

EFFECT OF AGE AND TYPE OF SCHOOL ON MMPI-A SCORES IN A 13-18 YEAR OLD MEXICAN ADOLESCENT SAMPLE

*Emilia Lucio^{*1}, Quetzalcoatl Hernandez-Cervantes¹,
Consuelo Duran¹ and James N. Butcher²*

¹Universidad Nacional Autónoma de México

²University of Minnesota

ABSTRACT

The question as to whether the MMPI-A can be appropriately used to assess a 13-year-old adolescent has been addressed in past research on the test. This study was designed to provide information on the adequacy of administering the personality inventory to 13-year-old Mexican adolescents; in addition, the current Mexican MMPI-A norms were examined to determine their validity when using them with this younger group selected according to the same sampling criteria as the normative sample. A sample of 203 13-year-old adolescents (83 girls and 120 boys) was compared with the Mexican normative sample of 4050.

The participants were obtained from both public and private schools (54% from public senior high schools); all participating schools (public and private) were selected to represent the different geographical and socioeconomic zones of Mexico City. Results indicate that the MMPI-A can be used with 13-year-old adolescents as long as they can understand the test and answer it properly. However, some differences between public and private schools on the MMPI-A validity scales were found.

It was concluded that reading and comprehension levels likely differ between some of the Mexican schools. Therefore, it would be important to assure that the adolescent can read and comprehend the items at a 6th grade level in order to produce valid test results.

Keywords: MMPI-A, age, school, effect.

* Address for correspondence: Estudios de Postgrado, National Autonomous University of Mexico, E-mail melgm@servidor.unam.mx, Phone 52(55) 56222318, Fax: 52 (55) 5606-2096, Once Martires 91-Casa 5, Col. Centro, Delegacion Tlalpan, C.P. 14000

RESUMEN

Este estudio fue diseñado con la finalidad de dar información acerca de lo apropiado de aplicar el inventario de personalidad de Minnesota para adolescentes: MMPI-A a adolescentes de 13 años. Además se examina si las normas del MMPI-A de la versión mexicana en español son válidas con un grupo de menor edad. Con esta finalidad se compararon los datos obtenidos con el grupo de estudio con los de 4050 adolescentes de la muestra normativa de entre 14 y 18 años. Los participantes del estudio 203 adolescentes de 13 años (83 muchachas y 120 muchachos pertenecían a escuelas públicas y privadas y fueron seleccionados de diferentes zonas de la Ciudad de México con diferentes niveles socioeconómicos. Los resultados indican que el MMPI-A puede emplearse con adolescentes de 13 años, siempre y cuando entiendan el instrumento y lo respondan adecuadamente. No obstante se encontraron algunas diferencias entre los estudiantes de escuelas públicas y privadas en relación a las escalas de validez. Se concluye que los niveles de lectura y comprensión difieren en las escuelas de la Ciudad de México, por lo que es importante asegurarse que los adolescentes tienen que tener un nivel de lectura de 6o. grado para que los resultados del inventario sean válidos.

Palabras clave: MMPI-A edad, escuela, normas.

INTRODUCTION

The use of the Minnesota Multiphasic Personality Inventory-Adolescents (MMPI-A) has a long history, particularly with youngsters in clinical settings (Baer, 2004). Butcher, Graham, and Ben-Porath (1995) comment on age-related issues concerning MMPI-A studies whereas among the six areas of productive research identified by Archer (1997) we find the establishment of optimal age ranges for use with the inventory. In the development of the MMPI-A in the United States the test developers collected a national sample of adolescents between the ages of 12 and 18 (Butcher et al., 1992); however, the authors developed norms alone for the 14 to 18 year olds. On whether the MMPI-A may be appropriate to assess 13-year-olds, Butcher and Williams (2000) mention that it is possible to do so if they are mature enough to answer the items meaningfully and if they read at a 6th-grade level. The MMPI-A Report authors also pose the question of the age effect on MMPI-A scores and state that when administering the inventory to adolescents 12 or 13 years old clinicians should be aware of its use with an age group that has a higher incidence of difficulty with the assessment and consequently interpretations should be made with caution; they also point out that the inventory is probably developmentally inappropriate for children less than twelve (Butcher and Williams, 2000).

