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Non-melancholic depression: the contribution of personality, anxiety and life events to subclassification

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ABSTRACT

Background. We sought to develop a clinically useful subtyping system for the non-melancholic depressive disorders, and here we assess one weighted to central aetiological factors.

Methods. We studied 185 patients meeting DSM-III-R and/or clinical criteria for non-melancholic depression. Data were obtained by self-report, interview of patients and from corroborative witnesses. We developed a set of variables for class definition, assessing: (*i*) 'P', disordered personality as a vulnerability factor; (*ii*) 'A', meeting criteria for a lifetime anxiety disorder or positive on probe questions about trait anxiety characteristics, so assessing anxiety as a vulnerability factor; and (*iii*) 'L', psychiatrist and consensually-rated life event stress prior to depression onset.

Results. A latent class analysis generated a four-class solution for the P–A–L variables. Life event stressors had similar item probabilities across all four classes, and did not influence the four-class 'P–A' solution when deleted from the analysis, suggesting that life event stress may act more as a general provoking agent, rather than constituting any distinct 'reactive' or 'situational' depression class. Three classes generated clinically meaningful groupings, reflecting varying contributions of anxiety and disordered personality functioning, and with evidence of differential outcome over the following 12 months.

Conclusions: We suggest that a refined aetiologically-weighted model may assist definition of the non-melancholic depressive disorders, and provide the logic for exploring the comparative utility of differing treatments to identified vulnerability-based classes.

'Most studies of neurotic depression have dealt with episode-related symptoms, but there is a need for more studies of personality traits and life events that are indicative of problems in living'. Winokur (1991, p. 119).

INTRODUCTION

We seek to develop a clinically useful system for subtyping the non-psychotic, non-melancholic depressive disorders, once subsumed by the term 'neurotic depression'. Kiloh *et al.* (1971) conceptualized 'neurotic depression' as 'a diffuse entity encompassing some of the ways in which the patient utilizes his defence mechanisms to cope with his own neuroticism and concurrent environmental stress', speaking to the heterogeneity of the overall class. Such heterogeneity creates an immediate problem in any classificatory attempt. Currently, classification proceeds using alternative parameters. ICD-10 (WHO, 1992) subtyping proceeds largely on a severity dimension (e.g. 'mild' *v.* 'moderate'), but also considers recurrence and persistence patterns, while DSM-IV (APA, 1994) principally subdivides the primary unipolar depressive disorders into major depressive and dysthymic disorders.

How else might non-melancholic depression

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be subtyped? Although aetiological definition (e.g. bereavement reaction, post-traumatic stress disorder) is unusual in psychiatry, we now pursue the utility of an aetiologically driven model with three *a priori* classes, two predispositional and one a precipitant-weighted class. In a subsequent paper, we will pursue a symptom-based classification. Here, we first hypothesize a non-melancholic depression as a consequence of a disordered personality style ('P' class), an hypothesis supported by the over-representation of 'inadequate personality' and several personality disorders on the 'neurotic depression' pole in a number of factor analytical studies (see Parker *et al.* 1989), by the concept of 'characterological depression' (see Akiskal *et al.* 1980), and by the suggested over-representation of Cluster C personality disorders in those with depression (Oldham *et al.* 1995). Secondly, that as the concomitant and co-morbid expression of anxiety and depression is widely accepted, with each claimed to predispose to the other (see Preskorn & Fast, 1993), we hypothesize that anxiety (either as a primary Axis I disorder or an Axis II personality style) may also dispose to non-melancholic depression ('A' class). Thirdly, we hypothesize that there are those who lack both predisposing variables but who develop non-melancholic depression as a consequence of experiencing a major life event stressor ('L' class). In support of this last mechanism, Hirschfeld *et al.* (1985) noted that the 'notion of depression occurring in reaction to environmental stress has enjoyed great popularity'. It has been captured by the DSM-I (APA, 1952) emphasis on reactive disorders, the Research Diagnostic Criteria (RDC) concept of situational major depression (Spitzer *et al.* 1977), DSM-IV as an 'adjustment disorder with depressed mood' and by ICD-10 as 'brief' and 'prolonged' depressive reactions. In this paper, we construct and test the utility and validity of an hypothesized P–A–L model for subtyping non-melancholic depressive disorders in a new sample recruited specifically for this study.

