Categorical and Dimensional Stability of Comorbid Personality Disorder Symptoms in *DSM-IV* Major Depressive Disorder: A Prospective Study

Tarja K. Melartin, MD, PhD; Jari Haukka, PhD; Heikki J. Rytsälä, MD, PhD; Pekka J. Jylhä, MD, PhD; and Erkki T. Isometsä, MD, PhD

Objective: To investigate the categorical and dimensional temporal stability of Axis II personality disorders among depressive patients, and to determine whether variations in Axis I comorbid disorders or self-reported personality traits predict changes in researcher-assigned personality disorder symptoms.

Method: Patients with *DSM-IV* major depressive disorder (MDD) in the Vantaa Depression Study (N = 269) were interviewed with the World Health Organization Schedules for Clinical Assessment in Neuropsychiatry, version 2.0, and the Structured Clinical Interview for *DSM-III-R* Axis II Disorders and were assessed with the 57-item Eysenck Personality Inventory at baseline, 6 months, and 18 months. Baseline interviews occurred between February 1, 1997, and May 31, 1998; follow-up interviews were 6 months and 18 months after baseline for each patient. Of the patients included in the study, 193 remained unipolar and could be interviewed at both follow-ups. The covariation of the severity of depression, anxiety, alcohol use, and reported neuroticism and extraversion with assigned personality disorder symptoms was investigated by using general estimation equations.

Results: The diagnosis of personality disorder persisted at all time points in about half (43%) of the 81 MDD patients diagnosed with personality disorder at baseline. The number of positive personality disorder criteria declined, particularly during the first 6 months, by a mean of 3 criteria. The decline in reported personality disorder symptoms covaried significantly with declines in the severity of depressive and anxiety symptoms (depressive: $P = .02$ for paranoid, $P = .02$ for borderline, and $P = .01$ for avoidant; anxiety: $P = .08$ for paranoid, $P = .01$ for borderline, and $P < .001$ for avoidant). Changes in patients' perceptions of self as measured by neuroticism covaried with changes in paranoid ($P = .01$) and borderline ($P < .001$) personality disorder symptoms.

Conclusions: Among MDD patients, the categorical stability of concurrent personality disorder diagnoses assigned while depressed is relatively poor, but the dimensional stability is moderate. The remission of depression as well as variations in Axis I comorbidity, particularly anxiety disorders, influences personality disorder diagnoses. These diagnostic difficulties most likely reflect broader variations in patients' perceptions of self over time, not merely psychometric problems related to the pertinent diagnostic criteria.

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Corresponding author: *Erkki T. Isometsä, MD, PhD, Institute of Clinical Medicine, Department of Psychiatry (Välskärinkatu 12 A), PO Box 22, 00014 University of Helsinki, Finland (erkki.isometsa@hus.fi).*

The comorbidity of depression and personality disorders is common. The reported prevalence of personality disorders in clinical samples of depressive patients has varied widely, ranging between 18% and 86%.[1] In the *DSM-IV*, personality disorders are defined as inflexible, maladaptive, and persistent patterns of personality traits, which cause significant functional impairment or subjective distress and have an onset in adolescence or early adulthood. In acute depression, however, the diagnostic assessment of personality disorders is complicated. When the depression is treated, patients' perceived personality disorder features often seem less apparent.[2,3] Although some earlier studies have reported a significant association between changes in personality disorder scores and improvement in depressive symptoms,[2,3] some have reported no such relationship between changes in personality disorder scores and changes in depression or anxiety.[4,5] In addition, recent studies (in patients without depression) of personality disorder patients,[6–8] of personality disorder symptoms in nonpatients,[9,10] and of primary-care patients[11] have shown changes in perceived personality disorder features over time. The relative stability of personality disorders is usually reported to be higher for dimensional measures than for categorical ones and to be somewhat greater across shorter time intervals.[12,13] In a sample of mostly outpatients with chronic depression, the categorical stability of personality disorder diagnoses ranged from low to moderate in a 30-month study[12] and from poor to fair in a 10-year follow-up study, while dimensional personality disorder stability remained fair to moderate.[13] Despite the high comorbidity of current alcohol use disorders and some personality disorders,[14] the effects of the former on the stability of personality disorder symptoms have not, to our knowledge, been comprehensively investigated among depressive patients. Moreover, samples of previous studies on depressive patients have been small,[2,5] have focused on antidepressant trials,[3] have included mainly patients with chronic depression[12,13] or anxiety disorders,[4,5]

and have used only 2 time points.[3–5,12] Thus, although the finding that personality disorder symptoms change in relatively short periods appears widely recognized, whether changes in the diagnostic symptoms of personality disorder, changes in depression severity, and changes in other comorbid disorders are related, and how they are related, remains far less clear.

