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Research report

Psychological predictors of single and recurrent major depressive episodes

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Abstract

Aim: To examine for differential psychological risk factors in a nonclinical sample having single or recurrent episodes of major depression. *Methods:* A cohort of 164 subjects was assessed initially in 1978 in their last year of teacher training, and at five-yearly intervals in 1983, 1988 and 1993. Experience of episodes of DSM major depression and anxiety disorders from each wave were summed and three groups (nil, one, and two or more episodes of major depression) were derived. The cohort also completed a series of self-report measures including neuroticism, state and trait depression, self-esteem, dependency, childhood parental environment and social support. *Results:* The group with two or more episodes were distinctly more likely to have met lifetime criteria for an anxiety disorder and to have had multiple anxiety disorder diagnoses over their lifetime. Groups with one or more episodes reported higher mean scores for trait depression, neuroticism and maternal overprotection and lower mean scores for paternal care and self esteem at baseline in 1978, but these variables did not predict differences between groups with single and recurrent episodes. At 1993, those with two or more episodes differed from those with none and single episodes in reporting lower trait depression scores and decreased perception of satisfactory social support over time, suggesting a psychological scarring effect for those with repeated episodes. © 1999 Elsevier Science B.V. All rights reserved.

Keywords: Depression; Affective disorders; Anxiety disorders; Risk factors; Prediction of recurrence

1. Introduction

Depression is now viewed less as a discrete, self-limiting illness and more as a relapsing disorder with

substantive disability (Angst, 1992; Coryell et al., 1994). This change in view implies a need for a greater focus on the prediction of the lifetime pattern of depression, both in terms of the total number of reported episodes and particularly, in identifying and distinguishing those who may suffer frequent episodes from those who experience a single episode. A longitudinal cohort study design allows for examina-

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tion of such factors over an extended time period, with the potential to identify differential risk factors.

Angst (1992) presented a review of studies predicting recurrence of major depression and concluded that the best predictors were early age of onset of first episode and the number of previous episodes, also verified by others (Warner et al., 1992). He noted the effects of personal physical health and the presence of a sick spouse as variables likely to impede recovery. He also noted the effects of premorbid personality factors (high neuroticism and obsessiveness) as predictors of poor outcome.

Several other factors have been identified as predicting the course of depression. Neuroticism has been the most consistent risk factor to onset and relapse, also thought to relate to chronicity and negative long term outcomes (Eccleston and Scott, 1991; Lee et al., 1992; Taylor and McLean, 1993). The risk of developing multiple episodes has been linked with female gender, younger age of onset, and lifestyle factors such as family history of depression, alcohol consumption and suicide attempts (Lewinsohn et al., 1988; Scott, 1988; Merikangas et al., 1994). Nolen-Hoeksema (1987) has also hypothesised that sex differences in depression prevalence may be associated with differences in coping styles (women using more self consolatory activities and men using active coping styles which tend to shorten episodes). Recovery time, conversely, has been found to be related to the length of time between the onset of symptoms and the introduction of treatment, stress prior to and during the recovery period, premorbid neuroticism, adverse life events, age of onset and family history (Eccleston and Scott, 1991; Monroe et al., 1992; Scott et al., 1992; Warner et al., 1992). In a recent paper, Kendler et al. (1997) reported that low family income, parental over-protectiveness, high levels of neuroticism, low levels of mastery and stressful life events prolonged recovery.

More recently there has been consideration of the role of comorbidity with anxiety disorders. Anxiety symptoms are said to be more frequent in individuals who develop a chronic depression (Scott, 1988), certain anxiety disorders may have differing relevance to specific depressive subtypes (Merikangas et al., 1994) and subjects with an early onset of major depression are more likely to suffer from an anxiety

disorder (Parker et al., 1997). The significance of sex differences in depression has been questioned by findings that once anxiety disorders are controlled for, the relationship between female sex and major depression is reduced by more than 50% (Breslau et al., 1995; Wilhelm et al., 1996).

