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Examining the utility of a temperament model for modelling non-melancholic depression

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Objective: Depression is currently modelled dimensionally, along severity, duration and recurrency dimensions. An alternative model allows dimensional expressions of temperament and personality to influence risk to onset as well as persistence. Here, we examine the utility of a temperament model.
Method: A questionnaire assessing temperament dimensions and a number of depression variables was administered to a large routine general practice sample and with the temperament measure also completed by a small clinical sample.
Results: 'Anxious worrying' and 'irritable' dimensions were identified as internalizing and externalizing expressions of a trait anxiety dimension, three other 'temperament' dimensions (i.e. 'introversion', 'self-centred' and 'obsessive') were refined, while a 'self-blame' dimension intruded into the factor analytic solution. High scores on the 'anxious worrying' dimension were associated with all depression parameters. The 'irritable', 'introversion' and 'self-blame' dimensions were less clearly linked with depression variables, while higher scores on the 'self-centred' and 'obsessional' dimensions did not appear to increase the chance of depression onset, persistence or recourse to treatment.
Conclusion: A temperament-based approach appears to have some conceptual utility in modelling depression, and particularly, the non-melancholic disorders. It is likely, however, to require complementing with refined at-risk personality dimensions.

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Key words: depression; depression modelling; depression vulnerability; personality; temperament

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Introduction

Current classificatory systems (both DSM-IV and ICD-10) principally model the depressive disorders dimensionally, both in regard to severity and duration, and, with ICD-10 additionally having a recurrence dimension. We seek to determine the utility of another dimensional model, one weighting the contribution of temperament and personality as both predisposing to onset and persistence of depression.

On theoretical grounds, we view 'temperament' as the constitutional hard-wiring and, at least theoretically, distinguished from 'personality' – conceptualized here as temperament modified by developmental factors and other influences. It may be, however, that the fundamental dimensions of personality and temperament are synonymous. Thus, the so-called 'five factor model' or FFM – comprising neuroticism, extraversion, agreeableness, conscientiousness and openness to experience (1, 2) – is variably described as a five-factor model of personality or of temperament. More importantly, the first four dimensions have been identified with consistency across three differing samples by Livesley et al. (3), comprising general population and volunteer twin samples as well as a sample of those with personality disorder. In that study, multivariate genetic analyses yielded four genetic and environmental factors that were judged as 'remarkably similar' to the phenotypic factors, and with high hereditability. The consistency in their identification and their high hereditability argues for their status as 'temperament' dimensions, if the definition provided earlier is accepted.

Just as Livesley et al. (3) were then able to argue that personality disorders may then be modelled as extreme dimensions of normative personality, these

dimensions may theoretically also dispose to and shape certain expressions of the depressive disorders. The first four in the FFM paradigm (i.e. neuroticism, extroversion/introversion, agreeableness and conscientiousness) correspond to clinically observed styles in those who present with non-melancholic depression, with an 'anxious worrying' style being common, and with smaller percentages showing 'shy and introverted', 'irritable/hostile', and 'obsessional' styles.

Historically, two expressions ('anxious depression' and 'irritable/hostile depression') have been identified in studies variably using factor analysis, cluster analysis, grade of membership and latent class analyses (see Ref. 4), after excluding those with psychotic and melancholic conditions. It is conceivable then that these two expressions (which are held to reflect symptom pattern as well as predisposing personality styles) reflect the principal or entire descriptive range. Alternately, there may be numerous temperament and personality-driven expressions, ranging progressively from the meaningful to the essentially inconsequential, but that they have escaped identification. The current study pursues the relevance of temperament.

Material and methods

Temperament measure

We first developed a comprehensive self-report measure of descriptors capturing the temperament domains of interest. For anxious worrying, we sought descriptors of neuroticism, high anxiety and emotional dysregulation, examining items from 15 formal measures. For introversion, we considered descriptors from five measures of shyness, introversion, introversion personality style and social phobic features – ensuring a large number of items. For low 'agreeableness' we examined 11 direct and indirect measures of hostility/irritability, of externalizing and other Cluster B (DSM-conceptualized 'dramatic, emotional or erratic') behaviours and of measures of the so-called Type A temperament style (so that items such as being 'hot-tempered', 'taking words out of other people's mouths' and 'being in a hurry most of the time' were included). As we sought in particular to clarify whether irritability and hostility were synonymous constructs – and the nature of irritability – this ensured a large number of items to be evaluated. For the obsessional personality style we examined constructs from 11 measures assessing obsessionality, reliability and perfectionism.

