Evaluating cross-cultural equivalence of ArabicMMPI-2 Via bilingual test-retest method and Algerian sample

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Abstract:

The Minnesota Multiphasic Personality Inventory (MMPI/MMPI-2) (Butcher & Rouse, 1996) is the most extensively researched and most widely used personality assessment questionnaire in the United States and is widely adapted in other countries. Both the original MMPI (Butcher & Pancheri, 1976) and the revised form (MMPI-2) have been extensively adapted for international use (Butcher, 1996; Butcher et al., 2003).

In Arab countries, **Soliman (1996)*** translated the MMPI-2 into Arabic and the University of Minnesota Press carried out the back translation and the evaluation of this translation using a professional linguist; then, after a few editorial and stylistic changes, the Arabic translation of the MMPI-2 was approved for use by the University of Minnesota.

Soliman examined the validity of the Arabic MMPI-2 via a clinical study but he did not evaluate the cross-cultural equivalence of the test in Arabic countries. In this contribution, we extend his research by incorporating a bilingual test –retest method. The aim of this study was to examine the adequacy of the Arabic translation of the MMPI-2 via assessing a sample of Algerian people.

A reliability study of the translated version was conducted to assess the comparability of the Arabic MMPI-2 to the English form. Correlations coefficient of the clinical and content scales were calculated for the two versions. The cross-language correlations have reported moderate to high correlations between languages versions of the test. Correlations coefficient are comparable to test-retest correlation of English-English scales scores. For the validity and clinical scales, the correlation of the Arabic-English scores for the total sample were generally high (ranging from a low of .50 for the Sc scale and a high of .91 for the Mf scale) with a mean of .72. For the content scales, the correlations of the Arabic-English scores were slightly higher (ranging from .71 to .94). The mean raw scores for the scales of both versions, and the mean profile configuration of validity, clinical and content scales for the Algerian sample, show that the English and Arabic versions are comparable.

Key words: Arabic MMPI-2 – cross cultural equivalence – bilingual test retest.

ملخص:

إن اختبار منيسوتا المتعدد الأوجه للشخصية -MMPI/MMPI) (Butcher & Rouse, 1996) (2 من أكثر اختبارات تقييم الشخصية استعمالا في الولايات المتحدة الأمريكية ومن أكثر الاختبارات المكيفة في البلدان الأخرى. ولقد تم تكييف كل من النسخة القديمة (Butcher &Pancheri, 1976) (MMPI) والنسخة الجديدة ;Butcher, 1996) (MMPI-2) Butcher et al.,2003) للاستعمال العالمي.

أما في البلاد العربية فقد قام "سليمان" (1996)*بترجمة استبيان MMPI- 2 وتعليماته إلى اللغة العربية بتصريح من مطبعة جامعة منيسوتا، ثم خُضعت الترجمة لمراجعات عديدة من قبل المتخصصين في علم النفس وفى اللغة الانجليزية . لقد قام سليمان في مقال له بدراسة صدق النسخة العربية لاختبار MMPI-2 لكن عبر حالات عيادية فقط، فلم يدرس مدى تكافؤ الترجمة العربية للاختبار مع النسخة الأصلية عن طريق عينة من ثنائي اللغة، ولم يدرس البنية العاملية لمختلف مقاييس الاختبار ولم يدرس نمط الإجابة على البنود في هذه الدراسة حاولنا مواصلة دراسة سليمان و كان هدفنا دراسة مدى تكافؤ النسخة المترجمة إلى العربية مع النسخة الأصلية الأمريكية و ذلك عن طريق عينة من مزدوجي اللغة (عربي- انجليزي) وبينت نتائج الدراسة أن معاملات الارتباط في المقاييس الأساسية مرتفعة تتراوح بين 50. في مقياس Sc و91. في مقياس Mf. أما في مقاييس المحتوى فظهر ارتفاع في معاملات الارتباط الذي يتراوح بين71 في مقياس ANG و94 في مقياس WRK. فقد بينت الدراسة أن النسختين العربية والأمريكية متكافئتين على مستوى المفهوم، ولا يوجد اختلاف كبير بين التطبيقين و كل المقاييس الإكلينيكية و كل مقاييس المحتوى غير مرتفعة لما تحول إلى درجات T حسب المعايير الأمريكية.

