

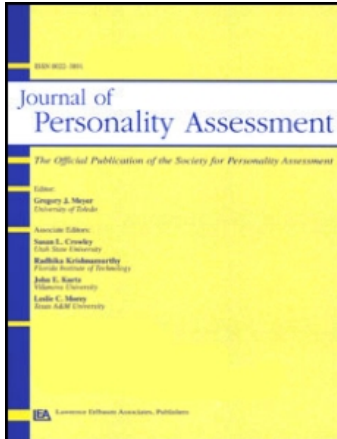
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## Journal of Personality Assessment

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t775653663>

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Online publication date: 10 June 2010

**To cite this Article** Cheung, Fanny M. , Cheung, Shu-fai and Zhang, Jianxin(2010) 'Convergent Validity of the Chinese Personality Assessment Inventory and the Minnesota Multiphasic Personality Inventory-2: Preliminary Findings With a Normative Sample', Journal of Personality Assessment, 82: 1, 92 – 103

**To link to this Article:** DOI: 10.1207/s15327752jpa8201\_14

**URL:** [http://dx.doi.org/10.1207/s15327752jpa8201\\_14](http://dx.doi.org/10.1207/s15327752jpa8201_14)

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# Convergent Validity of the Chinese Personality Assessment Inventory and the Minnesota Multiphasic Personality Inventory–2: Preliminary Findings With a Normative Sample

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We examined the convergent validity of the Chinese Personality Assessment Inventory (CPAI; Cheung, Leung, et al., 1996), an indigenously constructed measure, by comparing its patterns of correlations with the MMPI–2 (Butcher et al., 2001). A valid sample of 147 Chinese students took both the CPAI and the MMPI–2. Results provide preliminary support for the convergence between most of the CPAI clinical scales and the relevant MMPI–2 scales. The CPAI personality scales further illustrated the patterns of personality features associated with the MMPI–2 scales in a Chinese cultural context. We discuss discrepancies in the correspondence between a number of CPAI and MMPI–2 clinical scales.

A major task of clinical psychologists in Chinese societies involves psychological assessment. The need for Chinese-language clinical assessment tools has led to the widespread use of translated instruments from the West (Cheung, 1996). One of the advantages of translating and adapting well-established instruments is the possibility of tapping the wealth of evidence accumulated to support the conceptual and psychometric properties of these instruments (Cheung, 1985). An important example is the Chinese Minnesota Multiphasic Personality Inventory and its revised versions, MMPI–2 and MMPI–A (Cheung, 1985, 1995; Cheung & Ho, 1997; Cheung, Song, & Zhang, 1996; Cheung, Zhang, & Song, 2003). Like other international adaptations, studies of the Chinese MMPI and the MMPI–2 confirmed that similar patients from different nations produced similar profiles (Butcher, 1996; Cheung & Song, 1989; Cheung, Zhao, & Wu, 1992). Interpretations based on MMPI and MMPI–2 research data generally could be applied cross-culturally.

Although the MMPI was found to be clinically valid in the Chinese culture, caution has to be exercised in interpreting test scores when there are significant cultural differences in score elevations of the different normative samples. For example, Scales 2 (Depression) and 8 (Schizophrenia) on the

Chinese MMPI and MMPI–2 were consistently found to be elevated among normative samples in China and Hong Kong when the American norms were used (Cheung, 1985, 1995; Cheung, Song, et al., 1996).

One of the most important deficiencies of translated tests is the failure to include culturally relevant or emic constructs that are important to the local culture (Cheung & Cheung, 2003). Are the personality constructs covered in translated tests meaningful to the local people? Do translated instruments sufficiently tap the range of personality constructs that are meaningful and useful to the local people? Cross-cultural psychologists who work outside of the dominant Western culture are increasingly raising these questions. With the rapid development of psychology in other parts of the world, indigenous instruments have been constructed to address these cross-cultural concerns. The development of indigenous measures often involves a combined etic–emic approach that incorporates culturally universal as well as culture-specific constructs (Church & Katigbak, 1988). It is important for indigenous instruments to address personality characteristics that are both meaningful locally but also comparable cross-culturally. The Chinese Personality Assessment Inventory (CPAI; Cheung,

Leung, et al., 1996) was developed in such an approach to provide an indigenous instrument covering personality characteristics for normal as well as diagnostic assessment of the Chinese people.

### CPAI

The CPAI was developed as a collaborative project between psychologists in Hong Kong and China. It includes scales to assess normal personality as well as clinical personality features. For the normal personality scales, the personality constructs were derived from person descriptions used in a wide range of daily life experiences. For the clinically based personality constructs, references were made to the clinical experiences of local mental health professionals and the previous applications of translated tests like the MMPI. Large-scale studies were conducted to select the items for each scale. The detailed steps in the construction of the CPAI may be found in Cheung, Leung, et al. (1996) and Cheung et al. (2001).

The CPAI was standardized on a representative sample of 2,444 Chinese respondents aged 18 to 65 from different regions in China and Hong Kong. The samples from China ( $n = 1,998$ ) were based on a quota sample from seven major regions in China, and the Hong Kong sample ( $n = 446$ ) was based on random sampling from a territory-wide household survey. Standardized scores similar to the uniform T score of the MMPI-2 (Tellegen & Ben-Porath, 1992) were developed using this normative sample (Yung et al., 2000). Separate norms were developed for men and women because gender differences were found on many of the scales.

A number of CPAI personality and clinical scales were developed based on constructs that were considered to be particularly relevant to the Chinese culture but have not been covered in other personality instruments. Factor analysis of the CPAI extracted four personality factors and two clinical factors. The four principal component factors for the personality scales were Dependability, Interpersonal Relatedness (IR), Social Potency, and Individualism. The two clinical factors were Emotional Problems and Behavioral Problems (see Cheung, Leung, et al., 1996; Cheung et al., 2001).

Whereas many of the CPAI personality scales overlap with universal constructs covered by Western tests, some of the indigenously derived scales are particularly relevant to the Chinese culture. The scales of the CPAI may not be totally subsumed under the Five-factor model of personality (FFM), the personality theory that is most dominant in Western psychology currently (Goldberg, 1990; McCrae & Costa, 1997). The FFM claimed that personality could be universally subsumed under five major dimensions. However, in a joint factor analysis between the CPAI and the NEO-Personality Inventory-Revised (Costa & McCrae, 1992), the major measure of the FFM, it was found that the IR factor was unique to the CPAI and did not load on any of the FFM facets (Cheung et al., 2001).

The IR factor consists of scales that are indigenously derived for the Chinese culture, including Harmony, Face, and Ren Qing (Relationship Orientation). It adds predictive value beyond those contributed by the FFM dimensions in predicting a variety of Chinese social behavior including filial piety, trust, persuasion tactics, and group communication styles (Cheung et al., 2001).

Examination of the relationships among the CPAI personality and clinical scales in the standardization study showed that the Dependability factor from the normal personality scales was, as expected, the most significant predictor of the clinical scales. However, the indigenous IR factor also explained additional variance when predicting three specific clinical scales in the standardization sample of 2,444 respondents. Among the four CPAI personality factors, high IR and Individualism and low Dependability and Social Potency predicted the participants' scores on the Somatization, Depression, and Antisocial Behavior scales (Cheung, Gan, & Lo, in press).

The clinical scales of the CPAI were designed to assess common forms of psychopathology found among Chinese psychiatric patients. These clinical scales tap symptoms that are universal but may be manifested in culturally specific contexts. Analyses of the results from the CPAI standardization study showed that all of the CPAI clinical scales were negatively correlated with general and specific indexes of life satisfaction. However, to establish the convergent validity of the CPAI, their correlations with another conventional clinical assessment measure should be examined.

One of the most commonly used objective personality tests in clinical settings in the MMPI-2 (Butcher et al., 2001). The MMPI-2 has been translated into Chinese (Butcher, Cheung, & Lim, 2003; Cheung, Zhang, & Song, 2003). Together with its predecessor, the Chinese MMPI, they are also the personality tests most frequently used by clinical psychologists in Hong Kong and China (Cheung, 1996). Studies of the Chinese MMPI and the MMPI-2 in China and Hong Kong have shown that the tests are useful and valid for clinical assessment (Cheung & Song, 1989; Cheung, Song, et al., 1996; Cheung, Zhao, & Wu, 1992; Kwan, 1999). In this study, we examined the convergent validity of the CPAI by comparing the pattern of correlations between the clinical and relevant personality scales of the CPAI and the MMPI-2 scales. The CPAI clinical scales cover similar forms of psychopathology as the MMPI-2 clinical and content scales. It is expected that scales assessing similar forms of psychopathology will be positively correlated.