This paper considers data relating to anxiety disorders, personality factors, and lifestyle influences in an attempt to predict the frequency of episodes in a non-clinical sample studied over a 15-year period.

2. Method

We have detailed the study extensively in previous publications (Wilhelm and Parker, 1989, 1993, 1994; Wilhelm et al., 1996) so that only summary details are given here. We initially sought to recruit a socially homogeneous group of young adults, and so invited those engaged in a postgraduate teachers' training program to participate in a longitudinal study in 1978. We enrolled 170 subjects (114 women and 56 men) who provided us with baseline data on a number of variables. In 1983, we assessed 109 women and 56 men; in 1988, we assessed 108 women and 53 men; and in 1993, 104 women and 52 men (giving response rates of 97, 95, and 92%, respectively). By 1993, two women and two men had died from natural causes, a further one withdrew from the 1988 assessment because of ill health, three had refused further participation (one at 1988, two more at 1993) and six could not be located (five at 1983 and one further at 1993).

Each of the three 5-year follow-up interviews (1983, 1988, 1993) has involved a semi-structured interview covering work, social network, and patterns of illness and coping style variables. Subjects also completed a series of self-report questionnaires including trait depression using the Costello and Comrey (1967) scale, neuroticism using the Eysenck Personality Inventory (Eysenck and Eysenck, 1964) and self-esteem using the Rosenberg (1965) scale with all three being measured on all occasions. A state depression measure (Wilson, 1979), and the Parental Bonding Instrument (Parker et al., 1979) were administered at all waves other than 1993. A Sex Role Inventory (Bem, 1974) generating masculinity, femininity and social desirability scales was

administered at waves from 1983 to 1993. Social support was assessed at the three follow-up waves by asking the subjects to rate the perceived amount of social support ‘generally’ and ‘in times of stress’ using a four-point scale with separate ratings for partners, family and friends. These scores were summed to give an overall score for perceived social support.

We have also used the Diagnostic Interview Schedule (Robins et al., 1981) and, subsequently, its newer form, the Composite International Diagnostic Interview (Robins and Helzer, 1988) at these three waves as a case-finding instrument. The depression and anxiety sections of the DIS and CIDI were used to generate DSM-III and then DSM-III-R diagnoses for all anxiety disorders as well as major depression. At each wave, data were gathered for each episode and these were identified on a time line allowing for the identification of age of onset and lifetime rates for each disorder. The subjects were allocated to a major depression category depending on the number of episodes experienced (none, one, or two or more episodes), a strategy used previously by other researchers (Angst, 1992; Warner et al., 1992). Self-report measures and other relevant variables were included in the analyses to test for significant predictors of the course of depression. The interaction between the number of episodes of major depression and the presence of anxiety disorders was examined closely. The anxiety disorders rated included panic disorder, generalised anxiety disorder (GAD), agoraphobia, simple and social phobias, and a composite ‘major anxiety disorder’ which represented the presence of one or more of the clinical anxiety disorders, namely, panic disorder, GAD and agoraphobia. A category labeled ‘all anxiety’ which encompasses one or more of the anxiety disorders experienced by the current sample (i.e. a major anxiety disorder or a social or simple phobia) was also included in some analyses.

3. Results

For the 156 subjects who provided data over the 15 years, 27 (17.3%) had experienced one episode of major depression, 14 (9%) had experienced two, five (3.2%) experienced three, four (2.6%) experienced

four, one (0.6%) experienced five, and the remaining three (1.9%) had experienced 6–12 episodes, so that 27 (17.3%) had experienced two or more episodes. Only a small percentage (i.e. 5.1% of the cohort) of those who reported an episode of major depression over the time of the study had actually experienced one prior to baseline assessment in 1978.

It was therefore decided to classify subjects into either nil ($n = 102$), one ($n = 27$), and two or more episode ($n = 27$) categories. The chi-square statistic revealed no significant differences between males and females represented in the three depression categories ($\chi^2 = 1.2$, NS; refer to Table 1). On inspection of data in Table 1, ‘one’ and ‘two or more’ episodes are seen slightly more frequently in females.