الكلمات المفتاحية : اختبار MMPI-2- النسخة العربية - التكافؤ عبر الثقافي- طريقة التطبيق و إعادة التطبيق.

*هي ترجمة تجريبية و تستعمل للبحث فقط.

1-Introduction:

The Minnesota Multiphasic Personality Inventory(MMPI-MMPI-2) (Butcher & Rouse, 1996) is the most extensively researched and most widely used personality assessment questionnaire in the United States and is widely adapted in other countries. Both the original (MMPI)(Butcher & Pancheri, 1996) and the revised form (MMPI-2) have been extensively adapted for international use (Butcher, 1996; Butcher et al, 2003).

The MMPI was published in 1943 by Hathaway and McKinley who were working in the University of Minnesota Hospitals. The authors used an empirical keying approach in the construction of the original "clinical scales" so that scale items were those that best distinguished between patients with discrete psychopathological conditions and a group of examinees who were not hospitalized. The original MMPI contained 566 self-referenced true/false statements (Graham, 2000).

In 1989 the updated and restandardized MMPI-2 was published by Butcher, Dahlstrom, Graham, Tellegen, and Kaemmer (1989). Because the original MMPI was so widely used, great care was taken to make improvements (e.g., updating language, including more representative norms, applying uniform T-score conversions, developing new scales) while maintaining its continuity with the original instrument (preserving the clinical scales and their empirical meaning). The MMPI-2 consists of 567 items, and contains numerous scales to assess both normal range personality constructs and psychopathological symptomatology. In the present study we focus on just the most commonly used scales of the MMPI-2: 3 "validity scales", 10 "clinical scales", and 15 "content scales".

The three validity scales, L (lie), F (infrequency), and K (correction), were developed to measure: a deliberate and rather unsophisticated attempt to present oneself in a favorable manner, deviant or atypical ways of responding to test items, and a more subtle and sophisticated attempt to present oneself in a favorable light, respectively (Butcher et al., 1989; Graham, 2000).

The 10 MMPI-2 clinical scales were designed to measure: an excess concern about one's health (Hs, Hypochondriasis), various symptoms associated with depression (D, Depression), hysterical syndromes associated with involuntary psychogenic loss or disorder of function (Hy, Hysteria), psychopathic or sociopathic characteristics, including delinquent acts, sexual problems, family problems, and difficulties with authorities (Pd, Psychopathic deviate), gender-role divergence, including interests or hobbies that were opposite to the stereotypical gender role (Mf, Masculinity-Femininity), paranoid symptoms, interpersonal sensitivities, and a tendency to misinterpret the motives and intentions of others (Pa, Paranoia), generalized anxiety and distress, unreasonable fears, compulsions, and obsessions (Pt, Psychasthenia), psychotic symptoms, such as bizarre mentation, peculiarities of perception, and hallucinations, social alienation, and poor family relationships (Sc, Schizophrenia), hypomanic symptoms, including elevated mood, accelerated speech and motor activity, irritability, and flights of ideas (Ma, Hypomania) and social withdrawal and self-deprecation (Si, Social Introversion)(Butcher et al., 1989; Graham, 2000).

The 15 content scales were developed using a more modern rational-deductive approach to scale construction, and cover a wide range of clinical and normal-range concerns. They include: Anxiety (ANX; tension, worry, fears, lack of confidence, and somatic indications of anxiety), Fears (FRS; specific fears such as high places, snakes, spiders, fires, and storms), Obsessiveness (OBS; rumination about decisions and problems, and compulsions such as counting and saving unimportant things), Depression (DEP; brooding, crying easily, pessimism, suicidal ideation, and guilt), Health Concerns (HEA; gastrointestinal symptoms, neurological symptoms, dermatological problems, and pain), Bizarre Mentation (BIZ; paranoid ideation, ideas of reference, delusional thinking, and hallucinations), Anger (ANG; fear of losing self-control over aggressive impulses, irritability, impatience, stubbornness, physical and/or verbal abusiveness, and explosivity), cynicism (CYN; hostility, suspicion, misanthrope, distrust, and selfishness), Antisocial Practices (ASP; antiauthority ideation, rationalization and identification with criminal behavior,

