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ENGLISH AND CHINESE LANGUAGE ASSESSMENT OF DSM-5 PERSONALITY DISORDERS AND INTERPERSONAL PROBLEMS IN BILINGUAL SPEAKERS

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Ziqi Wu

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The thesis of Ziqi Wu was reviewed and approved* by the following:

Aaron L. Pincus Professor of Psychology Thesis Advisor

Frank G. Hillary Associate Professor of Psychology

Janet van Hell Professor of Psychology and Linguistics

Melvin Mark Professor of Psychology Head of the Department of Psychology

*Signatures are on file in the Graduate School

ABSTRACT

A review of the literature on Chinese translations of Western self-report personality assessment measures indicates the need to empirically evaluate of the validity of assessing Western personality and clinical constructs in the Chinese language and culture. The current study presents a novel approach to examining this critical question in cross-cultural clinical assessment science and practice. 200 Mandarin Chinese and English bilingual participants (93 males and 97 females) were recruited to collect both English and Chinese self-report ratings on the Inventory of Interpersonal Problems – Short Circumplex (IIP-SC) and The Personality Diagnostic Questionnaire - 4+ (PDQ-4+) to examine the similarities and differences in associations between DSM-5 personality disorders and interpersonal problems across languages. The structural summary method (SSM) for circumplex data and a recently developed bootstrapping methodology were used for computing confidence intervals around SSM parameters to analyze and compare the interpersonal circumplex profiles for the same personality disorder constructs (e.g., narcissistic) derived from English language and Chinese language data. The current study evaluated whether assessment of Western personality disorder constructs in Chinese language and culture result in similar interpersonal profiles, suggesting they can be cross-culturally identical and generalizable. English and Chinese verbal fluency served as control variables.

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Chapter 1

Introduction

Native Chinese speakers constitute one-fifth of the world's population and live throughout Asia, Europe, and North America. This makes personality assessment in the Chinese language increasingly important regardless of where it is practiced. Recent literature reviews reflect that there is a paucity of personality assessment in Chinese language in general, and a notable lack of personality disorder research in Chinese populations. In the epidemiological studies that do exist, personality disorder prevalence is relatively low in Asian-origin samples generally (Ryder, Sun, Dere, & Fung, 2014) and significantly lower than in the United States. Although this could mean that personality disorders are a Western phenomenon with little clinical relevance for Chinese culture, Ryder el al. (2014) pointed out that the low rates may result from "a lack of understanding about what constitutes personality disorder in Asian culture contexts" (p. 86).

Chinese culture, which is a collectivist culture, encourages people to focus more on sharing benefits and group success, to put the good of the group before the good of the self. It is very different than the United States culture, which is an individualistic culture, encouraging people to focus more on the self, achievement, and individual benefit, to put the good of the self before the good of the group (Hui & Triandis, 1986; Hofstede & McCrae, 2004). Under the historically strong influence of Confucianism, Chinese people emphasize keeping social harmony and peace while avoiding conflict (Chang, Arkin, Leong, D. Chan, & K. Leung, 2004). The difference between Chinese culture and American culture might impact personality assessments based on Chinese translations of Western measures of personality and psychopathology. For example, cultural differences may give rise to different interpretations when reading the same words translated from another language, as culture has the power of shaping the norms, values and ideals held by a population (Sedikedes, Gaertner, & Toguchi, 2003).

Assessment of Personality Disorders in China

In China, an interesting situation has emerged with the assessment of personality disorders. Clinical practice is guided by a Chinese nosology while clinical research typically employs translated measures (self-reports, semi-structured interviews) of the Diagnostic and Statistical Manual of Mental Disorders-5th Edition (DSM-5, American Psychiatric Association, 2013) personality disorders. The current Chinese Classification of Mental Disorders (CCMD-3; Chinese Psychiatric Association, 2001) classifies personality disorders into paranoid, schizoid, dissocial, impulsive, histrionic, anankastic, anxious, dependent, and unspecified subtypes (T. Zhang, L. Wang, M. Good, B. Good, Chow, Dai, ... Xiao, 2012). Some CCMD-3 personality disorders use different labels for similar diagnoses found in the DSM-5, such as impulsive personality disorder and borderline personality disorder. Other personality disorders, such as anxious (CCMD-3) and narcissistic (DSM-5), are used for clinical diagnosis in either China or the United States but do not have counterparts in the other culture's diagnostic classification. It is also notable that although practitioners in China use the CCMD-3, most scientific study of personality disorders in China uses translated measures assessing Western (DSM-5) personality disorders (e.g., J. Huang, Napolitano, J. Wu, Y. Yang, Xi, Y. Li, & K. Li, 2014; J. Huang, Y. Yang, J. Wu, Napolitano, Xi, & Cui, 2012; Ma, P. Wu, S. Yang, K. Cheng, Chiu, & Lane, 2010; L. Wang, Ross, T. Zhang, Dai, H. Zhang, Tao...Xiao, 2012).

The differences between practice and research need to be bridged to advance accurate diagnosis and culturally-appropriate assessment of personality disorders in China. There is an urgency for cultural research on personality disorders in samples with Asian origins. The current study focused on the practice of employing translated personality assessment measures for research in Chinese populations using a novel approach. Specifically, a bilingual sample of participants completed self-report measures of DSM-5 personality disorders and interpersonal problems in both English and Chinese and their associations were examined across languages. This is the first study to employ this approach to examine the validity of assessing personality disorders in Chinese samples using translated measures based on the DSM-5.