As the data were not normally distributed, Mann-Whitney U (Wilcoxon Rank Sum W -test) for independent samples was then conducted to determine if there was a difference in the total number of reported depression episodes and total duration of all episodes. There was no significant sex difference in either the total number of reported episodes ($z = -0.30$; NS) or the total duration of episodes ($z = -0.23$; NS). The same test was used to determine whether the duration episodes differed between those with one and repeated episodes. Those with repeated episodes had a significantly longer total duration ($z = -2.99$; $P < 0.01$). As the total duration may simply reflect frequency of episodes, mean duration of episodes was also examined. Those with a single episode had a mean duration for 37.04 (S.D. 51.6) weeks compared to 24.79 (S.D. 22.9) weeks for those with repeated episodes, which was not statistically significant ($z = -0.27$; NS).

The interaction between the number of episodes of major depression and presence of any anxiety disorder was examined. Table 2 data indicate a gradient

Table 1
Prevalence of major depressive episodes (MDE) for males, females and the total sample

	Episodes of major depression (%)		
	None	One	Two or more
Male	71.1	13.5	15.4
Female	62.5	19.2	18.3
Total	65.4	17.3	17.3

Table 2

Mean age of onset (and S.D.) for those reporting a lifetime anxiety disorder examined against number of major depressive episodes

Type of Disorder		Number of episodes of major depression			Test of significance
		None (<i>n</i> = 102)	One (<i>n</i> = 27)	Two or more (<i>n</i> = 27)	
Major Depression	Age of onset	—	31.6 (6.3)	26.3 (5.8)	<i>t</i> = 3.2***
Panic disorder	No	97 (95%)	21 (78%)	16 (59%)	$\chi^2 = 24.4$ ***
	Yes	5 (5%)	6 (22%)	11 (41%)	
Generalised anxiety disorder	Age of onset	28.8 (12.8)	23.3 (8.8%)	21.5 (8.8)	<i>F</i> = 1.0
	No	94 (92%)	23 (85%)	15 (56%)	$\chi^2 = 22.0$ ***
Yes	8 (8%)	4 (15%)	12 (44%)		
Agoraphobia	Age of onset	33.9 (6.6)	30.7 (13.6)	25.8 (6.8)	<i>F</i> = 2.7
	No	99 (97%)	23 (85%)	21 (78%)	$\chi^2 = 12.2$ ***
Yes	3 (3%)	4 (15%)	6 (22%)		
Simple phobia	Age of onset	34.0 (1.0)	24.5 (11.4)	18.3 (11.6)	<i>F</i> = 2.3
	No	91 (89%)	20 (74%)	20 (74%)	$\chi^2 = 6.0$ *
Yes	11 (11%)	7 (26%)	7 (26%)		
Social phobia	Age of onset	18.6 (10.6)	13.3 (8.1)	7.1 (4.0)	<i>F</i> = 3.8*
	No	87 (85%)	23 (85%)	18 (67%)	$\chi^2 = 5.2$
Yes	15 (15%)	4 (15%)	9 (33%)		
Major anxiety (GAD, panic, agoraphobia)	Age of onset	16.3 (8.2)	11.0 (8.8)	15.4 (9.5)	<i>F</i> = 0.6
	No	92 (90%)	19 (70%)	11 (41%)	$\chi^2 = 31.8$ ***
Yes	10 (10%)	8 (30%)	16 (59%)		
All anxiety (all categories of anxiety disorders)	No	75 (74%)	15 (56%)	7 (26%)	$\chi^2 = 21.2$ ***
	Yes	27 (26%)	12 (44%)	20 (74%)	

*** *P* < 0.001; ** *P* < 0.01; * *P* < 0.05.

effect in that those with two or more episodes of major depression had higher rates of meeting 'major anxiety' and 'all anxiety' status than those with one episode, who in turn, had higher rates than those subjects in the 'no depression' group. Such a gradient was evident across all anxiety disorders examined individually. Mean ages of onset of the anxiety disorders were examined to determine whether there were similar gradients. Results indicate that the mean age of onset of simple phobia was significantly younger in those who had multiple episodes of depression, with similar trends for all of the other anxiety groupings, with the exception of social phobia.

