

## Temperament and Character Inventory in patients with bipolar disorder: influence of depressive symptoms

Filip Rybakowski<sup>1</sup>, Magdalena Kosmowska<sup>2</sup>,  
Anna Leszczyńska-Rodziewicz<sup>2</sup>, Agnieszka Kałwa<sup>3</sup>,  
Marzena Zakrzewska<sup>3</sup>, Joanna Hauser<sup>2</sup>

<sup>1</sup> Department of Child and Adolescent Psychiatry, University of Medical Sciences, Poznań, Poland

<sup>2</sup> Department of Adult Psychiatry, University of Medical Sciences, Poznań, Poland.

<sup>3</sup> Department of Basic Psychological Research, University of Adam Mickiewicz, Poznań, Poland

### Summary

**Background:** Specific personality traits may differ between bipolar affective disorder patients and controls. However, depressive symptomatology may influence the dimensions of the personality in individuals with affective disorders.

**Methods:** Temperament and Character Inventory was used in 44 bipolar disorder patients and 50 sex- and age-matched healthy controls. The severity of depressive symptoms was assessed with self-assessment and clinician-rated instruments.

**Results:** In whole group of bipolar patients the level of harm-avoidance was higher than in controls. This personality dimension score was significantly correlated with depression severity. In euthymic bipolar patients ( $n=25$ ) patients score significantly lower than controls in the temperamental dimension of persistence.

**Discussion:** The low persistence may be a psychological marker for bipolar affective disorders. The relevance of this construct to the etiopathogenesis of the manic-depressive illness requires further study.

**Key words:** bipolar disorder, temperament, character, depression

### Introduction

Personality characteristics have been considered the background of vulnerability to affective disorders. It was suggested that personality is formed on the basis of genetic or constitutional basis called temperament and the superimposed structure emerging during development, comprising cognitive patterns and defense mechanisms called character. According to Kraepelin [1] specific forms of premorbid temperament determine the risk and clinical picture of the affective disorder, and they can be observed between the episodes of illness. Kretschmer [2] introduced the concept of two continua from personality subtypes to psychotic subtypes, one referring to manic-depressive illness

(cyclothymic – cycloid- manic-depressive) and other to schizophrenia (schizothymic – schizoid – schizophrenic). Akiskal et al. [3] proposed that in individuals with affective disorders the four types of temperamental structure can be identified: cyclothymic, hyperthymic, dysthymic and irritable. These temperament types are supposed to be present in a substantial percentage of the population and may represent the subclinical forms of affective disorders.

The other approach to the personality characteristics comes from the factor analytic studies in various populations (including psychiatric patients), in which it was demonstrated that individuals with various ethnic background and different developmental experiences share the same multidimensional structure of personality. However, in some psychiatric disorders, the average of some specific personality dimension is significantly different from that in the general population (i.e. neuroticism in depression or novelty seeking in substance abuse). This may suggest that dimensional personality traits predispose to the development of psychiatric disorders.

Cloninger et al. [4] proposed that temperament consists of several dimensions: novelty seeking (NS), harm avoidance (HA) and reward dependence (RD), which may be measured with the Tridimensional Personality Questionnaire (TPQ). Subsequent studies indicated that the RD dimension should be split into persistence (P) and three other RD subscales [5]. Novelty seeking is defined as a tendency to respond actively to novel stimuli. Harm avoidance reflects a tendency for inhibitory response to signals of aversive stimuli. Reward dependence measures a tendency for a positive response to the signals of reward, and persistence assesses the ability to perpetuate the activity without the reward. In 1993, the model was modified to include also three dimensions of character: self-directedness (SD), cooperativeness (C) and self-transcendence (ST) [6]. These facets of personality refer respectively to the ability to adapt to different situations according to one's goal, ability to interact with other people, and ability to identify with the whole world. Cloninger also postulated that temperamental dimensions of personality depend mainly on the genetic influence, are relatively stable over lifetime and are universal across cultures and ethnic groups. On the other hand, character was conceptualized as changeable with maturation and age, what may result from antecedent temperament, sociocultural pressures and random life events.

The substantial part of research on the personality dimensions in affective disorders refers to the association between neuroticism and major depression. Prospective studies indicated that this personality dimension is associated with increased risk of a depressive episode, and may explain over 50% variance in the genetic liability to this disorder [7]. The presence of categorical entities such as cyclothymic and hyperthymic personality in patients with major depression indicates the risk of bipolar spectrum disorders. Less is known about the dimensional personality predictors of vulnerability to the bipolar affective illness. The finding of a dimensional trait which predisposes to bipolar illness may help in identifying persons with bipolar spectrum disorders, which initially present to psychiatric care with depressive symptoms.