That emotional states affect self-perception and autobiographical memory in a number of ways[15] seems well established, albeit, on the level of mechanisms, not well elucidated. Autobiographical memory concerns personally experienced past events and contributes to an individual's sense of self.[16] A lack of autobiographical memory specificity and a pronounced bias to recall negative material are consistent characteristics of depressive patients.[16,17] Depressive patients tend to overgeneralize memories, which appears to be a phenomenon associated with rumination, avoidance of intrusive thoughts, and impairment in executive capacity.[16] Current depressive mood state has also been reported to affect reported neuroticism.[18,19] The effects of various mood states could also influence patients' perceptions of their usual self, ie, their enduring patterns of behavior and inner experience. Because estimations of personality disorder symptoms are based largely on patients' verbal reports on their conscious subjective recollections of such patterns, mood effects could also influence personality disorder diagnoses. Whether the presence of depression and of comorbid disorders affects patients' appraisals of their personalities and their recall of specific behavioral traits is not well known. However, mood states not only affect patients' perceptions but may also cause problems for a researcher due to a halo effect[20] while interviewing a comorbid depressive patient. The perception of former symptoms often influences the perception of a particular one. Thus, temporal variations in Axis I comorbid disorders may not only affect patients' self-perception or memory but also complicate the researcher's efforts to distinguish pertinent Axis II symptoms.

We investigated the stability of personality disorder symptoms prospectively in a representative cohort of psychiatric patients with MDD in a Finnish city. We examined whether the effects of various mood states could influence estimations of personality disorder symptoms that are largely dependent on patients' perceptions and verbal reports of conscious subjective recollections. We evaluated whether changes in anxiety and depression, severity of alcohol use associated with stability of personality disorder symptoms at 6 and 18 months, and temporal changes in patients' reports of personality dimensions of neuroticism and extraversion explained the stability of personality disorder symptoms at 6 and 18 months. We also determined both the categorical (ie, meeting or not meeting criteria for a specific personality disorder) and dimensional (ie, the number of criteria met within each diagnostic category of personality disorders) stability of personality disorders among patients with *DSM-IV* MDD. Our hypothesis predicted (1) categorical stability of personality disorders to be only moderate or poor, (2) dimensional stability to be better than the categorical stability, (3) poor stability of reported personality disorder symptoms to be accounted for by the degree of improvement in depression and comorbid disorders, and (4) changes in reported neuroticism and extraversion to covary with reported personality disorder symptoms.

METHOD

The background and methodology of the Vantaa Depression Study have been described in detail elsewhere.[1,21] In brief, the Vantaa Depression Study is a collaborative depression research project of the Department of Mental Health and Alcohol Research of the National Public Health Institute, Helsinki, Finland, and of the Department of Psychiatry of the Peijas Medical Care District (PMCD; currently part of the Helsinki University Central Hospital), Vantaa, Finland. The ethics committee of the PMCD approved the research protocol.

Screening and Baseline Evaluation

The first phase of patient sampling for the Vantaa Depression Study involved screening all patients aged 20 to 60 years (N = 806) in the PMCD for a possible new episode of *DSM-IV* MDD between February 1, 1997, and May 31, 1998.[1] Vantaa is Finland's fourth largest city, with a population of 169,000 in 1997, and the PMCD provides psychiatric services free of charge to all its citizens. After a positive screen, patients were fully informed of the study project and were requested to participate. Of the 703 eligible patients, 542 (77%) provided their written informed consent.

In the second phase, researchers (3 psychiatrists and 2 clinical psychologists) using the World Health Organization Schedules for Clinical Assessment in Neuropsychiatry (SCAN), version 2.0,[22] interviewed the 542 consenting patients; 269 were subsequently diagnosed with *DSM-IV* MDD and were included in the study. Those patients who were currently abusing alcohol were interviewed after 2 to 3 weeks of abstinence in order to exclude those with a substance-induced mood disorder. All psychiatric and medical records in the PMCD, including a standardized set of laboratory tests, were also available. If it was uncertain whether the patient had substance-induced MDD or not, he or she was excluded from the study. The diagnostic reliability of SCAN 2.0 was excellent ($\kappa = 0.86$; 95% CI, 0.58–1.0).[1] The Structured Clinical Interview for *DSM-III-R* Axis II Disorders (SCID-II)[23] served to assess diagnoses on Axis II. In addition, the cohort baseline measurements included, among the other scales, the 17-item Hamilton Depression Rating Scale (HDRS),[24] the 21-item Beck Depression Inventory (BDI),[25] the Beck Anxiety Inventory (BAI),[26] and the 57-item Eysenck Personality Inventory (EPI)[27] (for details, see reference 1).

