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MMPI–2 Characteristics of Transsexuals Requesting Sex Reassignment: Comparison of Patients in Prehormonal and Presurgical Phases

ESTHER GÓMEZ-GIL,ANGELA VIDAL-HAGEMEIJER, AND MANEL SALAMERO-BAR

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MMPI–2 Characteristics of Transsexuals Requesting Sex Reassignment: Comparison of Patients in Prehormonal and Presurgical Phases

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To assess psychopathology in transsexuals at different phases of sex reassignment, we administered the Spanish adaptation of the MMPI–2 (Ávila-Espada & Jiménez-Gómez, 1999) to 107 male-to-female and 56 female-to-male transsexuals. Except for the Mf scale, mean T scores from the Clinical scales were within the normal range and did not differ between sexes. Male-to-female transsexuals seeking sex reassignment hormonal therapy, but not female-to-male patients, scored significantly higher on the Depression, Hysteria, Psychopathic Deviate, Schizophrenia, and Social Introversion scales than patients seeking sex-reassignment surgery. The results show that the majority of patients were free of psychopathology. Transsexuals in the initial phases of sex reassignment may experience more distress than in later phases; however, these results are unlikely to reflect clinically relevant differences.

Gender identity disorder (GID) of adulthood or adolescence (*Diagnostic and Statistical Manual of Mental Disorders,* 4th ed. [*DSM–IV*]; American Psychiatric Association, 1994), also known as *transsexualism* (*International Classification of Diseases,* 10th ed. [*ICD–10*]; World Health Organization, 1993), is characterized by a strong and persistent cross-gender identification accompanied by persistent discomfort with the biological sex or sense of inappropriateness in the gender role of that sex (American Psychiatric Association, 1994) and usually is accompanied by the wish to make his or her body as congruent as possible with the preferred sex through surgery and hormone treatment (World Health Organization, 1993). To this end, transsexuals often seek help from mental health professionals or gender identity clinics to obtain formal support for hormonal and surgical sex-reassignment therapy.

An important area of research in transsexualism is the nature and frequency of psychological distress, psychopathology, and mental comorbidity (Cole, O'Boyle, Emory, & Meyer, 1997; De Cuypere, Janes, & Rubens, 1995; Gómez-Gil, Trilla, Salamero, Godás, & Valdés, 2007; Landén, Wälinder, & Lundström, 1998). As a group, these patients are known to show noticeable levels of psychological distress resulting from multiple stressors including frequent familial and social rejection, employment problems, and economic and legal difficulties for sex reassignment (Gómez-Gil & Esteva de Antonio, 2006). To study these repercussions on clinical presentation, personality, and neuropsychological performance, various psychometric measures including tests, inventories, scales, and structured psychiatric interviews have been used (Bodlund, Kullgren, Sundbom, & Höjerback, 1993; Haraldsen & Dahl, 2000; Lothstein, 1984).

Several studies have used the Minnesota Multiphasic Personality Inventory (MMPI; Hathaway & McKinley, 1940) and the MMPI–2 (Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989) to assess patterns of psychological distress in transsexual patients (for a review, see Lothstein, 1984; Vidal-Hagemeijer, Gómez-Gil, & Peri-Nogués, 2003). Although initial MMPI profiles have shown significant increases on several scales (Beatrice, 1985; Hunt & Hampson, 1980; Lothstein, 1979; Tsoi, Kok, & Long, 1977), other studies have demonstrated that mean profiles for these patients were notably free of psychopathology (Caron & Archer, 1997; Cole, 1997; Greenberg & Laurence, 1981; Hunt, Carr, & Hampson, 1981; Miach, Berah, Butcher, & Rouse, 2000; Michel et al., 2002; Tsushima & Wedding, 1979), suggesting that transsexualism is usually an isolated diagnosis and not part of any general psychopathological disorder. Examination of recent MMPI research with transsexuals reveals several key issues that need to be addressed. First, to the best of our knowledge, only two published studies have used the MMPI–2 (Caron & Archer, 1997; Miach et al., 2000) in addition to preliminary data examining a subset of the participants in this study (Gómez-Gil, Vidal Hagemeijer, Godás, & Peri, 2005). Second, only Cole et al. (1997) and the gender team (Gómez-Gil et al., 2005) have examined differences on the MMPI according to gender groups. Third, no published studies have compared the MMPI or MMPI–2 scores of transsexuals at different phases of the triadic treatment process for sex reassignment.

