) also observed an important link between poor intimacy in marriage and lack of self-esteem. Furthermore the same group (Brown et al., 1988) reported that there was a relationship between the support provided by a close tie and recovery or improvement in women suffering from chronic depression. This recovery was independent of the effect of a reduction in the overall ongoing difficulty score and the occurrence of 'fresh start' events.

While the numbers of women in the general population were too few for a serious test of the vulnerability hypothesis concerning early loss of mother the high rate among the depressed patients suggested that it was a risk factor and that with larger numbers the vulnerability effect might be shown to hold in a general population series. However, the result might be due to some nosocomial effect, i.e., that women with early loss of mother might be more likely to seek or receive psychiatric treatment once they get depressed. There is in any case evidence that such early loss is only an indicator of a more crucial underlying factor — lack of adequate parental care in childhood (Bifulco et al., 1987).

Paid employment outside the home did not have a protective effect — if anything, the re-

verse. However, in Camberwell this was only a second order factor after the other three factors had been examined. Furthermore, a recent analysis of employment in another population suggests that a much larger sample size is required to sort out the complex processes that may be involved, particularly as, for women with children at home, full-time work (in contrast to part-time work) appears to increase the risk of depression given a major crisis (Brown and Bifulco, 1990).

In conclusion, our study generally supported Brown and Harris's aetiological model of depression in a quite different cultural setting; though this was limited to the role of provoking agents and one vulnerability factor (lack of intimacy). On the other hand it would have been surprising if in such a different sociocultural background the vulnerability factors were entirely the same. The original study should only be seen as serving as a general and heuristic model of the role of psychosocial stressors; it is hoped that research in other cultures may in time help to specify the basic underlying aetiological processes that are involved.

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