Table 1. Sociodemographic and Clinical Characteristics of Different Personality Disorder Categorical Stability Subgroups of Patients With Major Depressive Disorder (N = 193)

Characteristic	Stable Personality Disorder (n = 35), 18% of Sample	Unstable Personality Disorder (n = 68), 35% of Sample	No Personality Disorder (n = 90), 47% of Sample	χ^2	*P* Value
Sociodemographic factors, n (%)					
Sex, female	21 (60)	52 (77)	66 (73)	3.26	NS
Outpatients	26 (74)	58 (85)	79 (88)	3.55	NS
Married/cohabiting	16 (46)	36 (53)	52 (58)	1.51	NS
Employed[a]	25 (71)	39 (59)	56 (64)	1.53	NS
Current comorbidity, n (%)					
Anxiety disorder	18 (51)	39 (57)	49 (54)	0.34	NS
Stable anxiety disorder	9 (26)	7 (10)	4 (4)	12.27	.002
Alcohol use disorder	13 (37)	17 (25)	13 (14)	7.95	.019
Stable alcohol use disorder	8 (23)	3 (4)	2 (2)	17.98	.001
Clinical features, mean (SD)				F	
Age, y	42.0 (11.4)	39.1 (11.4)	42.0 (10.7)	1.57	NS
No. of previous MDEs[b]	2.5 (3.7)	2.3 (3.3)	1.0 (1.2)	7.06	.001
No. of comorbid Axis I disorders	1.5 (1.3)	1.3 (1.1)	1.0 (1.0)	3.44	.034
Time spent in MDE, mos during follow-up	7.9 (6.5)	5.4 (5.3)	3.1 (3.4)	13.51	< .001
17-item HDRS score	21.2 (5.1)	19.3 (6.2)	17.7 (6.0)	4.77	.010
BAI score	27.8 (10.3)	21.6 (10.5)	18.6 (9.2)	11.12	< .001
Size of social network[c]	6.3 (3.6)	7.3 (3.5)	8.4 (3.6)	5.10	.007
Neuroticism score[d]	16.8 (4.6)	14.5 (5.2)	11.7 (5.3)	13.86	< .001
Extraversion score[d]	8.7 (4.7)	11.5 (4.5)	12.3 (3.9)	9.08	< .001

[a]Data missing from 5 patients.
[b]Data missing from 1 patient.
[c]Data missing from 2 patients.
[d]Estimated at the lowest level of depressive symptoms (HDRS score).
Abbreviations: BAI = Beck Anxiety Inventory, HDRS = Hamilton Depression Rating Scale, MDE = major depressive episode, NS = not statistically significant.

Follow-Ups

Of the 269 individuals with current MDD who were initially included in the study, 193 remained unipolar and could be followed up at both 6 and 18 months.[21] At baseline, of these 193 patients, 139 (72%) were female, 69 (36%) were married, 129 (67%) were employed, 78 (40%) had no professional education, 106 (55%) had a comorbid anxiety disorder, and 43 (22%) had a comorbid alcohol use disorder. The mean age of the patients was 41.0 years (SD = 11.1 years). The majority, 170 of 193 (88%), received antidepressants at normal adult doses.[28] Nearly all patients (98%) received some psychosocial treatment in the acute phase, but only about one-fifth (16%) had weekly psychotherapy during the follow-up.[29] The 76 patients who dropped out included those who switched to bipolar disorder (n = 13) and those who died (n = 8) during the follow-up. The attrition rate for those still alive and not switching into bipolar disorder was 22.2% (55 of 248). Drop-out patients presented slightly more paranoid symptoms (mean ± SD = 2.0 ± 1.6 vs 1.4 ± 1.8, $t = -2.074$, $P = .039$) and higher BAI scores (mean ± SD = 24.8 ± 10.9 vs 21.3 ± 10.4, $t = -2.249$, $P = .025$) but showed no significant difference ($P > .05$) in other sociodemographic variables or in neuroticism or extraversion scales from the participants.

The outcome of MDD and the comorbid disorders were investigated at 6 and 18 months with repeated SCAN 2.0 and SCID-II interviews; observer-reported and self-reported scales, including the life-chart, HDRS, BDI, and BAI; and medical and psychiatric records (for details, see reference 21). The same interviewer assessed the same patient at all 3 assessments. The Cronbach α for EPI neuroticism and extraversion was good at baseline, at 6 months, and at 18 months (neuroticism: 0.73, 0.85, 0.87; extraversion: 0.80, 0.77, 0.78, respectively).[19] At baseline, 6 months, and 18 months, respectively, the Cronbach α was 0.86, 0.87, and 0.89 for criteria of avoidant personality disorder; 0.79, 0.76, and 0.81 for criteria of paranoid personality disorder; and 0.80, 0.84, and 0.83 for criteria of borderline personality disorder .