Translated Personality Disorder Assessment Instruments

To extend the recent review of personality disorder research in Asian cultures (Ryder et al., 2014), and respond to its call for increased research on personality disorders with Asian samples, L. Wu & Pincus (2015) reviewed the clinical instruments for assessment of personality disorders that are available in Mandarin Chinese versions. For high quality control, only articles that were published in peer-reviewed, English language journals were included in their review. The current existing personality assessment instruments were classified into interview and self-report formats, as well as omnibus and specific personality disorder or pathological trait instruments; and, the best available measures in Mandarin Chinese were identified.

Regarding English-language DSM-5 personality disorder assessment instruments, 3 diagnostic interviews and 2 self-report inventories have published Mandarin Chinese translations.¹ The Mandarin Chinese Version of Structured Clinical Interview for DSM-IV Axis II Personality Disorders (SCID-II) was developed by Shanghai Mental Health Center (Dai, Xiao, & Z. Wang, 2006) and is the most commonly used diagnostic interview in research with Chinese

¹ DSM-5 did not revise the criteria for personality disorders, thus instruments developed to assess DSM-IV personality disorders remain applicable.

participants (T. Zhang, Chow, L. Wang, Dai, & Xiao, 2012; T. Zhang et al., 2012; J. Huang et al., 2014; J. Huang et al., 2012; Ma et al., 2010; L. Wang et al., 2012). The Personality Disorder Interview for DSM-IV (PDI-IV) (J. Yang, McCrae, Costa, Yao, Dai, Cai, & Gao,2000; J. Yang, Bagby, Costa, Ryder, & Herbst, 2002) and the International Personality Disorder Examination (IPDE; Han & Xu, 1998) are also available in Mandarin Chinese, but not as widely used as the SCID-II in China. The Mandarin Chinese version of Personality Diagnostic Questionnaire – 4+ (PDQ-4+; J. Yang et al., 2000) is the most popular self-report instrument used in China and it has been employed in many studies with both clinical and non-clinical samples (e.g., H. Cheng, Y. Huang, B. Liu, & Z. Liu, 2010; T. Wang et al., 2012; T. Zhang et al., 2012). The Parker Personality Measure (PERM; W. Wang, Hu, Mu, D., Chen, Song... & He, 2003) is also available in Mandarin Chinese, but not commonly used.

There are also a few instruments available in Mandarin Chinese measuring specific personality disorders and pathological personality traits. The McLean Screening Instrument for Borderline Personality Disorder (MSI-BPD), translated by Y. Wang, F. Leung, & Zhong (2008), is a self-report screening scale specific for Borderline Personality Disorder. All the instruments available in Mandarin Chinese measuring pathological personality traits are self-report questionnaires, including two omnibus measures, two specific measures, and two relative measures. The two omnibus measures are the Dimensional Assessment of Personality Pathology-Basic Questionnaire (DAPP) translated by Zheng et al. in 2002, and Zuckerman-Kuhnman Personality Questionnaire (ZKPQ) translated by (Y. Wu, W. Wang, Du, Li, Jiang, Y. Wang, 2000). The two specific measures are the Pathological Narcissism Inventory (PNI; You, F. Leung, Lai, & Fu, 2013) specific for pathological narcissistic traits, and the Personality Belief Questionnaire (PBQ-OCPD; Ng, 2005) which was only translated for Obsessive Compulsive Personality Disorder traits. There are also two omnibus measurements relevant to pathological personality traits. The Chinese Personality Assessment Inventory-2 (CPAI-2; F. Cheung, K. Leung, Song, & J. Zhang, 2001)² was designed in both Chinese (Mandarin and Cantonese) and English, measuring an array of personality characteristics and clinical symptoms. The Chinese translation of the Inventory of Interpersonal Problem – Short Circumplex (IIP-SC; L. Wu, Roche, Dowgwillo, S. Wang, & Pincus, 2015) measures distress level associated with common interpersonal problems. The CPAI-2 and IIP-SC scales exhibit significant and theoretically meaningful associations with personality disorders (F. Cheung, S. Cheng, & F. Leung, 2008; Pincus & Wiggins, 1990; Wright, Pincus, Hopwood, Thomas, Markon, & Krueger, 2012).

Although these instruments were well translated and their psychometric properties and initial validity examined, a limitation of their validity evaluations is that all previous research that could be identified employed monolingual assessment (Mandarin Chinese translations) of personality disorders and external validity variables (e.g., Dai et al., 2006; J. Yang el al., 2000; You et al., 2013; L. Wu et al., 2015). Theoretically, this procedure examines the construct validity of scores on two Mandarin Chinese translations, but assumes the etic personality disorder construct assessed by the translated Mandarin Chinese measure has a similar definition and interpretive meaning in a different language and cultural context, which has not been tested. Yet, due to language and cultural differences, successful linguistic translation alone is not sufficient to establish the validity of a translated measure (Rode, 2005). Even with rigorous translation and back translation procedures, the Mandarin Chinese words that were translated from English might still be interpreted in a different way in the Chinese cultural context. Thus, researchers still need to develop ways to make such comparisons.

 $^{^2}$ Now referred to as the Cross-cultural Personality Inventory-2 (F. Cheung, van de Vijver, & Leong, 2011).

One novel way to extend the study of construct validity of scores on translated personality measures across cultures is to compare the nomological net of associations for both the translated measure and its original English measure derived from bilingual respondents. By using bilingual participants completing both translated Chinese measures and English measures, the impact of potential variability in linguistic interpretation across two languages can be more precisely evaluated. If nomological associations are consistent across translations, this helps to further establish the validity and utility of scores on a translated measure.