After diagnosis of GID in adulthood and adolescence, sex reassignment is considered the treatment of choice and usually includes three chronological phases: a real-life experience in the desired role, hormone therapy for the desired sex, and surgery to change the genitalia and other sex characteristics. Most gender teams have adopted the guidelines of the Standards of Care of the Harry Benjamin Gender Dysphoria Association (HBGDA; Meyer et al., 2001), which have articulated an international consensus about the psychiatric, psychological, medical, and surgical management of GID. According to these standards, when the transsexual patient has passed the diagnostic phase, the mental health specialist in GID usually recommends starting the real-life experience and/or psychotherapy. In the second phase, when the individual meets eligibility and readiness

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criteria for hormone therapy (including a documented real-life experience or psychotherapy lasting at least 3 months), the mental health professional makes a formal recommendation to the endocrinologist to initiate cross-sex hormonal therapy. In the third phase, when the real-life test and hormonal therapy have resulted in a satisfactory social role change and the applicants meet criteria for breast or genital surgery (including at least 12 months of continuous hormonal therapy and 12 months of successful full time real-life experience), they are referred to the surgeon. Surgical transformation in biological males consists of vaginoplasty, and in cases of unresponsiveness of breast tissue to estrogenic therapy, mammoplasty is also frequently performed. In biological females, the surgical procedure consists of mastectomy, salpingo-oophorectomy and hysterectomy, and phalloplasty. After hormonal therapy and sex-reassignment surgery (SRS), transsexuals have been found to become more "stable" (Fleming, Cohen, Salt, Jones, & Jenkins, 1981; Lothstein, 1984; Michel, Mormont, & Legros, 2001). This suggests the influence of sex change on the psychological functioning of the participant may vary at different stages of the sex-reassignment process.

The purpose of this study was to assess psychopathology in Spanish transsexuals seeking sex reassignment using the MMPI–2 and to determine whether there were any differences between transsexual patients requesting sex reassignment hormonal therapy (SRHT) and those requesting SRS. Based on our work with patients who have applied for sex-reassignment in Catalonia (an autonomous region of Spain), our clinical impression is that levels of psychopathology in most transsexuals are minimal. Moreover, in view of the increase in stability found in transsexuals after hormonal therapy and surgical interventions in the studies mentioned previously and in our clinical practice, we expected transsexuals seeking SRHT to produce higher test scores than transsexuals at a later phase requesting SRS.

METHOD

Participants

The sample comprised 163 transsexual patients (107 biological men and 56 biological women) diagnosed with GID in adulthood or adolescence as defined by the *DSM–IV* (American Psychiatric Association, 1994) at the Hospital Clinic of Barcelona. The sample was selected from a total of 254 patients with complaints of gender dysphoria who contacted the Department of Psychiatry and Psychology at this hospital between 2000 and April 2006 to request a formal recommendation from their mental health professional to their endocrinologist or surgical colleagues for hormonal or surgical therapy. This public hospital is the only center providing specialized and comprehensive psychiatric, psychological, and endocrine therapy for transsexual patients in Catalonia, but surgical treatment is only available privately in this region. We excluded 24 patients who failed to meet the *DSM–IV* criteria for GID as well as 24 transsexuals who were administered the MMPI instead of the MMPI–2 and 43 transsexuals due to missing data.

Psychopathology Assessment: The Spanish Adaptation of the MMPI–2

The MMPI–2 (Butcher et al., 1989) is a 567-item restandardization of the MMPI. Its validity and reliability have been established. The inventory comprises three Validity scales—Lie (L), Infrequency (F), and Correction (K)—and 10 Clinical scales: Hypochondriasis (Hs), Depression (D), Hysteria (Hy), Psychopathic-deviate (Pd), Masculinity-femininity (Mf), Paranoia (Pa), Psychasthenia (Pt), Schizophrenia (Sc), Mania (Ma), and Social introversion (Si). This inventory is currently the most widely used questionnaire for systematic assessment of psychopathology.

The Spanish adaptation of the MMPI–2 by Ávila-Espada and Jiménez-Gómez (1999) was made after six different translations by psychologists with experience of translating medical texts into Spanish. The versions were discussed and approved and then applied in several pilot trials to test the comprehensibility of the items. The definitive version was administered to 1,906 normal participants stratified according to age and area of residence to establish benchmarks. Raw scores are converted to uniform T scores relative to normative data using the norms corresponding to the biological sex. In accordance with the test guidelines of the Spanish manual, scores of above 80 on the L, 100 on the F, and 70 on the K Validity scales are suggestive of response distortion. Scores of 65 or above in the Clinical scales were considered to be clinically significant.

Procedure

Each participant underwent clinical interviews with a psychiatrist and a psychologist who both had several years of experience. Gender identity disorders were diagnosed using the *DSM–IV* (American Psychiatric Association, 1994) and the *ICD–10* criteria (World Health Organization, 1993). For all cases of transsexualism included in this report, the two experts agreed on the diagnosis. The gender identity team at the Hospital Clinic has adopted the guidelines of the Standards of Care of the HBGDA (Meyer et al., 2001).