Item selection involved choosing ones identified empirically as superior in development studies (e.g. higher factor loadings) and after considering their clinical usefulness as defining 'markers'. The initial set comprised 13 anxious worrying, 32 hostility/irritability, 17 introversion and eight obsessionality items.

To obtain judgements about trait characteristics (as necessary for a temperament and personality questionnaire) subjects were asked to tick the rating option 'that best describes the way you *usually* or *generally* feel or behave' (over the years and not just recently).

Sample, study one

Pursuing a 'bottom up' approach, we sought a psychiatrically non-clinical sample, and for ease of data collection, studied patients routinely attending a general practitioner. In addition to providing socio-demographic data and completing the 'temperament' measure, subjects were required to (i) complete an 18-item severity measure (5) of depression in the medically ill (DMI), (ii) state whether they had ever been 'significantly depressed' (over their lifetime) or (iii) received 'antidepressant medication'. The second issue (lifetime depression) was assessed by asking 'Over your lifetime, have you ever had a period where you have been depressed (i.e. felt significantly depressed, hopeless and pessimistic about things, had a drop in self-esteem or self-worth, and not been able to cope as well as usual) for a period of AT LEAST TWO WEEKS?' Subsidiary questions sought data on age at first episode, duration of longest episode, whether such episodes (in general) were viewed as (a) 'normal blues and to be expected', (b) 'at times, distinct disorders and above and beyond "reasonable distress" that might be expected in the circumstances', or (c) 'always, a distinct disorder'. Details on recourse to consultation with a general practitioner, a psychologist or a psychiatrist were obtained.

Patients attending general practitioners in six Sydney single or group practices were approached by the practice secretary or by a research assistant to complete the questionnaire while waiting – subject to the patient not being severely unwell physically, at least 16 years of age, and English speaking. Forms were completed anonymously and 'posted' into boxes adjacent to the practice secretary. While the refusal rate was not formally recorded, few patients declined and few patients failed to return questionnaires. However, a significant number failed to complete the kit when called for consultation with their general practitioner and not wanting to complete the kit after

their surgery visit, allowing only partial completion of the questionnaire.

Sample, study two

A series of 50 patients (recruited consecutively over two intervals), and treated by the first author for depressive disorder were requested to complete (mostly during a follow-up review) the refined temperament measure, to assess its relevance in a clinical sample.

Results

Study one

While more than 900 questionnaires were returned, sample analyses were restricted to 638 fully completed sets, with subjects having a mean age of 38.3 (SD 16.5) years, and with 55% females. Forty-five per cent were single, 43% married and 12% separated, divorced or widowed, 62% were born in Australia, and 67% were either in full-time or part-time employment.

The mean score on the DMI state depression measure was 14.2 (SD 13.3), with 30% exceeding the cut-off score of 20 or more for possible depression 'caseness'. Fifty-five per cent admitted to a lifetime episode of depression, commencing at a mean age of 25.4 (SD 12.1) years, with 47% of those judging episodes as representing 'normal blues', 40% as being a distinct disorder at times and 13% as always being a distinct disorder. The median and mean duration of the longest episode (our measure of 'persistence') were 4 and 11 months, respectively. Twenty-one per cent of the sample reported previous receipt of an antidepressant drug. For those reporting an episode, 46% had consulted a general practitioner, 22% a psychologist and 23% a psychiatrist.

If our questions assessing lifetime depression did detect 'clinical depression', we would expect progressively decreasing rates of professional attention in those reporting their depression as 'always' at a disorder level, as 'sometimes' at disorder level, as representing normal 'blues', and as never experienced. Respective rates for visiting a psychiatrist were 67, 29, 6 and 0%, for visiting a psychologist 42, 28, 13 and 0%, and for receiving treatment from a general practitioner 74, 57, 27 and 0.4%, respectively.