In patients with major depression assessed with TCI, the severity of depression influenced scores in the dimensions of harm-avoidance, self-directedness and in some studies in the novelty-seeking dimension [8, 9]. Recent studies have shown,

that in almost 50% of the follow-up period, patients with bipolar illness present some symptomatology, mainly subsyndromal depressive symptoms [11, 12]. This indicates that, depressive symptoms should be taken into consideration in the interpretation of results of TCI self-assessment in bipolar patients. In this study, we analyzed the TCI in bipolar patients compared with healthy, age- and sex-matched control subjects. In patients with bipolar illness, the severity of the depressive symptomatology was also assessed, by means of the Beck Depression Inventory (BDI) and Hamilton Depression Rating Scale (HDRS) to detect the potential effect of depressive symptomatology on the TCI dimensions in such patients.

## Material and Method

### Subjects

The study was conducted on 44 patients (mean age 44.5; sd. 11.9) with bipolar affective disorder (14 male and 30 female individuals) and 50 control subjects (mean age 44.8; sd. 14.0; 18 male and 32 female subjects). Patients were diagnosed according to the DSM-IV as bipolar I and bipolar II subtypes with the Structured Clinical Interview for DSM-IV- axis I disorders (patient version) SCID-P [12]. We recruited patients from the outpatient lithium clinic and community care, and healthy controls were selected from the representative sample of general population with no psychiatric disorders. All subjects signed the informed consent for the study. The study was approved by the Ethics Committee of the University of Medical Sciences in Poznań.

### Methods

All subjects were evaluated with a Polish version of the Temperament and Character Inventory, which was validated earlier [13]. The TCI is a self-report instrument of yes/no answers, assessing the personality dimensions: Novelty Seeking (40 items), Harm Avoidance (35 items), Reward Dependence (24 items), Persistence (8 items), Self – Directedness (44 items), Cooperativeness (42 items) and Self-Transcendence (33 items).

Additionally, in patients, two tests measuring the severity of depressive symptoms were performed: Beck Depression Inventory (BDI) and Hamilton Depression Rating Scale (HDRS), respectively, for self-assessment and clinician assessment of depression.

### Statistical analysis

Personality dimensions of patients and controls were compared with one-way analysis of variance (ANOVA). Next, Pearson's correlation coefficients between both depression scales and personality dimensions were calculated. In further analysis the comparison of personality traits between bipolar patients with depressive symptoms below the diagnostic cut-off level (BDI score <10 and HDRS <8) and controls was performed.

## Results

The mean depression severity in this group of patients was: in the HDRS score: 6.8 (7.6), (range 0–27) and in the BDI score: 10.3 (11.4), range (0–37). In the first analysis comparing the personality dimensions in the whole group of bipolar illness patients and age and sex matched controls, the statistically significant difference was found in the harm-avoidance dimension, where patients scored higher than controls: 19.9 (7.5) vs. 15.2 (7.4)  $F=8.03$ ;  $p=0.01$  (results are shown in Table 1). In the group of patients the BDI score and the HDRS score were significantly correlated (Pearson correlation coefficients=0.81,  $p<0.001$ ). The statistically significant correlation coefficients were also found between depression severity scores (BDI and HDRS) and two personality dimensions: harm-avoidance, respectively:  $r=0.58$ ,  $p=0.001$ ;  $r=0.51$ ,  $p=0.001$ ; and self-directedness  $r=-0.56$ ,  $p=0.001$ ;  $r=-0.51$ ,  $p=0.001$ . The correlation coefficients between other personality dimensions, and BDI and HDRS score were presented in Table 2. After restricting the analysis to the group of patients with depression severity below the diagnostic cut-off ( $n=25$ ), the comparison of personality dimensions of bipolar patients and controls brought different results. The only significant difference between bipolar patients and controls was found in the persistence dimension respectively, 3.7 (1.4) vs. 4.4 (1.8);  $F=3.91$ ,  $p=0.05$  (results are shown in Table 3).

Table 1

Comparison of personality dimensions between patients with bipolar disorder ( $n=44$ ), and controls ( $n=50$ ). Data are shown as mean  $\pm$  SD with analysis of variance for the group factor.

Personality dimension	Patients Mean $\pm$ SD		Controls Mean $\pm$ SD		ANOVA/F (2,94)	P
Persistence	4.1	1.7	4.4	1.8	0.57	0.46
Novelty Seeking	10.0	5.0	10.0	6.0	0.00	0.90
Harm Avoidance	19.9	7.5	15.2	7.4	8.03	0.01
Reward Dependence	15.4	3.5	14.0	3.2	0.34	0.56
Self-transcendence	20.8	8.3	27.1	9.0	0.03	0.80
Self-directedness	12.7	6.4	17.0	6.4	1.27	0.26
Cooperativeness	32.2	5.1	32.4	4.8	0.05	0.83