We then examined for relationships between frequency of depression and self-report measures collected over the various waves. As the trends were consistent across the various waves, Table 3 reports data from two time points only (the first wave and last wave at which those data were collected). Several of the self-report measures (in particular, higher trait depression and greater maternal overprotection as well as lower self-esteem, lower PBI

paternal care and lower social desirability) demonstrate a gradient across the three groups (nil, one and two or more episodes). There were no gradients across groups for the masculinity and femininity scales on the sex role inventory, on dependency scales, nor for PBI paternal overprotection scores.

The contrast analyses indicate that, with the exception of 1993 trait depression scores, all of the mean differences lay between the 'no depression' and the 'one or more episode' groups. For trait depression at 1993, there were also differences between the 'one' and 'two or more' episode groups. For state and trait depression and for social desirability, the differences were more marked at the later wave than at the first wave, indicating an effect over time due to repeated episodes.

Two discriminant function analyses were conducted to determine whether differences existed between the 'no depression' and the 'one or more episode' categories as well as between the 'one episode' and 'two or more episode' categories (using the same categorisation method as for the contrast analyses). The variables entered were those self-

Table 3
Mean self-report scores examined against episode frequency and contrast analyses examining for group differences

Self-report measures (mean (S.D.))	Year	Number of episodes of major depression			F ratio	Contrast analyses	
		None	One	Two or more		A	B
Trait depression	1978	29.1 (11.1)	32.8 (11.8)	35.0 (12.5)	3.3*	**	
	1993	27.6 (11.5)	27.6 (10.0)	43.7 (11.9)	22.8***	***	***
Neuroticism	1978	8.1 (4.5)	10.9 (5.2)	10.1 (4.7)	5.1**	**	
	1993	7.2 (4.9)	9.7 (4.4)	11.8 (5.4)	10.3***	***	
Self-esteem	1978	1.3 (1.4)	1.7 (1.5)	2.1 (1.7)	3.2*	*	
	1993	0.7 (1.1)	1.3 (1.6)	1.7 (1.7)	6.7**	**	
Dependency	1978	52.1 (9.7)	55.6 (9.6)	52.5 (10.1)	1.4		
	1993	53.2 (9.5)	53.6 (7.9)	55.6 (8.9)	0.7		
Paternal care	1978	23.1 (8.1)	21.0 (7.9)	18.9 (9.5)	2.2*	*	
	1993	22.7 (8.6)	19.7 (8.2)	19.1 (10.5)	2.2*	*	
Maternal care	1978	27.1 (6.4)	24.9 (6.1)	24.9 (8.7)	2.0		
	1993	27.7 (7.4)	23.1 (8.4)	25.4 (9.8)	2.9*	*	
Paternal over-protection	1978	12.5 (6.5)	14.3 (8.4)	14.1 (8.7)	- 1.4		
	1993	11.7 (7.1)	13.0 (10.0)	10.9 (7.8)	- 0.2		
Maternal over-protection	1978	13.3 (7.0)	15.2 (7.2)	18.5 (8.5)	5.6**	**	
	1993	12.8 (8.1)	14.5 (8.3)	16.3 (9.7)	6.0**		
State depression	1978	56.3 (5.3)	59.7 (7.7)	56.5 (5.2)	3.6*		
	1993	53.3 (7.0)	57.8 (8.1)	59.2 (11.0)	7.8***	***	
Sex role (femininity)	1983	95.6 (10.2)	95.9 (8.3)	95.5 (10.2)	- 0.6		
	1993	96.1 (9.1)	96.7 (9.9)	95.3 (11.9)	0.04		
Sex role (masculinity)	1983	91.4 (12.5)	94.0 (12.1)	93.6 (14.4)	- 1.1		
	1993	94.0 (12.7)	96.8 (12.9)	93.6 (14.8)	- 0.5		
Social desirability	1983	106.2 (9.8)	103.3 (9.8)	101.7 (9.1)	2.3*	*	
	1993	108.5 (8.6)	105.8 (7.6)	104.6 (11.6)	2.2*	*	
Social support	1983	17.5 (3.7)	16.6 (3.6)	16.3 (4.4)	1.7		
	1993	17.2 (4.0)	15.8 (4.2)	14.5 (4.6)	2.9*	**	

*** $P < 0.001$; ** $P < 0.01$; * $P < 0.05$.

Contrast A = no depression compared with one or more episodes.