Prior to obtaining norms for 13-year-olds and suggesting separate norms for adolescents 14 and under (Archer, 1997), Archer and Gordon (1994) assessed the stability of 70 MMPI-A modified items by comparing item endorsement frequency and item test-retest correlations in a group of 13 to 17 years old. In their results, the authors comment that such item modifications did not result in significant changes in response patterns. Normative equations on a sample of normal girls and boys ages 13 through 17 years were used by Malinchoc, Colligan and Offord (1996) to develop norms for the Optimism-Pessimism (PSM) scale of the

MMPI; their results pointed toward PSM suitable reliability and the scale's ability to assess explanatory style within adolescents. Janus, de Groot and Toepfer (1998) found no significant differences for age in mean T scores of the MMPI-A between 13-year-old and 14-year-old inpatients; nevertheless, they did find a strong multivariate effect when using Archer's MMPI-A norms resulting in lower T-score values in contrast to using the standard MMPI-A norms, and that univariate differences based on norms were found in almost all scales for boys and girls.

Another study evaluated the effects of psychopathology and demographic characteristics on MMPI-A scores using multiple linear regression analyses with the U.S. standardization sample (Schinka, Elkins, David and Archer, 1999). Their results show that the Infrequency (F) and Variable Response Inconsistency (VRIN) scales were influenced most by demographic variables; that there was no influence on the content scales except for the Bizarre Mentation (BIZ) scale, and no demographic variable influence for supplementary-scale scores. Gumbiner, Arriaga and Stevens (1999) compared scores of juvenile delinquents on the MMPI-A using the current U.S. norms, the Marks-Briggs adolescent norms, and the MMPI-2 adult norms reporting that in general, the MMPI-A scale elevations were lowest, followed by the Marks-Briggs norms while MMPI-2 T-score means were the most elevated.

There are other studies with the inventory where 13-year-olds have been included in MMPI-A norms use or development. Imhof and Archer (1997) examined the concurrent validity of IMM based on a residential treatment sample of 66 adolescents aged 13-18 years. Findings evidenced concurrent validity of the scale as well as a number of correlate descriptors by means of the other instruments employed, such as the Extended Objective Measure of Ego Identity Status-2nd Revision and other standardized measures. In the Russian translation of the instrument (Atlis, 2004), a group of 344 students ages 13-18 from different public schools completed the Russian-language MMPI-A; when scored against American norms average group profiles were within normal limits for basic validity, clinical and content scales.

There are few studies addressing this issue among Hispanic population. Negy et al. (1997) studied MMPI-A performance in a Mexican-American adolescent sample of 120 thirteen to 18-year-olds; findings from this study indicated that scores on all scale groups of the inventory differed minimally from the U.S. normative group's performance, and that Mexican-American profile varied due to acculturation levels and socioeconomic status. In a related study, Gumbiner (1998) analyzed Hispanic adolescent MMPI-A profiles examining parents' education and employment relationship to scale elevations; among other results, the author mentions that boys' dislike for school and low aspirations were related to lower education and employment of their fathers compared to those for the normative U.S. sample. More recently, Mendoza-Newman (2000) studied level of acculturation, socioeconomic status (SES), and MMPI-A performance in a non-clinical Hispanic adolescent sample finding no relationship between acculturation and SES and the Lie (L) or 5 scales (Masculinity-Femininity) whereas Calderon (2002) examined how bilingual Mexican adolescents performed on the MMPI-A when comparing their levels of acculturation to mainstream U.S. population emphasizing that Mexican-American adolescents do differ from national standardized norm group's performance on selected clinical and validity scales once these levels are taken into account. Furthermore, Scott et al. (2002) assessed the Hispanic MMPI-A generalizability in five Spanish-speaking countries recommending further studies to determine appropriateness for adequate norms usage or adaptation.

The MMPI-A has been standardized with Mexican adolescents (Lucio et al., 1999) and exhibits high test-retest reliability and high alpha coefficients in most of the scales (Farias, Duran and Gomez-Maqueo, 2003). When normative data were obtained in the standardization of the MMPI-A for Mexico (Lucio et al., 1998), the original sample comprised a group of 13-year-old student adolescents who were at the end of the process left out to comply with the range of 14 to 18 years old established by the MMPI-A Project Committee (Butcher et al., 1992). There is deep interest in identifying specific adolescent psychopathology since serious emotional problems, such as depression, suicidal ideation and attempt (Gonzalez-Forteza et al., 2002; Mondragon, Borges and Gutierrez, 2001), drug addiction and antisocial conduct tend to emerge earlier in Mexican adolescents (Juarez-Garcia et al., 2005; Villatoro et al., 2005). In addition, 13-year-olds represent a significant group in Mexican junior high schools thus an increasing demand for assessing younger at-risk adolescents within clinicians and school psychologists (Barcelata, Lucio and Duran, 2004).

