The Factor Structure of the Italian version of the MCMI-III compared to the Dutch and American versions

Claudia Pignolo[1], Rosalba Rosato[1], Agata Andò[1], Stefania Cristofanelli[2], Laura Ferro[2], Alessandro Zennaro[1]

[1] Department of Psychology, University of Turin, Italy
[2] Social and Human Sciences Department, University of Valle d'Aosta, Italy

ABSTRACT. Studi precedenti sull'analisi fattoriale del *Millon Clinical Multiaxial Inventory-III* (Millon, Millon, Davis & Grossman, 2009), utilizzando diverse procedure di estrazione dei fattori, hanno individuato tre o quattro fattori. Lo scopo del presente studio è stato quello di esplorare la struttura fattoriale della versione italiana del MCMI-III utilizzando entrambe le scale, linearmente dipendenti e indipendenti, sia per valutare le differenze di genere, sia per confrontare i risultati ottenuti con quelli della versione olandese ed americana dello strumento. Sono stati identificati quattro fattori, simili nei due sottocampioni, maschile e femminile, ma differenze di contenuto sono state rilevate tra le scale *overlapping* (che presentano, cioè, item condivisi) e le scale *non-overlapping*. La soluzione a quattro fattori risulta simile a quella olandese ed i primi due fattori ottenuti si sono mostrati coerenti alla soluzione a tre fattori proposta negli studi americani.

SUMMARY. Introduction: Previously factor analytic research on the Millon Clinical Multiaxial Inventory-III (MCMI-III) using different factor extraction procedures, found three or four factors. In particular, Rossi, van der Ark, and Sloore (2007), through a sophisticated research design that examined and compared various aspects of the factor structure of the MCMI-III, identified a four-factor solutions for both male and female subsamples and for both linearly dependent and independent scales. The aim of this study was to explore the factor structure of the Italian version of the MCMI-III using both linearly dependent and independent scales, to evaluate gender differences, and to compare our results with the Dutch and American factor structure. Method: The present study used a sample of 881 psychiatric patients of Northern and Central Italy. Principal Factor Analysis with direct oblimin rotation was performed for the entire sample and for both men and women. Results: We identified four factors that were similar for men and women, but we found differences in content between solutions with overlapping and non-overlapping scale. The four-factor solution was similar to the Dutch one and the first two factors were congruent with the three-factor solution proposed in American studies. Conclusions: Taken together, our findings indicate that the factor structure of the MCMI-III is consistent across countries.

Keywords: *MCMI-III; Factor structure; Cross-cultural; Gender*

INTRODUCTION

The *Millon Clinical Multiaxial Inventory – Third Version* (*MCMI-III*; Millon, Millon, Davis & Grossman, 2009) is one of the most frequently used psychological inventories. It consists of 24 scales measuring personality disorders (1 = Schizoid, 2A = Avoidant, 2B = Depressive, 3 = Dependent, 4 = Histrionic, 5 = Narcissistic, 6A = Antisocial, 6B = Aggressive, 7 = Compulsive, 8A = Negativistic, 8B = Masochistic, S = Schizotypal, C = Borderline, and P = Paranoid), and clinical syndromes (A = Anxiety, H = Somatoform, N = Bipolar: Manic, D = Dysthymia, B = Alcohol Dependence, T = Drug Dependence, R = Posttraumatic Stress, SS = Thought Disorder, CC = Major Depression, and PP = Delusional Disorder). Four validity scales are also included (V = Invalidity, X = Disclosure, Y = Desirability, and Z = Debasement). The third version of the MCMI was introduced in 1994, with the purpose of more closely reflecting the changes which had been implemented with the Diagnostic and Statistical Manual of Mental Disorders, IV edition (APA, 1994).