Study Design

For the purposes of the present study, we classified patients according to their categorical stability of personality disorders (Table 1). The subgroups were (1) stable personality disorder (diagnoses at 3 interviews), (2) unstable personality disorder (diagnoses at 1 or 2 interviews), and (3) no personality disorder diagnosis during the entire follow-up period. In dimensional analyses, the most prevalent personality disorder (paranoid, borderline, and avoidant) from each of the 3 clusters was specifically analyzed. Neuroticism and extraversion were assessed with the EPI self-questionnaire at 3 time points. Changes in reported neuroticism and extraversion were compared to changes in researcher-assessed personality disorder symptoms.

We used the SCID-II to assign research diagnoses on Axis II at 3 time points (baseline, 6 months, and 18 months), performed by the same interviewer throughout the follow-up. At each time point, we evaluated the presence of criteria

Table 2. Current Comorbid Personality Disorders and Outcome of Major Depressive Episode (MDE) Among 193 Depressive Patients With Personality Disorder at Baseline, Evaluated in All 3 Interviews and Followed for 18 Months

Personality Disorder Groups	Baseline, n/N (%)[a]	6 Months, n/N (%)	χ^2	*P* Value	18 Months, n/N (%)	χ^2	*P* Value
Any personality disorder	81/193 (42)	47/81 (58)			43/81 (53)		
MDE		22/47 (47)			20/43 (47)		
Partial remission		14/47 (30)			14/43 (33)		
Full remission		11/47 (23)	7.45	.024	9/43 (21)	10.88	.004
Any cluster A personality disorder	35/193 (18)	12/35 (34)			11/35 (31)		
MDE		4/12 (33)			6/11 (55)		
Partial remission		5/12 (42)			3/11 (27)		
Full remission		3/12 (25)	1.63	NS	2/11 (18)	3.14	NS
Any cluster B personality disorder	24/193 (12)	11/24 (46)			11/24 (46)		
MDE		4/11 (36)			4/11 (36)		
Partial remission		3/11 (27)			4/11 (36)		
Full remission		4/11 (36)	0.06	NS	3/11 (27)	3.37	NS
Any cluster C personality disorder	60/193 (31)	34/60 (57)			26/60 (43)		
MDE		18/34 (53)			16/26 (62)		
Partial remission		10/34 (29)			5/26 (19)		
Full remission		6/34 (18)	8.99	.011	5/26 (19)	14.38	.001

[a]At baseline, all patients in each personality disorder group were in a major depressive episode.
Abbreviation: NS = not statistically significant.

symptoms ("enduring patterns of behavior and inner experience") in the time frame of lifetime. Thus, the time periods were deliberately overlapping, and we did not evaluate the changes in personality disorder symptoms between visits.

Both categorical and dimensional stabilities of personality disorders were investigated separately. In the analyses, we used continuous scores (HDRS, BAI) for depression and anxiety and the categorical *DSM-IV* diagnostic criteria for alcohol use disorders.

Statistical Method

Univariate analyses were conducted to examine between-group differences in the sociodemographic factors, comorbidity, and clinical features, comparing groups of unstable personality disorder/stable personality disorder/no personality disorder (Table 1) and outcome of major depressive episode (MDE) and current comorbid personality disorders (Table 2). The Pearson χ^2 test, the Student *t* test, 1-way analysis of variance, and the Kruskal-Wallis test were used when appropriate. For descriptive purposes, we present in the tables all *P* values that are significant at the $< .05$ level, irrespective of the high number of statistical tests. The Friedman test for repeated measures was used for analyzing number of personality disorder criteria and diagnoses met over time by subjects diagnosed at baseline with Axis II disorder. The statistical software used was SPSS, version 14.0 (SPSS Inc, Chicago, Illinois).

There were 3 measurements (baseline, 6 months, 18 months) for each individual for sum scores of paranoid, borderline, and avoidant personality disorders. We analyzed the changes of scores by calculating the difference between 2 consecutive measurements. This resulted in 2 changes between 3 measurements. These changes were analyzed with general estimation equations (GEEs)[30] that take into account that there were repeated measurements for individuals. First, we evaluated, using GEE models, whether changes in anxiety, depression, and severity of alcohol use used as explanatory variables were associated with the dimensional stability (change) of the 3 above-mentioned personality disorders (response variables). Second, we analyzed whether variations in reported neuroticism and extraversion, besides the comorbid disorders, also contributed to the stability of personality disorder symptoms. The R[31] language and environment for statistical computing was used.