Therefore, the need to evaluate if current Mexican MMPI-A norms would then apply to this younger group which also fulfilled the same sampling criteria as the normative sample did. On the other hand, given the developmental tasks and sociocultural contexts of a diverse and heterogeneous adolescent population in Mexico, there was an interest to assess if there was an effect of age and/or type of school (public or private) on the scores of a composite sample that would integrate the 13-year-old group to the normative sample. Therefore, the purposes of this exploratory study are (1) to examine if 13-year-old adolescents can understand the MMPI-A properly and hence generate a valid profile, and (2) evaluate the effects of age and type of school on the MMPI-A scores in a Mexican adolescent composite sample: the normative sample plus this excluded younger group.

METHOD

The research questions are as follows: 1) is the MMPI-A profile produced by a 13-year-old subgroup valid and reliable? 2) Are there mean differences in the MMPI-A scale groups associated with differences in age or type of school in the composite sample? 3) Does change in the MMPI-A scores over levels of age depend on the type of school? 4) If there are significant differences for one or more of the main effects or interactions, which MMPI-A scales are changed and which are unaffected by age or type of school?

Variables

For profile validity and reliability, the independent variable is the subgroup's age (13 years old) and the dependent variable the MMPI-A profile. For the MANOVA analyses there are two independent variables, age (13 to 18) and type of school (junior high public and private; senior high public and private); dependent variables are the scores on all MMPI-A scale groups: Validity, Clinical, Content, and Supplementary.

Participants

To assess profile validity in the 13-year-old subgroup 203 youngsters participated: 83 girls and 120 boys. As noted before, these adolescents attended the same public and private schools from where the Mexican normative sample was drawn. The composite sample used to assess age and school effect was conformed by these 203 13-year-olders plus the 4050 adolescents from the Mexican normative sample, resulting in a final study sample of 4,253 students from 13 to 18 years old.

Instruments

Demographic data were gathered through an ad-hoc form which was completed by all participants. The official translated, adapted and standardized version for Mexico of the Minnesota Multiphasic Personality Inventory for Adolescents (MMPI-A) by Lucio et al. (1998). The translation procedures for the Mexican version followed a strict methodology and most of the scales exhibited alpha coefficients equal or higher than those of the United States normative sample (Lucio et al., 1999).

Procedure

Consent was granted from each school's authorities and subsequently participants' parents. All of the students were given the choice of voluntary participation and were administered the test at their schools in groups of no more than 25 students each. There were at least two administrators in each group to ensure that the adolescents followed instructions properly and to answer any questions on the meaning or phrasing of items. Descriptive and frequency analyses were used with demographic data. To assess profile validity and reliability with the 13-year-old group, the MMPI-A interpretive system developed by Archer (2000) was used along with the corresponding Mexican inventory norms. To evaluate age and type of school effects in the composite sample, MANOVAs were carried out for each MMPI-A group of scales (Validity, Clinical, Content, and Supplementary), calculated separately for boys and girls and using raw scores. All statistical procedures were performed with SPSS version 15.

RESULTS

Demographic Characteristics

A composite sample of 4,253 Mexican student adolescents was used for the several statistical analyses (48% boys and 52% girls; $X=15.5$, $SD=1.35$). Most of the participants were from public senior high schools (54%); all participating schools (public and private) were selected to represent the different geographical and socioeconomic zones of Mexico City. The most common fathers' reported occupation was "employee" (35%) whereas mothers' occupation was "homemaker" (47%). Almost 40% of the students reported living

with both parents and siblings. Age and sex sample distribution, and other demographics are presented in Table 1.

Table 1. Demographics of the Mexican MMPI-A adolescent composite study sample

	Boys		Girls		Total	
	n	%	n	%	N	%
<i>Age</i>	2024	47.6	2229	52.4	4253	100
13	120	5.9	83	3.7	203	4.8
14	412	20.3	511	22.9	923	21.7
15	502	24.8	649	29.1	1151	27.0
16	400	19.8	464	20.8	864	20.3
17	372	18.4	380	17.1	752	17.7
18	218	10.8	142	6.4	360	8.5
<i>Type of school</i>						
Public junior high	381	18.8	488	21.9	869	20.4
Public senior high	1084	53.5	1225	55.0	2309	54.3
Private junior high	323	16.0	289	13.0	612	14.4
Private senior high	236	11.6	227	10.2	463	10.9