A series of K-means cluster analyses of temperament items and other study variables (such as age and sex) failed to obtain any support for a model presuming categorical subgroups. We therefore proceeded with the assumption that the data were best modelled dimensionally.

A series of factor analyses of the 70-item temperament questionnaire were undertaken. The first two factors accounted for 14.9 and 10.4%, respectively, the third and fourth factors each accounted for more than 5%, and the fifth to ninth factors each accounted for some 2% of the variance. Three-factor through to eight-factor oblique rotation solutions were inspected. In the three-, four- and five-factor solutions, the first factor was dominated by anxious worrying items (with factor loadings of 0.67–0.80) but also contained irritable-hostile items (with loadings of 0.42–0.66), suggesting that it was a general anxiety factor, comprising both 'internalizing' items (e.g. feeling stressed, worrying) but with a significant contribution from 'externalizing' items (e.g. irritable, angry and snappy). Only after a six-factor solution was imposed did a separate irritable-hostile factor emerge.

The six-factor solution produced four dimensions (labelled 'anxious worrying', 'introversion', 'irritable' and 'obsessive' – with respective variances of 8.7, 7.2, 6.1 and 3.9%) that corresponded to our *a priori* model. In addition, it included a 'self-centred' factor (4.6% of the variance), which we interpret as the converse expression of 'agreeableness' (as labelled in FFM studies) and an unanticipated factor (labelled 'self-blame') accounting for 1.9% of the variance. Table 1 reports oblique factor loadings for the 37-item set refined in the six-factor solution. For each factor, scores on tabulated items were summed to create scale scores – apart from factor five where only the two first and seemingly central items (self-blame and self-criticism) were summed.

A correlation matrix established moderate associations (all $P < 0.001$) linking anxious worrying scores with irritability ($r = 0.54$), self-blame ($r = 0.30$) and self-centred ($r = 0.27$) scores. Self-centred and irritability ($r = 0.45$, $P < 0.001$) scores were associated, while all other correlation coefficients were trivial.

In terms of socio-demographic influences, older subjects returned higher introversion ($r = 0.26$) and obsessive ($r = 0.19$) scores, while younger subjects returned higher irritability ($r = 0.17$) scores (all $P < 0.001$). Males scored lower on anxious worrying (8.2 vs. 10.1, $t = 4.1$), and higher on the introversion (11.7 vs. 9.3, $t = 4.8$) and self-centred (5.2 vs. 3.7, $t = 5.7$) scales (all $P < 0.001$). While such analyses demonstrated formal statistical significance, the influence of the large sample size on such analyses must be respected.

Table 1. Factor loadings of identified factors, together with comparison of mean scale scores obtained in both the general practice study and from a clinical sample

I Anxious worrying		II Introversion		III Irritable		IV Self-centred		V Obsessional		VI Self-blame	
Stress easily	0.81	Very sociable	−0.76	Snaps if irritated	0.66	Takes advantage of others	0.64	Very self-disciplined	0.67	Blame myself	0.54
Minor issue worrier	0.78	Quiet with people	0.71	Hot tempered	0.65	Manipulates people	0.63	Sets high standards	0.67	Self-critical	0.48
Worrier	0.76	Likes social stimulation	−0.70	Bad tempered	0.63	Not tolerant of people	0.59	Plans ahead	0.65	Do right thing by people	0.44
Worry that the worst will happen	0.73	Enjoys mixing	−0.70	Gets angry	0.61	Not sympathetic	0.57	Conscientious	0.62	Sorry for others worse off	0.44
Easily upset	0.71	Likes parties	−0.69	Quick tempered	0.60	Blames others	0.51	Meets stated commitments	0.60		
Rattled easily	0.71	Reserved at parties	0.69	Snaps if delayed	0.55	Critical of others	0.50	Commitment focused	0.60		
Tense and nervy	0.71	Prefers being alone	0.67	Impulsive	0.55	Not help others	0.48	Things carried out correctly	0.58		
Stew over things	0.70	Hangs back socially	0.63	Sometimes insulting	0.55						
		Avoids groups	0.62	Snappy when stressed	0.54						
		Energizer at parties	−0.67								

*Items are abbreviated, and listed for those exceeding 0.44 loadings. *t*-Tests contrast mean scores from two contrast samples. $*P < 0.05$, $**P < 0.001$.