Current Study

The current study is the first research to recruit a Mandarin Chinese-English bilingual sample to compare assessment of personality disorders and interpersonal problems concurrently using both translated and original English instruments. By asking the bilingual individuals to complete the assessments in both English and Mandarin Chinese, potential variability in linguistic interpretation across two languages can be more precisely evaluated. The Inventory of Interpersonal Problems – Short Circumplex (IIP-SC; Hopwood, Pincus, DeMoor, & Koonce, 2008; Soldz, Budman, Demby, & Merry, 1995; Chinese IIP-SC; L. Wu et al., 2015) and the Personality Diagnostic Questionnaire – 4+ (PDQ-4+; Hyler, 1994; Chinese PDQ-4+; J. Yang et al., 2000) were selected to study whether or not the Western conceptualizations of personality disorders imply the same kinds of interpersonal dysfunction in a Chinese population. That is, are the DSM-5 personality disorders associated with similar interpersonal difficulties when they are assessed using the same instruments in both English and Mandarin Chinese in the same bilingual individuals?

Personality Disorders

The PDQ-4+ is one of the most commonly used self-report inventories for assessing personality disorders consistent with DSM-IV/5 criteria in both clinical and non-clinical Englishlanguage research (e.g., Abdin, Koh, Subramaniam, Guo, Leo, Teo, ... & Chong, 2011; Bagby & Farvolden, 2004; Davison, Leese, & Taylor, 2001; Hopwood, Donnellan, Ackerman, Thomas, Morey, & Skodol, 2013; Taylor, James, Bobadilla, & Reeves, 2008). There are also translations of the PDQ-4+ in other languages, such as Spanish (Calvo, Caseras, Gutierrez Ponce, & Torrubia, 2002) and Chinese (J. Yang et al., 2000). Since the Chinese PDQ-4+ is the most commonly used instrument in research on personality disorders in Chinese populations (L. Wu & Pincus, 2015), it was selected in the current study to assess DSM-5 personality disorders in order to map personality disorders onto the interpersonal problems circumplex (Wilson, Stroudt, & Durbin, 2017).

Interpersonal Problems

The IIP-SC is a 32-item short version of the 64-item Inventory of Interpersonal Problems-Circumplex (IIP-C; Alden, Wiggins, & Pincus, 1990). IIP-SC is a widely used selfreport measurement of subjective distress level from chronic interpersonal difficulties, including behavioral inhibition (behaviors I find hard to do) and behavioral excesses (behaviors I do too much) in social relationships, associated with interpersonal theory (Dawood, Dowgwillo, L. Wu, & Pincus, in press; Pincus & Ansell, 2013) and circumplex structure (Gurtman & Pincus, 2003). The circumplex model is a two-dimensional circular space commonly divided into eight octants for mapping interpersonal themes based on the underlying dimensions of Agency/Dominance and Communion/Affiliation (see Figure 1). The Agency/Dominance is related to dominancesubmission and the Communion/Affiliation is related to warmth-coldness. The IIP-SC is a commonly used clinical assessment instrument in English speaking countries, broadly used by researchers interested in areas of personality disorders in recent years (e.g., Hopwood et al., 2008; Pincus & Ansell, 2013; Pincus & Hopwood, 2012; Wright et al., 2012). There are also translations of the IIP-SC in other languages such as Dutch (Vanheule, Desment, & Rosseel, 2006), Spanish (Salazar, Marti, Soriano, Beltran, & Adam, 2010), and Mandarin Chinese (L. Wu et al., 2015).



Figure 1-1: The interpersonal problems circumplex (Wright et al., 2012).

Prior research found that individuals seeking psychotherapy often complain about having difficulties when relating to people in social interactions, and these difficulties were labeled "interpersonal problems" (Horowitz, 1979). The IIP-SC was designed to assess interpersonal problems in a manner that conforms to a circumplex model. Many researchers have suggested that personality disorders are fundamentally impairments in relations between self and other

(Skodal, 2012), and thus the IIP-SC should show significant and substantively meaningful patterns of the associations with personality disorders (Benjamin, 1993; Hopwood et al., 2013; Pincus & Gurtman, 2006). This perspective was evaluated in a recent meta-analytic review of interpersonal dysfunction in personality disorders covering 127 published and unpublished studies comprising 2,579 effect sizes over the past 20 years (Wilson, Stroudt, & Durbin, 2017). Their results indicated that 9 of the 10 DSM-5 personality disorders (excluding obsessivecompulsive personality disorder) exhibited unique and substantively meaningful circumplex patterns of associations with dysfunctional interpersonal traits. Specifically, paranoid, schizoid, and schizotypal personality disorders showed associations primarily with cold interpersonal traits. Avoidant personality disorder showed associations with both submissive and cold interpersonal traits. Antisocial, histrionic, and narcissistic personality disorders shoed associations with dominant interpersonal traits. Borderline personality disorder showed associations with all interpersonal traits except nonassertiveness and overnurturance. Dependent personality disorder also showed association with all interpersonal traits except dominance. These findings confirm that the DSM-5 personality disorders exhibit unique and meaningful profiles of interpersonal dysfunction, and support the choice of examining interpersonal circumplex profiles in the current study.

Thus, by collecting responses to both English and Chinese versions of the IIP-SC and the PDQ-4+ from bilingual participants, as well as knowing the relationship between personality disorders and interpersonal problems in North American samples from previous research, novel support for the cross-cultural validity of assessing DSM-5 personality disorders using translated measures was examined by comparing the patterns of associations between personality disorders and interpersonal problems in English and Chinese.