METHOD

Eight consultant psychiatrists assessed consecutive referrals to a tertiary referral Mood Disorders Unit (MDU) and recruited (subject to consultant availability) from other hospitals to ensure a sample of in-patients and out-patients not unduly weighted to tertiary and/or treatment resistant patients. Inclusion criteria were: (*i*) meeting DSM-III-R (APA, 1987) criteria for a major depressive episode; (*ii*) an episode duration of less than 24 months (to exclude those with such chronic disorders compromising clarification of aetiological determinants); and (*iii*) not having a higher order diagnosis (i.e. schizophrenia, alcoholism, dementia). Sample members included previously untreated, partially responsive and treatment resistant patients, with such heterogeneity judged to reflect the varied presentations faced in clinical practice.

Clinical assessment

The patient's questionnaire assessed socio-demographic information, past medical conditions, previous psychiatric treatments, family history details and included a structured life event stressor inventory quantifying the self-rated impact of antecedent stressors in the 12 months prior to onset (on a 1–6 scale ranging from 'nil' to 'catastrophic').

A trained psychologist then documented lifetime and current depressive episodes (assessing a wide range of clinical features of depression and anxiety), any family history of psychiatric disorder, drug and alcohol details, and generated current and lifetime diagnoses of panic disorder, generalized anxiety disorder, agoraphobia, social phobia and obsessive–compulsive disorder via the computerized Composite International Diagnostic Interview (CIDI), version 1.1 (WHO, 1993), and, if any present, clarifying whether their onset preceded or followed the initial depressive episode. The patient completed the 9-item Costello-Comrey (1967) trait anxiety measure, the Beck Depression Inventory or BDI (Beck *et al.* 1961), and checklists of descriptors assessing current mood, other affects and 27 anxiety symptoms generating a total 'current anxiety symptom' score.

The interviewing psychiatrist assessed more complex clinical features of the current and previous depressive episodes, sought information on suicide and self-injurious behaviours, completed the 17-item Hamilton

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measure (Hamilton, 1967), the Newcastle Index (Carney *et al*. 1965) and CORE measure of psychomotor disturbance (Parker *et al*. 1994), and chose one of four MDU clinical diagnoses (i.e. psychotic (PD), endogenous (ED), neurotic (ND) and reactive (RD) depression), described previously (Parker *et al*. 1994). The psychiatrist rated the severity of both acute and chronic life event stressors according to the six DSM-III-R anchor points, and also used DSM-III-R criteria to derive a global assessment of functioning (GAF) score. In taking a developmental history, remembered evidence of behavioural inhibition in early school years as well as any school avoidance due to somatic symptoms ('school phobia') was sought. Lifelong 'trait anxiety' was assessed by asking the patient if, when not depressed, they were: (*i*) 'a nervy person', (*ii*) 'a worrier'; (*iii*) 'tense'; and (*iv*) 'anxious'.

Subsequently, and akin to the contextual life event rating technique developed by Brown & Harris (1978), each psychiatrist presented their patient's history to rating panels of two or more research psychiatrists involved in the study, for independent judging (on a 6-point scale providing options ranging from 'none' to 'catastrophic') of the stressfulness of antecedent life events, thus generating a 'consensus' life event score. Across the varying psychiatrist–rater dyads, the coefficients of agreement ranged from 0·68 to 0·97. Rater discrepancies were resolved either by further discussion until consensus was reached or, if not, using the mean rating.

Vignettes of the personality styles underpinning 14 personality disorder (PD) classes were provided, including all 10 DSM-IV listed PDs, one DSM-IV PD listed for further study (i.e. depressive) and three DSM-III-R PDs (i.e. passive-aggressive, self-defeating, sadistic). Additionally, we included an anxiety personality vignette (i.e. 'nervy, tense and worrier'), as generalized anxiety disorder has been proposed as a PD by some writers (e.g. Preskorn & Fast, 1993). Late in the 2–3 h interview, the psychiatrist rated the degree to which each vignette descriptor approximated to the 'individual's long-term personality', with 0–5 scales allowing ratings ranging from 'not at all' to 'an extreme degree'.

The psychiatrists rated (on four-point scales ranging from 'no' to 'definitely') the extent to which the patient's personality was 'disordered', with eight parameters of 'disordered personality' articulated by Millon (1986) listed (i.e. inflexible/defective; causing significant personal discomfort; reducing opportunities; inability to function effectively and efficiently; inability to adjust to the environment; vicious or self-defeating cycles; tenuous stability under stress; personal discomfort to others). Additionally, the psychiatrist sought evidence of 'dysfunctional relationships' across five domains (again defined by Millon, 1986) involving: intimate relationships; family relationships; peer relationships; work; and work relationships, with rating options being 'functional', 'probably dysfunctional' and 'definitely dysfunctional'.

We sought validating information from referrers and family members who completed questionnaires that assessed severity of antecedent life event stressors, whether they viewed the patient as nervy, a worrier, tense, anxious, and the extent to which the patient showed evidence of disordered personality functioning.

