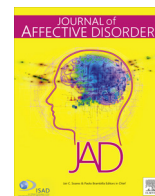




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## Research paper

## The reliability and validity of the Japanese version of the Temperament and Personality Questionnaire for patients with non-melancholic depression

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## ABSTRACT

**Background:** Parker et al. (2006) proposed a new approach to classify specific sub-types of non-melancholic depression caused by various stress factors and premorbid personality styles: the Temperament and Personality Questionnaire (T&P). The current study aim was to develop the Japanese version of the T&P and evaluate its reliability and validity.

**Methods:** We studied 114 patients with non-melancholic depression. Reliability was assessed using the test-retest method. Convergent validity of the T&P was compared with the clinician ratings of each patient for the eight personality traits. We also assessed the impact of depressive state on the T&P.

**Results:** The test-retest intraclass correlation coefficients among eight constructs of the T&P ranged from 0.77 to 0.89, indicating good-to-excellent reliability. Anxious Worrying ( $\rho=0.29$ ), Perfectionism ( $\rho=0.17$ ), Personal Reserve ( $\rho=0.18$ ), Irritability ( $\rho=0.38$ ), and Social Avoidance ( $\rho=0.32$ ) showed adequate levels of convergent validity; Rejection Sensitivity ( $\rho=0.16$ ), Self-criticism ( $\rho=-0.02$ ), and Self-focus ( $\rho=0.07$ ) showed relatively weak convergent validity. Perfectionism ( $\rho=-0.06$ ), Social Avoidance ( $\rho=0.17$ ), Anxious Worrying ( $\rho=0.40$ ), Personal Reserve ( $\rho=0.30$ ), Irritability ( $\rho=0.28$ ), Rejection Sensitivity ( $\rho=0.35$ ), Self-criticism ( $\rho=0.49$ ), and Self-focus ( $\rho=0.24$ ) showed minimal sensitivity to mood state effects.

**Limitations:** Only one site was used. While a Likert scale was used, the clinician-rated personality trait measure had not been validated.

**Conclusions:** The J-T&P is a reliable and valid measure for assessing temperament and personality in Japanese patients with non-melancholic depression.

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## 1. Introduction

Depression is estimated to affect approximately 350 million people worldwide (World Health Organization, 2012). Latest

estimates from the 2010 Global Burden of Disease study indicate that major depressive disorder (MDD) accounts for 2.5% of the global disease burden (Murray et al., 2012), and MDD is predicted to be the leading cause of disability in high-income countries by 2030 (Mathers and Loncar, 2006). Despite available treatments, MDD is a highly heterogeneous disorder, leading to problems in classification and specificity of treatment (Paris, 2014).

Existing literature indicates that personality traits predict, and may influence, the course and treatment response of depression (Klein et al., 2011). For example, a meta-analysis of 175 studies linking personality and depression showed that MDD is associated with high neuroticism and low conscientiousness (Kotov et al., 2010). Moreover, large community studies have reported that

**Abbreviations:** FFM, five-factor model; ICCs, intraclass correlation coefficients; J-T&P, Japanese version of the Temperament and Personality Questionnaire; MDD, major depressive disorder; ISPOR, International Society for Pharmacoeconomics and Outcomes Research; QIDS-SR16-J, 16-Item Quick Inventory of Depressive Symptomatology Self Report; T&P, Temperament and Personality Questionnaire; RMSEA, Root Mean Square Error of Approximation

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higher levels of neuroticism predict the onset of first lifetime MDD episodes (De Graaf et al., 2002; Fanous et al., 2007; Kendler et al., 1993, 2006; Ormel et al., 2004). Furthermore, patients high in neuroticism or low in agreeableness respond better to antidepressant medication than to psychotherapy (Bagby et al., 2008).