Chapter 2

Method

Participants

200 participants were recruited at a state university among the international student population, with 93 males and 107 females (Age Mean= 23.76 year old). Participants were required to speak English as second language with Mandarin Chinese as their native language. Participants were required to be international students who were born in China with at least 15 years of life experience in Mainland China before they came to the United States for further education. Each participant received \$10 after the study as compensation for their time.

Materials

The IIP-SC (Soldz et al., 1995) is a 32-itme self-report measure of distress level associated with common interpersonal problems. The Chinese version of the IIP-SC (L. Wu et al., 2015) was translated from English to Mandarin Chinese using rigorous back-translation procedures. All eight octants of the interpersonal problems circumplex are fully covered by four-item octant scales. Each item has a 5-point response option ranging from 0 (not at all) to 4 (extremely) measuring the distress participants have when experiencing common interpersonal problems in relationships. These include behavioral inhibitions (i.e., "It's hard for me to . . .") and behavioral excesses (i.e., "I do . . . too much"). Higher scores reflect greater distress level associated with each common interpersonal problem. The Chinese IIP-SC scales exhibit meaningful associations with the personality and psychopathology scales of the CPAI-2 (L. Wu et

al. 2015) and are sensitive to change in students transitioning from China to attend university in the United States (Qi, K. Wang, Pincus, & L. Wu, 2018).

The PDQ4+ (Hyler, 1994) is a 99-item, self-administered, true-false questionnaire for diagnosing the 12 personality disorders within the DSM-IV. The Chinese version of PDQ4+ (J. Yang et al., 2000) was translated from English to Mandarin Chinese using rigorous back-translation procedures. The Chinese version of PDQ-4+ made adaptations on 7 items of the original PDQ-4+ for the use in Chinese populations. They also created 8 new items as possible substitutes for the items that were considered culturally problematic, but they also kept the translated original items, resulting the Chinese version of PDQ-4+ has 107 items instead of the original 99 items. The full 107-item version of Chinese PDQ-4+ was assessed in the current study but scores were computed based only on the translated original items.

The English letter Verbal Fluency Test and the Chinese version of the Phoneme Verbal Fluency Test were selected to serve the function as language screening tests. The testing materials followed the instruction of Van Assche, Duyck, & Gollan (2013), using the letters F/A/S to be tested in English, and L/M/D to be tested in Mandarin Chinese. For English Verbal Fluency Test, participants were asked to come up words beginning with each letter in English as many as possible in 60 seconds. For Chinese Verbal Fluency Test, phoneme fluency instructions were given due to a lack of alphabetic script. Participants were asked to produce words beginning with each particular sound of the letters, which can form different syllables with different tones in Mandarin Chinese. R. Chan & E. Chen (2004) pointed out that phonemic fluency in Chinese may be more difficult than letter fluency in English, resulting low-educated or cognitive impaired participants having difficulties to complete the task. It helped to exclude the participants who didn't receive enough Mandarin Chinese education in China with a limited Chinese culture background. The Tails A and Trails B from the Halstead-Reitan Neuropsychological Test Battery (Reitan & Wolfson, 1993) were selected to measure visual processing and visuomotor tracking (Lezak, 1995). Especially Trails B, which is more sensitive to brain function, is more demanding than Trails A in terms of sequential cognitive abilities, motor speed, and visual search (Gaudino, Geisler, & Squires, 1995). After reviewing the Chinese translated Trails B (Lu & Bigler, 2000), the English version of Trails A and Trails B was selected for the current study. There are three reasons to not use the Chinese translated Trails B: 1) the Chinese version of Trails B doesn't not require switching between number and letter, since the Chinese version used Chinese characters of the number instead of letters; 2) Chinese pinyin has the same alphabet with English, which means Chinese speakers can still recognize English alphabet even if they don't speak English; 3) The participants are all bilingual, which means they can all understand English alphabet fluently.

Block Design is a subtest from the Wechsler Adult Intelligence Scale – IV (WAIS-IV; Wechsler, 1997). Block Design was not scored, only serving as an activity to fill in the break period.

Procedures

All participants completed the study in the testing room with a Mandarin-English bilingual research assistant. Research assistants greeted the participants and asked them to sign consent forms after going over the information together. Each participant was assigned to complete the IIP-SC and PDQ4+ in Mandarin Chinese and English in a counterbalanced order. Because English and Chinese questionnaires had the same items, a 15-minute break was provided to decrease the likelihood that participants were basing their answers off their prior responses. During the break, participants were asked to complete the Verbal Fluency test and Trails Making test. If participants completed the two tests in less than 15 minutes, they were asked to do Block Design tasks to ensure that all participants had the same break time. The Verbal Fluency test served as a language proficiency test for both Mandarin Chinese and English. the Verbal Fluency data was treated as dimensional scores, and participants with inadequate Chinese or English abilities were dropped if necessary. The Trials Making test was used as a filler test to make sure that all the participants have the same break time in between English and Chinese questionnaires. The Block Design was used as a filler test and there is no data collection.