Table 2 examines scale scores in relation to depression variables. If our temperament scales identify risk to depression and/or its persistence, several associations with our depression variables would be expected. First, that individuals scoring higher on the scales would be more likely to be currently depressed (i.e. exceed the suggested cut-off score for our state depression measure). Univariate analyses (Table 2) confirmed such links for the anxious worrying, self-blame, irritable and introversion dimensions, but identified a converse link with the obsessive scale (i.e. currently depressed subjects had lower obsessive scores), while no association was evident for the self-centred scale. Second, that higher scale scores would be associated with experiencing a lifetime depressive disorder. Progressing across a gradient of 'normal blues' to 'always a disorder', then anxious worrying, irritable and introversion scores were significantly higher in those reporting episodes at the disorder level. Third, that scale scores would be higher in those who had received treatment for depression. For those having experienced a lifetime depression, univariate analyses in Table 2 indicate that those who had so consulted a general practitioner returned significantly higher anxious worrying scores, while those consulting a psychiatrist scored significantly higher on that scale and on the irritable scale. Fourth, that scale scores would link with the duration of the longest depressive episode. Longer depressive episodes were reported by those who scored higher ($P < 0.05$) on the anxious worrying ($r = 0.20$), self-blame ($r = 0.13$) and introversion ($r = 0.12$, $P < 0.05$) scales only.

A series of logistic (stepwise forward) regression analyses were then undertaken with scores on each scale examined as predictors of depression variables, with tests of significance set at the $P < 0.001$ level. For those who scored above cut-off on our state depression measure, 'current depression' was predicted by higher anxious worrying (Wald or $W = 108.8$, odds ratio or $\mathrm{OR} = 1.2$, $\mathrm{CI} = 1.16$–1.25) scores, lower obsessive and higher self-blame scores, but with the overall accuracy prediction of 76% only marginally improved when scale scores other than anxious worrying were entered. Reporting a lifetime episode of depressive 'disorder' (excluding those reporting 'blues' only and comprising 27% of the sample) was predicted by anxious worrying scores only ($W = 36.3$, $\mathrm{OR} = 1.14$, $\mathrm{CI} = 1.09$–1.18). Previous receipt of an antidepressant was predicted significantly by higher anxious worrying ($W = 34.5$, $\mathrm{OR} = 1.1$, $\mathrm{CI} = 1.1$–1.2) and self-blame ($W = 5.8$, $\mathrm{OR} = 1.2$, $\mathrm{CI} = 1.0$–1.4), as well as lower obsessive ($W = 4.2$, $\mathrm{OR} = 0.9$, $\mathrm{CI} = 0.9$–1.0) scores but the

Table 2. Influence of study variables on scale scores

	Anxious worrying	Introversion	Irritable-hostile	Self-centred	Obsessive	Self-blame
State depression						
>20	13.7	11.9	13.5	4.8	12.6	3.9
≤20	7.5	9.7	10.6	4.2	13.3	2.9
t	12.8***	3.9***	5.8***	1.9	−2.1*	7.4***
Use of antidepressants						
Yes	12.7	11.5	13.1	4.5	12.5	3.8
No	8.3	10.1	11.0	4.3	13.2	3.1
t	7.6***	2.4*	3.5***	0.5	−2.1*	4.2***
Lifetime depression						
Yes	10.8	10.7	12.5	4.3	12.9	3.6
No	7.4	10.0	10.1	4.4	13.3	2.8
t	7.2***	1.4	5.1***	−0.3	−1.5	6.3***
Lifetime depressive 'disorder'						
Yes	15.5	13.9	13.8	4.6	12.0	3.9
No	8.8	10.1	11.2	4.4	13.2	3.2
t	7.2***	3.9***	2.8**	0.6	02.2*	3.1**
Lifetime depressive 'disorder'						
Normal blues	8.4	9.9	11.0	4.0	13.3	3.5
Sometimes blues	11.8	10.5	13.9	4.6	12.7	3.7
Always disorder	15.5	13.9	13.8	4.6	12.9	3.6
F	29.6***	6.0**	10.5***	1.2	2.8	1.7
Psychiatric consultation						
Yes	12.9	11.7	13.9	4.2	12.2	3.8
No	10.1	10.5	12.1	4.3	13.1	3.6
t	3.4***	1.4	2.4*	0.3	−1.9	1.3
General practitioner consultation						
Yes	12.0	11.4	12.9	4.6	12.7	3.7
No	9.8	10.2	12.1	4.1	13.0	3.5
t	3.3***	1.2	1.2	1.3	−0.9	1.2