The Spanish adaptation of the MMPI–2 was administered in the third interview with the psychologist as part of routine evaluations by the gender team. Patients were urged to respond sincerely and were given standardized instructions prior to administration of the tests.

The transsexual sample was divided into groups according to sex—male-to-female (MF) and female-to-male (FM) transsexuals—and according two phases of the sex-reassignment process: transsexuals requesting SRHT, including patients in the first phase of the sex-reassignment process who may or may not have begun the real-life experience and had not started hormonal therapy, and transsexuals requesting SRS, including patients who had adapted successfully to life in the desired sex and had received continuous hormonal therapy for at least 1 year.

We analyzed data by descriptive tests using the SPSS Version 12.0 statistical software package for Windows. We performed between-group comparison of quantitative variables using the two-tailed Student's *t*test for independent samples. We performed between-group comparison of categorical variables using the chi-square analysis and comparisons of proportions. We measured effect size by Cohen's (1988) d or h and by the phi coefficient for categorical data. The level of significance was set at $p < .05$.

RESULTS

The demographic characteristics of the sample are given in Table 1. The mean age for MF and FM transsexual patients was 29.9 years ($SD = 9.0$) and 27.6 years ($SD = 7.5$), respec-

TABLE 1.—Demographic characteristics of MF and FM Spanish transsexuals.

	Male-to-Female Transsexuals[a]		Female-to-Male Transsexuals[b]			
Demographic	*M*	*SD*	*M*	*SD*	*t*	*p*Value
Age (years)	29.9	9	27.34	7.5	1.822	.070
	n	%	*n*	%	χ^2	
Educational level					2.620	.270
Basic and lower secondary secondary school	60	56.1	30	53.6		
Higher secondary school	37	34.6	16	28.6		
University	10	9.3	10	17.95		
Employment status					7.381	.117
High qualified employment	7	6.5	10	17.9		
Low qualified employment	77	72.0	33	58.9		
Unemployed	17	15.9	11	19.6		
Student[c]	3	2.8	2	3.6		
Social economic[c]	3	2.8	0	—		
Living arrangements					3.300	.470
With parents	38	35.5	24	42.9		
With partner	27	25.2	17	30.4		
Alone	22	20.6	10	17.9		
With friends	20	18.7	5	8.9		
Non–Spanish-native patients	31	29	6	10.7	5.982	.014

Note. MF = Male-to-female; FM = Female-to-male.
[a] $n = 107$. [b] $n = 56$. [c] Categories collapsed for statistical analysis to obtain expected values for at least 80% of cells greater than or equal to 5.

tively. The two groups were not significantly different for age, educational level, employment status, or living arrangements. Compared with the MF transsexual group, the FM group contained a significantly lower percentage of non-Spanish nationals (χ^2, $p = .014$, $\phi = .21$).

Table 2 shows the means, standard deviations, statistical test comparison values, and measures of effect size for MMPI–2 standard Validity and Clinical scales in both sexes. Other than a moderate increase on the Mf scale, mean T scores on all scales were in a range consistent with a nonsignificant level of psychopathology ($T \leq 65$). Nonsignificant differences on Clinical scores were found with respect to biological sex (maximum $d = .31$).

Table 3 shows the percentage of profiles suggestive of response distortion according to the Spanish manual (Ávila-Espada & Jiménez-Gómez, 1999) and the percentage of T scores ≥ 65 for Clinical scales; 28% of the MF and 27% of the FM transsexuals obtained high scores ($T \geq 65$) on one or more Clinical scales other than the Mf scale. Comparing the percentage of valid profiles between MF and FM transsexuals, nonsignificant differences were found between the two sexes (maximum $h = .26$) except for the Ma scale ($h = .36$).

The means, standard deviations, statistical comparison values, and measures of effect size for MMPI–2 standard Validity and Clinical scales across two sex-reassignment phases are given in Table 4 for the total sample and for the MF and FM

TABLE 2.—Means, standard deviations, statistical comparisons, and effect size of MMPI–2 T scores for MF and FM transsexual patients.