Of 245 patients meeting our inclusion criteria (noted above), 162 (66%) received an MDU clinical and 142 (58%) a DSM-III-R diagnosis of a non-melancholic depression. To maximize our sample size for analyses, we included all 185 subjects diagnosed as having a non-melancholic depression by one or both systems. Of the 185, 117 (63%) were female, the mean age was 39·6 (S.D. 13·1) years, the mean duration of their current episode was 33·3 weeks, and mean depression scores were 20·5 for the Hamilton and 30·1 for the BDI. Seventy-four (40%) of the subjects had a family member and 72 (39%) a referrer who returned collateral data. The lifetime prevalence of an anxiety disorder was 51%, with 31% meeting criteria prior to their first depressive episode.

Twelve-month review

We sought to re-interview all subjects at 12 months and: (*i*) assess naturalistic outcome, principally according to definitions proposed by Frank *et al*. (1991) for remission, relapse, recovery and recurrence; as well as (*ii*) reassess several key study variables to estimate consistency.

Refining the class variables to be analysed

Reflecting our wish to develop a clinically useful subtyping system, the refined set of variables focussed on psychiatrist-assessed rather than self-reported items, and was confined to putatively strong indicators of disordered personality, anxiety and life events, with cut-off scores selected to avoid extremely high or low frequencies of positive cases (see Table 1).

'*P*' *or disordered personality variables*

There were five disordered personality variables: (*i*) the single item ('inadequate personality – yes *v*. no) from the Newcastle Index; (*ii*) endorsements of 'definitely' on three or more of the eight 'disordered personality' parameters; (*iii*) rating as having two or more 'dysfunctional relationships'; (*iv*) rating three or more on (a) any of the component scales contributing to 'eccentric' and 'dramatic' personality styles, and (b) on at least three of the four component scales contributing to a 'sensitive' personality style, with those three molar clusters derived by a principal components analysis (PCA) of scores generated on our 14 DSM personality disorder vignettes (three PDs were not represented in the final scales; obsessive–compulsive and passive-aggressive because of non-differential loadings across all three factors, and antisocial for having similar loadings on the first and second factors); and (*v*) rating three (i.e. 'present to a considerable extent') or more on the anxiety personality vignette, and so assigned as having an 'anxious personality style'.

'*A*' *or anxiety variables*

There were two anxiety variables: (*i*) if the subject affirmed trait anxiety probe questions ('nervy', 'worrier', 'tense', and/or 'anxious'); and (*ii*) if in receipt of a CIDI-generated lifetime diagnosis of one or more of the five anxiety disorders, they were rated as having a 'lifetime anxiety disorder'.

'*L*' *or life event stressor*

There were two life event stressors: (*i*) a psychiatrist-generated acute stressor rating of $\geqslant 4$ (i.e. severe to catastrophic) on the operationalized DSM scale assigned the patient as 'DSM acute stressor' positive; and (*ii*) a consensus rating for antecedent life events in the year before depression onset of $\geqslant 4$ more (i.e. severe to catastrophic) generated positive 'consensus antecedent stressor' assignment.

Statistical analysis for identifying subclasses

Latent class analysis (LCA), a multivariate mixture model for analysing categorical data and which seeks to identify indicators separating members and non-members of presumed latent or underlying classes, was used. The models were fitted using the algorithm developed by Bartholomew (1987).

RESULTS

Latent class analyses

We examined models with one, two and three latent variables, examining the stability of the solutions and the interpretability and plausibility of each solution, with associated changes in log-likelihood and chi-square goodness-of-fit playing only a peripheral role due to the relatively small sample size. The single latent variable model with four classes reported in Table 1 provided the most coherent and stable solution. For each class, the LCA estimated the item probability (i.e. the probability of a member of a particular class being positive on that item) and the proportion in each class (i.e. class prevalence), so allowing the probability of class membership to be calculated for each individual using their pattern of responses. The item probabilities encouraged us to interpret the solution in terms of 'personality' ('P') and 'anxiety' ('A') factors – with classes then comprising those who were positive on both factors (i.e. P^+A^+), negative on one or the other (i.e. P^+A^-; P^-A^+), and those who were negative on both factors (i.e. P^-A^-).