overall accuracy of 79.9% was contributed to almost entirely by anxious worrying scores – which alone had an accuracy of 79.0%. Only higher anxious worrying scores predicted previous recourse to a general practitioner ($W = 10.3$, OR = 1.06, CI = 1.02–1.1) and to a psychiatrist ($W = 11.1$, OR = 1.07, CI = 1.03–1.12) for a depressive disorder. When all scale scores were entered as predictors of depression persistence, only higher anxious worrying scores remained significant in a multiple regression analysis ($B = 0.19$, $t = 3.4$, $P < 0.01$).

Study two

Fifty patients (52% female, mean age 44.6, SD 14.4 years) completed the refined questionnaire at presentation or at follow-up assessment. If scale scores predict chance of a depressive episode and recourse to treatment, higher scores would be anticipated in the clinical sample than in the overall general practice sample. Our clinical sample members scored significantly higher on the anxious worrying (14.4 vs. 9.3, $t = 5.7$, $P < 0.01$), self-blame (3.8 vs. 3.2, $t = 2.5$, $P < 0.05$), irritable (13.1 vs. 11.4, $t = 2.0$, $P < 0.05$) and introversion (12.3 vs. 10.3, $t = 2.0$, $P < 0.05$) scales but did not differ on the self-centred (4.4 vs. 4.4) and obsessional (13.8 vs. 13.1) scales.

Discussion

We hypothesized that fundamental temperament styles influence the likelihood of developing depression and influence its persistence. Study limitations included no formal measure of lifetime depression or psychiatric assessment, but strong links between self-reported depression and recourse to professional treatment support the validity of depression estimates.

We developed a questionnaire weighted to identifying four of the five FFM dimensions. Factor analyses identified two dominant factors ('anxious worrying' and 'intraversion'), so corresponding to the Eysenkian model of neuroticism and extraversion (6). It was only when we proceeded to an imposed six-factor solution that we were able to obtain separate 'irritable' and 'anxious worrying' factors and identify the *a priori* dimensions of interest beyond anxious worrying and intraversion. Each issue is worthy of focus.

As noted earlier, 'anxious depression' and 'irritable/hostile depression' have been identified consistently – in addition to more 'biological' expressions such as psychotic and melancholic depression. In our applied research (4, 7, 8), we demonstrated that those with an 'anxious depressive' expression had a family history of anxiety, were likely to show behavioural inhibition or shyness in childhood, had a high lifetime rate of both formal anxiety disorder and Cluster C (DSM-conceptualized 'anxious and fearful') personality style characteristics. By contrast, those with an 'irritable hostile depression' were more likely to have a Cluster B personality style, to describe volatile interpersonal relationships and to be more inclined to 'act out' with anger, frustration and irritability when depressed. Thus, we established links between longstanding personality or temperament styles and symptomatic expressions of depression. Historically, 'irritability' and 'hostility' have generally been viewed as synonymous constructs. Our factor analyses provide a challenge. Both 'anxious worrying' and 'irritability' items loaded strongly on the first general factor, with separation only achieved by moving to the six-factor solution. Their relative interdependence was further suggested by the respective scale scores correlating 0.54. Such findings favour a common trait anxiety construct, and with differentiation emerging more from the manifestation of that 'trait anxiety' – with contrasting 'internalizing' and 'externalizing' expressions. This is in keeping with the properties of the FFM-based NEO measure (1), where its 'neuroticism' domain has six facets, including 'anxiety' (defined by tension, fear, worry and apprehension) and 'hostility' (defined by hot temper, anger and easy frustration).