	MF Transsexuals[a]		FM Transsexuals[b]		Student's *t* Test		
Scale	*M*	*SD*	*M*	*SD*	*t*	*p*	Effect Size (Cohen's *d*)
MMPI–2 Validity scale							
L	55.93	10.3	58.2	9.2	–1.341	.182	–.24
F	54.8	10.7	55.5	14.9	–0.362	.718	–.06
K	49.4	10.0	51.9	11.2	–1.437	.153	–.24
MMPI–2 Clinical scale							
Hs	56.0	10.5	52.7	10.5	1.909	.059	.31
D	55.0	10.3	51.7	11.7	1.853	.066	.31
Hy	55.8	11.7	56.1	12.4	–0.126	.900	–.03
Pd	57.9	10.6	59.7	12.4	–0.940	.349	–.15
Mf	65.0	11.4	65.6	11.7	–0.321	.749	–.05
Pa	59.2	13.2	55.4	14.4	1.711	.089	.28
Pt	56.5	12.5	53.3	11.5	1.585	.115	.26
Sc	58.5	13.7	55.5	12.6	1.381	.169	.22
Ma	52.2	9.6	53. 8	12.2	–0.926	.356	–.15
Si	52.6	9.7	52.7	9.9	–0.038	.969	–.01

Note. MMPI–2 = Minnesota Multiphasic Personality Inventory–2; MF = Male-to-female; FM = Female-to-male.
[a] $n = 107$. [b] $n = 56$.

TABLE 3.—Percentage of transsexual patients with elevated scores in the Validity and Clinical MMPI–2 scales

		MF Transsexuals[a]		FM Transsexuals[b]		Comparison of Two Proportions		
Scale	Cutting Score	*n*	%	*n*	%	*z*	*p*	Effect Size (Cohen's *h*)
MMPI–2 Validity scale								
L	(≥80 T)[c]	1	1.0	0	0.0	—	—	.20
F	(≥100 T)[c]	2	1.9	4	7.0	1.209	.227	.26
K	(≥70 T)[c]	5	4.7	4	7.0	0.250	.802	.10
MMPI–2 Clinical scale								
Hs	(≥65 T)	17	15.9	7	12.5	0.349	.727	.10
D	(≥65 T)	23	21.5	8	14.3	0.902	.367	.18
Hy	(≥65 T)	20	18.7	12	21.4	0.205	.838	.07
Pd	(≥65 T)	26	24.3	15	26.8	0.159	.873	.06
Mf	(≥65 T)	55	51.4	29	51.8	–0.116	.907	.01
Pa	(≥65 T)	29	27.1	11	19.6	0.865	.387	.18
Pt	(≥65 T)	25	23.4	9	16.1	0.886	.376	.18
Sc	(≥65 T)	30	28.0	11	19.6	0.984	.325	.20
Ma	(≥65 T)	7	6.5	10	17.9	1.993	.046	.36
Si	(≥65 T)	8	7.47	6	10.7	0.405	.686	.11

Note. MMPI–2 = Minnesota Multiphasic Personality Inventory–2; MF = Male-to-female; FM = Female-to-male.
[a] $n = 107$. [b] $n = 56$. [c] Validity criteria according to the test guidelines of the MMPI–2 Spanish manual (Ávila-Espada & Jiménez-Gómez, 1999).

transsexual subsamples. The total group of transsexuals seeking SRHT ($n = 84$) scored significantly higher on the Hy, Pd, Mf, and Sc scales than the group seeking SRS ($n = 79$), with ds ranging from .34 to .61. Comparing these groups by sexes, MF transsexuals seeking SRHT ($n = 38$) scored significantly higher on the Hs, D, Hy, Pd, Pa, Pt, Sc, and Si scales than MF transsexuals seeking SRS ($n = 69$), with ds ranging from .49 to .78. FM transsexuals seeking SRHT ($n = 46$) did not score differently on Clinical scales to FM transsexuals seeking SRS ($n = 10$). Other than a moderate increase on the Mf scale, the groups showed no significant elevations in mean T scores on any scale. We recorded similar findings when we conducted the analyses after excluding 7 MF and 6 FM patients with profiles suggestive of response distortion using the Validity scale criteria used according to the test guidelines of the Spanish manual (data not shown).

DISCUSSION

These findings support previous research and indicate a lack of significant psychopathology in the mean MMPI–2 profiles of transsexuals consulting a gender dysphoria team for sex reassignment other than an increased Mf scale score. About one fourth of this population obtained high scores on at least one Clinical scale other than the Mf scale. Moreover, the group of MF transsexuals (but not the FM group) in the prehormonal phase scored significantly higher on almost all of the Clinical scales of the MMPI–2 compared with the MF group in the later presurgical phase; however, mean Clinical scores in both cases were in the normal range.