Despite evidence from studies linking personality and depression, existing measures of personality are designed to assess broad personality constructs and are not intended for clinical patients with depression. Previous studies have used classification systems and measures of personality, such as the five-factor model (FFM) (McCrae and Costa, 1987) and the Temperament and Character Inventory (Cloninger et al., 1993), which were developed using healthy, non-clinical samples and may not be suitable for classifying MDD patients. For instance, the FFM classifies personality traits into five higher-order categories and does not associate them with specific symptoms of depression. Kasahara and Kimura's (1975) multi-axial system is most commonly used in Japan for the classification of mood disorders according to personality. Based on this system, pre-morbid characteristics of depression impact clinical features, response to treatment, and the course of the illness (Denda, 2001).

Parker and Manicavasagar (2005) proposed a new approach to classify specific sub-types of non-melancholic depression caused by various stress factors and pre-morbid personality styles. The researchers conducted careful clinical observations and a comprehensive literature review of personality styles overrepresented in those who develop depressive disorders (Parker and Roy, 2002) and developed the Temperament and Personality Questionnaire (T&P), which is a refined measure of personality traits or constructs observed in those who develop depression (Parker et al., 2006). This ranges from two higher-order personality dimensions (Neuroticism and Introversion) to eight lower-order personality dimensions (Anxious Worrying, Perfectionism, Personal Reserve, Irritability, Social Avoidance, Rejection Sensitivity, Self-criticism, and Self-focus). The scale demonstrated good reliability and validity in a clinically depressed sample (Parker et al., 2006). The Brazilian Portuguese version of the T&P has been validated (Spanemberg et al., 2014b, 2014c).

We, therefore, aimed to develop the Japanese version of the Temperament and Personality questionnaire (J-T&P), and to evaluate its reliability and validity for MDD patients with non-melancholic features.

## 2. Methods

### 2.1. Development of the J-T&P

The questionnaire comprises 109 self-report items and 10 sub-scales at its eighth tier. In addition to the eight sub-scales assessing temperament and personality (89 items), two additional sub-scales ascertain disordered personality function (10 items measuring non-cooperativeness and 10 items quantifying ineffectiveness).

We followed the 10-step guidelines by the International Society for Pharmacoeconomics and Outcomes Research (ISPOR) (Wild et al., 2005). The J-T&P was developed by Japanese psychologists (NT, NK) and psychiatrists (YK, AN). First, a bilingual Japanese psychiatrist (AN) forward-translated the original English T&P into Japanese. Second, back-translations were completed by professional native English translators who were uninformed about the nature of the study. Thereafter, back-translations were sent to the original developer of the T&P (Dr. Gordon Parker) to detect any existing biases and discrepancies. This process was repeated twice until semantic equivalence between the original and back-translated versions was ascertained.

### 2.2. Participants and procedures

We recruited outpatients and inpatients diagnosed with MDD according to DSM-IV criteria (American Psychiatric Association,

1994) at Gunma Hospital, which is a psychiatric hospital in the northern part of the Greater Tokyo Area. Initially, we contacted 126 patients. Three patients declined to participate and nine had remarkable psychomotor disturbance (a core feature of melancholia) (Spanemberg et al., 2014a), based on clinical assessment by treating psychiatrists; therefore, 12 individuals overall were excluded. The total study sample comprised 114 patients (90.5%).

Before the initial visit, treating psychiatrists evaluated using a Likert scale based on the original study (Parker et al., 2006) the degree to which the eight T&P constructs (Anxious Worrying, Perfectionism, Personal Reserve, Irritability, Social Avoidance, Rejection Sensitivity, Self-criticism, and Self-focus) had manifested from the past to the present. Demographic data (e.g., age, sex, duration of illness, comorbid mental disorders and history of hospitalization) were also collected. At the initial visit, all patients were asked to complete a set of questionnaires including the J-T&P (109 items) and the Japanese version of the 16-item Quick Inventory of Depressive Symptomatology Self Report (QIDS-SR16-J). The QIDS-SR16-J is a self-rated questionnaire designed to measure the signs and symptoms of a major depressive episode; its internal consistency was high (Cronbach's  $\alpha=0.86$ ) and the total scores were highly correlated with the Beck Depression Inventory scores ( $r=0.86$ ,  $p < 0.001$ ) (Beck et al., 1961; Fujisawa et al., 2010). At the following visit, patients completed the J-T&P again to evaluate the test-retest reliability.