Research assistants then would lead participants to the computer to start the first questionnaire, which was English or Chinese IIP-SC and PDQ4+ assigned with a counterbalanced schedule. Research assistants provided participants their I.D. number and stayed in the room in order to answer questions. It took about 20 minutes to complete the questionnaires. After participants completed the questionnaires, research assistants started to time the 15-minute break. Participants were asked to complete both English and Chinese Verbal Fluency tests on computer, following the randomly assigned language order. It took about 8 minutes to complete the test, including 6 minutes of testing and 2 minutes of standard English instruction on screen with Chinese verbal explanation by research assistants. When participants were performing Verbal Fluency test, research assistants stayed outside of the testing room to allow participants to perform it alone in order to avoid causing embarrassment. After participants finished the task, they were asked to get the research assistants outside. Then, research assistant then led participants to the testing desk to complete Trail Making test in paper and pen. It took about 3 minutes to complete the test including standard English instruction on paper and Chinese verbal explanation by research assistants. Depending upon the time remaining from the total 15 minutes, participants would be asked to perform Block Design tasks to fill in the 15 minutes interrupting break. If there was no time left after completing Verbal Fluency and Trail Making tests, Block Design task was skipped. Research assistants provided Chinese verbal explanation to Block Design tasks, but they did not collect data for it. After the 15-minute break, the research assistant

led participants back to the computer to complete the second questionnaire, which was IIP-SC and PDQ4+ in the other language. Again, the research assistant provided them their I.D. number and stayed in the room to assist them if necessary. It also took about 20 minutes to complete the questionnaire. After completing the second questionnaire, participants were informed that their participation is finished and much appreciated. Participants were asked to sign a receipt in order to receive \$10 compensation to their time.

Analyses

Two steps of data analysis were used to compare English and Chinese assessments of the IIP-SC and PDQ-4+. Step 1 of data analysis used the well-established structural summary method for circumplex data (SSM; Gurtman, 1992; Gurtman & Pincus, 2003; Wright, Pincus, Conroy, & Hilsenroth, 2009). PDQ-4+ scales were correlated with each IIP-SC octant scale in their matching language, leaving a Chinese 8-point profile and an English 8-point profile (see Figure 2-1). The SSM fitted the profile of correlations across circumplex octants to a cosine curve to quantitatively evaluate PDQ-4+ personality disorders as external scales. Within the framework of the interpersonal circumplex, profiles of correlations were summarized by 4 parameters (and 3 confidence intervals), which include Amplitude, Angular displacement, Elevation, and Prototypicality—R² (Trucco, Wright, & Colder, 2013). Amplitude reflects how distinct a profile is by showing the differentiation of a scale's correlations across the eight interpersonal octants. Angular displacement referred to the location where the curve peaks in two-dimensional circumplex space, reflecting its primary interpersonal theme. Elevation is the average correlation across octants, a standardized score measuring general interpersonal distress level. R² indicated how well a perfect cosine curve fits the profile of correlations between PDQ-4+ scales and the octant scores, e.g., its prototypicality. Among the 4 SSM parameters, Amplitude and Angular

displacement are interpreted when R^2 is interpretable (.80 indicates good fit to a cosine curve while .70 indicates acceptable fit—Zimmermann & Wright, 2017), and Elevation is interpreted regardless of the value of R^2 . There were 10 English and 10 Chinese PDQ-4+ personality disorder interpresonal profiles generated using the SSM.



Figure **2-1**: Illustration of the cosine curve parameters associated with the structural summary method for circumplex data (Trucco et al., 2013).

In Step 2, the English SSM parameters with Chinese SSM parameters for each personality disorder scale were compared for convergences and divergences using a recently developed bootstrapping procedure to compute circular confidence intervals for SSM parameters (Zimmerman & Wright, 2017). Specifically, Chinese language and English language interpersonal profiles for a specific personality disorder were statistically compared by creating bootstrapped circular CIs around structural summary parameters and bootstrapped CIs on the parameter differences across languages using syntax developed for the R statistical platform (Zimmermann & Wright, 2017; see also Dowgwillo & Pincus, 2017; Dowgwillo, Roche, & Pincus, 2018; Williams & Simms, 2016; Williams, Thomas, Donnellan, & Hopwood, 2014). The bootstrapping methodology is used to determine whether the SSM parameters from Englishlanguage profiles and the SSM parameters from Chinese-language profiles were significantly different from each other or not. By using the resampling procedure to create confidence intervals around SSM parameter differences, the English profiles and Chinese profiles were statistically compared to provide a more rigorous examination of possible differences. Steps 1 and 2 together provided a novel approach to examining how well the translated Chinese personality instruments (PDQ-4+ &IIP-SC) assess the same constructs as the original English instruments, expanding the evidence for cross-cultural validity and generalizability of their scores.

Steps 1 and 2 were then repeated, controlling for Verbal Fluency scores. This was done by computing the interpersonal profiles with partial correlations between PDQ-4+ scales and each IIP-SC octant scale. If results change, it would indicate that language proficiency has a significant impact on the results.

Interpretation Guideline

For interpreting SSM parameters, although clear guidelines for interpreting elevation and amplitude are lacking, heuristic cutoffs of \geq |.15| (Wright et al, 2012), \geq |.14| (L. Wu, Roche, Dowgwillo, S. Wang, & Pincus, 2015), and \geq |.10| (Williams & Simms, 2016) have been have been proposed as constituting an elevated and/or differentiated profile. In the current study, we adopted the more liberal \geq |.10| cut off for interpreting elevation and amplitude (with .10 to .19 considered small, .20 to 29 considered moderate, and .30+ considered large). The cut off for R² was .70 (Dowgwillo et al., 2017; Williams & Simms, 2016; Williams et al., 2014; Wright et al., 2009). For interpreting confidence intervals, the cutoff for probability was .5, meaning that the confidence intervals of amplitude and angular displacement (degree) were interpretable when the probability was higher than .5 (Zimmermann & Wright, 2017; Dowgwillo & Pincus, 2017; Dowgwillo et al., 2018).

