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Research report

Psychometric properties of the Hong Kong Chinese (Cantonese) TEMPS-A in medical students ☆

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ABSTRACT

Background: The self-rated auto-questionnaire, the Temperament Scale of Memphis, Pisa, Paris and San Diego (TEMPS-A) is the latest development in the study of temperamental attributes. It has been used and validated in different cultures and countries. The current study aims at validating the Chinese (Cantonese) version of the TEMPS-A and comparing the psychometric properties of the long and short forms of the translated scale.

Methods: The Chinese (Cantonese) version of TEMPS-A was prepared with the standard translation and back-translation method, and approved by the original authors (HSA & KKA). It was administered to medical students of the two local universities, and results were analyzed.

Results: 613 valid questionnaires were returned. The Cronbach-Alpha coefficients for the depressive, cyclothymic, hyperthymic, irritable and anxious temperament subscales were 0.63, 0.82, 0.78, 0.80, and 0.84, respectively. The strongest correlation was observed between the cyclothymic and irritable temperaments ($R=0.600$). Factor analysis yielded one large composite (depressive and anxious) and four homogenous factors, cyclothymic, anxious, hyperthymic and irritable. A newly reconstituted 43-item short form, based on methods suggested by the original authors yielded similar factor structure.

Limitations: The narrow age range of subjects somewhat limits generalization of the results. However, external and concurrent validations against other validated scales have been demonstrated for the original English versions as well as against the most commonly used languages of the world; furthermore, such validation has also been demonstrated for Chinese (Mandarin).

Conclusions: The Chinese (Cantonese) version of TEMPS-A and the reconstituted 43-item short form were found to have good internal consistency and factor structures comparable to those of other languages from diverse cultures across the planet. We propose that the Cantonese TEMPS-A is a useful tool for local use.

1. Introduction

The study of human temperaments in modern times was made a respectable scientific endeavor by Eysenck and Eysenck (1969). Many other instruments have been developed since then, of which the latest are those of Cloninger et al. (1994) and Akiskal and Akiskal (2005a). Temperaments refer to temporally stable behavioral traits with strong affective reactivity, has general appeal in empirically unraveling the kaleidoscopic profile of human behavioral liabilities and assets on the one hand (Akiskal and Akiskal, 2005b), which have been buttressed by genetic data using different technologies (Kang et al., 2008; Gonda et al., 2011; Greenwood et al., 2012, 2013), and immediate clinical significance in their hypothesized relationship with affective disorders in a state-trait fashion on the other (Akiskal, 1981). Indeed, while circularity of bipolar disorder has intrigued generations of clinicians and researchers, the phenomenological continuity of cyclothymic temperament (Kretschmer, 1936; Akiskal et al., 1977, 1979; Akiskal and Mallya, 1987; Akiskal and Akiskal, 1992; Akiskal and Akiskal, 2005a) with bipolar disorders has vast implications in understanding bipolarity in terms of etiology and treatment formulation.

Affective temperaments have since been operationalized (Akiskal and Mallya, 1987), the commonest instrument used being the self-rated auto-questionnaire, the Temperament Scale of Memphis, Pisa, Paris and San Diego (TEMPS-A). The TEMPS-A

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was constructed based on both historical and clinical grounds (Kraepelin, 1921; Kretschmer, 1936; Akiskal et al., 1977,1979). The depressive, cyclothymic, hyperthymic and irritable temperaments in the original framework were further supplemented by the anxious axis (Akiskal, 1998; Akiskal et al., 2005a). Temperamental attributes thus measured have been correlated with genetic, psychophysiological and clinical measures (Gonda et al., 2009; Goto et al., 2011). With the original 110-item version being too long for population-based surveys a 39-item short version was later devised (Akiskal et al., 2005b), showing good psychometric properties in terms of concurrent validity with the Temperament and Character Inventory (TCI) (Cloninger et al., 1994), internal consistency, as well as preservation of the proposed 5-subscale structure of temperaments.

Despite the apparent universality of affective temperaments in its original Euro-American conception, as borne out in validation studies in different ethnic groups, these studies also showed variations in factor structure and item composition across different cultures (Vahip et al., 2005; Akiyama et al., 2005; Gonda et al., 2011). TEMPS has translations in over 25 different languages (Karam et al., 2005; Blöink et al., 2005; Vahip et al., 2005; Borkowska et al., 2010; Pompili et al., 2008; Figueira et al., 2008; Rozsa et al., 2008; Krebs et al., 2006), including Japanese and Korean (Matsumoto et al., 2005; Kang et al., 2008). To date, TEMPS has not yet been validated in Chinese Cantonese communities.