admission of antisocial or unlawful behaviors), Type A (TPA; hard driving, fast paced, task-orientation, competitiveness, and workaholism), Low Self-Esteem (LSE; a lack of self-esteem, feelings of unattractiveness and uselessness), Social Discomfort (SOD; introversion, social avoidance, dislike of crowds, parties, or group activities), Family Problems (FAM; general problems with family), Work Interference (WRK; difficulties concentrating, anxiety, tension, lack of self-confidence, and indecisiveness about career choices), Negative Treatment Indicators (TRT; negative attitudes towards health care providers and treatment, pessimism about individuals being understanding or helpful) (Butcher et al., 1989; Butcher, Graham, Williams, &Ben-Porath, 1990; Graham, 2000).

1- Translation of the MMPI-2 into Arabic:

The MMPI is well known in the Arab countries. It attracted the attention of psychologists early in test development activities. The MMPI was originally translated into Arabic in the mid-1950 by three Egyptians psychologists who were graduates of major American universities: Attia M. Hana, Emadeddin Ismail, and Louis Meleika (Soliman, 1996). But this translation did not follow the stringent translation and adaptation procedures that are used today.

After the MMPI-2 was published, the MMPI-2 was translated into Arabic by Soliman (1996) an Egyptian psychologist. But hedid not follow exactly the method proposed by Butcher (Butcher, 1996).

The translation was done in simple Arabic language, which understood, read and spoken by all Arabic –speaking people. After the step of the translation, the University of Minnesota Press carried out the back translation and the evaluation of this translation using a professional linguist; then, after a few editorial and stylistic changes, the Arabic translation of the MMPI-2was approved for use by the University of Minnesota.

After the completion of the translated version, it was necessary to test the accuracy of the translation and its psychometric properties. But Soliman examined the validity of the Arabic MMPI-2 via a clinical study and he did not evaluate the cross-cultural equivalence of

the test in Arabic countries. Otherwise, he did not conduct a bilingual test-retest, and he did not perform a factor analysis of the basic scales, and he did not examine item endorsement percentages of the MMPI-2 scale scores.

In this contribution, we wish to extend the research of Soliman by incorporating a bilingual test–retest method. The intent of this study is to examine the adequacy of the Arabic translation of the MMPI-2 via assessing a sample of Algerian people.

The present study attempts to provide validation for the Arabic MMPI-2. If the Arabic translation of the MMPI-2 is accurate, bilinguals should respond similarly to the two versions. Consequently, we expect to find that a sample of Arabic-English bilinguals will produce a similar pattern of mean scores on MMPI-2 scales regardless of translation and demonstrate high correlations between their individual scores on Arabic and English versions of MMPI-2.

2- Previous studies using bilingual test-retest method:

The bilingual retest technique is considered an important method for evaluating the accuracy and adequacy of a translation of a test (Butcher, 1996). In this method, both the original language form and the translated version are administered to a selected group of bilinguals who are familiar with both cultures. Then, scale mean differences or item endorsement frequencies across the two versions are compared, or cross-language correlations are computed (Sireci & Berberoglu, 2000).

A number of studies have used the bilingual technique for checking translation adequacy of the MMPI and MMPI -2 items (e.g., Butcher & Gur, 1974; Tran, 1996; Velasquez et al., 2000).

Butcher and Gur (1974) administered the English-language and the Hebrew translation of the MMPI to 28 bilinguals. The cross-language correlation for the 13 basic scales ranged from .51 to.91, with a mean of .74.

Tran (1996) found,in a sample of 32 college students, that the mean correlation coefficient between scores on the English MMPI-2 and those on the Vietnamese translation of the MMPI-2 was .72, with coefficients ranging from a low of .35 for the Hy scale and high of .88 for the Mf scale.

In a Hmong adaptation study involving 30 bilinguals , Deinard, Butcher, Thao, Vang, and Hang (1996) reported that the mean cross-language correlation was .59, with scales Ma and D showing the lowest (.38) and highest (.80) correlations, respectively.

In contrast, in a sample of 148 bilingual Iceland adults, a high cross-language correlation with mean of .79 was found (Konraos, 1996).