The MCMI has been translated into many languages (*Dutch*: Sloore & Derksen, 1997; Sloore, Derksen & De Mey, 1994; *Spanish*: Cardenal & Sánchez, 2007; *French*: D'Elia & Lagier, 1986; *Italian*: Zennaro, Ferracuti, Lang & Sanavio, 2008), but factor analytic research across different versions is relatively limited in quantity and quite heterogeneous in methods and results. Some researchers have analyzed only personality disorder scales (Choca, Retzlaff, Strack, Mouton, & Van Denburg, 1996; Cuevas, García, Aluja & García, 2008; O'Connor & Dyce, 1998), whereas others have examined the personality disorder and clinical syndrome scales together. Craig and Bivens (1998) and Haddy, Strack and Choca (2005) identified three factors: *General Maladjustment, Paranoid/Delusional Thinking with Detached Emotionality, and Antisocial Acting out*, the former, and *Low versus High Psychopathology, Psychotic Thinking/Social Alienation*, and *Low versus High Emotional Constraint*, the latter. Both these studies used Principal Component Analysis (PCA) with varimax rotation. Moreover, the Dutch version has been investigated by Rossi, van der Ark and Sloore (2007) through a sophisticated research design that examined and compared various aspects of the factor structure of the MCMI-III. The authors tested a number of statistical approaches, including different factor analytic techniques, such as PCA and Principal Factor Analysis (PFA); different rotation procedures, varimax and direct oblimin rotation as well; and two statistical procedures applied to both linear dependent (overlapping) and independent scales (non-overlapping). Ultimately, four factors were identified: G*eneral Maladjustment, Aggression/Social Deviance, Paranoid/Delusional Thinking, and Emotional Instability/Detachment*. As researchers from different countries have found three to four factors using the MCMI as a whole, the factor structure of the inventory is not definite.

Furthermore, gender differences in the factor structure has been poorly investigated. It is generally argued that men and women differ in terms of personality disorders and psychopathology (Fenigold, 1994; Widiger & Samuel, 2005). Examining the personality scales of MCMI-III, Lindsay, Sankis and Widiger (2000) found no significant differences between the two biological sexes. Besides this, it is also worth considering that factor structure should be evaluated across different cultures and gender (see Comrey & Lee, 1992). As far as we know, only one study has explored this issue. Rossi et al. (2007) found a similar four-factor structure in both male and female subsamples, reporting coefficients of congruence greater than .98. This suggest that more research is needed to fill this gap.

Recently, Zennaro et al. (2013) investigated the validity and reliability of the Italian MCMI-III, although they did not report on its factor structure. The validity and reliability data indicated that it has acceptable values regarding internal consistency: Cronbach's alpha ranged from .72 to .88 in clinical scales and from .66 to .82 for personality scales with the exception of the Histrionic (α = .44) and Compulsive (α= .49) scales. Moreover, Specificity (SP) values indicate that the MCMI-III is extremely adequate in correctly identifying individuals when they truly have no Axis I syndromes, with the exception of the Anxiety scale (SP = .57). Sensitivity (SE) values were lower than expected, but resembled values published by Millon in 1994. Overall, the Italian version of the MCMI-III has similar psychometric properties to those reported by Millon (1994).

To date, no studies have yet investigated the factor structure of the Italian MCMI-III. To extend the literature on this under investigated topic, this article aims to explore the factor structure of the MCMI-III in an Italian sample using both linearly dependent and independent scales and to test the factor structure between the male and female subgroups. Moreover, we aimed to investigate cross-cultural invariance of the Italian version of the MCMI-III compared to the American and Dutch versions of the inventory.

METHOD

Participants

We collected 885 MCMI-III protocols of Italian speaking patients. All subjects were recruited at either public or private clinical services in Northern and Central Italy. Out of the 885 collected records, 4 were eventually excluded due to invalid MCMI-III profiles. Data included in the analysis refer to: 313 men (35%) and 568 women (65%), ranging from 17 to 83 years of age with a mean age of 38.8 (*SD* = 14.12).

All diagnoses were based on patients' charts. Forty patients had not met the diagnostic criteria for any disorder and 36% (n = 314) had comorbid conditions. About 93% (*n* = 822) received an Axis I primary diagnosis (30% Eating Disorder; 23% Mood Disorder; 19% Anxiety Disorder; 6% Substance-Related Disorder; 3% Somatoform Disorder; 1% Delusional Disorder) and about 38% (*n* = 333) received an Axis II primary diagnosis (3% Cluster A; 13% Cluster B; 14% Cluster C; 9% Personality Disorder NOS).

