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# The Zuckerman–Kuhlman personality questionnaire in bipolar I and II disorders: A preliminary report



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## ABSTRACT

Patients with bipolar disorder have tendencies of higher impulsivity and sensation seeking, they might contribute differently to the emotional states of bipolar I (BD I) and II (BD II). We administered the Zuckerman–Kuhlman Personality Questionnaire (ZKPQ), the Plutchik–van Praag Depression Inventory (PVP), the Mood Disorder Questionnaire (MDQ), and the Hypomania Checklist (HCL-32) in 23 patients with BD I, 22 BD II, and 64 healthy volunteers. Both BD I and II scored higher on ZKPQ Impulsive sensation seeking (and its Impulsivity facet), Neuroticism–anxiety and Aggression–hostility, and on PVP and HCL-32 scales than controls did; BD I scored higher on MDQ and General sensation seeking facet than controls did. Compared to BD II, BD I scored higher on Impulsive sensation seeking (and General sensation seeking) and on MDQ. Moreover, General sensation seeking predicted MDQ, and Activity predicted HCL-32 in BD I. Aggression–hostility predicted HCL-32 in BD II. General sensation seeking predicted MDQ and HCL-32, and together with Neuroticism–anxiety, predicted PVP in controls. Our study suggests that Impulsive sensation seeking, and its General sensation seeking facet might help to delineate the two types of bipolar disorder.

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## 1. Introduction

The bipolar disorder often presents with succeeding episodes of mania, depression, and euthymia (i.e., no symptoms), which involves important fluctuations in mood, cognitive functioning, and social behavior. The clinical symptoms vary between its two major types, i.e., the bipolar I (BD I) and II (BD II), and between individuals (American Psychiatric Association, 2013). Considering that personality traits reflect the individual differences, scholars have studied the trait scores in bipolar disorder. For instance, using the NEO-PI-R (Costa and McCare, 1985), one big five-factor model of normal personality measure, Kim et al. (2012) found significantly higher Neuroticism and lower Extraversion traits in BD II than in BD I. Using NEO-PI-R and other temperament measures, Strong et al. (2007) failed to demonstrate a difference on the Neuroticism–like trait in BD I and II. On the other hand, personality traits are associated with the affective states of bipolar disorder, but mainly are confined to those of BD I. For instance,

Neuroticism is positively correlated with depression, and Conscientiousness positively with mania in BD I (Lozano and Johnson, 2001).

Normal personality traits can also be measured using the alternative five-factor model, the Zuckerman–Kuhlman Personality Questionnaire (ZKPQ, Zuckerman et al., 1993), which describes five domains namely Impulsive sensation seeking, Neuroticism–anxiety, Aggression–hostility, Activity and Sociability. The impulsivity trait–facet, which is characterized by a lack of forethought and a failure to contemplate risks and consequences before acting, has been treated as a stable feature of bipolar disorder (Swann et al., 2004; Saddichha and Schuetz, 2014). The manic state, which is often found in BD I, is highly connected with sensation-seeking (Zuckerman, 1994). In addition, the manic state of bipolar disorder and sensation seeking was biologically linked to monoamine oxidase activity (Zuckerman, 1985). Unfortunately, most facet levels of NEO-PI-R, such as the Impulsivity of Neuroticism and the Excitement–Seeking of Extraversion were not fully-studied in BD I and II previously (Strong et al., 2007; Kim et al., 2012). Therefore one might easily ask whether the Impulsive sensation seeking trait, which is composed of both Impulsivity and General sensation seeking facets, together with other four traits, could help to differentiate BD I and II disorders.

In the current study, we have hypothesized that there were significant differences between BD I and II: (1) of ZKPQ personality

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traits, especially of Impulsive sensation seeking trait and its facet General sensation seeking; (2) of the emotional states, i.e., the mania, hypomania and depression; and (3) of the relationships between personality traits and the emotional states. Therefore, besides ZKPQ, we have administered the Mood Disorder Questionnaire (Hirschfeld et al., 2000), the Hypomania Checklist-32 (Angst et al., 2005), and the Plutchik–van Praag Depression Inventory (Plutchik and van Praag, 1987) in patients with BD I and II disorders as well as in the healthy volunteers (controls).

## 2. Methods

### 2.1. Participants

Sixty-four healthy volunteers, who had no history of psychiatric or neurological abnormalities, were recruited from hospital, college staff-members and community; 23 patients with BD I, and 22 BD II, who were diagnosed according to the DSM-5 criteria (American Psychiatric Association, 2013) were invited to participate in the current study (Table 1). All participants had no history of alcohol or drug abuse. There were no significant differences regarding age (one-way ANOVA,  $F [2, 106]=2.11$ ,  $p=0.13$ ,  $MSE=74.99$ ), received education ( $F [2, 106]=0.10$ ,  $p=0.91$ ,  $MSE=1.32$ ), or gender (Pearson  $\chi^2=2.30$ ,  $p=0.32$ ) between groups. The study protocol was approved by a local Ethics Committee and all participants had given their written informed consents (the informed consents of the young adolescents were signed by their guardians).