Contrast B = one episode compared with two or more episodes.

report measures in Table 3 (with gender also included as a separate variable) and the anxiety disorder categories in Table 2. The 'no depression' and 'one or more episode' comparison categories produced a combined χ^2 of 37.3 ($P < 0.0002$), using these variables. The loading matrix of correlations between predictors and discriminant functions suggest that the best predictors for distinguishing between 'no depression' and 'one or more episodes' were major anxiety ($r = 0.81$), neuroticism ($r = 0.47$) and maternal overprotection ($r = 0.43$) variables. The second discriminant function, examining 'one episode' versus 'two or more episodes', did not produce a significant combined χ^2 (11.1, NS), thereby indicating that the two groups were not distinct from one another.

A number of lifestyle variables collected in 1993

(cigarette and alcohol consumption, suicide attempts, chronic illness, and family history of depression) were subjected to chi-square analyses to determine whether they had any impact on the frequency of major depression episodes (Table 4). A higher proportion of subjects in the two or more episode category had attempted suicide than the other two groups. These attempts had all occurred when subjects were young (i.e. prior to 1978), rather than as a consequence of repeated episodes. Those with repeated episodes were more likely to suffer from a chronic physical illness.

Finally, several self-report measures were correlated to determine whether they were measuring similar constructs. The first and last waves will be reported here for all correlations significant at the 0.0001 level. Firstly, neuroticism and trait depression

Table 4
Chi-square analyses of lifestyle information collected in 1993 and the major depression episode (MDE) categories

Variables	Number of episodes of major depression			Tests of significance
	None	One	Two or more	
Cigarette consumption				
No	90 (88%)	26 (96%)	21 (78%)	$\chi^2 = 4.4$
Yes	12 (12%)	1 (4%)	6 (22%)	
Alcohol consumption				
No	23 (23%)	4 (15%)	8 (30%)	$\chi^2 = 1.7$
Yes	79 (77%)	23 (85%)	19 (79%)	
Suicide attempts				
No	99 (97%)	25 (93%)	21 (78%)	$\chi^2 = 12.1***$
Yes	3 (3%)	2 (7%)	6 (22%)	
Chronic illness				
No	76 (75%)	22 (81%)	14 (52%)	$\chi^2 = 6.9*$
Yes	26 (25%)	5 (19%)	13 (48%)	
Family history				
No	63 (62%)	15 (56%)	10 (37%)	$\chi^2 = 5.6$
Yes	38 (38%)	12 (44%)	17 (63%)	

*** $P < 0.001$; ** $P < 0.01$; * $P < 0.05$.

were positively correlated in 1978 and 1993 ($r = 0.46$ and 0.47 , respectively). Likewise, neuroticism and low self-esteem were positively correlated ($r = 0.33$ and 0.55), as were low self-esteem and trait depression ($r = 0.33$ and 0.50). Also, high social desirability scores were negatively correlated with low self-esteem at both waves ($r = -0.40$ and -0.37).

4. Discussion

The subjects described in the present study were recruited from a sample of convenience and (by design) with similar socioeconomic and professional backgrounds (most being teachers). A total of 34.6% had reported at least one episode of major depression during their life and these figures appear to be reasonably representative when compared with several other community studies of depression. For instance, Merikangas et al. (1994) reported that 43% of their study sample had experienced an episode of depression, while Kennedy et al. (1991) indicated that 23% of their sample had been symptomatic. We have previously noted (Wilhelm and Parker, 1994)

high rates of depressive experience within our sample but argued that the repeated interview technique probably leads to higher rates being reported (or not forgotten) in men. We have also reported that both sexes have engaged in high levels of help-seeking, which adds support to higher rates of depression and may reflect the high levels of education, and low levels of sociopathy, drug and alcohol abuse. The possibility that teaching may predispose individuals to high levels of depressive has been experienced (Wilhelm et al., in press and does not appear to be substantiated).