All participants provided informed consent prior to participating in the study. The institutional review board at Gunma hospital approved the ethical and scientific validity of this study.

### 2.3. Statistical analysis

All statistical analyses were performed using SPSS Version 22.0 (Armonk, NY: IBM Corp.) The significance level was set at  $p < 0.05$ . Correlations above 0.8, between 0.6 and 0.8, between 0.4 and 0.6, between 0.2 and 0.4, and below 0.2 were considered very strong (excellent), strong (high), moderate, weak (adequate), and very weak, respectively (Evans, 1996).

#### 2.3.1. Test-retest reliability

The replicability of eight personality dimensions was assessed using the test-retest method. Intraclass correlation coefficients (ICCs) between test and retest scores were calculated.

#### 2.3.2. Internal consistency

The internal consistency of eight personality dimensions was assessed using Cronbach's alpha.

#### 2.3.3. Confirmatory factor analysis

Confirmatory factor analysis was used to estimate the model-based reliability of the four personality dimensions and eight personality dimensions (The Black Dog Institute, 2013), the goodness of fit of the tiered models, and the observed factor scores from the seven models. The values of the Root Mean Square Error of Approximation (RMSEA) below 0.05 indicate a close fit; between 0.05 and 0.08, a fair fit; between 0.08 and 0.1, a mediocre fit; and, over 0.1, a poor fit (Kline et al., 2005).

#### 2.3.4. Convergent validity

In order to determine convergent validity, the eight J-T&P scale scores (Anxious Worrying, Perfectionism, Personal Reserve, Irritability, Social Avoidance, Rejection Sensitivity, Self-criticism, and Self-focus) were compared with scores of the eight T&P constructs measured using a four-point Likert scale. Convergent validity was evaluated using Spearman's correlation coefficients.

#### 2.3.5. Concurrent correlations

To assess the impact of depressive state and traits, Spearman's correlation coefficients between the J-T&P scale scores of eight personality dimensions and QIDS-SR16-J scores were evaluated.

**3. Results**

**3.1. Demographic and clinical characteristics**

From September 2013 to January 2014, a total of 114 patients were studied. The mean age of the patients was 45 years (SD=11) and 44.7% (n=51) were female. The mean age of first MDD onset was 40 years (SD=12) and the median length of depressive episode was 36 months (IQR=12 to 96). There was one acute depression patient (the length of depressive episode was 1–2 months) and no patients had physical illness or exposure to recurrent psychological abuse or trauma. Seven patients reported comorbid mental disorders, including general anxiety disorder (n=1), social anxiety disorder (n=3), alcohol dependence (n=1), and obsessive-compulsive disorder (n=2). Of all the patients, 36.8% (n=42) had a history of hospitalization. To evaluate test-retest reliability, 108 patients (94.7%) completed the questionnaires at the second visit with a mean interval of 27 days (SD=18).

**3.2. Test-retest reliability**

Table 1 presents the ICCs for each J-T&P subscale of eight personality dimensions. All constructs showed good-to-excellent test-retest reliability.

**Table 1**  
Cronbach's alpha, test-retest reliability and impact of depression for the Japanese version of the Temperament and Personality questionnaire (J-T&P) subscales scores.

J-T&P subscale	Cronbach's alpha	Test-retest ICC	J-T&P		Spearman correlation (rho) between QIDS-SR16-J score and J-T&P score
			Test mean score	Retest mean score	
Anxious worrying	0.81	0.84	13.9	13.3	0.40**
Perfectionism	0.86	0.81	13.0	12.8	-0.06
Personal reserve	0.86	0.85	10.6	10.7	0.30**
Irritability	0.91	0.88	10.3	9.8	0.28**
Social avoidance	0.82	0.89	14.1	13.8	0.17
Rejection sensitivity	0.84	0.86	7.7	7.8	0.35**
Self-criticism	0.67	0.79	14.3	14.4	0.49**
Self-focus	0.67	0.77	4.3	4.6	0.24*

QIDS-SR16-J=the Japanese version of 16-item self-rated Quick Inventory of Depression Symptomatology  
ICC=Intraclass correlation coefficient.