Differentiating item probabilities across the classes allowed an estimate of the utility of a variable. For instance, the 'disordered personality' variable had very low item probabilities in the P^- classes (i.e. 0·01 in P^-A^- and 0·04 in P^-A^+). In the P^+A^- class, its probability was distinct (i.e. 0·54), and more so in the P^+A^+ class (i.e. 0·83). Our interpretation is that those in the P^- classes were highly unlikely to have a disordered personality, that disordered person-

Table 1. *Four-class imposed latent class analyses reporting item probabilities of putative differentiating personality* (*P*), *anxiety* (*A*) *and life event* (*L*) *variables* (*with analyses repeated after removing L variables*)

Putative, P, A and L Variables	Cut-off derived prevalence %	LCA class							
		P^-A^- $N = 72$		P^-A^+ $N = 54$		P^+A^- $N = 31$		P^+A^+ $N = 28$	
P									
Inadequate personality[1]	51	0·17	(0·17)	0·43	(0·40)	0·98	(1·0)	1·0	(0·95)
Disordered personality[2]	23	0·01	(0·01)	0·04	(0·04)	0·54	(0·57)	0.83	(0·71)
DSM eccentric personality style[2]	18	0·02	(0·03)	0·13	(0·12)	0·40	(0·38)	0·44	(0·41)
DSM dramatic personality style[2]	23	0·02	(0·03)	0·07	(0·04)	0·77	(0·75)	0·48	(0·49)
DSM sensitive personality style[2]	22	0·03	(0·03)	0·11	(0·05)	0·31	(0·31)	0·81	(0·82)
Anxious personality style[2]	30	0·07	(0·06)	0·45	(0·46)	0·14	(0·16)	0·79	(0·71)
A									
Nervy[3]	38	0·06	(0·06)	0·81	(0·79)	0·04	(0·06)	0·78	(0·79)
Worrier[3]	59	0·34	(0·32)	1·0	(1·0)	0·20	(0·22)	0·89	(0·90)
Tense[3]	48	0·18	(0·17)	0·95	(0·93)	0·04	(0·04)	0·86	(0·90)
Anxious[3]	47	0·15	(0·15)	0·90	(0·88)	0·00	(0·00)	0·97	(1·00)
Lifetime anxiety disorder[4]	51	0·36	(0·36)	0·54	(0·54)	0·48	(0·50)	0·87	(0·81)
L									
DSM acute stressor[2]	28	0·29		0·32		0·29		0·15	
Consensus antecedent stressor[5]	49	0·47		0·55		0·46		0·44	
Prevalence of class		39%	(39%)	29%	(27%)	17%	(17%)	15%	(17%)

*$P < 0·05$; **$P < 0·001$.

[1]Newcastle Index item; [2]psychiatrist-rated judgement; [3]rated by psychiatrist following probe questions to patient; [4]CIDI-generated; and [5]rated at consensus conference.

ality contributed directly to the P^+A^- class, and that it made an additional contribution to the P^+A^+ class – in that those with significant anxiety were also more likely to be judged as having a disordered personality. Again, the variable 'nervy' had low item prevalence in the A^- classes (i.e. 0·06 and 0·04) and high prevalences in the A^+ classes (i.e. 0·81 and 0·78). By contrast, the lifetime anxiety disorder variable showed less impressive differentiation across the A^+ and A^- classes. Additional analyses clarified the likely reason (i.e. some subjects developed their first episode of lifetime anxiety during a depressive episode, while an item such as 'nervy' appeared more to assess a pre-morbid characteristic).

Several other Table 1 nuances are noteworthy. First, the 'DSM sensitive personality style' variable had a much higher item prevalence in the P^+A^+ class than in the P^+A^- class, suggesting that it successfully captured the DSM Cluster C concept of an 'anxious or fearful' personality style. Secondly, our P^+ variable was not homogeneous, with the P^+A^+ class having a strong weighting from the 'DSM sensitive personality' variable, while the P^+A^- class was more weighted by the 'DSM dramatic personality' variable.

Thirdly, we failed to identify a distinct 'life event' class, with the life event item probabilities comparable across all four classes, and with removal of the two L variables having minimal effect on the class prevalences derived in the original four-class solution when we repeated the LCA. Again repeating the LCA – but here substituting the subject's own rating of the impact of any antecedent life events – led to almost identical class prevalences to those derived in the original solution. Finally, the percentage assigned as having a diagnosis of 'reactive depression' (RD) was rare in the P^+A^+ class (i.e. 14%), and of similar likelihood in the three remaining classes (i.e. 44%–55%), indicating that while our clinician raters commonly made such a diagnosis, it was not distinctly over-represented in any one class.