RESULTS

Categorical Stability of Personality Disorders

The overall categorical stability of personality disorders among depressive patients was poor. In only 35 of the 81 MDD patients (43%) with a personality disorder diagnosis at baseline did this persist at all time points. In the univariate analyses (Table 1), a stable personality disorder associated significantly with baseline or stable alcohol use and stable anxiety disorder, as well as a more severe MDE, a higher number of previous MDEs and comorbid Axis I disorders, a smaller social network, more time spent depressed, greater neuroticism and anxiety, and lower extraversion. We found no statistically significant differences in sociodemographic factors (Table 1).

The outcome of the index MDE was associated with personality disorder diagnoses (Table 2). The number of patients with a cluster A personality disorder declined from 18% at baseline to 6% at 6 months and remained at about the same level (6%) at 18 months. The same respective percentages for clusters B and C were 12%, 6%, and 6%—and 31%, 18%, and 13%. Thus, about one-third of the patients with a baseline cluster A personality disorder and about one-half of those with a baseline cluster B or C personality disorder remained at the full criteria at all 3 time points during the 18 months (Table 2). The patients with a stable cluster A or B personality disorder were equally distributed

Table 3. Number of Personality Disorder Criteria and Diagnoses Met Over Time by Subjects Diagnosed at Baseline With Axis II Disorder (N = 193)

Baseline Personality Disorder Diagnosis	No. of *DSM-IV* Criteria Endorsed at Baseline, Mean (SD)	No. of *DSM-IV* Criteria Endorsed at 6 Months, Mean (SD)	6-Month Personality Disorder, N (%)	No. of *DSM-IV* Criteria Endorsed at 18 Months, Mean (SD)	18-Month Personality Disorder, N (%)	Friedman Test χ^2	*df*	*P* Value
Cluster A (n = 35)	6.4 (1.8)	3.7 (2.2)	12 (34)	3.6 (2.4)	11 (31)	32.2	2	<.001
Paranoid (n = 33)	4.6 (0.7)	2.4 (1.6)	10 (30)	2.6 (1.0)	10 (30)	34.4	2	<.001
Schizoid (n = 3)[a]	4.7 (1.2)	1.0 (1.0)	3 (100)	3.3 (2.3)	1 (33)			
Schizotypal (n = 0)[a]								
Cluster B (n = 24)	8.8 (2.8)	5.8 (4.4)	11 (46)	5.9 (4.5)	11 (46)	10.7	2	.005
Antisocial (n = 2)[a]	6.5 (0.7)	4.5 (0.7)	2 (100)	4.0 (0.0)	2 (100)			
Histrionic (n = 3)[a]	4.7 (0.6)	3.3 (2.1)	2 (67)	3.3 (3.1)	2 (67)			
Borderline (n = 19)	5.5 (1.0)	3.6 (2.3)	8 (42)	3.1 (2.3)	6 (32)	15.7	2	<.001
Narcissistic (n = 3)[a]	6.0 (1.0)	1.7 (2.9)	1 (33)	2.3 (2.1)	0 (0)			
Cluster C (n = 60)	10.4 (4.3)	7.3 (5.0)	34 (57)	6.8 (5.7)	26 (43)	28.8	2	<.001
Obsessive-compulsive (n = 11)	5.4 (0.7)	2.3 (2.1)	3 (27)	2.8 (2.4)	3 (27)	13.7	2	.001
Dependent (n = 12)	5.6 (0.8)	2.3 (1.9)	1 (8)	2.7 (2.8)	3 (25)	11.8	2	.001
Avoidant (n = 46)	5.1 (1.0)	3.4 (2.2)	26 (57)	2.9 (2.6)	18 (39)	27.2	2	<.001
Passive-aggressive (n = 10)	5.9 (0.6)	3.5 (2.5)	3 (30)	4.5 (2.9)	4 (40)	4.2	2	NS

[a]Too few valid cases for statistical processing. No statistics were computed.
Abbreviation: NS = not statistically significant.

across the various outcome groups, but those with a stable cluster C personality disorder more often remained at the full criteria of MDE (53% at 6 months and 62% at 18 months) (Table 2).

Dimensional Stability of Personality Disorder Symptoms

The mean number of criteria met decreased significantly, particularly over the first 6 months, for each of the personality disorder clusters and for individual personality disorders with enough valid cases for statistical analyses (Table 3). Correlation coefficients for the number of criteria met over the 3 assessment points ranged from 0.48 to 0.51 for paranoid personality disorder, from 0.58 to 0.68 for borderline personality disorder, and from 0.61 to 0.68 for avoidant personality disorder and were significant at the .01 level (2-tailed) for all the personality disorder criteria and at all 3 time points.