## Discussion

In this study, we demonstrated that patients with bipolar illness differ significantly in personality profile from healthy control subjects. We found that in bipolar patients, with various severities of depressive symptoms the level of harm avoidance dimension is higher than in the control individuals. However this personality dimension is significantly correlated with the severity of depression measured both with the self-assessment and the clinician-rated instrument. After restricting the analysis only

Table 2

The correlations between the Beck Depression Inventory score (BDI) and Hamilton Depression Rating Scale score (HDRS) with personality dimensions measured with TCI in bipolar disorder patients. Data are shown as Pearson's correlation coefficients and their significance

	BDI	HDRS	P	NS	HA	RD	SD	ST
HDRS	0.81							
	0.00							
P	0.24	0.06						
	0.10	0.69						
NS	-0.13	-0.23	0.18					
	0.40	0.14	0.23					
HA	0.58	0.51	-0.13	-0.42				
	0.00	0.00	0.40	0.00				
RD	0.02	-0.07	0.12	-0.05	-0.08			
	0.92	0.68	0.45	0.75	0.63			
SD	-0.56	-0.51	-0.40	-0.09	-0.51	0.18		
	0.00	0.00	0.04	0.59	0.00	0.25		
ST	0.22	0.18	0.48	0.40	-0.18	0.10	-0.38	
	0.15	0.23	0.00	0.04	0.26	0.52	0.04	
C	-0.19	-0.19	-0.21	-0.02	-0.26	0.50	0.71	-0.29
	0.21	0.21	0.15	0.89	0.09	0.00	0.00	0.06

Table 3

Comparison of personality dimensions between euthymic patients with bipolar disorder (n=25), and controls (n=50). Data are shown as mean  $\pm$ SD with analysis of variance for the group factor.

Personality dimension	Patients Mean $\pm$ SD		Controls Mean $\pm$ SD		ANOVA,df (2,75)	P	
Persistence	3.7	1.4	4.4	1.8	3.91	0.05	
Novelty Seeking	20.8	6.0	19.9	6.6	0.33	0.57	
Harm Avoidance	16.5	7.1	15.2	7.4	0.52	0.48	
Reward Dependence	15.5	3.4	14.9	3.2	0.53	0.47	
Self-transcendence	30.6	7.2	27.1	9.0	2.81	0.10	
Self-protective	16.1	7.1	17.0	6.4	0.32	0.58	
Cooperativeness	33.9	4.3	32.4	4.8	1.69	0.20	

to the group of patients with the severity of depression below the diagnostic cut-off, a different picture emerged. Patients scored significantly lower than controls in the temperamental dimension of persistence, and no other statistically significant difference in personality dimensions was found.

This observation confirms the results of two previous studies. Osher et al. assessed two groups of bipolar patients with TPQ (prototypical version of TCI) and found that the only dimension which differentiated between patients with bipolar illness and control subjects in both studies was persistence [14, 15]. This may indicate that low persistence is a psychometric trait, which may characterize patients with bipolar illness independently of cultural and other environmental influences.

Individuals with low persistence score are characterized as unreliable, unstable, fickle and capricious. Recently, it was proposed that this dimension of TCI might show an association with information processing in the brain [16]. One may hypothesize, that a low score in this temperamental construct reflects the deficits in the ability of regulation of affect and disturbance of emotional reactivity, which are observed in euthymic bipolar disorder patients [17].

Temperamental dimensions of personality show substantial heritability and persistence has been shown to depend mainly on additive genetic effects and non-shared environment. It was reported that the persistence score was influenced by the interaction of catechol-O-methyltransferase and serotonin transporter promoter region polymorphisms in healthy volunteers of Israeli population [18]. Both of these genes are described as candidate genes of particular current interest in bipolar illness [19, 20]. According to Benjamin et al. [21] personality dimensions may be considered endophenotypes of psychiatric disorders, and our study confirms the potential role of low persistence as a predisposing trait in bipolar disorder.

This study has several limitations. The cross-sectional design was used, and no causal relationship can be established. One cannot exclude that low persistence in bipolar disorder patients is rather an effect of illness, and not the premorbid trait. The sample size, especially after restricting the group only to the euthymic patients was small, however we were able to show statistically significant difference in the previously described personality dimension. We also did not perform the psychometric assessment of the severity of manic symptoms in patients. Individuals with manic or hypomanic symptoms were excluded from the study only on the basis of clinical assessment.

In conclusion, this study confirms, that low persistence is a universal trait of euthymic bipolar disorder patients. The relationship of this trait to the etiopathogenesis of bipolar disorder warrants further study of longitudinal design.

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Author's address:

Filip Rybakowski M.D., Ph.D.  
Department of Child and Adolescent Psychiatry  
University of Medical Sciences, Poznań  
ul. Szpitalna 27/33  
60-572 Poznań, Poland  
Phone (+ 48 61) 8491 355  
Fax. (+48 61) 8480 392  
e-mail: filrybak@polbox.com