In Velasquez et al. (2000), 27 bilingual participants were administered both the English version and the Spanish translation of the MMPI-2. No significant mean differences on the basic scales were found, and the mean cross-language correlation was .71, with coefficients ranging from .60 (Hy) to .77 (D,Pa, Pt, Sc, and Ma)

In a more recent study, Chung and al., (2006) found, in a sample of 53 Korean/English bilinguals, that all cross-language correlations were lower than the Korean and American test-retest comparison groups; with coefficients ranging from .24 (Pa) to .82 (Ma).

All these previous studies have used the bilingual test-retest method for checking translation adequacy of the MMPI and MMPI -2 items, and all the studies have showed high cross-language correlation for the 13 basic scales, with mean correlation coefficients ranging from .59 (in Hmong adaptation study) and .79 (in Iceland study). In the present study, we have used the same procedure and technique and done the same comparisons and the results showed high mean correlation coefficients in the 13 basic scales (.74).

3- Method:

Participants and Procedure:

A bilingual study was conducted to determine whether the Arabic version produced the same results as English version for individuals who take the MMPI-2 in both languages. A reliability study of the

translated version was conducted to assess the comparability of the Arabic MMPI-2 to the English form.

A test-retest study was done using a group of 49 Algerian volunteers, consisting of 19 bilingual men with a mean age of 51.95 and a standard deviation of 10.2, and 30 native Algerian women whose mean is 24.3 with a standard deviation of 5.41, took part in this study. Many other protocols were eliminated from the study - according to the exclusion criteria that were set by American standards (Butcher et al., 1989)- because they possessed one or more of the following features: cannot say score 15; F (infrequency) 20; Fb (Back F) 20; VRIN (Variable Response Inconsistency) 13; TRIN(True Response Inconsistency) ; or TRIN 13.

All the bilingual subjects spent at least four years in the United States as PhD student and are fluent in both English and Arabic. The monolingual (Arabic-Arabic) subjects were administered the Arabic MMPI-2 (Soliman, 1996) twice with one week interval between administrations.

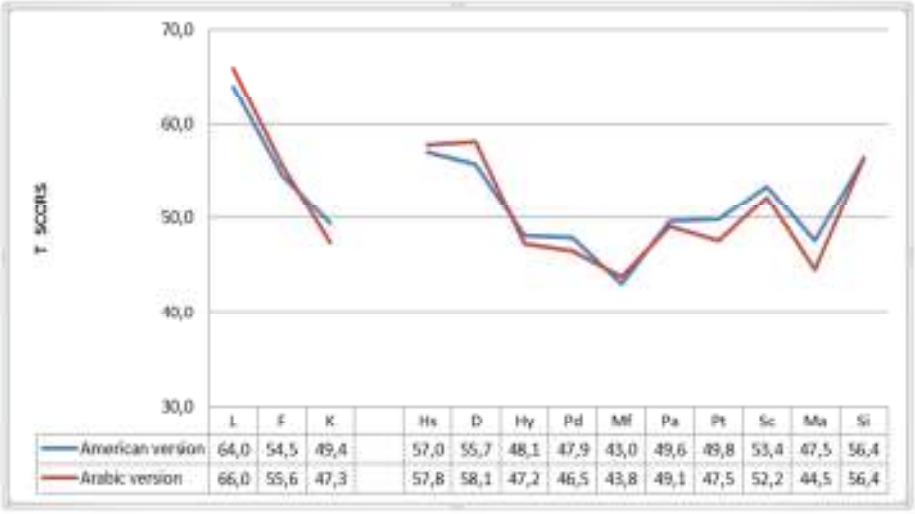
The bilingual group was administered the Arabic MMPI-2 (Soliman, 1996) and the English MMPI-2 (Butcher et al., 1989) in a balanced order. So that, half of the subjects received the Arabic version first while the other half received the English version first. The order was reversed for the second administration one week later.

4- Results :

Table (1) and **figures (1)** and **(2)** displays descriptive statistics and effect size comparing scores on the Arabic and English MMPI-2. Raw scores of the 13 basic and 15 content scales were converted to K-corrected T-scores using American adult norms.

For both versions, the highest mean elevation among the basic scales was on scale L (66 for Arabic version; 64 for the American version), and the next highest mean scale elevations were on scales D (58.12 for the Arabic version; 55.71 for the American version) and Hs (57.88 for Arabic version; 57 for the American version)

For both versions, the lowest scores were on scale Ma, with mean of 44.53 for the Arabic version and 47.53 for American version and scale Mf (43.88 for the Arabic version and 43.06 for American version).