While the decline in all personality disorder symptoms covaried significantly with the decrease in the severity of depression (Table 4), declines in borderline and avoidant personality disorder symptoms also covaried with the decrease in the severity of anxiety. When changes in reported neuroticism and extraversion were entered into the models, the association with decreasing personality disorder symptoms and severity of depression remained significant for all personality disorders. Moreover, the decreasing score of reported neuroticism was associated with the decline in paranoid and borderline personality disorder symptoms, and the reduction in the severity of anxiety was associated with the decreasing symptoms of avoidant personality disorder (Table 4).

DISCUSSION

As expected, we found the categorical stability of personality disorder diagnoses to be poor and the dimensional stability of symptoms moderate among depressive patients. For only about half of the patients did personality disorder persist at the diagnostic level at the 3 time points. The number of positive personality disorder criteria declined mainly during the first 6 months by 3 criteria on average. The decline in personality disorder symptoms associated significantly not only with the decreasing severity of depression but also with the decreasing severity of comorbid anxiety. Moreover, variations in the patient's perceptions of his or her usual self, as measured by reported neuroticism, covaried significantly with a decline in some, but not all, personality disorder symptoms.

To our knowledge, no previous study has investigated the impact of all Axis I current comorbidity on the stability of personality disorder symptoms among depressive patients. Our study also benefits from some additional strengths. It comprises a cohort of patients representing psychiatric outpatients and inpatients with MDD in a large Finnish city; two-thirds of all depressed subjects in the city of Vantaa are estimated to receive treatment in the PMCD.[32] All patients were assessed with semistructured interviews for all Axis I and II disorders as well as with self-reported personality trait scales at 3 different time points. We used *DSM-IV* diagnoses and definitions, and we used modern antidepressants. However, some limitations must also be noted. First, we assessed Axis II diagnoses with the SCID-II for *DSM-III-R*, as the SCID-II for *DSM-IV* was not yet available for the first interviews in February 1997. Second, although we included all comorbid personality disorders in a cohort of 193 carefully diagnosed depressive patients, not all personality disorders could be analyzed separately due to the small number of cases in these subgroups. Third, the attrition rate for those living and not switching into bipolar disorder was 22.2%. While the dropouts were slightly more paranoid and exhibited more anxiety symptoms at baseline, that this would

Table 4. Changes in Sum Scores of Paranoid, Borderline, and Avoidant Personality Disorders—General Estimation Equation Models[a]

Change in Severity of Depression, Anxiety, and Alcohol Use	Estimate	Robust SE	Robust *Z*	*P* Value
Stability of paranoid personality disorder symptoms				
Female gender	−0.038	0.196	−0.019	.55
Age	0.003	0.007	0.415	.34
Change in severity of depression (HDRS score)	0.024	0.011	2.107	.02
Change in severity of anxiety (BAI score)	0.014	0.010	1.396	.08
Change in alcohol use	0.246	0.120	1.233	.11
Stability of borderline personality disorder symptoms				
Female gender	−0.245	0.174	−1.409	.07
Age	0.010	0.007	1.361	.09
Change in severity of depression (HDRS score)	0.021	0.010	2.049	.02
Change in severity of anxiety (BAI score)	0.021	0.009	2.186	.01
Change in alcohol use	0.231	0.238	0.972	.17
Stability of avoidant personality disorder symptoms				
Female gender	−0.093	0.147	−0.633	.26
Age	0.011	0.007	1.691	.05
Change in severity of depression (HDRS score)	0.018	0.008	2.223	.01
Change in severity of anxiety (BAI score)	0.031	0.009	3.356	< .001
Change in alcohol use	−0.007	0.197	−0.038	.50
Change in Severity of Depression, Anxiety, Alcohol Use, and Personality Traits				
Stability of paranoid personality disorder symptoms				
Female gender	−0.005	0.196	−0.028	.53
Age	0.001	0.007	0.178	.43
Change in severity of depression (HDRS score)	0.020	0.012	1.755	.04
Change in severity of anxiety (BAI score)	0.004	0.010	0.397	.34
Change in alcohol use	0.275	0.191	1.435	.07
Change in EPI neuroticism score	0.049	0.021	2.299	.01
Change in EPI extraversion score	−0.023	0.025	−0.898	.18
Stability of borderline personality disorder symptoms				
Female gender	−0.210	0.172	−1.217	.11
Age	0.009	0.007	0.172	.43
Change in severity of depression (HDRS score)	0.018	0.010	1.712	.04
Change in severity of anxiety (BAI score)	0.008	0.010	0.819	.21
Change in alcohol use	0.215	0.236	0.908	.18
Change in EPI neuroticism score	0.075	0.019	3.861	< .001
Change in EPI extraversion score	0.012	0.026	0.478	.32
Stability of avoidant personality disorder symptoms				
Female gender	−0.098	0.150	−0.651	.26
Age	0.010	0.007	1.579	.06
Change in severity of depression (HDRS score)	0.016	0.008	1.936	.03
Change in severity of anxiety (BAI score)	0.026	0.010	2.677	.004
Change in alcohol use	0.044	0.200	0.222	.41
Change in EPI neuroticism score	0.013	0.022	0.608	.27
Change in EPI extraversion score	−0.040	0.026	−1.540	.06