The status of 'irritable/hostile' depression has remained unclear over time. Many commentators refer to a subclass marked by irritability and anger (e.g. Refs 9, 10), while others (e.g. Refs 11–13), emphasize more on complaining behaviours, hostility and open aggression. We suggest that there may be wisdom in distinguishing two expressions, rather than regarding them as synonymous constructs. We would recommend that the term 'hostility' be reserved for those with a distinct Cluster B style of volatility and frustration aggression, and that 'irritability' be reserved for those who externalize high trait anxiety via irritable and snappy behaviours.

As noted, 'anxious worrying' and 'intraversion' were the dominant constructs identified in our factor analyses, but we also identified two other putative FFM constructs ('obsessive' and 'self-centred', with the latter being viewed as the converse expression of the FFM construct 'agreeableness'); however, each accounted for only small percentages of the variance. We did foreshadow the possibility that a temperament-based model of non-melancholic depression would lose relevance if taken beyond its intrinsic explanatory capacity, an interpretation pursued shortly by considering results of our multivariate analyses.

Conversely, our factor analytic solution appeared to proceed beyond refining the temperament dimensions of interest, in that an unsought 'self-blame' dimension emerged as a factor. This may have been artefactual, whereby currently depressed subjects generated a mood state-based 'depression' factor. Alternately, a 'depressive personality' dimension may have exerted its salience, despite few items in the original set. Coyne and Whiffen (14) have argued for two key personality style vulnerabilities to depression – those who are 'autonomous or self-critical' (individuals who become self-critical when internalized goals are thwarted) and those who are 'sociotropic' or dependent in establishing secure relationships to bolster their self-esteem. Our self-blame factor had relevant items, suggesting that such a 'personality' style may have extended the solution beyond one limited to higher order and lower order temperament dimensions.

Our general hypothesis was that temperament styles increase the risk of depression onset and persistence, and we suggest that findings support a refined model. In both the univariate and multivariate analyses, the 'anxious worrying' scale was clearly the most salient, being linked with all depression variables.

For those who scored high on the irritable and introversion scales, less ubiquitous links with depressive variables were demonstrated in the univariate analyses, but rarely added substantially to prediction effected by 'anxious worrying' in multivariate analyses.

Scores on the self-centred scale failed to predict depressive experience or treatment. It would be hard to suppose that 'self-centred' individuals do not develop depression, particularly when their needs are unmet. However, clinical observation suggests that such individuals tend to have transient depressive episodes, with improvement sometimes associated with expressing their frustration by aggression and/or by blaming others (whereas 'depression' involves self-blame). Such reasons may explain the lack of links here with depression variables.

Finally, and seemingly counter-intuitively, lower rather than higher obsessive scores were returned by those currently depressed, those who had never

had a lifetime depression and those who had not received antidepressant medication. It is possible that our 'obsessive' items may have merely captured characteristics of 'normal' responsibility and conscientiousness, and with high scores lacking the capacity to capture the more pathological nature of obsessionality and perfectionism. Alternatively, it may be a true finding. Obsessive people tend to construct and control their worlds to minimize risk and, presumably, expose themselves to fewer depressogenic stressors. When so exposed they are likely to use cognitive strategies that also decrease their chance of recognizing depression while, when depressed, they are less likely to acknowledge such a state, and be uncomfortable about and disinclined to seek treatment. However, they are not immune to depressogenic stressors and, when depressed, can present clinically (where often their depression is persistent and treatment resistant), with their inability to renounce some goal seemingly contributing to depression and its persistence.

If our scales are valid measures of risk factors contributing to clinical depression and its treatment, then higher scale scores would be anticipated in our clinical sample compared with the overall general practitioner sample. Our clinical sample was readily distinguished by higher scores on the anxious worrying scale, and to lesser degrees by higher irritable, self-blame and introversion scale scores, but did not differ on the obsessive and self-centred scales, offering further support to conclusions reached within the general practice sample alone.