Correlates of those in identified classes

If our identified classes have a clinical 'meaning', they must proceed beyond the aetiological description suggested by our model, and be

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Table 2. *Sociodemographic, depression and depression-related data for those assigned to the four classes*

	Class								
	P^-A^-		P^-A^+		P^+A^-		P^+A^+		
Variable	%	Mean	%	Mean	%	Mean	%	Mean	Test
Age		39·4		43·7		34·0		38·6	$F = 3·83$**
Marital status									
Married/de facto relationship	37		54		19		37		$\chi^2 = 13·90$*
Separated or divorced	21		14		34		27		
Widowed	6		6		6		0		
Never married	37		27		41		37		
Years of education		13·4		11·6		12·9		12·6	$F = 2·60$
Occupational status		4·1		4·9		4·7		4·6	$F = 0·84$
Past depressive history									
Age at first depressive episode		30·9		30·7		23·3		19·4	$F = 6·71$***
Number of lifetime depressive episodes		7·3		10·1		19·9		47·5	$F = 21·05$**
Lifetime duration of mood disturbance (weeks)		79·4		96·4		130·2		154·9	$F = 1·66$
Number of hospitalizations		1·2		1·1		2·5		2·5	$F = 1·95$
Current depressive episode									
Duration (weeks)		30·7		31·9		30·9		44·3	$F = 1·59$
GAF severity		54·3		52·9		51·1		44·6	$F = 5·41$**
Hamilton severity		19·2		20·3		20·6		23·7	$F = 3·40$*
Beck severity		25·6		29·4		31·7		35·4	$F = 6·41$***
Mean Newcastle score		4·7		4·6		5·0		4·7	$F = 0·39$
Mean CORE score		3·4		3·5		3·1		3·2	$F = 0·11$
Suicide/self-injury									
History of suicide attempts prior to current episode	23		23		47		50		$\chi^2 = 12·65$**
Age at first suicide attempt		25·1		39·3		26·9		26·8	$F = 2·40$
Self-injury	16		17		22		27		$F = 3·80$*
Age at first self-injurious act		26·9		33·9		18·4		27·5	

*$P < 0·05$; **$P < 0·01$; ***$P < 0·001$.

independently validated. We, therefore, pursued the extent to which those assigned to the differing LCA classes were distinguishable on a range of clinical, historical, outcome and related variables.

Table 2 reports sociodemographic, past and current depression, as well as suicidal and self-injury data. Classes differed significantly in mean age – due to the younger P^+ classes. There was a lower rate of stable partnerships in the P^+A^- class. The P^+ class members were significantly more likely to have been younger at initial episode, to have had more episodes and to have had a higher rate of suicide attempts. There were non-significant trends for the P^+ members to have been depressed for a longer period and to have been hospitalised for depression. For the current episode, the P^+A^+ class scored as more severely depressed on both the self-report Beck and the clinician-rated Hamilton, and as more dysfunctional by receiving lower GAF scores. No differences were suggested on CORE and Newcastle scores across classes, arguing against any class weighted to patients with melancholia despite our attempt to select non-melancholic patients only.

We examined the prevalence and severity of current clinical and emotional state features. Twenty-six historically suggested clinical features of depression (e.g. non-reactivity, anhedonia, appetite and weight change) yielded neither differing class prevalences nor clinically significant differences in severity, however there were a number of differences in emotional state items. The P^+ class members were significantly more likely (all $P < 0·05$) to report emotions such as hopelessness ($F = 13·9$), helplessness ($F = 19·9$), worthlessness ($F = 8·6$), as well as irritability ($F = 4·4$) and inability to control anger ($F = 4·8$), while the A^+ classes were significantly more likely (all $P < 0·05$) to report 'frustration' ($F = 12·2$), preferring to be 'left alone' ($F = 9·4$) and being 'annoyed or angry' with themself ($F = 5·6$), indicating that P^+ class

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Table 3. *Family history, anxiety and drug and alcohol data for subjects assigned to the four classes*

	Class								
	P^-A^-		P^-A^+		P^+A^-		P^+A^+		
Variable	%	Mean	%	Mean	%	Mean	%	Mean	Test
Family history of anxiety									
Mother – anxiety state	15		28		39		28		$\chi^2 = 7{\cdot}01$
Father – anxiety state	10		14		14		27		$\chi^2 = 5{\cdot}12$
First-degree relative treated for 'nerves'	21		22		23		46		$\chi^2 = 7{\cdot}74$
CICI-diagnosed anxiety disorder preceding first depressive episode									
Any of the 5-CIDI syndromes	25		29		31		57		$\chi^2 = 9{\cdot}99$***
Pre-morbid anxiety									
School phobia in childhood		0·3		0·5		0·5		0·8	$F = 2{\cdot}71$*
Behavioural inhibition		0·5		0·9		0·9		1·3	$F = 8{\cdot}07$***
Costello–Comrey trait anxiety score		50·1		55·8		46·8		53·6	$F = 2{\cdot}55$
Total current anxiety symptom score		36·7		46·8		44·4		49·3	$F = 2{\cdot}86$*
Family history of alcohol problems									
Mother and/or father	14		36		46		43		$\chi^2 = 3{\cdot}45$**
Siblings	11		12		15		25		$\chi^2 = 3{\cdot}23$
First-degree relatives	23		39		48		50		$\chi^2 = 8{\cdot}74$*
Drug and alcohol history									
Past use of anxiolytics for more than a year	10		12		19		27		$\chi^2 = 5{\cdot}62$
Past dependence on anxiolytic drugs	6		14		19		30		$\chi^2 = 11{\cdot}01$*
Past excessive intake of alcohol for more than a year	11		12		22		17		$\chi^2 = 2{\cdot}52$

