Explores the Psychometric Properties of Mandarin-Translated Zuckerman Kuhlman Personality Questionnaire among Chinese High School Students in Malaysia

Lee Enn Hooi, Mohammad Rahim Kamaluddin, Norruzyatni Che Mohd Nasir, Hilwa Abdullah @ Mohd Nor, Noremy Md Akhir

Abstract: The Zuckerman Kuhlman Personality Questionnaire (ZKPQ-50-CC) is widely used tool to measure personality traits among the test takers and has been translated in various languages. However, based on the literatures related to personality, it is apparent that there is no Mandarin translated ZKPQ is available to measure personality traits among Chinese population based on the Alternative Five Factor Model. Therefore, the aim of this study is to validate and explore the psychometric properties of the Mandarin-translated version of the Zuckerman Kuhlman Personality Questionnaire. A cross-sectional study was designed involving 250 Malaysian Chinese High school students, aged thirteen to eighteen. Forward-backward translations were performed followed by the factor analysis and reliability testing. The five factors structure was assessed and the factor loadings are similar with the Malay version of ZKPQ. This Mandarin translated ZKPQ comprised of 38 items with the factor loadings ranged from 0.41 to 0.79. The reliability values also showed that Mandarin translated ZKPQ is reliable. As such, the Mandarin translated ZKPQ was found to be valid and reliable to use among Mandarin speaking population for the purpose of personality testing and screening.

Index Terms: Mandarin language, personality tool, psychometric properties, reliability, validation, Zuckerman-Kuhlman Personality Questionnaire

I. INTRODUCTION

Crime is often viewed as the outcome of anti-social behaviour. Over the decades, voluminous researches have been devoted to understand the possible factors for criminal acts. Along this line of thought, psychological factors or intrinsic factors are always acknowledged as potential factors that trigger criminal behaviour within a person.

Psychological factors such as negative personality traits, low self-control, and distorted thinking patterns are among the significant risk factors to develop criminal behaviour [1]. As such, personality seems to act as one of the fundamental factors in developing and forming criminal behaviour and it also refers to an individual’s appearance which includes thoughts, perceptions, values, attitudes, characters, abilities, beliefs, intelligence, motivation, habits and so on.

Mischel [2] has stated that the concept of personality acts as a dynamic organization of the psychophysical system of each individual which determines behavior and thought. As an effort to assess the personality traits of criminals, forensic psychologists and criminologists use several models to explain personality traits that are associated with criminal behaviour. Along this, Alternative Five Factor Model (AFFM) is considered as one of the potential models to link personality traits with criminal behaviour.

AFFM is a comparatively new model and also considered as a ‘revised’ model of Big Five Model (also known as Five Factor Model) which comprised of five personality traits: Impulsive Sensation Seeking, Aggression-Hostility, Neuroticism-Anxiety, Activity, and Sociability. This AFFM is considered as a ‘revised’ model as few modifications were made to the AFFM compared to the Big Five Model. For instance, agreeableness trait in Big Five was replaced with aggression, and impulsive sensation seeking replaced conscientiousness [3]. In addition, the broad dimension of extraversion in Big Five Model was also further break down into two separate domains i.e., activity and sociability [4]. This was because it was deemed that activity level merits a distinctive assessment as a major personality trait and should not be under one roof.

Moreover, the distinction between hostility and anxiety also played vital roles in the modification because both traits are said to have different psychobiological bases [5] and should not be placed under a single domain as originally found in the neuroticism domain of the Big Five Model [3]. This in turn justifies the significant need of AFFM as an alternative model to the Big Five in order to predict and link with criminal behaviour.
Consequently, this addresses the need of assessment tools to measure personality traits of AFFM as well. With this in mind, Zuckerman-Kuhlman Personality Questionnaire-Cross Cultural-50 items [6] is found to be the personality tool that that assesses the personality of test takers based on the AFFM. Zuckerman Kuhlman Cross-Culture Personality Questionnaire 50 items (ZKPQ-50-CC) is one of the most comprehensive and most widely used assessment tool to assess the individual personality. This questionnaire is derived from the efforts of Marvin Zuckerman. ZKPQ-50-CC has been translated and used by scholars from all over the world in various backgrounds such as in counseling, organizations, criminology [7][8] and many more.