Research of temperaments in Chinese communities is of particular interest. Clinical studies (MAK, 2009) and population-based surveys (Lee et al., 2009) in China have found prevalence of bipolar spectrum disorders and sub-threshold hypomania comparable with that of the West. Description of temperamental profiles in the Chinese population would be important in etiological research for bipolar spectrum disorders, and in informing clinical practice in the management of the millions of Chinese people estimated to suffer from bipolar spectrum disorder (Lin et al., 2013).

The current study aims at validating the Chinese (Cantonese) version of the TEMPS-A (cTEMPS-A) and exploring its psychometric properties and applicability. In view of the potential application in large-scale population based studies in China, we also attempted to derive a short version of the cTEMPS-A using two alternative methods: one is adopting the same 39 items of the original short version of the TEMPS-A, and the other is factor analyzing cTEMPS-A using the same methodology as the original authors (Akiskal et al., 2005b). We examined and compared psychometric properties of both versions.

2. Methods

2.1. Translation

The original English version-110 item of the Temperament Scale of Memphis, Pisa, Paris and San Diego-Auto-questionnaire (TEMPS-A) was adopted and translated independently into Chinese (Cantonese) by three bilingual psychiatrists (C.M.L, A.M., Y.T. X.) who then compared the texts item by item until consensus was reached. Selection of wording and phrasing emphasized broad comprehensibility to both speakers of the official Mandarin language and the Cantonese dialect, which is more common in Southern China. To assure criterion equivalence with the original version, content, semantic, technical and conceptual equivalence were all emphasized in the translation process, with a slight preference for content equivalence over semantic equivalence where the two were in conflict (Flaherty et al., 1998). Informal pilot interviews with clinical and non-clinical subjects were conducted to help in this process, by checking the wordings of the Chinese translation, so that translated items are broadly comprehensible and retain the meaning of the original items. The agreed-upon text was then back-translated to English by another psychiatrist (J.S.) who had no prior knowledge of the scale. The back-translated scale was scrutinized by the original author Akiskal who made suggestions for improvement. The panel of translators made further amendments to the Chinese text which was again back-translated into English. The original author endorsed the linguistic authenticity of the final draft of the cTEMPS-A, that is used in this study.

2.2. Sample

The cTEMPS-A was distributed to five classes of medical students (year one to year five) of two local universities for completion in mid-2009. Written informed consent was obtained. Approval from the Clinic Research Ethics Committee of the Chinese University of Hong Kong had been sought before the commencement of the study.

2.3. Statistical analysis

Data was analyzed using the Statistical Package for Social Science (SPSS) version 17. Internal consistency was measured using the Cronbach-Alpha coefficient. Factor loadings were calculated using principal component analysis (PCA) with varimax rotation with cut-off coefficient set at 0.3. Correlation between subscales was calculated using Pearson's bivariate correlation. *Z*-scores were calculated for different temperaments assuming normal distribution. To examine differences in scores, Chi-square test was used for categorical variables. For continuous variables, ANOVA was used for parametric variables. Significance level was set at $p < 0.05$.

2.4. Short versions

We explored two alternative methods to derive a short version of the cTEMPS-A.

2.4.1. The original 39-item short version

The corresponding 39 items of the original short version of TEMPS-A (Akiskal et al., 2005b) were used, and this version was analyzed for its internal consistency, factor structure and loading, subscale correlations, and *Z*-scores.

2.4.2. The reconstituted short version of the cTEMPS-A

A reconstituted short version of the cTEMPS-A was derived based on the method used by the original authors in 2005 (Akiskal et al., 2005b). The first 84 items of the TEMPS-A, consisting of dysthymic, cyclothymic, hyperthymic and irritable temperaments, were factor analyzed with PCA and varimax rotation. Items loading onto one factor with value equal or more than 0.45 were added to the 26 items of anxious temperament. The combined items were further factor analyzed. The cut-off of 0.45 was selected instead of 0.35 in the original short version, to strike a balance between inclusiveness and length of the short version. The final items were selected to form a short version based on factor loadings.

3. Results

3.1. Subjects

There were 680 year one to year five medical students and a total of 613 valid questionnaires were collected after 23 (3.61%) were discarded for incomplete entry. The response rate was 93.5%. There were 274 males (44.7%) and 339 females (55.3%) with a mean age of 20.8 (range 17–30, S.D.=2.0). Nearly all (99.9%) were single.