*$P < 0{\cdot}05$; **$P < 0{\cdot}01$; ***$P < 0{\cdot}001$.

Table 4. *Family member-generated scores for life events, anxiety and personally variables for those assigned to the four classes*

	Class								
	P^-A^-		P^-A^+		P^+A^-		P^+A^+		
Corroborative witness rating	%	Mean	%	Mean	%	Mean	%	Mean	Test
Life event stressors 12 months prior to depression		3·9		4·5		4·3		5·2	
Description of personality when not depressed									
'Nervy'	46		72		54		70		$\chi^2 = 9{\cdot}09$
'A worrier'	52		96		75		100		$\chi^2 = 18{\cdot}30$**
'Tense'	48		88		63		78		$\chi^2 = 11{\cdot}02$
'Anxious'	52		77		82		92		$\chi^2 = 11{\cdot}31$
Personality									
Total dysfunctional relationship score		4·4		3·9		7·7		6·1	$F = 1{\cdot}60$
Total disordered personality parameter score		11·7		11·6		11·7		14·5	$F = 1{\cdot}21$

*$P < 0{\cdot}05$; **$P < 0{\cdot}01$.

members were more likely to externalize anger and hostility, and A^+ class members to be angry with themselves.

Table 3 focuses on anxiety, and drug and alcohol variables. Data on family history of anxiety disorder were formally non-differentiating, despite a trend for the P^+A^+ class to be twice as likely to report a first-degree relative treated for nerves. Data on family history of alcohol problems indicated an over-representation (parents and all first-degree relatives) to the P^+ classes. Those in the A^+ classes were more likely to report school phobia and behavioural inhibition in childhood. The chance of onset of any of the five CIDI anxiety syndromes prior to onset of the initial depressive episode was

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significantly higher ($P < 0{\cdot}05$) in the P^+A^+ class (i.e. 57% *v.* 25% to 31% in the other classes). Past use of anxiolytic medication tended to be over-represented in the P^+A^+ class, while actual past dependence was significantly over-represented. There were no-significant trends for those in the 'A' classes to return higher Costello–Comrey trait anxiety and total current anxiety symptom scores.

Table 4 reports family member-generated data providing some support for the validity of our statistically derived class membership. Life event stressor scores (while highest in the P^+A^+ class) again failed to differentiate the classes. A^+ class members were consistently more likely to be rated positive on the four trait anxiety indicators, but differences were significant only for the 'worrier' item. P^+ class members showed a non-significant trend to receive higher dysfunctional relationship scores.

Twelve-month review

One hundred and seventeen (63%) were reassessed. While more detailed results will be reported elsewhere, there was consistent evidence of P^+A^+ class members having the worst progress. Only 42% (cf. 50%–64% in other classes) had reached 'recovery' criteria, 73% a partial or full remission (cf. 90%–100%), while they had been depressed for a longer period over the year (i.e. 40 *v.* 30–36 weeks). Their current GAF scores were the lowest (66·7 *v.* 74·6–77·8, $F = 2{\cdot}68$, $P < 0{\cdot}01$) and they scored lowest on a clinical global improvement measure (3·5 *v.* 4·1–4·3; $F = 2{\cdot}81$, $P < 0{\cdot}01$).

Consistency on several study variables was examined across the 12 months. Kappa coefficients for the trait anxiety items were all significant at the $P < 0.001$ level (i.e. 'nervy' = 0·54, 'worrier' = 0·33, 'tense' = 0·33, 'anxious' = 0·46). Intercorrelation of the total 'disordered personality' scores rated by the psychiatrist on the two occasions was 0·83 ($P < 0{\cdot}001$), while, for the 15 personality vignettes, scores were all significantly associated (range of rs = 0·41 to 0·87, mean 0·62).