It should be noted that those psychometrics which were developed in the English language may not be suitable to be used directly within Malaysian context due to the cultural and language differences. In Malaysia, this ZKPQ-50-CC was successfully validated in Malay language as Zuckerman Kuhlman Personality Questionnaire-40-Cross-Culture (ZKPQ-M-40-CC) which consists of 40 items and has been utilized in many researches pertaining to school and university students and also among high risk individuals and prison populations [9]. Since Malaysia is a multiracial country with Chinese as the second major ethnic in Malaysia; it is imperative to have a Mandarin based ZKPQ as an effort to cater the Mandarin speaking populations in Malaysia and also other parts of the world. With this in mind, the present study aims to explore the psychometric properties of ZKPQ-M-40-cc (Malay version) into Mandarin language. The researchers used the Malay language ZKPQ since it has been validated locally and found to be culturally sensitive. It is highly anticipated that the emergence of validated Mandarin translated ZKPQ would be very beneficial for personality assessment and screening especially for Mandarin speaking populations in Malaysia. It is also expected to be very useful for criminal behavioural risk assessment among Mandarin speaking populations which act as fundamental for further intervention and rehabilitation efforts.

II. METHODS

A. Study Design and Respondents
A cross-sectional research design method was adapted to validate ZKPQ tool into Mandarin language. A number of selection criteria was determined as indicators to select appropriate samples for this study. Inclusion criteria included those who are able to read and understand Mandarin language as well as those who are Malaysians. As such, this study was conducted among Chinese school students from Malaysia. The aim of this validation study was clearly briefed to the respondents prior to their participation. As ethical considerations, respondents were informed regarding the anonymity and confidentiality of the data. Since it involves school children, consent was also obtained from respondents’ respective parents and teachers. The questionnaire was administered in a group format and they took about 10 to 15 minutes to complete the entire questionnaire. A total of 250 Malaysian Chinese school students (male = 119, female = 131) were recruited in this study using a convenience sampling method. In terms of the age, the samples are fairly distributed according to the age (13 years old = 39, 14 years old = 42, 15 years old = 41, 16 years old = 44, 17 years old = 41, 18 years old = 43).

B. Validation Protocols
The present validation study involved several validation protocols in order to establish a valid and reliable Mandarin translated ZKPQ.

Forward-Backward Translations
The study commenced with Forward and Backward translation processes. A Forward-Backward Translation is a process of translating a questionnaire from one language to another language and translates back to the original language by linguists. To achieve this, two independent linguists were appointed to perform forward translation. In addition, a professional proof-reader was assigned as well to endorse the Mandarin translated ZKPQ. Consequently, the Mandarin version ZKPQ was termed as ZKPQ-Mn-cc (the suffix “Mn” indicates Mandarin version). A week later, another two bilingual experts who had zero exposure with original ZKPQ-M-40-cc was hired to perform the back-translation process. As an effort to produce a harmonized Mandarin-translated ZKPQ, the researchers compared both drafts (ZKPQ-M-40-cc and ZKPQ-Mn-cc) and necessary amendments were made. The amendments made were based on language levels and ambiguously worded items.

Subjective Validation – Content and Face Validity
Following the translation processes, the ZKPQ-Mn-40-cc was subjected to subjective validation processes: content and face validations. Content validity should be carried out at the planning stage to ensure the validity of the content from the beginning, rather than re-considering the content again in the final stage. The content validation process also ensures that the tool includes an adequate and representative set of items that tap the concept investigated [10]. For the purposes of content validity in this study, experts from the field of Criminology and Psychology were assigned to assess and validate the items in the ZKPQ-Mn-CC from content perspective. Since ZKPQ-M-40-cc is locally established personality tool, the primary role of the experts assigned herein was more to ensure that those items were relevant and suitable to the scope of measurement within Malaysian context especially Chinese related cultures. Several minor amendments were made by the experts from the context of rewording and restructuring of the sentences. For the purpose of face validation, the process was carried out among 25 students from one of the Chinese Private High Schools in Kedah, Malaysia.

In general, face validity can be defined as the degree to which a test or scale appears to measure what it claims to measure [11]. The main objective of face validation was to obtain the feedbacks from the respondents regarding language level, understandability of the items and technical aspects i.e. size of the fonts and layouts. In addition, respondents were also required to evaluate whether the items are clear,
easy to understand and free of typographical errors. Based on
the feedback, some improvements in terms of format and font
size have been performed. Additionally, some elusive words
have also been replaced by words that are easier to understand.
In addition, ZKPQ-Mn-CC also demonstrates good authenticity as all respondents understand the items in the
ZKPQ-M-40-CC. The language used was appropriate but
some minor amendments in terms of the construction of the
sentences were made based on feedbacks from the respondents.