Prior to 1984, several studies have described the psychological testing of transsexuals, but their results have been inconsistent (Lothstein, 1984). Although some studies have concluded that MMPI profiles of participants indicated serious psychological disturbance, depression, and interpersonal problems (Beatrice, 1985; Finney, Brandsma, Tondow, & LeMaistre, 1975; Hunt & Hampson, 1980; Langevin, Paitich, & Steiner, 1977; Lothstein, 1979; Stinson, 1972; Tsoi et al., 1977), others have concluded the opposite (Roback, McKee, Webb, Abramowitz, & Abramowitz, 1976; Rosen, 1974; Tsushima & Wedding, 1979) or that the increased scores on the various scales were less extreme (Hunt et al., 1981) or dependent on the variable "living as men or women" (Greenberg & Laurence, 1981). The relatively small sample sizes in most of these studies along with the social difficulties involved in living in accordance with one's gender in the 1970s and 1980s may be the most important reasons for the controversial findings of these studies, making it difficult to compare them with recent literature. Four recent studies with large samples have been published, and the results are consistent with our research. In a study of 86 MF candidates referred for psychiatric and psychological assessment to determine their suitability for hormonal or surgical sex-reassignment, Miach et al. (2000) showed that the vast majority (85%) of the transsexual group showed no evidence of psychopathology according to their MMPI–2 profile. In a similar study with 93 MF and 44 FM transsexuals, Cole et al. (1997) also reported MMPI profiles that were clearly within the normal range. Comparing 56 MF transsexuals, 56 FM transsexuals, and 112 normal adults, Caron and Archer (1997) also found that sex-reassignment candidates had normal mean MMPI–2 profiles. Michel et al. (2002), in a study with 29 men asking for a sex change, also found that the 16 patients diagnosed as transsexual showed an average profile on the MMPI Clinical scales within the normal range except for the Mf scale.

The high scores on the Mf scale in both groups in our study indicate that transsexual patients readily complied with cultural stereotypes of femininity in MF and masculinity in FM transsexuals. This finding is also consistent with the literature (Caron & Archer, 1997; Cole et al., 1997; Greenberg & Laurence, 1981; Hunt et al., 1981; Leavitt & Berger, 1990; Miach et al., 2000). Moreover, if the Mf scale is scored in accordance with the patient's gender identity, the scores are well within the normal range (Cole et al., 1997; Finney et al., 1975; Hunt et al., 1981).

Significant differences in the MMPI–2 profile due to sex were not found in this study or in preliminary research (Gómez-Gil et al., 2005). Thus, our data do not support the hypothesis that psychopathology is less marked or clinically relevant in FM transsexuals than in MF transsexuals. In agreement with our

TABLE 4.—Means, standard deviations, statistical comparisons, and effect size of MMPI–2 T Scores for total, MF, and FM transsexual patients in prehormonal and presurgical phases.

		Transsexuals Seeking SRHT[a]		Transsexuals Seeking SRS[b]		Student's *t* Test		
Scale	Group of Patients	*M*	SD	*M*	*SD*	*t*	*p*	Effect Size (Cohen's *d*)
MMPI–2 Validity scale								
L	Total	56.9	9.1	56.5	10.8	0.213	.832	.04
	MF	56.0	9.0	55.9	10.9	0.009	.993	.01
	FM	57.6	9.3	60.6	9.1	–0.929	.357	–.33
F	Total	56.6	12.8	53.4	11.4	1.649	.101	.26
	MF	57.5	12.1	53.3	9.6	1.986	.050	.40
	FM	55.8	13.4	54.3	21.0	0.282	.779	.09
K	Total	50.4	11.1	50.1	9.8	0.190	.850	.03
	MF	49.5	10.2	49.4	9.9	0.067	.947	.01
	FM	51.2	11.9	55.2	6.9	–1.030	.308	–.41
MMPI–2 Clinical scale								
Hs	Total	55.8	11.4	53.8	9.5	1.160	.248	.19
	MF	59.2	12.4	54.2	8.8	2.222	.030	.49
	FM	52.9	9.8	51.6	13.6	0.351	.727	.11
D	Total	55.5	11.5	52.2	9.9	1.978	.050	.31
	MF	59.3	10.2	52.6	9.6	3.385	.001	.63
	FM	52.3	11.6	49.0	12.1	0.810	.421	.28
Hy	Total	58.9	12.3	52.8	10.7	3.381	.001	.53
	MF	61.4	12.7	52.8	10.0	3.847	<.001	.78
	FM	56.9	11.8	52.6	15.0	0.983	.330	.32
Pd	Total	61.7	11.1	55.1	10.5	3.903	<.001	.61
	MF	62.8	11.3	55.2	9.2	3.760	<.001	.76
	FM	60.8	11.0	54.4	17.4	1.494	.141	.44
Mf	Total	67.1	11.5	63.3	11.1	2.135	.034	.34
	MF	67.3	10.9	63.8	11.5	1.529	.129	.31
	FM	66.9	12.1	59.8	7.9	1.774	.082	.69
Pa	Total	59.8	13.4	55.8	13.8	1.862	.064	.29
	MF	64.4	12.3	56.3	12.8	3.176	.002	.64
	FM	56.0	13.2	52.5	19.8	0.688	.494	.21
Pt	Total	57.0	12.5	53.8	11.9	1.677	.096	.26
	MF	61.3	13.3	53.9	11.4	3.046	.003	.61
	FM	53.4	10.7	53	15.5	0.091	.928	.03
Sc	Total	59.7	13.4	55.0	12.9	2.301	.023	.36
	MF	63.8	14.3	55.6	12.5	3.088	.003	.62
	FM	56.4	11.8	51.0	15.8	1.237	.222	.39
Ma	Total	52.9	11.6	52.5	9.3	0.287	.774	.04
	MF	51.6	10.6	52.5	9.0	–0.485	.629	–.09
	FM	54.1	12.4	52.3	11.8	0.416	.679	.15
Si	Total	54.1	10.9	51.1	8.2	1.973	.050	.31
	MF	55.8	11.6	50.9	8.1	2.321	.024	.52
	FM	52.7	10.1	52.8	9.1	–0.043	.966	–.01