## METHOD

### Participants

The sample consists of university students from Hong Kong and Southern China. The Hong Kong subgroup consists of

students enrolled in an undergraduate psychology course in a university in Hong Kong. They participated in the study as a class project to learn about objective personality tests. The subgroup of students from Mainland China was enrolled in an undergraduate psychology course in a university in Southern China. They were recruited to take the CPAI and the MMPI-2 on a voluntary basis to learn about psychological assessment. Consent was obtained from all the participants to use their test data for the study. To screen out invalid protocols on the CPAI, cases with more than 30 items left unanswered, those with their Response Consistency Index less than 4 out of a total score of 8, or a raw score of 5 and above on the Infrequency scale were deleted. Eight cases were discarded by the preceding CPAI criteria. For the MMPI-2, the criteria for deleting invalid cases followed the guidelines from the manual (Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989): a raw score over 13 on the Variable Response Inconsistency scale (VRIN) or a raw score below 6 and over 13 on the True Response Inconsistency scale (TRIN). An additional invalidation criterion was based on previous studies on the Chinese MMPI in which cases with a raw score over 10 on the 15-item Chinese Infrequency scale (Cheung, Song, & Butcher, 1991) were discarded. Twenty-seven cases were discarded by these MMPI criteria. The total number of cases discarded was 32, including 3 cases that were discarded by both CPAI and MMPI criteria.

The final sample consisted of 118 participants, including 32 men and 44 women from Hong Kong, and 20 men and 22 women from China. The mean age was 21.8 years ( $SD = 2.5$ ) for the Hong Kong subgroup and 20.3 years ( $SD = 2.0$ ) for the Southern China subgroup, respectively. All of the students were unmarried. We combined the two subgroups to form a larger sample for several reasons: The regional and ethnic background of the sample was similar, with the dominant provincial origin of Chinese residents in Hong Kong coming from Southern China. Previous studies with the CPAI and the MMPI (Cheung, Leung, et al., 1996; Cheung, Song, et al., 1996) showed that the pattern of results obtained from Hong Kong and Mainland Chinese participants were very comparable. The same Chinese norms for both the CPAI and MMPI-2 were applicable to ethnic Chinese in Mainland China and Hong Kong. Preliminary analyses showed that the patterns of the correlations of the two samples in this study were highly similar.

## Measures

**CPAI.** The CPAI consists of 22 personality scales for assessing normal personality traits, 12 clinical scales for assessing personality characteristics associated with psychopathology (including 1 that is double listed as a personality scale), and three validity indexes, with a total of 510 items (Cheung, Leung, et al., 1996). There are about 15 items on each scale. The items consist of self-descriptions of behavior to be answered in a true-false format. The average

Cronbach's alpha coefficient for the personality scales is .69 for the Chinese normative sample and .70 for the Hong Kong normative sample; that for the clinical scales is .75 and .78, respectively (Cheung et al., 2001). As researchers in Hong Kong and China developed the CPAI jointly, the items in the versions used in both locations were identical. In conformance with the local form of Chinese writing, complex Chinese characters were printed in the Hong Kong version and simplified Chinese characters were printed in the Mainland China version.

**MMPI-2.** The MMPI-2 (Butcher et al., 2001) has 567 items and consists of 5 validity scales, 10 clinical scales and 15 content scales. It has been translated into Chinese, and large-scale studies have been conducted in both China and Hong Kong (Cheung, Song, et al., 1996; Cheung, Zhang, et al., 2003). The reliability and validity of the Chinese MMPI-2 and its predecessor, the Chinese MMPI, have been established in previous studies (Cheung & Song, 1989; Cheung, Song, et al., 1996; Cheung, Zhao, & Wu, 1992). The response choice for the MMPI-2 is also a true-false format. The Chinese version of the MMPI-2 used in Hong Kong was the same as that used in Mainland China, with the exception that complex Chinese characters were printed in the version used in Hong Kong, and simplified Chinese characters were printed in the version used in Mainland China.

## Procedure

The participants took the CPAI and the MMPI-2 in a small classroom setting in two separate sittings without a time limit. They were debriefed on the general descriptions of the two tests and the purpose of the study after their participation.

We converted the individual participants' raw scores on the CPAI clinical and personality scales into standard scores using the Chinese norms derived from the standardization sample (Yung et al., 2000). We also converted their raw scores on the MMPI-2 clinical scales, content scales, and five supplementary scales (Welsh Anxiety, Welsh Depression, MacAndrew Alcoholism, Addiction Admission, Addiction Potential, and the Personality Psychopathology Five [PSY-5; Harkness, McNulty, & Ben-Porath, 1995] Scales) into T scores using the U.S. norms. To explore the relationship among these scales, we compared the standard scores of the CPAI scales with the T scores of the MMPI-2 scales using Pearson correlation analysis with two-tailed tests of significance.

## RESULTS

The correlation matrices between the 12 CPAI clinical scales and the MMPI-2 clinical and content scales are presented in

**TABLE 1**  
**Correlation Matrix Among MMPI-2 Clinical and Validity Scales and CPAI Clinical Scales**

	CPAI Clinical Scales											
	I-S	SOM	DEP	PHY	ANT	ANX	SEX	DIS	PAR	NEE	HYP	PAT
MMPI-2 Clinical Scales												
Hs	.24**	.27**	.35**	.65**	.20*	.25**	.06	.24**	.18	.16	.03	.10
D	.52**	.28**	.56**	.48**	.29**	.48**	.23*	.30**	.32**	.14	.01	.06
Hy	-.06	.02	.17	.49**	-.05	.03	-.07	.08	-.03	-.09	-.14	-.01
Pd	.33**	.21*	.44**	.48**	.39**	.35**	.06	.21*	.29**	.23*	.14	.11
Mf	.08	.09	.05	.03	-.03	.05	.08	.03	.07	.14	.07	-.01
Pa	.31**	.31**	.39**	.51**	.29**	.38**	.28**	.40**	.42**	.27**	.15	.22*
Pt	.66**	.41**	.66**	.54**	.53**	.66**	.26**	.53**	.60**	.40**	.23*	.23*
Sc	.52**	.40**	.55**	.50**	.56**	.51**	.35**	.55**	.58**	.38**	.35**	.29**
Ma	.16	.32**	.27**	.18	.44**	.17	.17	.39**	.31**	.32**	.50**	.14
Si	.51**	.25**	.39**	.26**	.36**	.51**	.44**	.25**	.39**	.15	.01	.08
MMPI-2 Validity Scales												
L	-.23*	-.33**	-.26**	-.10	-.27**	-.22*	-.14	-.20*	-.28**	-.30**	-.26**	-.11
F	.40**	.35**	.43**	.40**	.41**	.36**	.31**	.40**	.51**	.30**	.33**	.20*
F <sub>b</sub>	.47**	.36**	.50**	.38**	.44**	.51**	.29**	.50**	.57**	.39**	.30**	.23*
K	-.45**	-.37**	-.41**	-.14	-.49**	-.37**	-.35**	-.23*	-.37**	-.31**	-.31**	-.07
S	-.48**	-.38**	-.49**	-.27**	-.52**	-.48**	-.41**	-.36**	-.53**	-.42**	-.30**	-.15
VRIN	.07	.14	-.04	.10	-.03	.06	.10	.00	-.04	.11	.12	-.03
TRIN	.07	-.08	-.08	.00	.07	-.05	.03	-.13	.01	-.12	-.05	-.02

*Note.* CPAI Clinical Scales = Chinese Personality Assessment Inventory Clinical Scales (I-S = Inferiority versus Self-Acceptance; SOM = Somatization; DEP = Depression; PHY = Physical Symptoms; ANT = Antisocial Behavior; ANX = Anxiety; SEX = Sexual Maladjustment; DIS = Distortion of Reality; PAR = Paranoia; NEE = Need for Attention; HYP = Hypomania; PAT = Pathological Dependence); MMPI-2 Clinical Scales = Minnesota Multiphasic Personality Inventory-2 Clinical Scales (Hs = Hypochondriasis; D = Depression; Hy = Conversion Hysteria; Pd = Psychopathic Deviate; Mf = Masculinity-Femininity; Pa = Paranoia; Pt = Psychasthenia; Sc = Schizophrenia; Ma = Hypomania; Si = Social Introversion). MMPI-2 Validity Scales: L = Lie scale; F = Infrequency scale; F<sub>b</sub> = Back-Infrequency scale; K = Correction scale; S = Superlative Self-Presentation scale; VRIN = Variable Response Inconsistency; TRIN = True Response Inconsistency.