	L	F	K	Hs	D	Hy	Pd	Mf	Pa	Pt	Sc	Ma	Si
American version	64,0	54,5	49,4	57,0	55,7	48,1	47,9	43,0	49,6	49,8	53,4	47,5	56,4
Arabic version	66,0	55,6	47,3	57,8	58,1	47,2	46,5	43,8	49,1	47,5	52,2	44,5	56,4

Note: L: Lie; F: Infrequency; K : Correction; Hs: Hypochondriasis; D: Depression; Hy: Hysteria; Pd: Psychopathic Deviation; Mf: Masculininity-Femininity ; Pa: Paranoia; Pt: Psychasthenia; Sc: Schizophrenia; Ma: Hypomania; Si: Social Introversion

Fig 1: Comparison of means on basic scales between Arabic and American version

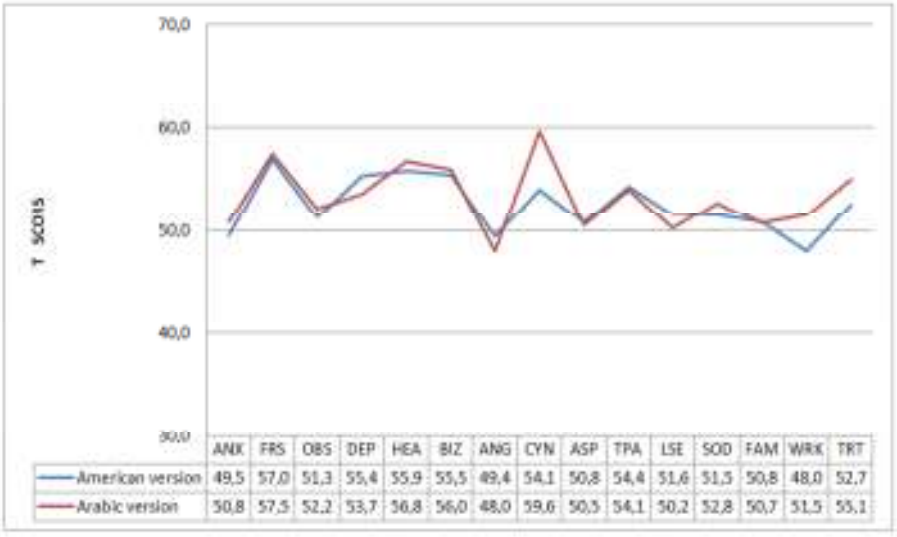
Therefore, mean profiles were similar for the two versions, both in terms of overall elevation and in terms of specific scales elevations; expect for scales D and Ma, all basic scale means fell within three T-score point of another.

All Cohen's d values were small with the exception of that for Ma, which showed moderately sized (d=.47) mean difference between the two versions.

No basic scale elevations (except L) were one standard deviation away from the normative means. But there are scales mean which fell

below the American normative means in the two versions: K, Hy, Pd, Mf, Pa, Pt and Ma.

For the content scales, all mean scores fell within five T score points across version expect for scale CYN and LSE, with d values ranging from .02 to .38. Like the basic scales, no content scale elevations were one standard deviation away from the normative means.



	ANX	FRS	OBS	DEP	HEA	BIZ	ANG	CYN	ASP	TPA	LSE	SOD	FAM	WRK	TRT
American version	49,5	57,0	51,3	55,4	55,9	55,5	49,4	54,1	50,8	54,4	51,6	51,5	50,8	48,0	52,7
Arabic version	50,8	57,5	52,2	53,7	56,8	56,0	48,0	59,6	50,5	54,1	50,2	52,8	50,7	51,5	55,1

Note: ANX: Anxiety; FRS: Fear; OBS: Obsessiveness; DEP: Depression; HEA: Health Concerns; BIZ: Bizarre Mentation; ANG: Anger; CYN: Cynicism; ASP: Antisocial Practices; TPA: Type A; LSE: Low Self-Esteem; SOD: Social Discomfort; FAM: Family Problems; WRK: Work Interference; TRT: Negative Treatment Indicators.