[a]No more than 2 observations per individual.
Abbreviations: BAI = Beck Anxiety Inventory, EPI = Eysenck Personality Inventory, HDRS = Hamilton Depression Rating Scale.

have markedly biased our findings regarding the stability of personality disorder symptoms still appears unlikely. Fourth, although the reliability of the diagnosis of MDD was excellent ($\kappa = 0.86$),[1] the reliability of the comorbid disorder diagnoses, including the diagnoses of personality disorders, was not formally tested. It is obvious that the test-retest reliability of measurement places an upper limit on personality disorder stability, and sources of error variance such as criteria, interpretation, and observation variance could, in theory, well lead to a finding of poor stability of personality disorder diagnoses. However, we used the same interviewer for the same patient in all assessments, which likely reduced these variances, and such factors are unlikely to explain the specific patterns of covariation we found between Axis I and II. Overall, to the degree that comparison is possible, the stability of the personality disorder diagnoses in our data appears similar to that in other studies.[4,6,9,12] Fifth, we did not have patients without MDD as a comparison group to control the impact of time. Sixth, it is important to note that unlike the Collaborative Longitudinal Personality Disorders Study (CLPDS),[33] we did not examine possible improvements in personality disorders during the follow-up. In contrast, using the same interviewer and SCID-II, we assigned 3 times the presence of personality disorder criteria symptoms over the adult lifetime, based on the *DSM-III-R* and *DSM-IV* explicit assumption that they represent enduring patterns of behavior and inner experience. In theory, true improvements in personality disorders during the follow-up could result in improvements in MDD or anxiety and thus explain the findings in our study. Due to the overlapping

time frame in assessment, this alternative explanation could not be tested. However, we find it most unlikely that, in the absence of targeted treatment, marked true changes in personality traits would take place in 18 months. Only 16% of patients in our study received weekly psychotherapy,[29] and specific treatments for personality disorders were not provided. As we reported previously,[29] there was the tendency in naturalistic studies for sicker patients to receive the most treatment of depression. However, we took into account the possible effects of treatment by adjusting for variations in symptoms of depression, anxiety, or neuroticism and extraversion in our analyses. Nevertheless, we cannot exclude the possibility that other treatment effects, not mediated by these factors, could to some degree influence our stability findings. We believe that our findings can be generalized to other psychiatric settings given the similarity of our baseline depression symptom ratings and patterns of comorbidity to those of a recent US study.[34] Other methodological details are discussed at depth elsewhere.[1,21,29]

As we expected, the categorical stability of personality disorder diagnoses was relatively poor. Our finding that only about one-half (43%) of the patients remained at or above the diagnostic threshold of personality disorder is consistent with the findings of previous studies on depressive patients, which report the stability of any personality disorder diagnoses to be 43%[4] and 51%[12] across 2 time points. Our finding is also highly consistent with the findings of the 12-month follow-up of the CLPDS.[6] As in our study, they also used 3 time points and reported that about half of the patients remained at or above the diagnostic threshold. Findings regarding the stability of personality disorder clusters have been contradictory and have varied depending on the reported stability (ie, relative versus absolute), the length of the follow-up period, and the patient sample studied. Consistent with our study, however, studies on depressive and anxious depressive[13,35] patients have suggested that cluster C exhibits the greatest absolute stability. We found that about one-half of the depressive patients with a baseline cluster B or C personality disorder and about one-third of those with a baseline cluster A personality disorder remained at the full criteria for 18 months. Nevertheless, even if some relative differences exist between the individual personality disorder categories in their temporal stability, the prevalences of all personality disorders appear prone to decline during follow-up among patients with depression.