\* $p < .05$ , two-tailed. \*\* $p < .01$ , two-tailed.

Table 1 and Table 2, respectively. The MMPI-2 supplementary scales and the PSY-5 scales are presented together with the content scales. The correlation matrices between the 22 CPAI personality scales and the MMPI-2 scales are presented in Tables 3, 4, 5, and 6, respectively.

With a high number of significant correlations between the two measures, we checked the mean scores of the respondents on the MMPI-2 validity scales including Scales L, F, F<sub>b</sub>, K, S, VRIN, and TRIN of the MMPI-2 to rule out possible biases due to response styles. Because scores on a number of MMPI-2 validity scales are typically elevated among normal samples (Cheung, Song, et al., 1996), we report T scores using the Chinese norms (Cheung, Zhang, et al., 2003) in addition to the U.S. T scores.

In these sections, we only describe the most important correlations that reflect the convergent validity of the two instruments. We also note those instances in which there are disagreements.

#### Correlations Between the CPAI Clinical Scales and the MMPI-2

As shown in Tables 1 and 2, most of the CPAI clinical scales were significantly correlated with the corresponding

MMPI-2 scales. We highlight those CPAI clinical scales with corresponding MMPI-2 scales below. Only those MMPI-2 scales with the highest correlations with the relevant CPAI clinical scales are included. We also note the lack of convergence for specific CPAI scales.

The Inferiority versus Self-Acceptance (I-S) scale of the CPAI is scored both as a personality scale and as a clinical scale. In this study, it correlated highest with Scale 7 (Pt or Psychasthenia; .66) on the MMPI-2 clinical scales, with WRK (Work/Interference; .68) and LSE (Low Self-Esteem; .65) on the content scales and with NEGE (PSY-5 Negative Emotionality/Neuroticism; .55).

The CPAI Depression (DEP) scale had its highest correlations with Scale 7 (Pt; .66) rather than with Scale 2 (D or Depression; .56) among the MMPI-2 clinical scales. However, it had higher correlations with the MMPI-2 content scales of DEP (Depression; .72).

The Physical Symptoms (PHY) scale of the CPAI covers a range of psychosomatic symptoms commonly found among Chinese psychiatric patients. It had its highest correlations with Scale 1 (Hs or Hypochondriasis; .65) and HEA (Health Concerns; .57) on the MMPI-2, both of which depict physical symptoms and worries about one's physical health.

The Anxiety (ANX) scale of the CPAI had its highest correlations with NEGE (.70), Scale 7 (Pt; .66), ANX (Anxiety;

**TABLE 2**  
**Correlation Matrix Among MMPI-2 Content Scales and CPAI Clinical Scales**

MMPI-2 Content Scales	CPAI Clinical Scales											
	I-S	SOM	DEP	PHY	ANT	ANX	SEX	DIS	PAR	NEE	HYP	PAT
ANX	.58**	.45**	.65**	.55**	.52**	.68**	.26**	.46**	.59**	.40**	.20*	.14
FRS	.24**	.30**	.14	.10	.04	.37**	.17	.19*	.29**	.28**	.04	.02
OBS	.61**	.50**	.54**	.32**	.55**	.64**	.36**	.45**	.55**	.41**	.32**	.10
DEP	.61**	.42**	.72**	.47**	.63**	.58**	.33**	.46**	.56**	.35**	.27**	.16
HEA	.25**	.35**	.36**	.57**	.31**	.28**	.20*	.30**	.27**	.25**	.22*	.15
BIZ	.30**	.27**	.30**	.24**	.37**	.24**	.26**	.49**	.48**	.31**	.34**	.25**
ANG	.32**	.33**	.41**	.23*	.44**	.42**	.24*	.38**	.40**	.36**	.27**	.10
CYN	.41**	.32**	.41**	.13	.53**	.32**	.33**	.35**	.56**	.35**	.46**	.18
ASP	.27**	.22*	.27**	.04	.39**	.16	.29**	.20*	.35**	.25**	.43**	.30**
TPA	.38**	.44**	.39**	.19*	.43**	.43**	.33**	.44**	.52**	.47**	.39**	.03
LSE	.65**	.33**	.49**	.25**	.47**	.55**	.37**	.29**	.43**	.25**	.15	.09
SOD	.48**	.33**	.40**	.27**	.37**	.52**	.45**	.32**	.40**	.10	.03	.06
FAM	.45**	.35**	.50**	.34**	.68**	.40**	.40**	.33**	.47**	.36**	.33**	.08
WRK	.68**	.37**	.60**	.41**	.60**	.60**	.29**	.40**	.50**	.35**	.28**	.15
TRT	.60**	.44**	.55**	.30**	.62**	.56**	.36**	.42**	.57**	.32**	.27**	.15
A	.64**	.46**	.65**	.37**	.59**	.63**	.34**	.44**	.62**	.37**	.27**	.18
R	-.06	-.18	-.06	.12	-.27**	-.02	-.02	-.14	-.21*	-.28**	-.36**	-.20*
MAC-R	.03	.12	.15	.10	.21*	.00	.10	.23*	.17	.06	.33**	.09
APS	.18	.13	.18*	.20*	.16	.15	.11	.08	.13	.20*	.13	-.01
AAS	.17	.18*	.23*	.35**	.22*	.24**	.03	.25**	.32**	.20*	.19*	.17
AGGR	-.02	.21*	.08	-.01	.25**	.03	.05	.25**	.27**	.24**	.37**	.04
PSYC	.03	.18	.16	.07	.24**	.09	.15	.34**	.32**	.28**	.35**	.22*
DISC	-.04	-.07	-.07	-.09	.08	-.20*	.03	-.05	-.09	.09	.27**	.20*
NEGE	.55**	.49**	.56**	.42**	.48**	.70**	.31**	.47**	.56**	.44**	.23*	.10
INTR	.40**	.13	.37**	.31**	.27**	.33**	.19*	.14	.26**	.02	-.13	-.02

*Note.* MMPI-2 = Minnesota Multiphasic Personality Inventory-2; CPAI = Chinese Personality Assessment Inventory. CPAI Clinical Scales: I-S = Inferiority versus Self-Acceptance; SOM = Somatization; DEP = Depression; PHY = Physical Symptoms; ANT = Antisocial Behaviour; ANX = Anxiety; SEX = Sexual Maladjustment; DIS = Distortion of Reality; PAR = Paranoia; NEE = Need for Attention; HYP = Hypomania; PAT = Pathological Dependence. MMPI-2 Content Scales: ANX = Anxiety; FRS = Fears; OBS = Obsessiveness; DEP = Depression; HEA = Health Concerns; BIZ = Bizarre Mentation; ANG = Anger; CYN = Cynicism; ASP = Antisocial Practices; TPA = Type A Behavior; LSE = Low Self-Esteem; SOD = Social Discomfort; FAM = Family Problems; WRK = Work Interference; TRT = Negative Treatment Indicators; A = Anxiety; R = Repression; MAC-R = MacAndrew Alcoholism; APS = Addiction Potential Scale; AAS = Addiction Admission Scale. Personality Psychopathology Five Scales: AGGR = Aggressiveness; PSYC = Psychoticism; DISC = Disconstraint; NEGE = Negative Emotionality/Neuroticism; INTR = Introversion/Low Positive Emotionality.

\* $p < .05$ , two-tailed. \*\* $p < .01$ , two-tailed.

.68), Welsh A (Welsh Anxiety; .63), and OBS (Obsessiveness; .64) on the MMPI-2.

The Distortion of Reality (DIS) scale correlated highest with Scale 8 (Sc; .55) and BIZ (Bizarre Mentation; .49) on the MMPI-2.