Note. MMPI–2 = Minnesota Multiphasic Personality Inventory–2; MF = Male-to-female; FM = Female-to-male; SRHT = Sex reassignment hormonal therapy; SRS = Sex-reassignment surgery.
[a]Number of patients seeking SRHT: Total ($n = 84$); MF ($n = 38$); FM ($n = 46$). [b]Number of patients seeking SRS: Total ($n = 79$); MF ($n = 69$); FM ($n = 10$).

findings, Cole et al. (1997) also failed to observe mean T scores above 70 in the MMPI profiles of the two groups (MF and FM) except for the Mf score of the MF subgroup when plotted on the male profile.

The study confirmed our hypothesis that MF and FM transsexual patients in the prehormonal phase of sex reassignment would score higher on several Clinical scales of the MMPI–2 than transsexuals in a later presurgical phase. However, several points need to be made here. First, the effect size statistic suggests that the mean differences on the significant Clinical scales are of small or moderate practical importance (Cohen, 1988) and that the mean scores are in a range that is not usually taken to represent a noticeable level of psychopathology. Therefore, the results suggest that a large number of transsexuals in the first phases of sex reassignment may experience relatively more psychological distress than patients in the later phases, although the results are unlikely to reflect clinically relevant differences. Other studies in the same line have presented similar results. In a limited sample of 12 MF transsexuals, Hunt et al. (1981) compared presurgical and follow-up MMPI scores 8 years later. Although the transsexuals were very satisfied with their decision to have surgery and their postsurgical evolution, the test showed negligible differences. Langevin et al. (1977) and Greenberg and Laurence (1981), also using the MMPI, have found that male applicants who had been living continuously as females (in a later phase) showed significantly less pathology than those who had been living as males (in a previous phase). Overall, it seems sensible to hypothesize that in spite of the high level of stress and change that accompanies the sex-reassignment process, the psychological repercussions could be modulated by various factors

such as the particular coping style of the individual, the psychiatric vulnerability, the level of education, the socioeconomic status, and moreover the social and legal situation of the country where the person is living. The favorable economic situation and open-minded society characteristic of several European countries, including modern-day Spain, may contribute to the finding that MMPI–2 scores remain in the normal range in all stages of sex-reassignment process.

This study has several limitations. First, our sample may not be entirely representative of the transsexual population because it is restricted to those seeking sex-reassignment treatment. The percentage with diagnosable psychopathology may be higher in the population of transsexuals who have not sought or begun the sex-reassignment process. Second, the dual use of the MMPI–2 both as a screening tool and as a research measure may undermine the integrity of the data. Although the participants were urged to respond sincerely, there is no guarantee that they in fact did so; they are actively seeking treatment, and they know that whether they receive treatment is, in part, contingent on their MMPI–2 scores. Although the means of the Validity scales were within the normal range, the variances reported show that a proportion obtained high scores. The cutoff points for Validity scales recommended in the Spanish manual (Ávila-Espada & Jiménez-Gómez, 1999) are less restrictive than in the English language manual (Butcher et al., 1989). Nevertheless, even after applying exclusion criteria and reanalyzing the data, similar results were found. Third, we used the MMPI–2, which was designed to evaluate relevant psychopathology. Other psychological tests may be more sensitive in assessing severe psychopathology or psychological distress; however, this is difficult to confirm. Lothstein (1984), in a review, described several tests used in assessing psychological functioning of applicants for sex reassignment including the MMPI, the Draw-A-Person test, and a number of cognitive tests of intellectual functioning. Among them, the Rorschach test is one of the main methods used to investigate the psychological functioning of sex-reassignment candidates (for a review, see Michel & Mormont, 2003; Porcelli et al., 2004). Caron and Archer (1997) found normal mean MMPI–2 profiles in sex-reassignment candidates (except for the Mf scale), but the Rorschach test suggested the presence of several various psychological problems; however, the later Rorschach study by Smith, Cohen, and Cohen-Kettenis (2002), like our study, found little or no support for the idea that the patients as a group suffered major psychological deterioration. Therefore, it is not clear whether the Rorschach test or other tests are more sensitive than MMPI–2 in detecting psychopathology in transsexuals. Fourth, our study used only basic scales; complementary scales might clarify the deviance in gender roles (Peterson & Dahlstrom, 1992).