Winokur (15) argued that research should seek to 'identify separate etiologies that in turn could translate into specific treatments'. Few of our temperament dimensions were suggested as identifying an increased risk to depression, and it may be that the longstanding consistent literature finding identifying only anxious worrying and irritable subgroups of non-melancholic depression reflects the reality. However, we suggest that there may be wisdom in persisting with the wider set to enrich clinical description, to assist understanding of determinants of adaptive and maladaptive coping and, in particular, to pursue management implications.

We now consider clinical implications to the model that we seek to develop for the non-melancholic depressive disorders. Current DSM and ICD classificatory systems for the depressive disorders model depression dimensionally and are not aetiologically focussed, with such non-specificity predictably leading to relatively non-specific findings in regard to treatment prediction. Decades ago, when distinctions were made between 'anxious depressive' and 'irritable/hostile depressive' subgroups, treatment specificity was more likely to be examined and identified. Thus, a review (16) of multiple studies concluded that 'anxious depressives respond well to major and minor tranquillizers but not to tricyclics, while hostile depressives show little improvement with conventional drug therapies'.

The current data bank is limited but nevertheless informative in suggesting that temperament and personality styles (which we view as shaping the risk or resistance to non-melancholic depression onset) may also influence the impact of psychotherapeutic and antidepressant drug treatments. The literature is limited (presumably because the current models ignore or minimize aetiology) but do provide some examples that should stimulate research interest and clinical hypotheses. For instance, it has been reported (17) that cognitive behaviour therapy (CBT) was more effective for depressed patients with avoidant personalities but less for those with obsessive personalities – and the converse for interpersonal psychotherapy (IPT). Beck (18) suggested that depressed patients dominant in sociotropy (dependent, anxious) responded better to supportive psychotherapy than to a problem solving approach. Of interest, a report from the NIMH Treatment of Depression Collaborative Program (19) established that those with a perfectionistic style had a significantly poorer outcome across all differing treatment modalities (i.e. imipramine, CBT, IPT and non-specific support).

Turning to antidepressant drugs, the selective serotonin reuptake inhibitors have been demonstrated to have distinct benefits for both anxious worrying and irritability (20), the latter finding being of importance in light of the earlier noted overview (16). One study (21) has shown that those with a clinical depression marked by irritability are more likely to have a decreased prolactin response to TRH stimulation (indicating greater serotonin dysregulation) and to be responsive to SSRI antidepressants. Thus, the SSRIs appear to be established as of use for both internalized ('anxious worrying') and externalized ('irritability') anxiety in those with non-melancholic depression.

However, unless comparative treatment studies respect the possibility of a spectrum model for non-melancholic depression (by measuring underlying temperament and personality contributions), treatment specificity effects will not be identified, so encouraging continuation of an unsophisticated parsimonious approach to managing ('major') depression, with practitioners applying a particular treatment (be it medication or other) in a seemingly

non-specific way. If, however, depression and non-melancholic depression in particular is driven by temperament and personality style, then attention to those engine components rather than to the symptomatic exhaust might advance its management.

Our temperament hypothesis effectively assumed that certain individuals are destined to be highly likely to develop depression as a consequence of that component. Study results found support only for an anxiety temperament (whether expressed in internalized or externalized ways), almost bringing us back to the historical 'neurotic depression' construct. As other 'temperament' styles did not appear clearly implicated, and when a personality style of 'self-blame' did intrude and link with depression variables, it becomes clear that vulnerability is likely to involve both temperament and personality constructs. If personality is truly temperament modified by developmental factors, it might be expected that developmental stressors (such as poor parenting, sexual abuse and socio-economic privation) might link more closely with such at-risk personality constructs than with temperament. Treatment strategies might then be developed on a more rational basis. Our study results clarify the utility of a temperament model, argue for the need to wed both temperament and personality dimensions to advancing a vulnerability model for depression, and provoke consideration of the clinical and research applications.

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