Profile Validity and Reliability

To assess MMPI-A profile validity and reliability with the 13-year-old subgroup the Mexican norms were applied to score the inventory and then interpretive reports were obtained separately for boys and girls (Archer, 2000). The Welsh Code for the male profile was 8970136/245: FL/K: with a mean clinical scale elevation of 50.4 (T-score); for the female profile the resulting Welsh Code was 95768140/32: FK/L: with a mean clinical elevation of 50.5 (T-score). Configural validity and scale interpretation of the MMPI-A for both girls and boys indicate that this group of 13-year-old adolescents has produced a consistent MMPI-A response pattern in agreement with acceptable values on validity scales “Variable response inconsistency” (VRIN) and “True response inconsistency” (TRIN). Both “Infrequency 1” (F1) and “Infrequency 2” (F2) are below T-score values of 53, reflecting adequate profile validity. The “Infrequency-Lie-Defensiveness” (F-L-K) validity scale configuration suggests that the group responded to the MMPI-A in a valid, accurate, and cooperative manner. The alpha coefficient of the 13 years old group are very similar to those of the Mexican and North-American normative sample, some of these coefficients are even higher in the 13 years old (tables 2 and 3). Furthermore, the validity scale features produced by these youngsters are typical of normal adolescents at the same time as the configural clinical scale interpretation indicates that the profile is within normal limits and presents no evidence of clinical levels of psychopathology.

Table 2. Reliability statistics for MMPI-A Basic scales in the Mexican 13 years sample

Scale	N of items	Cronbach's Alpha	
		Boys (n=120)	Girls (n=83)
F1	33	.56	.55
F2	32	.70	.75
F	66	.78	.81
L	14	.53	.66
K	30	.68	.71
1 Hs	32	.47	.35
2 D	57	.67	.66
3 Hy	60	.67	.58
4 Pd	49	.69	.62
5 Mf	44	.55	.52
6 Pa	40	.72	.71
7 Pt	48	.82	.80
8 Sc	77	.85	.86
9 Ma	46	.66	.74
0 Si	62	.74	.72

Table 3. Reliability statistics for MMPI-A Content and Supplementary scales in the Mexican 13 years sample

Scale	N of items	Cronbach's Alpha	
		Boys (n=120)	Girls (n=83)
ANX	21	.61	.56
OBS	15	.67	.74
DEP	26	.63	.57
HEA	37	.60	.39
ALN	20	.57	.55
BIZ	19	.66	.74
ANG	17	.62	.66
CYN	22	.70	.71
CON	23	.64	.73
LSE	18	.64	.66
LAS	16	.52	.47
SOD	24	.52	.30
FAM	35	.56	.59
SCH	20	.56	.60
TRT	26	.72	.73
MAC	49	.67	.68
ACK	13	.56	.58
PRO	36	.43	.37
IMM	43	.60	.66
A	35	.87	.87
R	33	.54	.57

Means by Type of School

Means by type of school are presented (figures 1 to 4) with respect to gender and the different scales group. The means are very similar and all of them are very near to T 50, as could be expected. With respect to clinical scales Sc (8) is the only scale 5 points higher to the normal mean and only in boys.

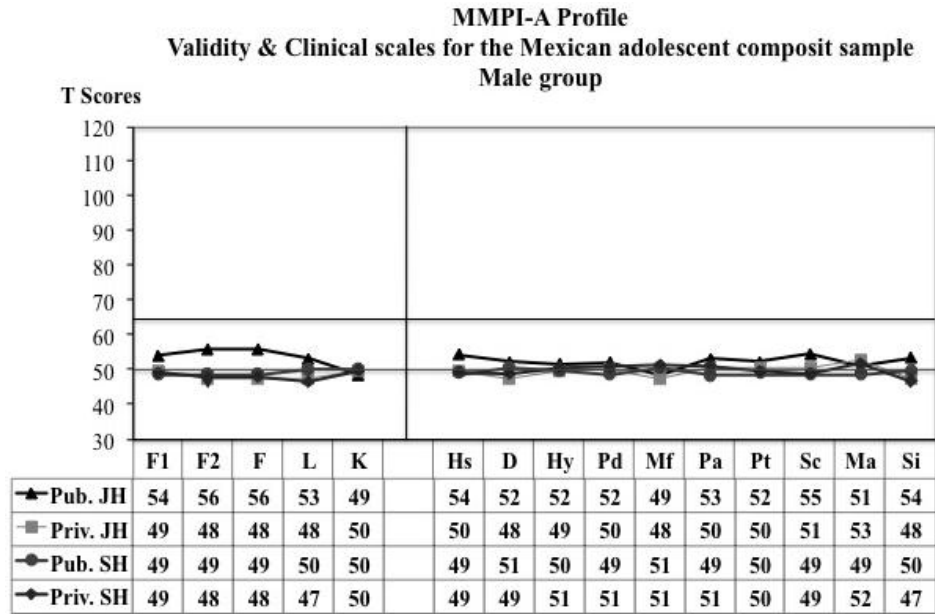


Figure 1.