\* p < 0.05.  
\*\* p < 0.01.

**Table 2**  
Correlations between participants' the Japanese version of the Temperament and Personality questionnaire (J-T&P) subscale scores and clinician ratings on equivalent constructs (concurrent validity).

Clinician ratings	Subscale scores							
	Anxious worrying	Perfectionism	Personal Reserve	Irritability	Social Avoidance	Rejection Sensitivity	Self-Criticism	Self-focus
Anxious worrying	<b>0.29**</b>	0.13	0.11	0.31**	-0.05	0.10	0.20*	0.14
Perfectionism	0.03	<b>0.17</b>	0.01	-0.07	-0.01	-0.03	-0.004	0.17
Personal reserve	0.03	-0.11	<b>0.18</b>	-0.06	0.18	-0.04	0.15	0.05
Irritability	0.12	0.07	0.07	<b>0.38**</b>	-0.11	0.12	0.09	0.26*
Social avoidance	-0.07	-0.02	0.29**	-0.01	<b>0.32**</b>	-0.07	0.08	-0.04
Rejection sensitivity	0.18	0.02	0.13	0.14	0.08	<b>0.16</b>	0.23*	0.21
Self-criticism	0.03	0.23*	-0.16	-0.04	-0.13	-0.004	<b>-0.02</b>	-0.12
Self-focus	0.04	0.04	0.02	0.15	-0.04	-0.11	0.01	<b>0.07</b>

\* p < 0.05.  
\*\* p < 0.01.

**3.3. Internal consistency**

Table 1 shows internal consistency in eight personality dimensions. All constructs showed acceptable-to-excellent internal consistency.

**3.4. Convergent validity**

Spearman's correlations between J-T&P scores and the evaluation scores of treating psychiatrists are presented in Table 2. Five constructs (Anxious Worrying, Perfectionism, Personal Reserve, Irritability, and Social Avoidance) showed adequate levels of convergent validity while the other three constructs (Rejection Sensitivity, Self-criticism, and Self-focus) showed relatively weak correlations.

**3.5. Concurrent correlations**

Spearman's correlations between J-T&P scores and the QIDS-SR16-J are presented in Table 1. The correlations were very weak for "Perfectionism" and "Social Avoidance," weak for "Anxious Worrying," "Personal Reserve," "Irritability," "Rejection Sensitivity," and "Self-focus," and moderate for "Self-criticism".

**3.6. Confirmatory factor analysis for the four and eight personality dimensions**

Both four and eight personality dimensions achieved a mediocre fit in the RMSEA (four personality dimensions: X<sup>2</sup>=747.64, p < 0.001, RMSEA=0.075, 90%CI=0.065–0.084, CFI=0.826, TLI=0.800; eight personality dimensions: X<sup>2</sup>=3276.10, p < 0.001, RMSEA=0.085, 90%CI=0.080–0.090, CFI=0.605, TLI=0.572).

**4. Discussion**

The current study demonstrated that the J-T&P had high test-retest reliability, internal consistency, an adequate level of convergent validity, and minimal sensitivity to mood state effects. These results were comparable with those obtained in the original study (Parker et al., 2006). Thus, the J-T&P is an acceptable instrument for assessing the temperament and personality of Japanese patients with non-melancholic depression.

Test-retest reliability was good to excellent. ICCs of six constructs (Anxious Worrying, Perfectionism, Personal Reserve, Irritability, Social Avoidance, and Rejection Sensitivity) were over 0.80 and those of two constructs (Self-criticism and Self-focus) approached 0.80 (r=0.79 and 0.77, respectively). In the original study, high reliability was shown for "Self-criticism" and "Self-

focus" ( $r=0.73$  and  $0.72$ , respectively) and excellent reliability was shown for the other six constructs ( $r=0.76$ – $0.93$ ), which was similar to our findings.