Construct Validity and Reliability Analyses
In general, objective validation is performed to ensure how
the items in the tools measure the concept that being assessed.
In other words, Construct validity is an objective validation
which assesses the degree to which an instrument or scale
measures what it supposed to measure. The preliminary analyses assessed were: correlation matrix, anti-image
correlation matrix, Kaiser-Meyer-Olkin (KMO) and
Bartlett’s test of sphericity [12]. The sample will be
considered adequate if two conditions are met: KMO values
must be more than 0.60 and Bartlett’s test of sphericity must
be significant (p < 0.05) [12]. In this study, construct validity
has been evaluated using the Exploratory Factor Analysis
method (EFA) by extracting factors using Principal Component Analysis (PCA). The factors were rotated using
Varimax rotation with Kaiser normalization to get the best
possible loadings on the factors. A loading factor of more than
plus or minus 0.3 was considered as acceptable. The
remaining items with factor loadings 0.30 were subjected to
reliability testing. For this, the internal consistency for each
dimension in ZKPQ-Mn-cc was measured through the
Cronbach (α) alpha coefficient method and the Cronbach
Split-Half alpha coefficient (α). After both methods of alpha
coefficients are performed, the correlation analysis was also
carried out to ascertain interdimensional correlation method
with the aim to show the associations between the domains in
ZKPQ-Mn-cc. The entire construct validity and reliability
analyses as well as correlation analyses were performed using
IBM SPSS version 23 software.

III. RESULTS AND DISCUSSION
As mentioned earlier, the construct validity of the
ZKPQ-Mn-40-cc was assessed using EFA with PCA. Prior to
EFA and PCA, preliminary analyses were carried out to
ascertain the suitability of data for factor analyses. The
preliminary analysis finds that the determinant value was
0.05; indicating that this data has no multicollinearity
problem and supports factor analysis [13]. The anti-image
correlation matrix for 39 items was between 0.50 and 0.86
which further supports the suitability for factor analyses. The
KMO value obtained in this study was 0.76 which indicates
that this study has sufficient sample to proceed with factor
analyses. In addition, the sample sufficiency of this study was
also supported by the significant value of Bartlett Test of
Sphericity (p<0.001). Table 1 below summarizes the findings
of preliminary analyses.

Table 1. Result of Preliminary Analyses

<table>
<thead>
<tr>
<th>Preliminary Analysis</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multicollinearity</td>
<td>0.05</td>
</tr>
<tr>
<td>Anti-image correlation</td>
<td>0.50 – 0.86</td>
</tr>
<tr>
<td>KMO value</td>
<td>0.76</td>
</tr>
<tr>
<td>Bartlett Test of Sphericity</td>
<td>$\chi^2(378) = 2826.648$</td>
</tr>
<tr>
<td></td>
<td>P &lt; 0.001</td>
</tr>
</tbody>
</table>

The EFA shows that the factor analyses of the data led to
emergence of five factors which is in line with AFFM.
Overall, the factor analysis revealed five loading factors that
explained 41.67% from the total variance. Scree plot also
suggested that five main components with eigenvalues greater
than 1. Precisely, Factor 1 contributed 13.98 percent variance
eigen value = 5.31, followed by Factor 2 of 10.16 percent variance
eigen value = 3.86, Factor 3 of 7.10 percent variance
eigen value = 2.70, Factor 4 of 5.87 percent variance
eigen value = 2.23 and Factor 5 of 4.56 percent variance
eigen value = 1.73. The scree plot is shown in Fig. 1.