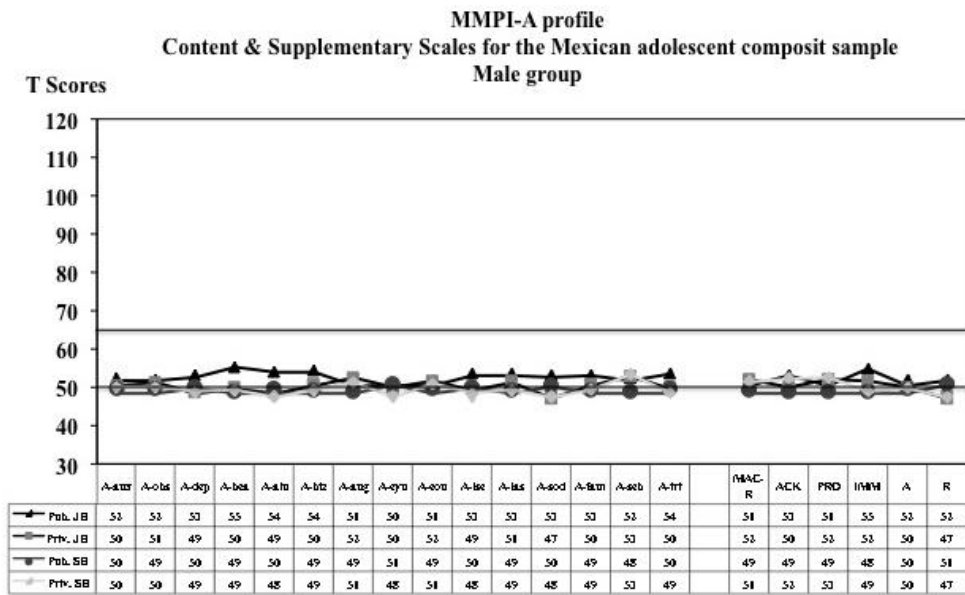


Figure 2.

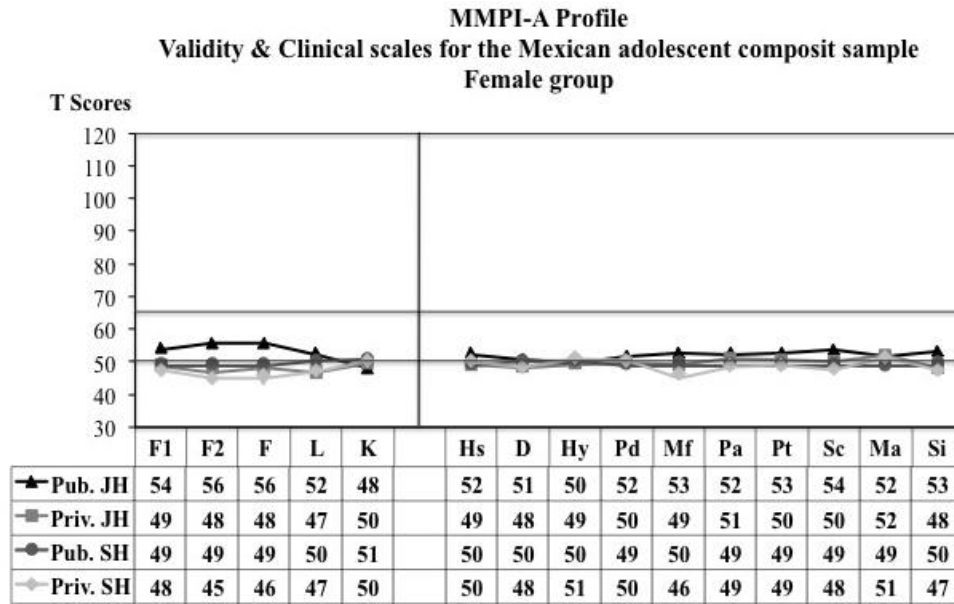


Figure 3.