The dimensional stability of personality disorders was moderate among depressive patients and, as hypothesized, was found to be better than the categorical stability. This finding of stability of dimensional symptoms and lack of stability of categorical personality disorder diagnoses has been robustly reported also by the CLPDS group.[7] Our finding that a reduction in the mean number of criteria met over the first 6 months for each individual personality disorder was significant is again consistent with the findings of the 12-month CLPDS follow-up study[6] as well as the study of personality disorder symptoms in nonpatients.[9] But this finding is inconsistent with the findings of some previous studies[4,5] on depressive patients that report for the majority of patients the loss of only 1 criterion or less. Correlation coefficients for the number of criteria met over the 3 assessment points ranged from 0.48 to 0.68 and were significant for all the personality disorder criteria at all 3 time points. Our somewhat lower correlations than those reported among personality disorder patients in the CLPDS (0.84–0.92)[6] are likely to be attributed to differences in the study design, ie, all patients having current MDD at baseline in our study, with the greater changes in mood and anxiety during follow-up versus the personality disorder patients in the CLPDS. Consistent with some[2,3] but not all[4,5] previous studies, we found that declines in all personality disorder symptoms were significantly associated with the decreases in the severity of depression. Moreover, at the categorical level, any stable personality disorder diagnoses were associated significantly with more severe MDEs, a higher number of previous MDEs, and longer periods of depression. Thus, both baseline history and severity, as well as subsequent changes in the level of depression, are likely to predict the stability of concurrent personality disorders over time. Comorbid personality disorder diagnoses seem likely to persist when depression is chronic, but the validity of these diagnoses remains uncertain.

To our knowledge, this is the first study to investigate the impact of all Axis I current comorbidity on the stability of personality disorder symptoms among depressive patients. We have previously reported that specific associations existed between various personality disorder clusters and anxiety/alcohol use disorders at baseline.[1] Thus, to find some specific temporal associations between mood states and various personality disorders was not unexpected. Although the impact of the severity of depression on the dimensional stability of personality disorder symptoms was significant in our study, the decreasing severity of comorbid anxiety also affected stability. Decreasing the severity of anxiety covaried significantly with the decline in borderline and avoidant but not in paranoid personality disorder symptoms. These findings seem to indicate that specific dimensional patterns of comorbidity persist and that the diagnosis of personality disorders, which is based on verbal reports of patients' conscious subjective views and feelings, is vulnerable to the effects of various mood states. To investigate the extent to which factors such as a lack of autobiographical memory specificity or a bias toward recalling negative material[16,17] contribute to stability of personality disorders remains a subject of further study. Stable alcohol use disorder affected the categorical stability of personality disorder diagnoses but not the dimensional stability of symptoms. It is likely that the assessment of alcohol use disorders that relied on the *DSM-IV* diagnostic criteria was not sensitive enough to estimate pertinent changes in alcohol use. This may have led to an underestimate of the

impact of alcohol use disorders. Changes in alcohol use could affect the stability of personality disorder symptoms by not only affecting patients' behavior and self-perception but also by a halo effect. In future studies, it would be important, though difficult, to elucidate the role of comorbid substance use disorders on the stability of personality disorder symptoms with measures that are more sensitive to the highly variable temporal patterns of misuse. For any clinician diagnosing personality disorders, the impact of these multidimensional variations of symptoms and syndromes over time poses a formidable challenge. In the absence of a gold standard, it may be reasonable to think of personality disorders as dimensional constructs, in which to weigh and integrate information from multiple sources and not to rely too much on a single evaluation, however careful.[36]

Finally, not only changes in mood and anxiety but also changes in patients' reported perceptions of their own personality traits predicted the stability of personality disorder symptoms. Changes in a patient's perceptions of his or her usual self as measured by self-reported neuroticism covaried significantly with the decline in the number of some, although not all, personality disorder symptoms. Reported neuroticism was associated in particular with decreasing paranoid and borderline personality disorder symptoms but insignificantly with the decline in avoidant personality disorder symptoms. These findings also suggest that personality disorder diagnostic criteria may be vulnerable not only to changes in mood states per se but also to a patient's related changing perception of behavioral patterns, thoughts, memories, and personally experienced past events. The difficulties encountered in assigning personality diagnoses to depressed patients are unlikely to reflect merely narrow psychometric problems but broader variations in these patients' perceptions of self over time.

Author affiliations: Mood, Depression, and Suicidal Behavior Unit, National Institute for Health and Welfare, Helsinki (all authors); Department of Psychiatry, Jorvi Hospital, Helsinki University Central Hospital, Espoo (Drs Melartin and Jylhä); Department of Public Health, University of Helsinki, Helsenki (Dr Haukka); and Department of Psychiatry, Helsinki University Central Hospital, Helsinki (Dr Isometsä), Finland.
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