On the other hand, the Antisocial Behavior (ANT) scale of the CPAI was less correlated with Scale 4 (Pd or Psychopathic Deviance; .39) and ASP (Antisocial Practice; .39). Instead, it was more highly correlated with Scale 8 (Sc; .56), FAM (Family Problems; .68), DEP (.63), and WRK (Work Interference; .60). The Paranoia (PAR) scale correlated more highly with Scales 7 (Pt; .60), 8 (Sc; .58), ANX (.59), Welsh A (.61), and NEGE (.56) but less so with Scale 6 (Pa or Paranoia; .41) and FRS (Fears; .28) on the MMPI-2. Hypomania (HYP) correlated only moderately with Scale 9 (Ma or Hypomania; .50) and CYN (.46).

A number of the CPAI clinical scales do not have direct correspondence with any of the MMPI-2 scales. We describe their patterns of correlation with the MMPI-2 scales in the following to illustrate the constructs covered by these scales.

The CPAI Somatization (SOM) scale is an indigenously derived scale depicting the tendency to present psychological distress in the form of somatic symptoms and the reluctance to seek psychological help. SOM had moderate correlations with OBS (Obsessiveness; .50), NEGE (.49), Welsh A (.46), ANX (.45), TPA (Type A Behavior; .44), and TRT (Negative Treatment Indicators; .44) on the MMPI-2. There was no significant correlation between Somatization and Scale 3 (Hy or Hysteria; .02).

The Sexual Maladjustment (SEX) scale of the CPAI was designed to tap psychosexual problems including sexual concerns and dysfunction and had little to do with masculinity-femininity as measured by Scale 5 (Mf) on the MMPI-2. Instead, it had moderate correlations with Scale 0 (Si or Social Introversion; .44) and SOD (Social Discomfort; .45) on the MMPI-2.

The Need for Attention (NEE) scale covers dependency, histrionic tendencies, and attention-seeking behavior. It correlated moderately with TPA (Type A Behavior; .47) and the OBS scale (.41) on the MMPI-2. There was no significant correlation between NEE and MMPI-2 Scale 3 (Hysteria; -.09).

The Pathological Dependence (PAT) scale of the CPAI covers a diverse range of addictive behaviors in Chinese societies, including dependence on alcohol, tobacco, soft drugs, and narcotics as well as gambling. Its correlations with MAC-R (MacAndrew Alcoholism; .09), APS (Addiction Potential; -.01), and AAS (Addiction Admission; .17) were insignificant. PAT was only correlated slightly with ASP (Antisocial Practice; .30), Scale 8 (Sc; .29), BIZ (.25), and Welsh R (Repression; -.20).

### Correlations Between the CPAI Personality Scales and the MMPI-2

Although the CPAI personality scales were designed to assess normal personality dispositions, some of these scales also would be associated with psychopathological tendencies. In the standardization sample of the CPAI, a few personality scales were significantly correlated with specific clinical scales (Cheung, Gan, et al., in press). We expected that these CPAI personality scales would also correlate significantly with the MMPI-2 scales. Tables 3, 4, 5, and 6 present the results of the correlation matrix between the CPAI personality scales and the MMPI-2 clinical and content scales, respectively. The CPAI personality scales are grouped under the four factors obtained from the standardization study

(Cheung et al., 2001): Dependability, IR, Social Potency, and Individualism.

The CPAI personality scales associated with the Dependability factor were significantly correlated with many of the MMPI-2 clinical and content scales. These CPAI scales include Practical-Mindedness (PRA), Emotionality (EMO), Responsibility (RES), Inferiority versus Self-Acceptance (I-S; the same scale is used as a clinical scale), Graciousness versus Meanness (G-M), Optimism versus Pessimism (O-P), External versus Internal Locus of Control (E-I), and Family Orientation (FAM). Only the more significant patterns of relationship are highlighted following.

Practical-Mindedness (PRA) on the CPAI assesses the tendency to be down-to-earth and pragmatic. It correlated negatively with all the MMPI-2 clinical and content scales, with the exception of Scale 3 (Hy), Scale 5 (Mf), and Welsh R (Repression). Its strongest correlations were with Scales 8 (Sc; -.47) and 7 (Pt; -.46) and with WRK (-.43).

The Emotionality (EMO) scale on the CPAI correlated significantly with all of the MMPI-2 content scales and most of the clinical scales except for Scales 5 (Mf), 3 (Hy), and 9 (Ma). Its highest correlations were with NEGE (.55), Scale 7 (Pt; .53), ANX (.53), ANG (Anger; .51), and WRK (.50).

The Graciousness versus Meanness (G-M) scale is an indigenous scale that depicts the willingness to accommodate

**TABLE 3**  
**Correlation Matrix Among MMPI-2 Clinical and Validity Scales and CPAI Personality Scales**

	CPAI Personality Scales									
	Dependability									
	PRA	EMO	RES	I-S	G-M	V-S	O-P	MET	E-I	FAM
MMPI-2 Clinical Scales										
Hs	-.16	.19*	-.08	.19*	-.03	-.06	-.24**	-.01	.12	-.22*
D	-.26**	.38**	-.29**	.49**	-.17	-.10	-.54**	-.14	.30**	-.36**
Hy	.01	.01	-.02	-.08	.23*	.11	-.09	-.03	-.06	-.04
Pd	-.44**	.40**	-.34**	.29**	-.26**	-.31**	-.36**	-.13	.27**	-.38**
Mf	-.06	.11	-.02	.14	-.07	-.09	-.13	.02	.22*	.08
Pa	-.22*	.34**	-.14	.26**	-.20*	-.05	-.27**	-.06	.18	-.24*
Pt	-.46**	.53**	-.37**	.59**	-.44**	-.29**	-.53**	-.13	.31**	-.47**
Sc	-.47**	.46**	-.33**	.45**	-.45**	-.29**	-.34**	-.14	.23*	-.43**
Ma	-.23*	.16	.07	.12	-.31**	-.23*	-.02	.09	.04	-.19*
Si	-.25**	.38**	-.30**	.50**	-.20*	-.14	-.37**	-.20*	.16	-.41**
MMPI-2 Validity Scales										
L	.38**	-.35**	.18	-.21*	.31**	.28**	.25**	.01	-.10	.07
F	-.28**	.25**	-.14	.32**	-.41**	-.28**	-.23*	-.11	.22*	-.32**
F <sub>B</sub>	-.27**	.33**	-.15	.38**	-.47**	-.19*	-.30**	-.05	.25**	-.26**
K	.25**	-.43**	.16	-.42**	.35**	.20*	.35**	.05	-.24**	.33**
S	.41**	-.50**	.28**	-.45**	.51**	.35**	.44**	.07	-.25**	.39**
VRIN	-.04	.10	.06	.10	.02	-.08	-.02	.03	.00	.01
TRIN	.03	-.04	-.09	.11	.03	-.04	.00	-.12	.10	-.19*

*Note.* MMPI-2 = Minnesota Multiphasic Personality Inventory-2; CPAI = Chinese Personality Assessment Inventory. CPAI Personality Scales: PRA = Practical Mindedness; EMO = Emotionality; RES = Responsibility; I-S = Inferiority versus Self-Acceptance; G-M = Graciousness versus Meanness; V-S = Veraciousness versus Slickness; O-P = Optimism versus Pessimism; MET = Meticulousness; E-I = External versus Internal Locus of Control; FAM = Family Orientation. MMPI-2 Clinical Scales: Hs = Hypochondriasis, D = Depression, Hy = Conversion Hysteria, Pd = Psychopathic Deviate, Mf = Masculinity-Femininity, Pa = Paranoia, Pt = Psychasthenia, Sc = Schizophrenia, Ma = Hypomania, Si = Social Introversion. MMPI-2 Validity Scales: L = Lie Scale; F = Infrequency Scale; F<sub>B</sub> = Back-Infrequency scale; K = Correction scale; S = Superlative Self-Presentation scale; VRIN = Variable Response Inconsistency; TRIN = True Response Inconsistency.

\* $p < .05$ , two-tailed. \*\* $p < .01$ , two-tailed.