DISCUSSION

While seeking to develop a clinically useful system for subtyping non-melancholic depression, we studied only those who met DSM criteria for major depression, so as to ensure a reasonable level of depression severity. The model will need, however, to be tested across other expressions of depression (including dysthymia and subsyndromal depressions), and for definitive conclusions about causal processes, prospective studies will have to be added to these largely cross-sectional and retrospective findings. It must also be acknowledged that many of our measures – being based on clinical assessment – have attendant limitations. In an independent publication (Parker *et al.* 1998) we assess their validity, principally by inter-correlating scores generated by psychiatrists, patients, family members and referrers. Predictably, while modest associations were demonstrated, patients nevertheless rated life events more severely than the interviewing psychiatrist and the consensus group. Secondly, agreement in rating trait anxiety and disordered personality functioning was poor across the varying rating groups, but with the best levels of agreement being between the corroborative witness and the referrer, with the mean kappa for the trait anxiety items being 0·38 and the Pearson correlation for disordered personality functioning being 0·29 ($P < 0{\cdot}05$). Twelve-month consistency across a number of central variables, as reported here, was more encouraging. Again, our Table 4 results (using family member-generated data) offered support for the capacity of study variables to discriminate subjects on the basis of anxiety and personality contributions. Nevertheless, further development of the model will need to ensure valid clinical assessment of identified key variables.

As each of the three factors proposed in our model is dimensional, varying admixtures of all three would be expected for each subject. Our LCA favoured a four-class model, underpinned by varying distributions from our 'P' and 'A' contributing factors, with the 'L' contribution being non-specific across the classes.

Our P^+A^+ class encompassed those with a highly disordered personality style (of the Cluster C, or 'anxious and fearful' type), who described themselves as anxious worriers, and were disproportionately more likely to receive a clinical diagnosis of 'neurotic depression'. They were most likely to have a family history of

anxiety, to report a family member treated for 'nerves', to have the highest lifetime likelihood of an anxiety disorder and to have been dependent on anxiolytic medication. They had their first depressive episode at a relatively young age, more lifetime depressive episodes, a lengthy current episode, and one distinguished by preferentially reporting emotions of irritability and anger. They had the worst outcome of the four classes over our 12-month review. While conforming to older concepts of 'neurotic depression', it would appear that this group is best distinguished by an 'anxious worrier' personality style.

Our P^+A^- members were also highly likely to express a disordered personality style, but across a more restricted range of domains and to be more likely to have a Cluster B (dramatic, acting-out) personality style over-represented than an anxious one. They were young, and had been significantly younger at both initial depressive or any self-injurious episode. They appear to be distinguished by having an unstable and volatile (*qua* 'hostile') personality vulnerability.

Our P^-A^+ class rated as highly anxious on our high trait anxiety descriptors, but – compared to our P^+A^+ class – were less likely to rate as having an anxious or 'DSM sensitive' personality style or to rate as 'personality disordered' on any PD cluster. They had the highest mean age and were most likely to be in a stable relationship. Thus, their anxiety appeared more loculated at the Axis I level in comparison to the anxious personality style of the P^+A^+ class.

Our P^-A^- class was not readily defined by our contributing variables, being essentially a residual class. Clearly, its prevalence in any sample would be influenced by cut-off criteria for contributing variables and could, if cut-offs were set low, be eliminated. We anticipated an L class (i.e. those who possessed neither of the dispositional P or A variables) of members who decompensated into a depressive episode as a consequence of an overwhelming or substantive life event stressor. However, neither in our screening analysis of the three latent variables nor in our definite four-class LCA could we identify a 'pure' L or life-event-driven class. A repeat LCA (after deleting the L variables) showed minimal variation both for item probabilities for the P and A variables, and in class prevalences. Even entering subjects' own ratings of the impact of pre-depression life events failed to influence the class prevalences, indicating that the suggested non-specificity of life events was not restricted to assessment by raters. Finally, similar item probabilities of the L variables across the four classes indicated that life events failed to offer any differentiation.

How then may acute life events contribute to any classification of the non-melancholic depressive disorders? We must first consider their role. Frank *et al*. (1994) noted that 'antecedent life events may play a role in producing, triggering, or maintaining an episode of depression', while Akiskal (1985) argued that life events are 'not causative but epiphenomenal'. Life events seemingly require interaction with predispositional or certain vulnerability factors, to then act as 'provoking agents' (Brown & Harris, 1978), but our data challenge the view that they generate a non-melancholic subtype. Our findings are then broadly consistent with a study (Hirschfeld *et al*. 1985) which contrasted RDC-defined situational and non-situational major depression, and which failed to establish clinical, family history and even life event stress differences between the groups. An accompanying editorial by Glass (1985) concluded that 'the presence or absence of a precipitant does not seem to be useful for subdividing groups of patients with major depression', and thus questioned the validity of the 'intuitively appealing' concept of 'situational depression'. While we also failed to find support for that concept, its existence may depend on the population studied, perhaps more to be expected in non-clinical samples, particularly if the 2-week duration criterion for major depression is not imposed.