Fig 2: Comparison of means on content scales between Arabic and American version

The highest elevations on Arabic version were CYN (59.65), FRS (57.82), BIZ (56.06), and HEA (56.82). Similarly, the American version produced the highest elevation at FRS (56.53) and LSE (56.65).

There are scale means which fell below the US normative means as ANG (48) for the Arabic version and ANX (49.53), ANG (49.41) and WRK (48.06) for the American version.

Table 1: **Means and standard deviations, and standard differences on basic and content scales between Arabic and American versions of the MMPI-2 (N=19).**

SCALES	American version		Arabic Version		
	Mean	SD	Mean	SD	Cohen 's *d*
Basic					
L	**64,00**	10,747	**66,00**	9,843	-.19
F	**54,53**	17,201	**55,65**	14,142	-.07
K	**49,41**	8,790	**47,35**	8,314	.24
Hs	**57,00**	8,732	**57,88**	9,905	-.09
D	**55,71**	6,926	**58,12**	9,545	-.28
Hy	**48,12**	9,300	**47,24**	7,628	.10
Pd	**47,94**	9,209	**46,53**	8,224	.16
Mf-	**43,06**	8,835	**43,88**	6,499	-.10
Pa	**49,65**	14,151	**49,12**	12,077	.04
Pt	**49,82**	8,376	**47,53**	10,339	.24
Sc	**53,47**	8,952	**52,29**	8,432	.13
Ma	**47,53**	7,081	**44,53**	5,328	**.47**
Si	**56,41**	6,634	**56,47**	8,442	-.00
Content					
ANX	**49,53**	11,052	**50,82**	11,326	-.11
FRS	**56,53**	13,196	**57,59**	12,435	-.08
OBS	**51,35**	11,090	**52,29**	12,004	.08

DEP	**55,47**	9,118	**53,71**	8,372	-.20
HEA	**55,94**	10,170	**56,82**	9,016	-.09
BIZ	**55,59**	11,164	**56,06**	9,107	-.04
ANG	**49,41**	9,448	**48,00**	7,921	.16
CYN	**54,18**	18,225	**59,65**	8,653	-.38
ASP	**50,82**	8,064	**50,59**	5,546	.03
TPA	**54,41**	12,520	**54,12**	11,837	.02
LES	**51,65**	8,039	**50,29**	8,564	.16
SOD	**51,59**	5,874	**52,88**	6,412	-.20
FAM	**50,88**	10,277	**50,71**	9,005	.01
WRK	**48,06**	14,002	**51,53**	9,214	-.29
TRT	**52,76**	15,861	**55,12**	9,816	-.17

Note: L: Lie; F: Infrequency ; K : Correction; Hs: Hypochondriasis; D: Depression; Hy: Hysteria; Pd: Psychopathic Deviation; Mf: Masculininity-Femininity ; Pa: Paranoia; Pt: Psychasthenia; Sc: Schizophrenia; Ma: Hypomania; Si: Social Introversion; ANX: Anxiety; FRS: Fear; OBS: Obsessiveness; DEP: Depression; HEA: Health Concerns; BIZ: Bizarre Mentation; ANG: Anger; CYN: Cynicism; ASP: Antisocial Practices; TPA: Type A; LSE: Low Self-Esteem; SOD: Social Discomfort; FAM: Family Problems; WRK: Work Interference; TRT: Negative Treatment Indicators.

In sum, for both versions, all clinical and content scale mean scores were not elevated when profiles were plotted against American adult norms. Except scale L showed highest elevation for both versions.

In contrast, most of the scale means fell below the US normative means. Mean T score for all scales are close across versions, with all scale means except for Ma and D falling within three T-score points of one another across version.

Cross-language correlations for the basic and content scales are presented in Table 2, using the Algerian test-retest and the established American test-retest reliabilities reported by Butcher et al.(2001) as comparisons.

Cross-language test-retest correlations were obtained by correlating MMPI-2 scale scores from the Arabic version with the corresponding scores from the American version. A correlation coefficient was computed for each scale, indexing the degree to which individual scale performance was the same across versions.

All cross-language correlations were higher and similar to Algerian and American test-retest comparison groups. The highest cross-language correlation was with scale Mf (.91) as in American men test retest (.84). The next two highest cross-language correlation, were on Si (.84) and F(.83), whereas the lowest cross-language correlations were on scales Sc (.50) as in American women test-retest (.54) and inHs (.65).