**TABLE 4**  
**Correlation Matrix Among MMPI-2 Clinical and Validity Scales and CPAI Personality Scales**

	CPAI Personality Scales											
	Interpersonal Relatedness						Social Potency			Individualism		
	REN	HAR	FLE	MOD	FAC	T-E	I-E	LEA	ADV	S-S	L-A	DEF
<b>MMPI-2 Clinical Scales</b>												
Hs	.03	-.08	.15	.01	.07	-.06	.08	-.14	-.17	-.04	-.21*	-.04
D	-.12	-.11	.04	.01	.13	.01	.35**	-.47**	-.49**	-.04	-.34**	.05
Hy	-.22*	-.21*	.26**	.15	-.20*	-.07	.10	-.09	.03	-.04	-.28**	-.24*
Pd	-.12	-.21*	.03	.07	.16	-.15	.02	-.15	-.18	.05	-.38**	.09
Mf	.12	-.04	.14	-.10	.10	-.11	-.08	-.09	-.02	-.12	-.02	.00
Pa	.16	-.12	.03	-.05	.23*	.01	.11	-.01	-.10	.22*	-.16	.17
Pt	.08	-.12	-.11	-.06	.32**	.03	.27**	-.29**	-.38**	.17	-.25**	.28**
Sc	.23*	-.14	-.11	-.02	.37**	-.06	.16	-.06	-.13	.32**	-.10	.38**
Ma	.31**	.01	-.21*	-.02	.19*	-.05	-.24**	.33**	.13	.29**	.23*	.29**
Si	.03	.01	-.10	-.11	.22*	.12	.57**	-.43**	-.42**	.17	-.18	.26**
<b>MMPI-2 Validity Scales</b>												
L	-.16	-.02	.25**	-.05	-.36**	-.09	-.02	-.21*	.06	-.07	-.17	-.33**
F	.16	-.09	-.12	-.09	.29**	-.01	.08	.00	-.14	.27**	-.05	.34**
F <sub>B</sub>	.27**	-.07	-.22*	-.11	.35**	-.01	.08	-.05	-.17	.27**	-.01	.46**
K	-.24*	-.07	.30**	.03	-.44**	-.13	-.21*	.02	.30**	-.26**	-.20*	-.43**
S	-.11	.06	.28**	-.03	-.51**	-.05	-.22*	.07	.28**	-.28**	-.08	-.46**
VRIN	.21*	.08	-.15	-.11	.23*	-.04	-.13	-.08	-.16	-.19*	-.15	.04
TRIN	-.05	.14	.08	.07	-.08	.10	.14	-.19*	-.08	-.16	-.09	-.06

*Note.* MMPI-2 = Minnesota Multiphasic Personality Inventory-2; CPAI = Chinese Personality Assessment Scales. CPAI Personality Scales: REN = Renqing (Relationship Orientation); HAR = Harmony; FLE = Flexibility; MOD = Modernization; FAC = Face; T-E = Thrift Versus Extravagance; I-E = Introversion Extraversion; LEA = Leadership; ADV = Adventurousness; S-S = Self versus Social Orientation; L-A = Logical versus Affective Orientation; DEF = Defensiveness (Ah-Q Mentality). MMPI-2 Clinical Scales: Hs = Hypochondriasis, D = Depression; Hy = Conversion Hysteria; Pd = Psychopathic Deviate; Mf = Masculinity-Femininity; Pa = Paranoia; Pt = Psychasthenia; Sc = Schizophrenia; Ma = Hypomania; Si = Social Introversion. MMPI-2 Validity Scales: L = Lie scale; F = Infrequency scale; F<sub>B</sub> = Back-Infrequency scale; K = Correction scale; S = Superlative Self-Presentation scale; VRIN = Variable Response Inconsistency; TRIN = True Response Inconsistency.

\* $p < .05$ , two-tailed. \*\* $p < .01$ , two-tailed.

and forgive others at the high-score end as opposed to the facetious, demanding, and scathing styles characterizing people who are mean toward others at the low-score end. The G-M scale was highly correlated with the following MMPI-2 content scales: CYN (Cynicism; -.62), TPA (-.60), ANG (-.52), and NEGE (-.51).

Optimism versus Pessimism (O-P) was negatively correlated with most of the MMPI-2 content scales as well as with many of the MMPI-2 clinical scales. High scores on O-P represent the optimism pole. The highest correlations were with ANX (-.59), DEP (-.56), Scale 2 (D; -.54), Scale 7 (Pt; -.53), and NEGE (-.52) of the MMPI-2.

The Family Orientation (FAM) scale of the CPAI is an indigenously derived scale depicting the important emphasis that the Chinese people places on close family ties. It correlated negatively with eight of the MMPI-2 clinical scales and all but one of the content scales. It correlated most highly with the MMPI-2 content scale measuring family relations, FAM (Family Problems; -.62).

The IR factor on the CPAI consists of indigenous scales designed to tap the endorsement of traditional values and a strong orientation toward instrumental relationships in a collectivistic culture. Only the Face scale obtained significant correlations above .35 with indexes of psychopathology

measured by the MMPI-2. It had low to moderate but significant correlations with many of the clinical and content scales, especially TPA (.47), CYN (.45), and NEGE (.41).

On the Social Potency factor, Introversion (I-E) was highly correlated with Scale 0 (Si; .57), SOD (.66), and INTR (.56) (PSY-5 Introversion/Low Positive Emotionality; .56) on the MMPI-2. The reverse case was found with the Leadership (LEA) scale, which had moderate negative correlations with Scales 2 (D; -.47), 0 (Si; -.43), INTR (-.44), and SOD (-.41). The pattern of correlations for the Individualism factor scales showed that self-centered orientation in the Chinese culture was moderately correlated with indicators of psychopathology, especially those on the MMPI-2 content scales. In particular, the indigenous scale of Defensiveness (DEF) was positively correlated with most of the MMPI-2 content scales, especially CYN (.57), TPA (.52) and TRT (.47).

### Response Style

The mean validity scale scores computed using the U.S. norms are 53.1, 65.2, 67.4, 45.9, 48.1, and 60.1 for L, F, F<sub>B</sub>, K, S, and VRIN, respectively. On the other hand, the



mean validity scale scores computed using the Chinese norms (Cheung, Zhang, et al., 2003) are 44.2, 48.3, 47.6, 49.2, 48.3, and 45.0 for L, F, F<sub>B</sub>, K, S, and VRIN, respectively. The percentage of cases having TRIN scores between the normal range (64F and 64T) was 69.5 using the U.S. norms and 84.7 using the Chinese norms. Although the mean scores on the Variable Response Inconsistency Scale (VRIN) and the Infrequency (F) scales were slightly elevated if the American norms are used, all of the mean scores were within the normal range when the Chinese norms were used.

As shown in Tables 1, 3, and 4, there are moderate correlations between some of the MMPI-2 validity scales and the CPAI clinical (e.g., Paranoia and Antisocial Behavior) and personality (e.g., Emotionality and Graciousness vs. Meanness) scales. However, the value of the correlation coefficients is generally lower than that obtained between the validity and clinical scales and between the validity and content scales of the MMPI-2.

## DISCUSSION

## Clinical Scales

Results from this study show that many of the CPAI clinical scales correlated positively with the relevant MMPI-2 clinical and content scales. The respondents' scores on the MMPI-2 validity scales were within the normal range, which suggest that their test-taking approach would not have accounted for the high number of significant correlations. The patterns of correlations provide preliminary support for the convergent validity of the CPAI clinical scales. Generally, there was stronger correspondence between the CPAI clinical scales and the MMPI-2 content scales, including those measuring depression, anxiety, physical health concerns, and distortion of reality. These two sets of scales were developed in similar approaches, with items selected on the basis of internal consistency (Butcher, Graham, Williams, & Ben-Porath 1990; Cheung, Leung, et al., 1996).