### 2.2. Questionnaires

Participants were asked to complete the following four questionnaires in Chinese in a quiet room. Brief descriptions of the questionnaires are given here. A. The ZKPQ provides five scales: (a) Impulsive sensation seeking (19 items), composed of two units, i.e. eight items of Impulsivity and 11 items of General

sensation seeking; (b) Neuroticism–anxiety (19 items); (c) Aggression–hostility (17 items); (d) Activity (17 items); and (e) Sociability (17 items). One point is given for each chosen item corresponding to personality traits. B. The PVP contains 34 items; each item has a three-point scale (0, 1 and 2), which corresponds to increasing depressive tendencies. C. The MDQ screens for a lifetime history of a manic or hypomanic syndrome, especially of manic symptoms, with 13 yes/no items derived from both DSM-IV criteria and clinical experience. D. The HCL-32 comprises 32 items for detecting hypomanic symptoms. Individuals were instructed to answer the forced-choice (yes or no) questions about emotions, thoughts, or behaviors, and to answer questions regarding the duration, the impact of family, social and work life, or people's reactions.

### 2.3. Statistics

Two-way ANOVA (i.e., group (3)  $\times$  scale (5)) was applied to the mean scores of ZKPQ scales, and one-way ANOVA was applied to the mean scores of MDQ, HCL-32, and PVP scales in the three groups. The post-hoc analysis by the Least Significant Difference test was employed to evaluate between-group differences and to estimate the 95% confidence interval (CI) for difference. The multiple linear regression with stepwise elimination was applied to investigate the impact of ZKPQ traits on the PVP, MDQ, and HCL-32 scale scores. A  $p$  value less than 0.05 was considered as significant.

## 3. Results

The internal reliabilities of the ZKPQ traits, PVP, MDQ and HCL-32 scales of the current study were satisfactory (Table 2). ZKPQ scale scores were significantly different among the three groups ( $F [2, 106]=36.90$ ,  $p < 0.001$ ,  $MSE=509.11$ ). BD I group scored significantly higher than the healthy control group did on Impulsive sensation seeking ( $p < 0.001$ , 95% CI: 2.60–6.07) (and specifically

**Table 1**

Demographic and clinical characteristics in the bipolar type I (BD I,  $n=23$ ) and II (BD II,  $n=22$ ) disorders, and the healthy volunteers (Controls,  $n=64$ ).

	BD I	BD II	Controls
Age (in years; mean $\pm$ S.D., range)	21.04 $\pm$ 5.66, 16–44	24.46 $\pm$ 6.59, 13–41	23.56 $\pm$ 5.85, 15–41
Gender (female:male)	15:8	17:5	38:26
Year of education received (mean $\pm$ S.D.)	17.61 $\pm$ 3.22	17.27 $\pm$ 4.08	17.67 $\pm$ 3.69
Obsessive–compulsive disorder (patient number)	12	14	–
Sleep problem (difficulty falling into/unrefreshing sleep; patient number)	16	15	–
Suicidal ideation (without attempt; patient number)	10	11	–
Mania attack (number range)	1–4	–	–
Hypomania attack (number range)	0–2	1–6	–
Depression attack (number range)	3–7	4–10	–
Medication (treatment)–naïve (patient number)	18	17	–
Medicated with anxiolytics (alprazolam, clonazepam, or lorazepam; patient number)	2	4	–
Medicated with antidepressants (fluoxetine or sertraline; patient number)	2	3	–
Medicated with mood stabilizers (valproate or lithium; patient number)	3	1	–

**Table 2**

Scale internal reliabilities (Alphas, in all participants), and mean scores ( $\pm$  S.D.) of personality traits and the emotional states of patients with bipolar I (BD I,  $n=23$ ) and II (BD II,  $n=22$ ) disorders and of the healthy volunteers (Controls,  $n=64$ ).

	Alpha	Score		
		BD I	BD II	Controls
Zuckerman–Kuhlman Personality Questionnaire				
Impulsive sensation seeking	0.77	11.52 $\pm$ 2.98 <sup>a,b</sup>	9.05 $\pm$ 4.47 <sup>a</sup>	7.19 $\pm$ 3.45
Impulsivity	0.69	4.39 $\pm$ 1.75 <sup>a</sup>	3.64 $\pm$ 2.26 <sup>a</sup>	2.44 $\pm$ 1.98
General sensation seeking	0.72	7.13 $\pm$ 1.96 <sup>a,b</sup>	5.41 $\pm$ 2.82	4.75 $\pm$ 2.49
Neuroticism–anxiety	0.86	14.00 $\pm$ 2.84 <sup>a</sup>	13.00 $\pm$ 2.93 <sup>a</sup>	6.02 $\pm$ 2.90
Aggression–hostility	0.73	8.48 $\pm$ 3.67 <sup>a</sup>	7.55 $\pm$ 3.35 <sup>a</sup>	5.17 $\pm$ 2.75
Activity	0.63	6.22 $\pm$ 2.95	7.50 $\pm$ 3.53	6.02 $\pm$ 2.83
Sociability	0.68	7.48 $\pm$ 4.32	6.91 $\pm$ 2.91	7.83 $\pm$ 2.77
Plutchik–van Praag Depression Inventory	0.94	32.83 $\pm$ 8.21 <sup>a</sup>	33.32 $\pm$ 7.59 <sup>a</sup>	9.33 $\pm$ 6.16
Mood Disorder Questionnaire	0.78	9.26 $\pm$ 1.54 <sup>a,b</sup>	3.77 $\pm$ 1.82	3.22 $\pm$ 2.24
Hypomania Checklist-32	0.86	23.35 $\pm$ 2.90 <sup>a</sup>	23.14 $\pm$ 1.70 <sup>a</sup>	14.88 $\pm$ 4.25

Note:

<sup>a</sup>  $p < 0.05$  vs. Controls.

<sup>b</sup>  $p < 0.05$  vs. BD II.

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