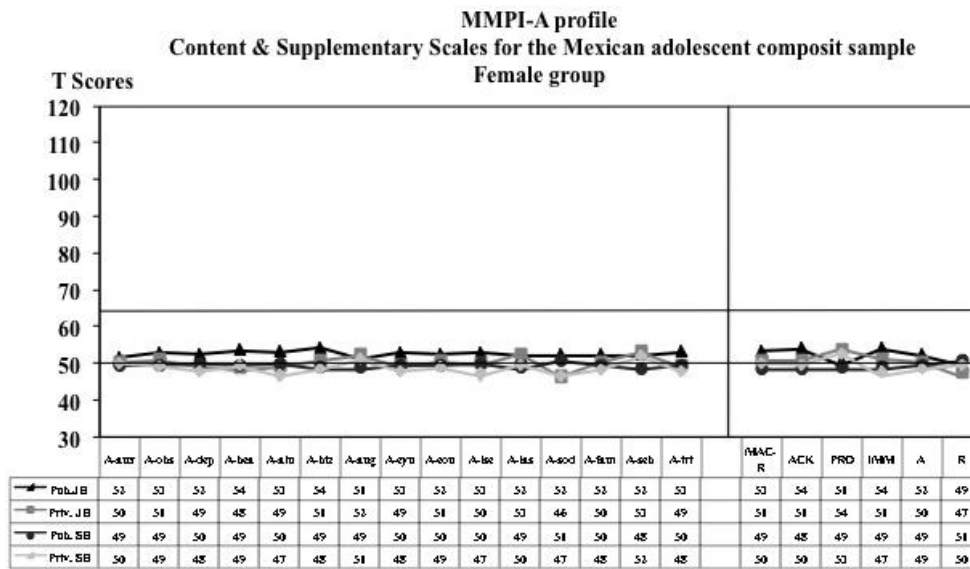


Figure 4.

Effect of Age and Type of School

Four 2 x 2 between-subjects multivariate analyses of variance were performed on each of the MMPI-A scale groups: Validity, Clinical, Content, and Supplementary (dependent variables). Independent variables were age (six levels: 13 through 18) and type of school (four levels: public junior and senior highs; private junior and senior highs). Raw scores were

used separately for boys and girls; order of entry of the independent variables was age then type of school. There were no univariate or multivariate within-cell outliers at $p < .001$; results of evaluation of assumptions of normality, linearity, and multicollinearity were satisfactory. Using Wilks' criterion, all combined dependent variables in the four MMPI-A scale groups were austere affected by type of school but neither by age nor their interaction; moreover, relatively higher values are observed for the girls than for the boys in the four scale groups. Estimates for effect size (partial Eta squared) are rather small suggesting reduced associations between type of school and the combined dependent variables; as for age, associations were even less substantial.

For the first group "Validity Scales" type of school has a relatively stronger effect on girls' scores, $F(18, 6237) = 6.51, p < .001$ partial $\eta^2 = .02$, than on boys', $F(18, 5651) = 4.16, p < .001$ $\eta^2 = .01$ (Table 4a); univariate analysis on this first group of scales shows that the highest school effect values are for the Infrequency (F) scale in the boys, $F(5, 20) = 11.1, p < .001$ and for the Infrequency 2 (F2) scale in the girls, $F(3, 18) = 14.8, p < .001$ (Table 4b). Within the Clinical scales group, the obtained values are more alike for girls, multivariate $F(30, 6461) = 2.43, p < .001$, and boys, multivariate $F(30, 5853) = 2.39, p < .001$, with partial η^2 values of .01 in both cases (Table 5a).

Table 4. Multivariate analysis of variance for the MMPI-A Validity Scales group in the Mexican adolescent sample

Source of variance	Boys (n=2024)					Girls (n=2229)				
	Wilks' Lambda	df ₁	df ₂	F	η^2	Wilks' Lambda	df ₁	df ₂	F	η^2
Age	.980	30.00	7994.00	1.316	.004	.981	30.00	8822.00	1.415	.004
School	.963	18.00	5651.68	4.161**	.012	.949	18.00	6237.17	6.505**	.017
Age by School	.948	72.00	10876.10	1.477	.009	.962	60.00	11557.73	1.432	.006

** $p < .001$.

Table 4b. Tests of between-subjects effects for the MMPI-A Validity Scales in the Mexican adolescent sample

Source of variance	Dependent Variable	Boys (n=2024)			Girls (n=2229)		
		df	F	η^2	df	F	η^2
School	VRIN	3	9.619**	.014	3	3.303	.004
	TRIN	3	.925	.001	3	4.941	.007
	F	3	11.107**	.016	3	13.229**	.018
	F1	3	9.750**	.014	3	6.530**	.009
	F2	3	8.511**	.013	3	14.788**	.020
	L	3	3.720	.006	3	13.730**	.018
	K	3	2.145	.003	3	3.454	.005

** $p < .001$.

In this second group of scales, tests of between-subjects effects show lower values than in the Validity group; type of school on scales 8 Schizophrenia (Sc) $F(3, 20) = 7.00$, $p < .001$ (in boys) and 5 Masculinity-Femininity (Mf) $F(3, 18) = 5.42$, $p < .001$ (in girls) were the highest statistically significant values (Table 5b).