Cronbach's alpha coefficients for eight personality dimensions achieved acceptable-to-excellent psychometric properties, ranging from 0.67 to 0.91, similar to findings from an Australian sample (0.62–0.91) (Parker et al., 2006) and Brazilian Portuguese sample (0.63–0.86) (Spanemberg et al., 2014c). Cronbach's alpha for six constructs (Anxious Worrying, Perfectionism, Personal Reserve, Irritability, Social Avoidance, and Rejection Sensitivity) were over 0.80 and two constructs (Self-criticism and Self-focus) approached 0.70 ( $r=0.67$ ,  $0.67$ , respectively).

Regarding convergent validity, Spearman's correlations between J-T&P scores and the evaluation scores of treating psychiatrists for five constructs (Anxious Worrying, Perfectionism, Personal Reserve, Irritability, and Social Avoidance) showed adequate levels of validity ( $\rho=0.2$ – $0.4$ ). However, the correlations for three constructs (Rejection Sensitivity, Self-criticism, and Self-focus) were relatively weak (See Table 2). Regarding the original study, convergent validity was comparable for "Self-focus" however, convergent validity was slightly weaker for "Rejection Sensitivity" and "Self-criticism."

Significant associations between depression severity and J-T&P scores were found for six personality constructs: "Anxious Worrying," "Personal Reserve," "Irritability," "Rejection Sensitivity," "Self-criticism" and "Self-focus" ( $\rho=0.40$ ,  $0.30$ ,  $0.28$ ,  $0.35$ ,  $0.49$ , and  $0.24$ , respectively). J-T&P scores showed correlations of at least a moderate magnitude with QIDS-SR16-J scores. Similarly, four (Anxious Worrying, Personal Reserve, Rejection Sensitivity, and Self-criticism) out of six constructs were also correlated with depressive symptoms based on the Beck Depression Inventory score in the original study ( $r=0.30$ ,  $0.29$ ,  $0.45$ , and  $0.37$ , respectively).

In our study, "Self-criticism" and "Rejection Sensitivity" showed low convergent validity compared with the Australian sample; this is potentially because of the unique aspects of Japanese culture, such that Japanese participants tended to overestimate their self-criticism and rejection sensitivity. We used a self-reported questionnaire that may cause reporting bias due to cultural factors. Regarding "Self-criticism" within the Japanese cultural system, which values maintaining, affirming, and forming significant social relationships, self-criticism is not an indication of low self-esteem or something to be avoided or overcome. Instead, self-criticism serves to develop and sustain significant social relationships and has positive social and psychological consequences (Kitayama et al., 1997). Conversely, for Western individuals who are relatively more likely to engage in self-enhancement, they may be less likely to endorse self-criticism. Regarding "Rejection Sensitivity," in individualistic cultures, such as the United States, the self is defined by independence, distinctiveness from others, and personal freedom. In contrast, in interdependent cultures, such as Japan, the self is defined by one's relationships, group memberships, and connections with others (Markus et al., 1991). Japanese people view themselves through the eyes of others and strive to maintain "face" and avoid shame (Vohs and Finkel, 2006). From these findings, perhaps Japanese people might have high rejection sensitivity. Such cultural differences may have led to differences in the validity of the "Self-criticism" and "Rejection Sensitivity" constructs.

#### 4.1. Limitations

The weaknesses in the present study are as follows: first, this study was conducted at only one site. However, the study site was a standard psychiatric hospital in a suburban/rural city in Japan and these results could be generalized to many other Japanese psychiatric hospitals. Second, we used a Likert scale to evaluate the presence of eight

personality constructs for the current study, which has not been validated. However, these evaluations were conducted by treating psychiatrists who had been seeing most of these patients for more than 12 months. Third, the sample size was limited. Although we did not undertake an exploratory factor analysis for J-T&P, our focus was not to create a new instrument, but to show the reliability and validity of the instrument in Japanese using its original structure.

## 5. Conclusion

The current study confirms that the J-T&P has adequate reliability and validity as a temperament and personality assessment tool. Thus, we expect that the J-T&P is useful for patients with non-melancholic depression in Japanese research and clinical settings.

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