Cross-language correlations for the content scales were larger than those for the basic scales, but still similar than the Algerian and American test comparison groups. The highest correlations were on WRK (.94) and FRS (.89). High cross language correlation suggest that the Arabic MMPI-2 is measuring the same dimensions as American MMPI-2 .

The mean T scores for the scales of both versions, and the cross-language correlations for the validity, clinical and content scales for the Algerian sample, show that the English and Arabic versions are comparable.

Table 2:**Cross-language correlation and test-retest correlation for MMPI-2 basic and content scales**

Scales	English- Arabic Bilinguals test-retest	Arabic- Arabic AlgerianTest-retest	English – English American test-retest*	
	N=19 (Men)	N= 30 (Women)	N= 82 (Men)	N= 111 (Women)
Basic				
L	.81	.77	.86	.81
F	.83	.68	.74	.70
K	.81	.72	.80	.80
Hs	.66	.73	.76	.75
D	.71	.78	.79	.80
Hy	.77	.66	.79	.74
Pd	.67	.70	.70	.69
Mf	**.91**	**.55**	.79	.74
Pa	.69	.67	.83	.56
Pt	.70	.75	.67	.68
Sc	**.50**	.61	.72	.54
Ma	.70	.69	.80	.65
Si	.84	**.90**	.93	.92
Mean	**.74**	**.71**	**.78**	**.72**
Content				
ANX	.86	.73	.89	.88
FRS	.89	.87	.82	.87
OBS	.85	.73	.84	.84
DEP	.74	.85	.84	.88
HEA	.79	.76	.80	.86
BIZ	.77	.69	.77	.78
ANG	.71	.87	.87	.82
CYN	.80	.82	.81	.88
ASP	.85	.82	.82	.86

TPA	.84	.85	.81	.78
LES	.75	.81	.84	.86
SOD	.87	.87	.91	.91
FAM	.89	.81	.84	.83
WRK	.94	.81	.90	.90
TRT	.83	.85	.79	.88
Mean	**.82**	**.81**	**.84**	**.85**

***Note** : American test-retest correlations from Butcher et al. (2001)

5- Discussion:

Bilingual participants who took the English and the Arabic MMPI-2 produced mean profiles similar in both languages. The profiles did not vary substantially across versions of the test. This finding suggests that any problems with the equivalence of the Arabic translation do not manifest in systematic bias in overall scale elevation.

Although cross-language correlations tended to yield coefficients quite high which range in .50 to .91 considered sizable, these values are equal in comparison to Algerian test-retest reliabilities, which range in the high .55-.90. The participants were responding similarly across versions and within versions.

Most of the 13 basic scales approached the test-retest reliabilities except for Mf (.91) scale which is high comparing to Algerian test-retest (.55). A majority of the 15 content scales approached the test-retest reliabilities and some scales (WRK (.94) and FAM(.89) slightly exceed the test-retest reliabilities.

This study demonstrated both the substantial strengths and weaknesses of the bilingual research design for studying test equivalence. Strengths include the ability to observe the difference in responding to two different languages versions of the test.

The weaknesses of this design is the difficulty to obtain a sample of a truly bilingual participants, which explain why most of the studies using this design have had very small sample sizes (Deinard et al.1996; Tran, 1996; Velasquez et al.; 2000).

Future investigations using this design would benefit from a screening procedure that tests participants formally on their proficiency in both languages. Along with language proficiency, acculturation level also needs to consider in future research. Previous studies have shown acculturation to be associated with general adjustment level, reflected on performance on MMPI/MMPI-2(Dong & Church, 2003).Study design should consider not only degree of bilinguality, but also acculturation.

Although not directly addressed by this study, the potential utility of the Arabic MMPI-2 for Algerians is noteworthy. For measurement of psychological problems, including anxiety, depression, physical illness, a well-developed standardized assessment scale is essential. The MMPI-2 is a particularly good candidate because it contains a broad item pool that addresses a wide variety of aspects of both normal personality and psychopathology.

To summarize, the results of the current study support the equivalence of the Arabic MMPI -2. Mean profiles were similar across samples; scale score correlations across versions were comparable in magnitude to test-retest correlations.

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