Despite a trend for women to report a slightly higher number and longer duration of episodes there were no significant sex differences and we subsequently conducted analyses on the cohort as a whole. Several other studies, which have reported that gender did not have an impact on the depressive experience (Angst, 1992; Ball et al., 1994) had speculated that a lifetime history of anxiety disorders account for a large proportion of the sex differences found in major depression. We entered gender as a variable in the discriminant function analyses, but this did not make a significant contribution in predicting those who did and did not have episodes of depression, despite the finding that the presence of

major anxiety disorders and then neuroticism were significant variables.

We have previously reported (Parker et al., 1997) that the presence of an anxiety disorder increased the risk of lifetime major depression and earlier onset of depression. The results in the present study add to these findings, in that those subjects reporting a greater frequency of episodes of major depression were significantly more likely to experience a lifetime anxiety disorder and to have generated more diagnoses for anxiety disorders over their lifetime. Clearly there is a relationship between these variables in that the younger the age of onset, the greater the time available for repeated episodes. However, the earlier age of onset may reflect some underlying vulnerability factor, which is related to the onset of anxiety and, in turn, depression. We confirmed the relevance of neuroticism, as a vulnerable personality style to major depression and the contribution of neuroticism may be manifest here.

It should be noted that both social and simple phobia reached low levels of significance, if any, and had the earliest age of onset. This could help explain why they were not related to the number of major depression episodes, but these two disorders may not share the same diathesis to major depression as the other anxiety disorders. Kessler et al. (1996) and Angst (1996) have noted lower odds ratios (ORs) for comorbidity of lifetime major depression and simple and social phobia compared to other anxiety disorders. Kessler et al. (1996) and Angst (1996) also reported ORs between presence of an anxiety disorder and presence of lifetime MDD, ranging from 2.9 and 2.4, respectively, for social phobia, 3.1 and 2.0 for simple phobia to the highest, of 6.0 and 4.4, respectively, for GAD. The range of ORs for our cohort was similar, from 1.8 for social phobia and 2.9 for simple phobia to 4.9 for GAD, with a higher OR of 8.9 for panic disorder.

The mean onset of generalised anxiety disorder preceded but largely overlapped with age of onset of major depression in both the single and two or more episode categories. This may indicate that episodes of GAD are largely comorbid with episodes of major depression and we may simply be picking up the same episodes under different guises. It has been reported (Kendler et al., 1992; Kendler, 1996) that these two disorders may be linked genetically, that is, Kendler (1996) reported that the GAD and major

depression link was twice as common in monozygotic twins when compared to dizygotic twins.

Lifestyle variables, such as cigarette and alcohol consumption, suicide attempts and presence of a chronic illness were examined in a hope of shedding some light on the disparate findings of previous researchers. The most significant result was that the 'two or more episode' category reported a higher number of suicide attempts (at an early age). Previous reports have noted that 15% of people suffering from major depression are at risk for suicide (Cassem, 1995), with suicide rates increasing with multiple depressive episodes. However, in our group, the suicide attempts were generally during adolescence rather than as a function of repeated episodes but did seem to act more as a marker of future repeated episodes. A less significant finding was whether the subject had a chronic illness and, similarly, the two or more episode category reported a higher proportion of chronic illness. Alcohol and cigarette consumption did not contribute to future episodes of major depression in the current sample but there are low rates of drug and alcohol use in the cohort (Wilhelm and Parker, 1989).