**TABLE 5**  
**Correlation Matrix Among MMPI-2 Content Scales and CPAI Personality Scales**

MMPI-2 Content Scales	CPAI Personality Scales									
	Dependability									
	PRA	EMO	RES	I-S	G-M	V-S	O-P	MET	E-I	FAM
ANX	-.35**	.53**	-.24**	.53**	-.46**	-.28**	-.59**	-.06	.30**	-.44**
FRS	-.13	.31**	-.02	.23*	-.31**	-.04	-.23*	-.01	.15	.03
OBS	-.25**	.42**	-.17	.56**	-.40**	-.13	-.47**	-.07	.27**	-.44**
DEP	-.35**	.48**	-.28**	.55**	-.46**	-.28**	-.56**	-.14	.39**	-.50**
HEA	-.20*	.24**	-.05	.20*	-.12	-.14	-.19*	.05	.13	-.20*
BIZ	-.26**	.31**	-.10	.27**	-.42**	-.24**	-.15	-.02	.12	-.20*
ANG	-.39**	.51**	-.26**	.29**	-.52**	-.31**	-.33**	-.09	.21*	-.26**
CYN	-.32**	.30**	-.17	.39**	-.62**	-.36**	-.28**	.03	.22*	-.28**
ASP	-.37**	.19*	-.18	.24**	-.56**	-.47**	-.16	.04	.16	-.21*
TPA	-.36**	.40**	-.13	.38**	-.60**	-.31**	-.36**	-.05	.25**	-.22*
LSE	-.32**	.38**	-.29**	.61**	-.30**	-.11	-.45**	-.20*	.35**	-.39**
SOD	-.16	.31**	-.17	.43**	-.19*	-.10	-.28**	-.11	.10	-.37**
FAM	-.31**	.36**	-.14	.35**	-.40**	-.31**	-.29**	-.05	.24**	-.62**
WRK	-.43**	.50**	-.40**	.63**	-.37**	-.22*	-.51**	-.19*	.34**	-.48**
TRT	-.40**	.44**	-.32**	.55**	-.50**	-.30**	-.43**	-.18*	.39**	-.44**
A	-.36**	.48**	-.25**	.59**	-.47**	-.25**	-.52**	-.09	.32**	-.46**
R	.09	-.12	-.10	-.06	.33**	.12	-.14	-.14	-.12	.05
MAC-R	-.07	.06	.15	-.02	-.17	-.13	.05	.01	-.08	-.03
APS	-.27**	.34**	-.12	.20*	-.11	-.16	-.29**	-.03	.07	-.10
AAS	-.16	.26**	-.08	.11	-.22*	-.14	-.11	-.07	.09	-.07
AGGR	-.13	.11	.02	-.01	-.39**	-.26**	.05	.03	.06	.04
PSYC	-.13	.11	-.04	-.02	-.38**	-.33**	.09	.01	-.03	-.07
DISC	-.22*	.00	-.04	-.08	-.06	-.29**	.18	.13	.02	-.01
NEGE	-.35**	.55**	-.26**	.51**	-.51**	-.26**	-.52**	-.10	.30**	-.41**
INTR	-.24**	.36**	-.31**	.36**	-.13	-.14	-.43**	-.17	.21*	-.30**

*Note.* MMPI-2 = Minnesota Multiphasic Personality Inventory-2; CPAI = Chinese Personality Assessment Inventory. CPAI Personality Scales: PRA = Practical Mindedness; EMO = Emotionality; RES = Responsibility; I-S = Inferiority versus Self-Acceptance; G-M = Graciousness versus Meanness; V-S = Veraciousness versus Slickness; O-P = Optimism versus Pessimism; MET = Meticulousness; E-I = External versus Internal Locus of Control; FAM = Family Orientation. MMPI-2 Content Scales: ANX = Anxiety; FRS = Fears; OBS = Obsessiveness; DEP = Depression; HEA = Health Concerns; BIZ = Bizarre Mentation; ANG = Anger; CYN = Cynicism; ASP = Antisocial Practices; TPA = Type A Behavior; LSE = Low Self-Esteem; SOD = Social Discomfort; FAM = Family Problems; WRK = Work Interference; TRT = Negative Treatment Indicators. A = Anxiety; R = Repression; MAC-R = MacAndrew Alcoholism; APS = Addiction Potential scale; AAS = Admission Addiction scale; Pwesonality Psychopathology Five Scales: AGGR = Aggressiveness; PSYC = Psychoticism; DISC = Disconstraint; NEGE = Negative Emotionality/Neuroticism; INTR = Introversion/Low Positive Emotionality.

\* $p < .05$ , two-tailed. \*\* $p < .01$ , two-tailed.

**Table 6**  
**Correlation Matrix Among MMPI-2 Content Scales and CPAI Personality Scales**

MMPI-2 Content Scales	CPAI Personality Scales											
	Interpersonal Relatedness						Social Potency			Individualism		
	REN	HAR	FLE	MOD	FAC	T-E	I-E	LEA	ADV	S-S	L-A	DEF
ANX	.09	-.08	-.20*	-.07	.37**	.11	.20*	-.17	-.41**	.19*	-.11	.31**
FRS	.17	.02	-.29**	-.09	.40**	.04	-.03	-.02	-.23*	-.08	-.04	.30**
OBS	.18	.06	-.16	-.11	.35**	.24**	.28**	-.15	-.39**	.19*	-.03	.32**
DEP	.12	-.13	-.06	-.05	.31**	.04	.28**	-.30**	-.31**	.28**	-.15	.37**
HEA	.15	-.02	-.02	.02	.19*	.01	.09	.00	-.13	.06	-.06	.17
BIZ	.33**	-.04	-.05	-.12	.30**	.00	-.09	.20*	.05	.25**	.11	.31**
ANG	.08	-.24**	-.22*	-.03	.35**	.00	.00	.08	-.12	.29**	.03	.35**
CYN	.34**	.05	-.30**	-.11	.45**	.08	.01	.10	-.13	.34**	.26**	.57**
ASP	.33**	.02	-.09	-.06	.36**	-.08	-.17	.15	-.01	.24**	.26**	.39**
TPA	.26**	-.05	-.33**	-.10	.47**	.10	-.03	.17	-.10	.30**	.14	.52**
LSE	.14	-.02	-.08	-.08	.27**	.03	.31**	-.37**	-.42**	.13	-.24**	.29**
SOD	.03	.03	-.13	-.09	.12	.17	.66**	-.41**	-.38**	.29**	-.07	.24**
FAM	.01	-.17	-.12	.09	.27**	-.04	.14	-.07	-.16	.36**	-.01	.42**
WRK	.12	-.05	-.08	-.10	.32**	.07	.32**	-.32**	-.38**	.22*	-.16	.38**
TRT	.17	-.07	-.13	-.05	.34**	.06	.21*	-.22*	-.23*	.35**	-.07	.47**
A	.12	-.01	-.25**	-.06	.37**	.12	.35**	-.21*	-.36**	.32**	-.04	.41**
R	-.20*	-.06	.24**	.09	-.20*	.00	.25**	-.33**	-.21*	-.30**	-.33**	-.34**
MAC-R	.26**	.01	-.05	-.01	.05	-.13	-.22*	.33**	.23*	.23*	.23*	.06
APS	-.09	-.07	-.09	.13	.26**	-.08	.04	.04	-.16	-.27**	-.17	-.09
AAS	.17	-.15	.07	-.05	.11	-.11	-.04	.04	-.02	.16	-.14	.10
AGGR	.24**	-.01	-.23*	.04	.20*	.03	-.22*	.42**	.26**	.29**	.33**	.38**
PSYC	.20*	-.10	-.23*	-.04	.18	-.07	-.19*	.32**	.16	.22*	.18*	.30**
DISC	.07	.00	.00	.13	.10	-.29**	-.24**	.20*	.21*	-.10	.11	-.06
NEGE	.07	-.07	-.30**	-.06	.41**	.06	.20*	-.12	-.38**	.16	-.07	.37**
INTR	-.16	-.15	.08	.09	.05	-.03	.56**	-.44**	-.38**	.07	-.34**	.04

*Note.* MMPI-2 = Minnesota Multiphasic Personality Inventory-2; CPAI = Chinese Personality Assessment Inventory. CPAI Personality Scales: PRA = Practical Mindedness; EMO = Emotionality; RES = Responsibility; I-S = Inferiority versus Self-Acceptance; G-M = Graciousness versus Meanness; V-S = Veraciousness versus Slickness; O-P = Optimism versus Pessimism; MET = Meticulousness; E-I = External versus Internal Locus of Control; FAM = Family Orientation. MMPI-2 Content Scales: ANX = Anxiety; FRS = Fears; OBS = Obsessiveness; DEP = Depression; HEA = Health Concerns; BIZ = Bizarre Mentation; ANG = Anger; CYN = Cynicism; ASP = Antisocial Practices; TPA = Type A Behavior; LSE = Low Self-Esteem; SOD = Social Discomfort; FAM = Family Problems; WRK = Work Interference; TRT = Negative Treatment Indicators. A = Anxiety; R = Repression; MAC-R = MacAndrew Alcoholism; APS = Addiction Potential scale; AAS = Admission Addiction scale; Pwesonality Psychopathology Five Scales: AGGR = Aggressiveness; PSYC = Psychoticism; DISC = Disconstraint; NEGE = Negative Emotionality/Neuroticism; INTR = Introversion/Low Positive Emotionality.

\* $p < .05$ , two-tailed. \*\* $p < .01$ , two-tailed.