Despite these limitations, we believe that a multidisciplinary dysphoria gender team needs to be aware of measurement issues when assessing psychopathology among gender dysphoric patients. The MMPI–2 appears to be a useful global instrument because these patients run the risk of developing psychopathology if unfavorable factors are present. Future studies using other psychological tests are needed to establish more clearly whether transsexuals present psychological distress and whether degrees of adjustment vary according to factors such as participants' sociodemographic characteristics, the stage of the process in which they find themselves, and their country of residence. Moreover, a longitudinal study testing the same participants in both the SRHT phase and the SRS phase may provide a basis for interesting additional research.

REFERENCES

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

Ávila-Espada, A., & Jiménez-Gómez, F. (1999). *MMPI–2: Inventario Multifásico de Personalidad de Minnesota–2* [*MMPI–2: Minnesota Multiphasic Personality Inventory–2: Manual for administration and scoring*]. Madrid, Spain: TEA Ediciones.

Beatrice, J. (1985). A psychological comparison of heterosexuals, transvestites, preoperative transsexuals, and postoperative transsexuals. *Journal of Nervous and Mental Disease, 173,* 358–365.

Bodlund, O., Kullgren, G., Sundbom, E., & Höjerback, T. (1993). Personality traits and disorders among transsexuals. *Acta Psychiatrica Scandinavica, 88,* 322–327.

Butcher, J. N., Dahlstrom, W. G., Graham, J. R., Tellegen, A., & Kaemmer, B. (1989). *MMPI–2: Minnesota Multiphasic Personality Inventory–2: Manual for administration and scoring*. Minneapolis: University of Minnesota Press.

Caron, G. R., & Archer, R. P. (1997). MMPI and Rorschach characteristics of individuals approved for gender reassignment surgery. *Assessment, 4,* 229–241.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.

Cole, C. M., O'Boyle, M., Emory, L. E., & Meyer, W. J. (1997). Comorbidity of gender dysphoria and other major psychiatric diagnoses. *Archives of Sexual Behavior, 26*, 13–26.

De Cuypere, G., Janes, C., & Rubens, R. (1995). Psychosocial functioning of transsexuals in Belgium. *Acta Psychiatrica Scandinavica, 91,* 180–184.

Finney, J. C., Brandsma, J. M., Tondow, M., & LeMaistre, G. (1975). A study of transsexuals seeking gender reassignment. *American Journal of Psychiatry, 132,* 962–964.

Fleming, M., Cohen, D., Salt, P., Jones, D., & Jenkins, S. (1981). A study of pre-and post-surgical transsexuals' MMPI characteristics. *Archives of Sexual Behavior, 10,* 161–170.

Gómez-Gil, E., & Esteva de Antonio, I. (2006). *Ser transexual* [Being transsexual]. Barcelona, Spain: Editorial Glosa.

Gómez-Gil, E., Trilla, A., Salamero, M., Godás, T., & Valdés, M. (2007). *Sociodemographic, clinical, and psychiatric characteristics of transsexuals from Spain*. Manuscript submitted for publication.

Gómez-Gil, E., Vidal Hagemeijer, A., Godás, T., & Peri, J. M. (2005). Perfil del inventario multifásico de personalidad Minnesota–2 (MMPI–2) en transexuales [Profile of the Minnesota Multiphasic Personality Inventory–2 (MMPI–2) in transsexuals]. *Revista de Psiquiatría de la Facultad de Medicina de Barcelona, 32,* 8–13.

Greenberg, R. P., & Laurence, L. (1981) A comparison of the MMPI results for psychiatric patients and male applicants for transsexual surgery. *The Journal of Nervous and Mental Disease, 169,* 320–323.

Haraldsen, I. R., & Dahl, A. A. (2000). Symptom profiles of gender dysphoric patients of transsexual type compared to patients with personality disorders and healthy adults. *Acta Psychiatrica Scandinavica, 102,* 276–281.

Hathaway, S. R., & McKinley, J. C. (1940). A multiphasic personality schedule (Minnesota): I. Construction of the schedule. *Journal of Psychology, 10,* 249–254.