Kendler et al. (1993) suggested that the probability that an individual will suffer from a major depressive episode is influenced by a number of risk factors, including gender, early parental loss, exposure to pathogenic parental rearing, personality style, exposure to traumatic events, a previous history of major depression, low social support, recent stressful life events and predisposing genetic influences. Those authors noted that most studies that have attempted to develop integrated aetiological models have suffered from a number of limitations, including reliance on cross-sectional assessments, neglect of salient risk factors and unsatisfactory analytic strategies. They undertook a longitudinal study, which was designed to predict the 1-year prevalence in major depression in a population-based sample of female twins. Their final structural equation modelling contained nine predictor variables – genetic factors, parental warmth, childhood parental loss, lifetime traumas, neuroticism, social support, past depressive episodes, recent difficulties, and recent stressful life events. Their final model (predicting 50% of the variance in the liability to major depression) included a refined set (ranked from the strongest in descending order) of significant vari-

ables: stressful life events, genetic factors, previous history of major depression, and neuroticism.

Our study differs from many other longitudinal studies because we are able to distinguish between those who present with either one episode or with multiple episodes. Thus, we are able to identify risk factors that predispose someone to suffering from single or, conversely, multiple episodes. Our list of risk factors differed from those considered by Kendler et al. (1993), and did not include genetic factors, parental loss, lifetime trauma and recent stressful life events. Any focus on stressful events would clearly be inappropriate in trying to model lifetime depression over such an extended period.

Trait depression and low self-esteem variables (not examined by Kendler et al. (1993)) were also identified here and are hardly surprising in terms of their suggested salience and we have quantified moderate correlations between these constructs. Social desirability was not examined by Kendler et al. (1993), but is a useful variable as it helps to examine the relevance of any response bias in subjects, and is a more positive construct, with a moderately strong correlation with self-esteem.

We did find evidence supporting links between early adverse parenting and major depression. Higher maternal protection and, to a lesser degree, low paternal care were identified as risk factors. There have now been a large number of studies using the PBI and implicating low parental care and high parental protection as risk factors to non-melancholic depression (Parker, 1992). Such associations do not, of necessity, demonstrate or prove a causal process but the finding that these variables had greater discrimination between groups in the earlier waves indicates that this is not due to a more negative views of childhood with increasing age or number of episodes. In a study by Kendler et al. (1993), low parental warmth acted as a moderate risk factor to the liability to major depression but subsequent analyses established that it had no direct effect, and that its indirect liability was mediated via the increased chance of prior depressive episodes, higher levels of recent difficulties and higher levels of neuroticism. Our study indicates a stronger relationship to perception of the parental environment, as the effect was greater in earlier waves. In previous studies using the PBI (Parker, 1983), links between low parental care and both occurrence of episodes

and severity of depression remained after partialling out neuroticism scores, but were weakened by the partialling process.

In another study, Kendler (1996) attempted to clarify the role of genetic and environmental factors in both the elicitation and provision of parenting behaviour, using a somewhat reduced version of the Parental Bonding Instrument. He concluded that parenting was both influenced by attitudes derived from the parents' family of origin as well as by genetically influenced parental temperamental characteristics. The parenting elicited by a child appears to be influenced by the temperament of the child which, in turn, is under partial genetic control. One could speculate that children who are higher in neuroticism might induce a more overprotective style from their parents.

The advantage of examining a number of the risk variables at a later stage (i.e. in 1993) is that we were able to identify several (i.e. the lifetime experience of anxiety disorders) that were not identified (or identifiable) in the 1978 analyses. We have also shown that risk factor variables act differently over time. Some like neuroticism and trait depression are consistent in their relevance, while others such as low self-esteem and perception of low parental care became less relevant. Others, such as perception of social support increased in relevance over time and seem to reflect a 'scarring' phenomenon where overrepresentation in those who have developed major depression is, in fact, more likely to be a consequence rather than a cause of a major depression itself. There has been growing interest in the relationship between anxiety disorders and depression, with reports that anxiety disorders may precede depression and affect the severity of depressive syndromes (Kessler et al., 1996). This study has demonstrated that some individuals have multiple anxiety disorders, which are reported at different stages of the life cycle, and that the number of anxiety disorders reported is a predictor of multiple episodes of depression.

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