Although there was convergence between many of the CPAI and MMPI-2 clinical scales, only moderate correlations were obtained between the CPAI and MMPI-2 scales assessing hypomania, paranoia, and antisocial behavior. The CPAI PAR scale seems to tap more of the anxiety and confusion features and other aspects of the internal symptom cluster covered by the MMPI-2 content scales (Butcher & Williams, 1992, pp. 138-141). The CPAI HYP scale covers features of the external aggressive tendencies cluster (Butcher & Williams, 1992, p. 141-144), which includes cynicism, anger, and acting-out behavior, instead of the amorality and psychomotor acceleration components covered by Scale 6 (Pa) on the MMPI-2. The discrepancies between ANT scale on the CPAI and the psychopathic tendencies as measured by Scale 4 (Pd) and ASP on the MMPI-2 highlights the social and emotional emphases of this CPAI clinical scale. Its higher correlations with FAM, WRK, and TRT on the MMPI-2 suggests that social deviance in the Chinese culture is strongly associated with disruptions in family ties and work adjustment. Clients scor-

ing high on ANT are less likely to be amenable to conventional forms of psychological treatment. Butcher et al. (1990) also noted that people scoring high on the FAM are viewed as "generally maladjusted, hostile, overactive, antisocial, not very helpful, and not reliable or responsible" (p. 87).

Discrepancies were also found in the pattern of relationships with some of the MMPI-2 clinical scales, especially those scales that were elevated even among Chinese normal samples (Cheung, Song, et al., 1996) including Scales 2, 7, and 8. The relatively lower correlation between the MMPI-2 Scale 2 (D) and the Depression (DEP) scale of the CPAI reflects the heterogeneous content of this MMPI-2 clinical scale. It has been noted previously in other Chinese normal samples that the elevated scores for the Chinese MMPI-2 may be explained by differences in cultural acceptance of certain behavior as normative, suggesting that some of the contents of Scale 2 do not reflect depression among Chinese people (Cheung, Song, et al., 1996). Instead, the MMPI-2 content scale of Depression (DEP) is more congruent with the CPAI

Depression scale. In the original development of the MMPI-2 content scales, it was found that DEP itself was more highly correlated with the Scales 7 (Pt) and 8 (Sc) than with Scale 2 (D) of the MMPI-2 clinical scales (Butcher et al., 1990).

Similarly, the heterogeneous content of MMPI-2 Scale 7 (Pt) also renders it to be a generic measure of psychological distress, especially in association with emotional problems. It was highly correlated with Inferiority versus Self-Acceptance (I-S), Depression, Anxiety, and Paranoia among the CPAI clinical scales. In this sense, it is similar in function to the CPAI I-S scale, which is highly correlated with many of the MMPI-2 clinical and content scales including Scale 7 (Pt), LSE, Welsh A, ANX, OBS, DEP, WRK, and TRT.

Scale 8 (Sc) of the MMPI-2 has posed a problem in cross-cultural interpretation due to its general elevation among normal samples in non-Western societies (Butcher, 1996; Cheung, Song, et al., 1996). The item contents of Scale 8 include social alienation and family alienation as well as general dissatisfaction in addition to the perceptual and delusional symptoms primarily associated with schizophrenic disorders. It correlated moderately with a number of CPAI clinical scales, including Paranoia (PAR), Antisocial Behavior (ANT), Depression (DEP), Distortion of Reality (DIS), Anxiety (ANX) and Inferiority versus Self-Acceptance (I-S).

The additional clinical scales on the CPAI provide measures on psychosocial maladjustment not covered by the MMPI-2 clinical and content scales. The CPAI SEX (Sexual Maladjustment) scale assesses discomfort in heterosexual relationships, which is partly related to the general level of social discomfort measured by Scale 0 (Si) and SOD on the MMPI-2. The PAT (Pathological Dependence) scale covers a range of addictive behavior common in Chinese societies, including drugs, gambling, smoking, and alcoholism. However, in this study, it was not significantly correlated with measures of addiction potential (APS), addiction admission (AAS), and alcoholism (MAC-R) but was moderately correlated with antisocial practice (ASP) on the MMPI-2. These discrepancies suggest possible cultural differences in the patterns of addictive behaviors covered by the two sets of scales and could be a subject of future investigation. In a study with prisoners in Hong Kong (Cheung, Kwong, & Zhang, 2003), PAT was the most elevated CPAI clinical scale among the violent offenders. Addictive habits are typical features of the criminal subculture in Chinese societies.

The inclusion of an indigenous clinical scale in the CPAI, SOM (Somatization), also illustrates more sensitively the tendency to present psychological problems in somatic idioms among Chinese patients (Cheung, 1995, 1998). The somatization tendency is distinct from conversion hysteria as measured by Scale 3 (Hy) on the MMPI-2, suggesting that the construct of the somatization tendency in the CPAI differs from conversion or somatization disorders. Its moderate correlations with many of the MMPI-2 content scales, including TRT, reflect the presence of general psychological distress, coupled with a lack of awareness of the psychologi-

cal nature of the problems or a reluctance to seek mental health intervention. Information on these cultural aspects of psychopathology helps the clinician to understand the sociocultural contexts in which the patients present their problems and to predict the treatment approach likely to be acceptable to the patients.

## Personality Scales

In addition to the clinical scales, several CPAI personality scales illustrate the patterns of personality features associated with psychopathology assessed by the MMPI-2. These CPAI personality scales tap personality dispositions in the Chinese culture that are likely to be associated with the presence or absence of clinical features. As personality scales, their patterns of correlation with the MMPI-2 were generally higher among the content scales than among the clinical scales, especially those content scales that assessed personality constellations than symptomatology.

For example, family orientation, graciousness, optimism, and pragmatism as measured by the CPAI Dependability factor scales were negatively correlated with many of the MMPI-2 content scales. Scales measuring inferiority, emotionality, and pessimism were positively associated with psychopathology on the MMPI-2. In particular, the negative correlations between Family Orientation and most of the MMPI-2 clinical and content scales demonstrate the important role of family ties in protecting against psychological distress. The scales on the CPAI Social Potency factor, including Introversion versus Extraversion and Leadership, are congruent with the MMPI-2 scales depicting difficulties in social interaction.

In contrast to these patterns of significant correlation, low or no correlation was found between the MMPI-2 scales and some of the indigenous CPAI personality scales. These indigenous scales include Harmony (HAR), Ren Qing (REN) and Modernization (MOD) on the IR factor. These scales were constructed to reflect the interdependent relational orientation that is emphasized in traditional Chinese relationships. These indigenous characteristics are not covered in Western measures of normal personality but have been shown to be useful in predicting important social behavior in the Chinese culture (Cheung et al., 2001). The emphasis on these relationships per se is not directly related to psychopathology. Among the IR factor scales, Face (FAC) was the only one that had moderate correlations with many of the MMPI-2 scales. The FAC scale has a strong secondary loading on the Dependability factor. People who are overly concerned with saving face are more likely to be vulnerable to social distress.

The CPAI indigenous personality scales provide clues to the personality constellations associated with psychopathology in a Chinese cultural context beyond those provided by the universal personality constructs. For example, the Face and the Defensiveness scales highlight culturally relevant reactions and defense mechanisms commonly

adopted by the Chinese people. The Face scale measures the concern for maintaining and enhancing one's image and the inclination to avoid losing face in front of others. The Defensiveness (DEF) scale depicts the common forms of defense mechanisms of rationalization and denial among the Chinese people that had been caricatured in Ah Q, the protagonist in a famous contemporary Chinese novel, *The True Story of Ah Q*, by Lu (1972). Cynicism and defensiveness are associated with poorer psychological adjustment as indicated by the moderate correlations between DEF and many of the MMPI-2 content scales.

Although the relational orientation and endorsement of traditional values measured by the IR factor scales such as Harmony and Modernization were generally unrelated to the common clinical features in Western models of psychopathology assessed by the MMPI-2 in this study, they were found to be associated with an indigenous clinical scale, SOM (Somatization), on the CPAI in the standardization study. SOM depicts the tendency to use somatic symptoms as a form of distress expression, which is a common form of help-seeking behavior among the Chinese people (Cheung, 1995, 1998). The IR factor scales provide clues to the indigenous personality constellations that affect symptom presentation and illness behavior in the Chinese culture. Cheung, Gan, et al. (in press) found that the IR factor scales explained additional variance beyond those explained by the Dependability factor scales in the prediction of SOM in the CPAI standardization sample.