Hypotheses

The hypotheses of the current study were:

 Most personality disorder profiles would exhibit prototypical interpersonal problems profiles and their SSM parameters would be consistent with recent meta-analytic findings (Wilson et al., 2017).

2) Most personality disorder profiles would be similar across language, which means confidence intervals of most English profile and Chinese profile would overlap with each other. Thus, confidence intervals for language difference would contain zero, indicating language effects are minimal between English and Chinese personality disorder profiles.

3) Some personality disorders might have distinct profiles in Chinese language inventories compared to English language inventories, which means confidence intervals for language difference would not contain zero, indicating language effects might exist for those specific personality disorder profiles. For example, Dependent Personality Disorder might have distinct profiles in Chinese language because Chinese people might have a different standard for dependency due to the collectivistic culture, resulting the threshold of Dependent Personality Disorder being different. Another potential distinct profile might be Narcissistic Personality Disorder, since Chinese people might not consider narcissism as a personality problem given that Narcissistic Personality Disorder is not in the CCMD-3.

Chapter 3

Results

The SSM parameters and circular confidence intervals for all personality disorders assessed in both Chinese and English are presented in Table **3-1**, and the confidence intervals around the Chinese language and English language difference scores are presented in Table **3-2**. For each personality disorder, the SSM profile is described, followed by cross-language profile comparisons.

	Elevation	Amplitude	Angular Location	R2	Probability	Ν
Paranoid PD E	0.23	0.12	133.53°	0.47	0.63	191
-	[.15, .32]	[.05, .20]	[102.56°, 173.43°]			
Paranoid PD C	0.23	0.12	112.44°	0.56	0.84	192
	[.14, .30]	[.06, .22]	[69.99°, 145.23°]			
Schizoid PD E	0.22	0.18	182.37°	0.72	1.00	191
	[.11, .31]	[.11, .27]	[156.85°, 211.90°]			
Schizoid PD C	0.19	0.22	181.12°	0.84	1.00	192
	[.09, .28]	[.13, .31]	[163.99°, 210.19°]			
Schizotypal PD E	0.22	0.14	171.84°	0.82	0.95	191
	[.15, .33]	[.07, .23]	[137.67°, 193.40°]			
Schizotypal PD C	0.16	0.12	185.5°	0.83	0.83	192
	[.06, .23]	[.05, .21]	[155.56°, 236.05°]			
Antisocial PD E	0.16	0.12	93.67°	0.93	0.90	191
	[.06, .26]	[.06, .20]	[49.09°, 131.11°]			
Antisocial PD C	0.19	0.14	103.58°	0.91	0.93	192
	[.09, .26]	[.07, .21]	[61.06°, 133.86°]			
Borderline PD E	0.30	0.11	43.24°	0.87	0.61	191
	[.21, .37]	[.06, .18]	[358.24°, 80.84°]			
Borderline PD C	0.27	0.08	53.21°	0.70	0.37	192
	[.18, .35]	[.03, .16]	[350.38°, 104.82°]			
Histrionic PD E	0.25	0.16	23.18°	0.77	1.00	191
	[.16, .32]	[.11, .24]	[357.38°, 43.66°]			
Histrionic PD C	0.15	0.22	20.65°	0.84	1.00	192

Table **3-1**: SSM parameters with confidence intervals.

	[.05, .22]	[.16, .30]	[.98°, 41.35°]			
Narcissistic PD E	0.34	0.07	69.29°	0.61	0.51	191
	[.26, .41]	[.03, .15]	[14.30°, 121.01°]			
Narcissistic PD C	0.24	0.10	59.28°	0.91	0.60	192
	[.15, .31]	[.05, .17]	[17.36°, 106,55°]			
Avoidant PD E	0.38	0.12	259.24°	0.83	0.83	191
	[.31, .44]	[.05, .20]	[215.38°, 297.64°]			
Avoidant PD C	0.35	0.14	271.04°	0.92	0.97	192
	[.28, .42]	[.09, .23]	[241.38°, 304.65°]			
Dependent PD E	0.38	0.16	325.76°	0.83	0.96	191
	[.32, .45]	[.09, .23]	303.37°, 351.69°]			
Dependent PD C	0.34	0.18	331.13°	0.90	0.99	192
	[.25, .40]	[.12, .27]	[307.67°, 353.24°]			
Obsessive Compulsive PD E	0.25	0.03	319.46°	0.19	0.08	191
	[.16, .32]	[.01, .11]	[174.10°, 141.38°]			
Obsessive Compulsive PD C	0.27	0.05	300.67°	0.41	0.19	192
	[.19, .34]	[.01, .14]	[175.87°, 45.22°]			

 Table 3-2:
 Cross-language differences in SSM parameters with confidence intervals.