Hunt, D. D., Carr, J. E., & Hampson, J. L. (1981). Cognitive correlates of biologic sex and gender identity in transsexualism. *Archives of Sexual Behavior, 10,* 65–77.

Hunt, D. D., & Hampson, J. L. (1980). Follow-up of 17 biologic male transsexuals after sex-reassignment surgery. *American Journal of Psychiatry, 137,* 432–438.

Landén, M., Wälinder, J., & Lundström, B. (1998). Clinical characteristics of a total cohort of female and male applicants for sex reassignment: a descriptive study. *Acta Psychiatrica Scandinavica, 97,* 189–194.

Langevin, R., Paitich, D., & Steiner, B. (1977). The clinical profile of male transsexuals living as female vs. those living as males. *Archives of Sexual Behavior, 6,* 143–154.

Leavitt, F., & Berger, J. C. (1990). Clinical patterns among male transsexual candidates with erotic interest in males. *Archives of Sexual Behavior, 19,* 491–505.

Lothstein, L. (1979). The aging gender dysphoria (transsexual) patient. *Archives of Sexual Behavior, 8,* 431–444.

Lothstein, L. (1984). Psychological testing with transsexuals: A 30-year review. *Journal of Personality Assessment, 48,* 500–507.

Meyer, W., III, Bockting, W. O., Cohen-Kettenis, P., Coleman, E., DiCeglie, D., Devor, H., et al. (2001). The Harry Benjamin Gender Dysphoria Association's Standards of Care for Gender Identity Disorders, sixth version. *Journal of Psychology and Human Sexuality, 13,* 1–30.

Miach, P. P., Berah, E. F., Butcher, J. N., & Rouse, S. (2000). Utility of the MMPI–2 in assessing gender dysphoric patients. *Journal of Personality Assessment, 75,* 268–279.

Michel, A., Ansseau, M., Legros, J. J., Pitchot, W., Cornet, J. P., & Mormont, C. (2002) Comparisons of two groups of sex-change applicants based on the MMPI. *Psychological Reports, 91,* 233–240.

Michel, A., & Mormont, C. (2003). Transsexualisme et Rorschach: une revue de la littérature [Transexualism and Rorschach: a review of the literature]. *Annales Médico Psychologiques, 161,* 125–131.

Michel, A., Mormont, C., & Legros, J. (2001). A psycho-endocrinological overview of transsexualism. *European Journal of Endocrinology, 145,* 365–376.

Peterson, C. D., & Dahlstrom, W. G. (1992). The derivation of gender-role scales GM and GF for MMPI–2 and their relationship to Scale 5 (Mf). *Journal of Personality Assessment, 59,* 486–499.

Porcelli, P., Affatati, V., Michel, A., Burdot, F., Todarello, O., Bellomo, A., et al. (2004). Valutazione del transessualismo primario e secondario tramite il Rorschach comprehensive system: Confronto trans-culturale di due gruppi di transessuali italiani e belgi [Assessment of primary and secondary transsexualism through the Rorschach comprehensive system: Cross-cultural comparison of two groups of Italian and Belgian transsexuals]. *Psichiatria e Psicoterapia, 23,* 30–42.

Roback, H. B., McKee, E., Webb, W., Abramowitz, C. B., & Abramowitz, S. I. (1976). Psychopathology in female sex-change applicants and two help-seeking controls. *Journal of Abnormal Psychology, 85,* 430–432.

Rosen, A. (1974). Brief report of MMPI characteristics of sexual deviation. *Psychological Reports, 35,* 73–74.

Smith, Y. L. S., Cohen, L., & Cohen-Kettenis, P. T. (2002). Postoperative psychological functioning of adolescent transsexuals: A Rorschach study. *Archives of Sexual Behavior, 31,* 255–261.

Stinson, B. (1972). A study of twelve applicants for transsexual surgery. *Ohio State Medical Journal, 68,* 245–249.

Tsoi, W., Kok, L., & Long, F. (1977). Male transsexualism in Singapore: A description of 56 cases. *British Journal of Psychiatry, 131,* 40–409. **Q9**

Tsushima, W. T., & Wedding, D. (1979). MMPI results of male candidates for transsexual surgery. *Journal of Personality Assessment, 43,* 385–387.

Vidal Hagemeijer, A., Gómez-Gil, E., & Peri Nogués, J. M. (2003). Psicopatología y trastorno de la identidad sexual [Psychopathology and gender identity disorder]. *Revista de Psiquiatría de la Facultad de Medicina de Barcelona, 30,* 147–151.

World Health Organization. (1993). *International classification of diseases: Diagnostic criteria for research* (10th ed.). Geneva, Switzerland: Author.