## CONCLUSIONS

The development of a new personality measure entails a program of validation studies. The CPAI is the first indigenously derived personality inventory that has encompassed such a program. The convergence between the CPAI and the MMPI-2 in a sample of university students from China and Hong Kong provides initial support for the validity of the CPAI as a clinical measure. The discrepancies between some of the CPAI and MMPI-2 scales highlight possible cultural differences in the measures as well as in the manifestation of psychopathology that need further investigation. Given the small sample size and the convenient nature of the sample in this study, it is necessary to extend the study to other community samples, especially clinical samples, to confirm these results. In addition, demonstration of the clinical utility of the CPAI requires stronger support beyond the convergent validity of two similarly constructed paper-and-pencil tests. Criterion validity needs to be established on the ability of the CPAI to identify psychopathology among clinical samples. A preliminary study (Cheung et al., 2003) showed that the CPAI clinical and personality scales differentiated between normal samples and samples of psychiatric patients and prisoners. Further studies are now underway to validate the second edition of CPAI scales among large-scale psychiatric samples.

## ACKNOWLEDGMENTS

This study was partly supported by a Direct Grant from The Chinese University of Hong Kong (Grant 220202030) and a grant from the Research Grants Council of Hong Kong (Grant CUHK4333/00H). We thank Poman Lo, Kevin Ng, Echo Fong, and Kylie Lu for their assistance in the data collection and analyses.

## REFERENCES

- Butcher, J. N. (Ed.). (1996). *International adaptations of the MMPI-2: A handbook of research and applications*. Minneapolis: University of Minnesota Press.
- Butcher, J. N., Cheung, F. M., & Lim, J. (2003). Use of the MMPI-2 with Asian populations. *Psychological Assessment, 15*, 248-256.
- Butcher, J. N., Dahlstrom, W. G., Graham, J. R., & Kaemmer, B. (1989). *MMPI-2: Minnesota Multiphasic Personality Inventory-2: Manual for administration and scoring*. Minneapolis: University of Minnesota Press.
- Butcher, J. N., Graham, J. R., Ben-Porath, Y. S., Tellegen, A., Dahlstrom, W. G., & Kaemmer, B. (2001). *MMPI-2 (Minnesota Multiphasic Personality Inventory-2) Manual for administration, scoring, and interpretation* (Rev. ed.). Minneapolis: University of Minnesota Press.
- Butcher, J. N., Graham, J. R., Williams, C. L., & Ben-Porath, Y. S. (1990). *Development and use of the MMPI-2 content scales*. Minneapolis: University of Minnesota Press.
- Butcher, J. N., & Williams, C. L. (1992). *Essentials of MMPI-2 and MMPI-A interpretation*. Minneapolis: University of Minnesota Press.
- Cheung, F. M. (1985). Cross-cultural considerations for the translation and adaptation of the Chinese MMPI in Hong Kong. In J. N. Butcher & C. D. Spielberger (Eds.), *Advances in personality assessment* (Vol. 4, pp. 131-158). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.
- Cheung, F. M. (1995). Facts and myths about somatization among the Chinese. In T. Y. Lin, W. S. Tseng, & E. K. Yeh (Eds.), *Chinese societies and mental health* (pp. 156-166). New York: Oxford University Press.
- Cheung, F. M. (1996). The assessment of psychopathology in Chinese societies. In M. H. Bond (Ed.), *Handbook of Chinese psychology* (pp. 393-411). New York: Oxford University Press.
- Cheung, F. M. (1998). Cross-cultural psychopathology. In C. D. Belar (Ed.), *Comprehensive psychiatry Volume 10: Sociocultural and individual differences* (pp. 35-51). Oxford: Pergamon.
- Cheung, F. M., & Cheung, S. F. (2003). Measuring personality and values across cultures: Imported versus indigenous measures. In W. J. Lonner, D. L. Dinnel, S. A. Hayes, & D. N. Sattler (Eds.), *Online readings in psychology and culture* (Unit 6, Chapter 5), Center for Cross-Cultural Research, Western Washington University, Bellingham, Washington. Retrieved November 7, 2003, from <http://www.ac.wvu.edu/~culture/Cheung.htm>
- Cheung, F. M., Gan, Y. Q., & Lo, P. M. (2003). Personality and psychopathology: Insights from Chinese studies. In W. S. Tseng (Ed.), *Asian culture and psychotherapy: Implications for East and West*. Honolulu: University of Hawaii Press.
- Cheung, F. M., & Ho, R. M. (1997). Standardization of the Chinese MMPI-A in Hong Kong: A preliminary study. *Psychological Assessment, 9*, 499-502.
- Cheung, F. M., Kwong, J. Y. Y., & Zhang, J. X. (2003). Clinical validation of the Chinese Personality Assessment Inventory (CPAI). *Psychological Assessment, 15*, 89-100.
- Cheung, F. M., & Leung, K. (1998). Indigenous personality measures: Chinese examples. *Journal of Cross-Cultural Psychology, 29*, 233-248.
- Cheung, F. M., Leung, K., Fan, R. M., Song, W. Z., Zhang, J. X., & Zhang, J. P. (1996). Development of the Chinese Personality Assessment Inventory. *Journal of Cross-Cultural Psychology, 27*, 143-164.

- Cheung, F. M., Leung, K., Zhang, J. X., Sun, H. F., Gan, Y. Q., Song, W. Z., et al. (2001). Indigenous Chinese personality constructs: Is the Five-factor model complete? *Journal of Cross-Cultural Psychology, 32*, 407–433.
- Cheung, F. M., & Song, W. Z. (1989). A review on the clinical applications of the Chinese MMPI. *Psychological Assessment, 1*, 230–237.
- Cheung, F. M., Song, W. Z., & Butcher, J. N. (1991). An infrequency scale for the Chinese MMPI. *Psychological Assessment, 3*, 648–653.
- Cheung, F. M., Song, W. Z., & Zhang, J. X. (1996). The Chinese MMPI-2: Research and applications in Hong Kong and the People's Republic of China. In J. N. Butcher (Ed.), *International adaptations of the MMPI-2: A handbook of research and applications* (pp. 137–161). Minneapolis: University of Minnesota Press.
- Cheung, F. M., Zhang, J. X., & Song, W. Z. (2003). *The Chinese Minnesota Multiphasic Personality Inventory (MMPI-2)*. Hong Kong: The Chinese University Press.
- Cheung, F. M., Zhao, J. C., & Wu, C. Y. (1992). Chinese MMPI profiles among neurotic patients. *Psychological Assessment, 4*, 214–218.
- Church, A. T., & Katigbak, M. S. (1988). The emic strategy in the identification and assessment of personality dimensions in a non-Western culture: Rationale, steps, and a Philippine illustration. *Journal of Cross-Cultural Psychology, 19*, 140–163.
- Costa, P. T., Jr., & McCrae, R. R. (1992). *Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI) professional manual*. Odessa, FL: Psychological Assessment Resources.
- Goldberg, L. (1990). An alternative "description of personality": The Big Five factor structure. *Journal of Personality and Social Psychology, 59*, 1216–1229.
- Harkness, A. R., McNulty, J. L., & Ben-Porath, Y. S. (1995). The Personality Psychopathology Five (PSY-5): Constructs and MMPI-2 scales. *Psychological Assessment, 7*, 104–114.
- Kwan, K. L. K. (1999). MMPI and MMPI-2 performance of the Chinese: Cross-cultural applicability. *Professional Psychology: Research and Practices, 30*, 260–268.
- Lu, X. (1972). *The true story of Ah Q* (H. Y. Yang & G. Yang, Trans.). Peking, China: Foreign Languages Press.
- McCrae, R. R., & Costa, P. T., Jr. (1997). Personality trait structure as a human universal. *American Psychologist, 52*, 509–516.
- Tellegen, A., & Ben-Porath, Y. S. (1992). The new uniform T-scores for the MMPI-2: Rationale, derivation, and appraisal. *Psychological Assessment, 4*, 145–155.
- Yung, Y. F., Chan, W., Cheung, F. M., Zhang, J. X., Leung, K., & Law, J. S. (2000). Standardization of the Chinese Personality Assessment Inventory: The prototype standardization method and its rationale. *Asian Journal of Social Psychology, 3*, 133–152.

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Received June 17, 2002  
Revised June 20, 2003