Table 5a. Multivariate analysis of variance for the MMPI-A Clinical Scales group in the Mexican adolescent sample

Source of variance	Boys (n=2024)					Girls (n=2229)				
	Wilks' Lambda	df ₁	df ₂	F	H2	Wilks' Lambda	df ₁	df ₂	F	η ²
Age	.962	50.00	9097.40	1.537	.008	.975	50.00	10041.47	1.103	.005
School	.965	30.00	5853.46	2.389**	.012	.968	30.00	6461.05	2.426**	.011
Age by School	.921	120.00	15490.32	1.374	.008	.950	100.00	15770.39	1.135	.005

** $p < .001$.

Table 5b. Tests of between-subjects effects for the MMPI-A Clinical Scales in the Mexican adolescent sample

Source of variance	Dependent Variable	Boys (n=2024)			Girls (n=2229)		
		df	F	η ²	df	F	η ²
School	1 Hs	3	6.378**	.009	3	1.735	.002
	2 D	3	3.348	.005	3	1.681	.002
	3 Hy	3	2.684	.004	3	0.399	.001
	4 Pd	3	6.095**	.009	3	3.132	.004
	5 Mf	3	1.629	.002	3	5.416**	.007
	6 Pa	3	6.899**	.010	3	2.961	.004
	7 Pt	3	2.454	.004	3	1.345	.002
	8 Sc	3	7.011**	.010	3	4.073	.005
	9 Ma	3	6.117**	.009	3	1.910	.003
	0 Si	3	4.008	.006	3	4.624	.006

** $p < .001$.

In the case of the Content and Supplementary groups, this difference increases mildly. For the Content scales, multivariate $F(45, 5909) = 2.57$, $p < .001$ is found in boys, and multivariate $F(45, 6524) = 3.45$, $p < .001$ in girls, partial $\eta^2 = .02$ in both (Table 6a); the highest univariate analysis values are for type of school's effect on the School Problems (A-sch) scale in boys ($F[3, 20] = 11.32$, $p < .001$), and in girls ($F[3, 18] = 9.77$, $p < .001$) (Table 6b). As for the Supplementary scales group, multivariate $F(18, 5651) = 3.57$, $p < .001$ is allocated in boys, and multivariate $F(18, 6237) = 4.24$, $p < .001$ in girls, partial $\eta^2 = .01$ in both (Table 7a).

Table 6a. Multivariate tests for the MMPI-A Content Scales group in the Mexican adolescent sample

Source of variance	Boys (n=2024)					Girls (n=2229)				
	Wilks' Lambda	df ₁	df ₂	F	η ²	Wilks' Lambda	df ₁	df ₂	F	H2
Age	.949	75.00	9531.27	1.398	.010	.960	75.00	10522.76	1.191	.008
School	.944	45.00	5909.59	2.561**	.019	.932	45.00	6524.54	3.475**	.023
Age by School	.897	180.00	18788.39	1.203	.009	.931	150.00	18430.61	1.045	.007

** $p < .001$.**Table 6b. Tests of between-subjects effects for the MMPI-A Content Scales in the Mexican adolescent sample**

Source of variance	Dependent Variable	Boys (n=2024)			Girls (n=2229)		
		df	F	η ²	Df	F	η ²
School	ANX	3	2.922	.004	3	2.127	.003
	OBS	3	1.317	.002	3	1.496	.003
	DEP	3	4.636	.007	3	2.482	.003
	HEA	3	7.402**	.011	3	5.817	.008
	ALN	3	5.178	.008	3	2.910	.004
	BIZ	3	6.704**	.010	3	5.896	.008
	ANG	3	2.549	.004	3	4.417	.006
	CYN	3	0.290	.000	3	2.184	.003
	CON	3	1.445	.002	3	4.412	.006
	LSE	3	3.005	.004	3	4.481	.006
	LAS	3	2.408	.004	3	3.312	.004
	SOD	3	2.876	.004	3	5.936**	.008
	FAM	3	5.080	.008	3	0.968	.001
	SCH	3	11.318**	.017	3	9.769**	.013
	TRT	3	2.057	.003	3	1.789	.002

** $p < .001$.**Table 7a. Multivariate tests for the MMPI-A Supplementary Scales group in the Mexican adolescent sample**

Source of variance	Boys (n=2024)					Girls (n=2229)				
	Wilks' Lambda	df ₁	df ₂	F	η ²	Wilks' Lambda	df ₁	df ₂	F	H2
Age	0.98	30	7994	1.321	0	0.988	30	8822	0.889	0
School	0.969	18	5651.68	3.570**	0.01	0.966	18	6237.17	4.243**	0.01
Age by School	0.956	72	10876.1	1.249	0	0.971	60	11577.7	1.080	0

** $p < .001$.

Table 7b. Tests of between-subjects effects for the MMPI-A Supplementary Scales in the Mexican adolescent sample