![Fig. 1. Scree Plot ZKPQ-Mn-40-CC](image)

After considering the minimum factor loadings of 0.40,
item correlations and the meaningful interpretation of the
items, only one item was removed. All these items exhibited
factor loadings of 0.40 and above. Based on the rotated
component matrix items shown in Table 2, the factor structure
and the compilation of items show a total of five factors.
Factor 1 reported eight items, factor 2 and factor 3 reported
nine items respectively while factor 4 reported seven items
and factor 5 reported six items. In factor 1, there are eight
items from the original Neuroticism-Anxiety traits were
loaded (NA1, NA2, NA3, NA4, NA5, NA6, NA7, NA8);
which is a clear indication for Neuroticism-Anxiety. In factor
2 there are eight items from original Aggressiveness- Hostility
(A1, A2, A3, A4, A5, A6, A7, A8) and one item from the
original Impulsive Sensation Seeking trait (ImpSS8) were
also loaded under factor 2. Since the majority of the items
loaded in factor 2 were Aggressiveness-Hostility items
(Agg-Host), therefore, this factor was labelled as Agg-Host
dimension. In factor 3, there are eight items from the original
Sociability trait were loaded (Sy1, Sy2, Sy3, Sy4, Sy5, Sy5,
Sy6, Sy7, Sy8) which signify factor 3 as a Sociability
dimension. Meanwhile, seven items (Act1, Act2, Act4, Act5,
Act 6, Act7, and Act 8) from the Activity trait were loaded
under factor 4. This in turn allow us to label factor 4 as Activity
dimension. Finally, six items (ImpSS1, ImpSS2, ImpSS3,
ImpSS44, ImpSS5, and ImpSS7) from the

![Table 1. Result of Preliminary Analyses](image)
Impulsive Sensation Seeking trait were loaded under this factor. One of the ImpSS item (ImpSS8) was loaded under factor 1 with the factor loading of 0.469. After careful evaluation of the content of ImpSS8, it is suggested to retain under factor 2 (Agg-Host). Besides that, another item (ImpSS6) was omitted under factor 5 since the factor loading value was only 0.340. In conclusion, there are 38 items were retained under five factors in Mandarin translated ZKPQ.

Table 2 shows the component matrix of EFA of ZKPQ-Mn-38-cc.

<table>
<thead>
<tr>
<th>No.</th>
<th>Item</th>
<th>Factor Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA1</td>
<td>Badan saya sering beraisa tidak selesa tanpa sebarang sebab yang manusabah. (BADA)</td>
<td>.593</td>
</tr>
<tr>
<td>NA2</td>
<td>Saya mudah sensitif dan mudah tergugah dengan kata-kata dan tindakan orang lain. (SAMA)</td>
<td>.556</td>
</tr>
<tr>
<td>NA3</td>
<td>Saya mudah beraisa takut. (SAMN)</td>
<td>.783</td>
</tr>
<tr>
<td>NA4</td>
<td>Kadang-kadang saya beraisa cemas. (KADC)</td>
<td>.599</td>
</tr>
<tr>
<td>NA5</td>
<td>Saya sering beraisa tidak pasti dengan diri sendiri. (SAMA)</td>
<td>.616</td>
</tr>
<tr>
<td>NA6</td>
<td>Saya sering beraisa hendak menangis tanpa sebab. (SAMN)</td>
<td>.715</td>
</tr>
<tr>
<td>NA7</td>
<td>Saya sering beraisa tidak selesa dan tidak shat tanpa sebab yang manusabah. (SAMN)</td>
<td>.759</td>
</tr>
<tr>
<td>NA8</td>
<td>Saya sering beraisa kecewa. (SAMN)</td>
<td>.645</td>
</tr>
<tr>
<td>A1</td>
<td>Apabila saya marah, saya mengeluarkan kata-kata yang tidak baik. (AMAH)</td>
<td>.569</td>
</tr>
<tr>
<td>A2</td>
<td>Apabila saya marah, biasanya saya akan mencarat atau menyapit. (AMAH)</td>
<td>.657</td>
</tr>
<tr>
<td>A3</td>
<td>Saya bersikap kasar terhadap orang yang saya tidak suka. (GART)</td>
<td>.601</td>
</tr>
<tr>
<td>A4</td>
<td>Jika seseorang membuat saya marah, saya akan memarahinya semula. (JMAM)</td>
<td>.637</td>
</tr>
<tr>
<td>A5</td>
<td>Saya sentiasa bersabar dengan orang lain meskipun mereka menyaktikan hati saya. (SBAS)</td>
<td>.401</td>
</tr>
<tr>
<td>A6</td>
<td>Saya seorang panas banar. (SPBN)</td>
<td>.552</td>
</tr>
<tr>
<td>A7</td>
<td>Apabila orang mengenangkan saya, saya menengking mereka semula. (AMEN)</td>
<td>.657</td>
</tr>
<tr>
<td>A8</td>
<td>Apabila orang tidak berseluv dengan saya, saya akan bergaduh dengan mereka. (ABUS)</td>
<td>.601</td>
</tr>
<tr>
<td>Impss6</td>
<td>Saya seringkali rasa seperti hendak memukul seseorang. (SUAM)</td>
<td>.469</td>
</tr>
<tr>
<td>Sy1</td>
<td>Saya suka kelaun secara berkumpulan. (SUAM)</td>
<td>.615</td>
</tr>
<tr>
<td>Sy2</td>
<td>Saya melakukan banyak masa bersama kawan-kawan. (SMBA)</td>
<td>.560</td>
</tr>
<tr>
<td>Sy3</td>
<td>Saya tidak memerlukan ramai kawan. (SMBA)</td>
<td>.517</td>
</tr>
</tbody>
</table>