We now consider the extent to which the three principal classes identified in our analyses correspond with representative earlier studies. In an early overview, Roth & Barnes (1981) concluded that three distinct subgroups of the 'depressive neuroses' had been identified: (*i*) anxious depressives; (*ii*) hostile depressives (variably labelled 'hysteroid dysphoria', 'angry depressive', 'self-pitying constellation', 'chronic characterological syndrome'); and (*iii*)

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depressives with personality disorder. Factor analytic studies have argued for several non-melancholic depressive subtypes – including 'psychopathic depression' or depression in an abnormal personality (Hamilton & White, 1959); 'anxious-tense depression' and 'hostile depression' in those who were irritable as well as anxious (Overall *et al.* 1966); and a group distinguished by blaming, demanding and complaining behaviours (Rosenthal & Gudeman, 1967). Blashfield & Morey (1979) reviewed 11 cluster analytical studies and suggested that there were generally two or three 'non-psychotic' clusters including a 'hostile' and an 'anxious' depression. In a representative study (Paykel, 1971), the first 'neurotic' group was labelled as 'anxious', scoring high on anxiety and neurotic symptoms, low on life event stressors and with the greatest number of previous depressive episodes. The remaining two groups were younger, had high life event scores, the first labelled 'hostile' depressives and the other 'young depressives with personality disorder'. While several grade-of-membership (GOM) analyses have been undertaken (e.g. Blazer *et al.* 1989), we note one by Davidson *et al.* (1988), who identified five pure types, including 'three forms of anxious depression', and with one described as often secondary to anxiety in younger patients often with personality problems including hostility and interpersonal sensitivity.

Others have described 'character spectrum disorder' (Akiskal, 1984) subgroups. Thus, Winokur (1991) argued for 'neurotic depression' being composed of two separate groups: (*i*) 'depression spectrum disease', a primary depression in an individual who has difficulties in living and many personality problems (especially lifelong irritability, hostility and a tendency to complain), as well as a family history of alcoholism (i.e. a vignette well captured by our A^+P^+ class); and (*ii*) 'secondary depression', occurring in an individual with a preexisting personality disorder or neurosis such as anxiety (akin to our P^+A^+ and P^-A^+ classes).

There does appear to be utility in viewing characterological depression as a spectrum condition with Axis II limitations disposing to Axis I depressive disorders (Siever & Davis, 1991). Our results may assist by identifying differential weighting of Cluster B and Cluster C personality types to separate depressive subclasses. Cluster B characteristics loaded on our P^+A^- class – such people may be more likely to respond to their depressed state with 'acting out' behaviours, whether best termed dramatic, volatile or 'hostile' (the dominant literature descriptor). By contrast, Cluster C characteristics loaded on our P^+A^+ class – such people may be more likely to handle their depressed state by 'internalizing' strategies (worrying, retiring or keeping to themselves), and so both experiencing and expressing their depression more intrapsychically than behaviourally.

While our analyses implicate anxiety as a distinct vulnerability factor to the onset of depression, further research should consider whether high trait anxiety, high state anxiety, meeting lifetime criteria for a formal anxiety disorder, and anxiety as a personality style define a common vulnerability pathway to secondary depression or whether differential tracks exist. We suspect that, of the listed constructs, state anxiety is least likely to contribute to any non-melancholic subtype as current anxiety symptom scores did not differentiate across our derived classes.

We noted our principal objective in the introduction – to develop a clinically useful system for subtyping the non-melancholic depressive disorders. The non-specificity of current classificatory listings builds to conceptual homogeneity so that all antidepressant therapies may be regarded as potentially appropriate for all non-melancholic depressive subtypes. Physicians would not regard a generic diagnosis such as hypertension as adequate in and of itself for dictating management guidelines, so that a therapeutic model is required which respects salient aetiological factors. In an early review, Blashfield & Morey (1979) concluded that 'anxious depressives respond well to major and minor tranquillisers but not to tricyclics, while hostile depressives show little improvement with conventional drug therapies'. Any such therapeutic specificity is unlikely to be limited to drug treatments. Thus, we agree with Winokur (1991, p. viii) that attempts should be made to 'identify separate etiologies that in turn could translate into specific treatments'. The next stages of our research will require validated clinical measures

of refined subclasses, comparison against alternative subclassing methodologies, and comparative examination of differential natural and treated histories.

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