Source of variance	Dependent Variable	Boys (n=2024)			Girls (n=2229)		
		df	F	η^2	df	F	η^2
School	MAC-R	3	4.134	.006	3	3.217	.004
	ACK	3	10.950**	.016	3	7.170**	.010
	PRO	3	3.806	.006	3	7.769**	.010
	IMM	3	8.065**	.012	3	5.100	.007
	A	3	2.476	.004	3	1.870	.003
	R	3	3.297	.005	3	2.821	.004

** $p < .001$.

Tests of between-subjects for this fourth group of scales indicate that the highest values are, once again, for type of school over the Alcohol/Drug Problem Acknowledgment (ACK) scale in boys ($F [3, 20] = 11.00, p < .001$) and the Alcohol/Drug Problem Proneness (PRO) scale in girls ($F [3, 18] = 7.77, p < .001$) (table 7b)

DISCUSSION

Findings indicate the possibility of using the MMPI-A with 13-year-old student adolescents since they understand the test and are able to answer it properly. Given the ability of this younger Mexican adolescent group to produce a valid MMPI-A profile, current Mexican norms can then be used with no problem. The profiles show that most of the differences between means are small; also the alpha Cronbach coefficients for this group are very similar to the alpha coefficients for the Mexican normative sample. Nevertheless, it seems that type of school has some effect on the validity scales, which may suggest that adolescents from private schools could have a higher reading level than adolescents from public schools, and possibly relate to socioeconomic status. This outcome shows similarity to the results of Archer (1997) and of Butcher and Williams (2000).

Within the validity scales, the greater effects of type of school within the groups of boys are in VRIN and F scales while for girls the greatest effect is on F and L scales. This may be due to the fact that girls have a more positive attitude toward psychological assessment and respond in a more careful way. It seems that this elevation in the L scale may describe the girls from public schools as more conventional than girls attending private schools. It is important to point out that the same percentage of invalid records in the 13-year-old group resulted in the normative sample from 14 to 18 years old indicating that a great percentage of 13-year-old adolescents do understand the MMPI-A.

In the clinical scales group the greatest effects of type of school are found for scale 8 in the boys' groups. In this scale the boys from public high schools have the greater mean, whereas for girls the most important effect relates to scale 5, which is not a clinical scale. The elevation in scale 8 within boys may be associated to greater immaturity from lower socioeconomic level and also to the fact that some items within this scale are too large or double negative which make them more difficult to understand. There is an interaction

between age and school in scale 4 in the group of boys probably because younger boys from public schools who have higher means correlates with the fact that aggression and conduct problems have increased in younger groups of adolescents in Mexico (Villatoro et al., 2005).

Among content scales the greatest effect is on school problems (SCH) for boys and girls, suggesting that boys and girls from public schools have fewer school problems since the Mexican public system is more relaxed in terms of discipline and perhaps they have also a lower academic performance. In the group of supplementary scales the greatest effect of type of school is found for boys over ACK, linked to the fact that junior high boys from public schools have more addiction problems, because this kind of school has less discipline, while boys from senior private public schools have more addiction problems possible because substances are more readily available for them. Boys from public schools are also more immature. Between girls the greater effects are found on PRO. The girls of private schools have a greater mean on PRO perhaps because their life style makes them more prone to addiction whereas girls from public schools are more aware of drug abuse and that relates to them exhibiting higher means.

In general, these results show that the effects of age are minimal and that possibly there is no need to have different norms for the 13-year-old adolescents but rather assess carefully if the items are comprehensible for them and take into account which scales may somehow be influenced by socioeconomic level, such as the Infrequency (F) or Lie (L) scales. The differences related to type of schools by the other hand are more significant and are perhaps related to differences in socio-economical status, and also to a lower cognitive performance, because perhaps these adolescents have less cultural opportunities.

Recent data show the largest legal permanent resident flow to the United States comes from Mexico, including a significant number of Mexican adolescents (U.S. Department of Homeland Security, 2007). It may be more valuable to assess how newly arrived Mexican adolescents compare to their own reference groups rather than to a population they are expected to differ, as it could be the case when using Hispanic MMPI-A norms. These results show that the MMPI-A may be suitable to carry out cross-cultural studies with adolescents who have recently become U.S. citizens or have been granted permanent residence in order to examine the psychological aspects of acculturation processes, as it has been discussed in the literature review.

Within clinical settings, the inventory can be used to explore differences in the onset of psychological disorders or the development of psychopathology in Hispanic groups that are imprisoned, have become inpatients at mental health facilities or merely become users of psychological services, such as career counseling or psychotherapy.

Further research is recommended with the MMPI-A among different age groups and settings in order to determine conclusively if it is necessary to have different norms for younger adolescents in Mexico.

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