Table 2. Component Matrix of EFA of ZKPQ-Mn-38-cc

Reliability Outputs

The internal consistency of the 38 items in Mandarin translated ZKPQ was calculated using the Cronbach’s alpha and split half reliability methods. Table 3 shows the findings of reliability analyses.

Based on Table 3, Mandarin translated ZKPQ has recorded a high reliability value of $\alpha$ from 0.63 to 0.83 for five dimensions with Neuroticism-Anxiety trait recorded a high Cronbach alpha value of 0.83. The split half reliability analyses findings also showed that the results of the
dimensions in the Unequal Length category of Sociability, Impulsive Sensation Seeking and Neuroticism-Anxiety have recorded high reliability values of 0.71, 0.64 and 0.82 while the dimensions of the Equal Length for Activity and Aggressiveness-Hostility have also recorded high reliability values of 0.71 and 0.74. Based on the reliability outputs, the values seem to be within the acceptable range as the cut-off reliability values above 0.70 are considered good particularly in the field of social science [14].

<table>
<thead>
<tr>
<th>Table 3. Reliability Output of ZKPQ-Mn-38-cc</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dimension/Trait</strong></td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>Activity</td>
</tr>
<tr>
<td>Sociability</td>
</tr>
<tr>
<td>Aggressiveness-Hostility</td>
</tr>
<tr>
<td>Impulsive Sensation Seeking</td>
</tr>
<tr>
<td>Neuroticism-Anxiety</td>
</tr>
</tbody>
</table>

IV. LIMITATION AND CONCLUSION

In this validation study, researchers were aware of the importance of test-retest reliability analyses. However, the researchers could not conduct the test-retest reliability due to logistics and accessibility factors. It is highly recommended to perform test-retest analyses in upcoming researches as it can shed some insight on the stability of this Mandarin translated ZKPQ. Despite of this limitation, the present study has successfully validated and explored the psychometric properties of Mandarin translated ZKPQ which is considered vital for personality screening and assessment among Mandarin speaking population in Malaysia.

REFERENCES


AUTHORS PROFILE

Miss Lee Enn Hooi is a psychology graduate from The National University of Malaysia and also alumni of University Mobility for Asia and Pacific (UMAP) International Programme. Email: leenhhooi0402@gmail.com

Dr. Mohammad Rahim Kamaluddin* is a Senior Lecturer and Criminologist (with Doctoral Degree qualification) at Human and Societal Well-Being Centre, Faculty of Social Sciences and Humanities, Universiti Kebangsaan Malaysia (UKM).

*Corresponding author Email: rahimk@ukm.edu.my

Dr. Nurruzayati Che Mohd Nasir (PhD) is a Senior Lecturer and Correctional Science Expert at School of Applied Psychology, Social Work and Policy, Universiti Utara Malaysia.

Email: zeyati@uum.edu.my

Dr. Hilawa Abdullah @ Mohd. Nor (PhD) is a Lecturer and Clinical Psychologist at Faculty of Social Sciences and Humanities, UKM.

Email: hilawa@ukm.edu.my

Dr. Noremy Md Akhir (PhD) is a Social Work Expert and Senior Lecturer at Faculty of Social Sciences and Humanities, UKM.

Email: noremy@ukm.edu.my

Dr. Tengku Elmi Azlina binti Tengku Muda is counselor and senior lecturer at Genius@Pintar National Gifted Centre, UKM.

Email: elmiazlina@ukm.edu.my