	Elevation	Amplitude	Angular Location
Paranoid PD	.1	01	-22.2°
	[1, .13]	[11, .09]	[-80.3°, 25.7°]
Schizoid PD	.02	04	08°
	[12, .16]	[15, .09]	[-43.7°, 39.1°]
Schizotypal PD	.09	.02	25.2°
	[4, .22]	[09, .13]	[-21.6°, 78.3°]
Antisocial PD	01	01	7.5°
	[14, .11]	[12, .10]	[-49.9°, 64.1°]
Histrionic PD	.10	05	1.1°
	[02, .22]	[14, .04]	[-30.2°, 30.9°]
Narcissistic PD	0.10	01	-10.1°
	[0, .21]	[10, .06]	[-79.7°, 65.2°]
Avoidant PD	0.02	04	12.5°
	[07, .12]	[14, .06]	[-38.7°, 67.4°]
Dependent PD	0.06	-0.03	4.5°
	[04, .16]	[14, .07]	[-70.4°, 38.0°]

For Paranoid Personality Disorder (Figure **3-1**), both the English and Chinese profile peaked in the BC octant (133.53°, 112.44°), with moderate elevation of .23 and a small amplitude of .12. R² values below .70 suggested profile complexity. However, examination of Figure **3-1** indicates the profiles are clearly reflecting problems of hostile-dominance, consistent with the angular location of each profile. Both English and Chinese language confidence intervals were interpretable. Figure **3-2** presents the confidence intervals of Paranoid Personality Disorder in both Chinese language (color red) and English language (color blue), which were overlapping each other, and all parameter difference confidence intervals contain zero (Table **3-2**).



Figure 3-1: SSM profile figure for Paranoid Personality Disorder.





For Schizoid Personality Disorder (Figure **3-3**), both the English and Chinese profile peaked in the DE octant (182.37°, 181.12°), with small to moderate elevations (.19, .22) and amplitudes (.18, .22). R² values indicated prototypical profiles. Both English and Chinese language confidence intervals were interpretable. Figure **3-4** presents the confidence intervals of Schizoid Personality Disorder in both Chinese language (color red) and English language (color blue), which were overlapping each other, and all parameter difference confidence intervals contain zero (Table **3-2**).



Figure 3-3: SSM profile figure for Schizoid Personality Disorder.



Figure 3-4: Confidence interval figure for Schizoid Personality Disorder.

For Schizotypal Personality Disorder (Figure **3-5**), both the English and Chinese profile peaked in the DE octant (171.84°, 185.50°) with small to moderate elevations (.16, .22) and small

amplitudes (.12, .14). R² values indicated prototypical profiles. Both English and Chinese language confidence intervals were interpretable. Figure **3-6** presents the confidence intervals of Schizotypal Personality Disorder in both Chinese language (color red) and English language (color blue), which were overlapping each other, and all parameter difference confidence intervals contain zero (Table **3-2**).



Figure 3-5: SSM profile figure for Schizotypal Personality Disorder.





For Antisocial Personality Disorder (Figure **3-7**), both the English and Chinese profile peaked in the PA octant (93.67°, 103.58°), with small elevations (.16, .19) and amplitudes (.12, .14). R² values indicated prototypical profiles. Both English and Chinese language confidence intervals were interpretable. Figure **3-8** presents the confidence intervals of Antisocial Personality Disorder in both Chinese language (color red) and English language (color blue), which were overlapping each other, and all parameter difference confidence intervals contain zero (Table **3-2**).



Figure 3-7: SSM profile figure for Antisocial Personality Disorder.



Figure **3-8**: Confidence interval figure for Antisocial Personality Disorder.

For Borderline Personality Disorder (Figure **3-9**), both the English and Chinese profile peaked in the NO octant (43.24°, 53.21°), with moderate to high elevations (.27, .30) but low to negligible amplitudes (.08, .11). R² values indicated prototypical profiles. Probability values indicated that only English language profile confidence interval could be interpreted. Thus, only English language profile alone is not sufficient to make cross-language profile comparisons.





For Histrionic Personality Disorder (Figure **3-10**), both the English and Chinese profiles peaked at the border of the LM and NO octants (20.65°, 23.18°), with small to moderate elevations (.15, .25) and small to moderate amplitudes (.16, .22). R² values indicated prototypical profiles. Both English and Chinese language confidence intervals were interpretable. Figure **3-11** presents the confidence intervals of Histrionic Personality Disorder in both Chinese language (color red) and English language (color blue), which were overlapping each other, and all parameter difference confidence intervals contain zero (Table **3-2**).



Figure **3-10**: SSM profile figure for Histrionic Personality Disorder.





For Narcissistic Personality Disorder (Figure **3-12**), both the English and Chinese profiles peaked at the border of the NO and PA octants (59.28°, 69.29°), with moderate to large elevations

(.24, .34) but low to negligible amplitudes .07, .10). The R² value for the English language profile indicated complexity (.61) while the R² value for the Chinese language profile was highly prototypical (.91). Both English and Chinese language confidence intervals were interpretable. Figure **3-13** presents the confidence intervals of Narcissistic Personality Disorder in both Chinese language (color red) and English language (color blue), which were overlapping each other, and all parameter difference confidence intervals contain zero (Table **3-2**).



Figure 3-12: SSM profile figure for Narcissistic Personality Disorder.





For Avoidant Personality Disorder (Figure **3-14**), both the English and Chinese profile peaked at HI octant (259.24°, 271.04°), with large elevations (.35, .38) and small amplitudes (.12, .14). R² values indicated prototypical profiles. Both English and Chinese language confidence intervals were interpretable. Figure **3-15** presented the confidence intervals of Avoidant Personality Disorder in both Chinese language (color red) and English language (color blue), which were overlapping each other, and all parameter difference confidence intervals contain zero (Table **3-2**).



Figure **3-14**: SSM profile figure for Avoidant Personality Disorder.





For Dependent Personality Disorder (Figure **3-16**), both the English and Chinese profiles peaked at border of JK octant and LM octants (325.76°, 331.13°), with large elevations (.34, .38)

and small amplitudes (.16. .18). R² values indicated prototypical profiles. Both English and Chinese language confidence intervals were interpretable. Figure **3-17** presented the confidence intervals of Dependent Personality Disorder in both Chinese language (color red) and English language (color blue), which were overlapping each other, and all parameter difference confidence intervals contain zero (Table **3-2**).



Figure 3-16: SSM profile figure for Borderline Personality Disorder.





For Obsessive Compulsive Personality Disorder (Figure **3-18**), only elevation from both English profile and Chinese profile was interpretable, with all the other parameters and confidence interval probabilities below threshold for interpretation. No cross-language profile comparison can be made.



Figure **3-18**: SSM profile figure for Borderline Personality Disorder.

After controlling for Verbal Fluency scores via partial correlation, the results remained the same for all the ten personality disorders. Thus, language proficiency did not influence the results in the current study.

Chapter 4

Discussion

The results from the current study provided promising evidence that using translated Western measures in Chinese populations is valid in terms of assessing DSM-5 personality disorders and interpersonal difficulties, as all specific personality disorder profiles were similar across Chinese and English language administrations within the same person. In a sample of bilingual participants, all the interpretable circular confidence intervals overlapped across English and Chinese languages within person and all the cross-language difference confidence intervals contained zero. This suggests that language effects are minimal when assessing DSM-5 personality disorders and interpersonal difficulties with well translated Western personality measures, despite the language and culture differences between the United States and China. Most broadly, the bilingual respondents appeared to provide very similar endorsements of personality disorder symptoms and interpersonal problems across languages.

Moreover, the substantive results are generally consistent with recent meta-analyses (Wilson et al., 2017) examining interpersonal profiles of personality disorders. The interpersonal profiles generated in the current study for all personality disorders except borderline and dependent were consistent with meta-analytic profiles. In the current study, borderline personality disorder did not exhibit a prototypical profile whereas it did in the meta-analysis. In contrast, dependent personality disorder exhibited a prototypical profile in the current study but did not in the meta-analysis. Finally, in both the current study and the meta-analysis, obsessive-compulsive personality disorder did not exhibit a distinct interpersonal profile.

In this bilingual sample, whether assessed in Chinese or English, Paranoid, Schizoid, and Schizotypal Personality Disorders were associated with cold interpersonal problems; Antisocial and Narcissistic Personality Disorders were with domineering interpersonal problems; Histrionic Personality Disorder was associated with overly-warm interpersonal problems; Avoidant Personality Disorder was associated with cold submissive interpersonal problems; and Dependent Personality Disorder was associated with warm submissive interpersonal problems. Borderline and Obsessive-Compulsive Personality Disorders did not exhibit distinct interpersonal themes but were associated with moderate to high general interpersonal distress (elevation).

Implications and Future Directions

Given the consistency of the interpersonal profiles across languages for each personality disorder, it appears that well translated Western measures of DSM-5 personality disorders are applicable in Chinese populations despite distinct languages and cultural norms. T. Zhang et al. (2012) compared Personality Disorder diagnosis in Chinese population using DSM-IV and CCMD-3 with 3,075 outpatient participants, showing that Personality Disorders were easily overlooked when the diagnosis was made based on the CCMD-3 rather than DSM-IV, suggesting that moving from CCMD-3 towards DSM system may be important. Given the evidence of the current study that Chinese translations of DSM-5 personality measures provided similar assessment results in a bilingual Chinese sample, it seems unnecessary to design Chinese personality disorder inventories for CCMD-3. Personality disorder assessment could be accomplished using well translated DSM-5 personality disorder inventories. Unifying practice and research in China may be best served by adopting DSM personality disorder nosology and employing high quality translations for both clinical and research purposes.

The current study provides a novel approach to examining the cross-cultural validity and utility of personality assessment in Chinese populations, and extends the evidence for assessment of DSM-5 personality disorders specifically. Given increasing scientific and clinical interest in extending Western personality assessment measures and methods to Chinese populations (L. Wang & Xiao, 2012; T. Zhang et al, 2012; T. Zhang et al., 2015; Zhu, Zhang, Yang, Wei, Xu, Wang...Wang, 2017), this approach may be of use in assessment of psychiatric symptoms and normal personality traits as well.

Since the results of current study indicated similarity between English and Chinese profiles, a 3rd step can be taken to further examine the validity of using translated Chinese personality assessments in Chinese populations. Step 3 would be a repeat of Step 1 and Step 2, but mapping Chinese PDQ-4+ scales onto English IIP-SC octants, and English PDQ-4+ scales onto Chinese IIP-SC octants. By crossing the language, further inferences regarding the generalizability of the translated personality disorder constructs can be drawn.

Another future direction is to consider the acculturation level of the participants. Since the participants were all international students studying in the United States, the duration they stayed in the United States/China and the degree of Westernization might influence how they responded in the two different languages. Analyzing acculturation level as a moderator could provide further evidence on how language impacts the association between interpersonal difficulties and personality disorder among bilingual speakers (see also Qi et al., 2018).

Moreover, it might be worthwhile to separate the sample size by gender and evaluate the difference between English assessment and Chinese assessment for females and males separately. There is some evidence to suggest gender differences in interpersonal problems in a comparison of American females and Chinese females, as American females scored higher than American males on the overly nurturant (LM), exploitable (JK), nonassertive (HI) problems, but there was no gender difference in Chinese college students. This suggests that American females reported being more distressed about their warm and submissive behavior than Chinese females. Thus, by analyzing females only, there might have some differences shown which were not apparent when

combining the genders together. However, the bootstrapping method used in the present study requires larger samples for such gender comparisons to be examined.

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