Measures

The MCMI-III is a 175-item self-report developed to assess personality disorders and clinical syndromes in clinical settings. In the current study, alphas ranged from .58 to .85, with a mean alpha of .74. These values closely resemble those of the Italian MCMI-III validation study by Zennaro et al. (2008). Four scales display Cronbach's alpha values to be lower than the bound criterion of α = .70 proposed by Nunnally (1978; see West & Finch, 1997): α = .67 for the Narcissistic scale, α = .62 for the Antisocial scale, α= .58 for the Compulsive scale, and α = .66 for the Bipolar scale.

Procedure

The Italian version of the MCMI-III was administered during psychodiagnostic evaluation by expert psychologists and psychiatrists, who have been in practice for many years. Clinicians informed all patients during their first clinical interviews that if they wanted to participate in the research project, they had to complete both the MCMI-III and the informed consent. The instrument was part of routine assessment following presentation for treatment. Not one of the contacted patients refused to participate.

The MCMI-III profiles were scored with the Psy4S software to obtain both raw[1] and base rate (BR) scores. According to standard guidelines, the MCMI-III profiles were considered valid if the total number of omitted or invalid responses was less than 12, the Validity Index was less than 2, and the raw score on the Disclosure (X) scale was within the range 34 to 178 (Millon et al., 2009).

Data Analysis

The factor structure of the MCMI-III Italian version was tested using raw scores instead of BR scores. BR are weighed transformations based on the prevalence of disorders in a given population and they can differ for gender and across countries and subgroups. The use of BR scores could, thus, intensify the differences between males and females because, on the basis of MCMI-III manual, they would undergo separate transformation. For example, on the Histrionic scale, a raw score of 22 is transformed into a BR scores of 73 for men and 88 for women. Since the focus of this research project was to investigate the factor structure of the MCMI-III in male and female subgroups, using BR scores could affect the results of our analysis. Moreover by processing raw scores we could make our results comparable to those from the American and Dutch MCMI-III.

Data analyses were carried out by using IBM SPSS Statistics V22. The number of factors to extract was determined using both parallel analysis (Horn, 1965; O'Connor, 2000), eigenvalues greater than 1 (Kaiser criterion) and scree plot (Cattel, 1966) in PCA with direct oblimin rotation. We subsequently performed PFA with direct oblimin rotation. To interpret the factor solutions, we considered the scales with a factor loading greater than .40. First, we compared factor solutions of linearly dependent and independent

1 The raw scale scores obtained are actually weighted raw scale scores, as prototypal items receive a weight of 2 points and nonprototypal items receive a weight of 1 point. Thus, linearly dependant scales (overlapping scales) comprise both prototypal and nonprototypal items whereas linearly independent scales (non-overlapping scales) comprise exclusively prototypal items.

scales for the entire sample. Second, we investigated gender differences by comparing factor solutions based on linearly dependant scales. All comparisons were carried out by performing Procrustes rotation (Mardia, Kent & Bibby, 1979) and computing the coefficient of congruence (**Φ**; Tucker, 1951). Several authors (Bentler & Bonett, 1980; Gorsuch, 1983; Mulaik, 1972; Van de Vijver & Leung, 1997) suggested, as a rule of thumb, that two factors should be considered consistent if **Φ** is greater than .90, whereas Lorenzo-Seva & ten Berge (2006) suggested the following more accurate threshold: .85 to .94 = *fair similarity*, higher than .95 = *good similarity*. The **Φ** values were also used, in this study, so as to compare our factor solutions with those reported by Craig and Bivens (1998), Haddy et al. (2005) and Rossi et al. (2007).

RESULTS

Table 1 provides means, standard deviations, and medians of the weighted raw scores for women, men, and entire sample. In the entire sample, absolute values of skew ranged from .004 to 1.398, kurtosis ranged from .151 to 1.986 for linearly dependent scales, and, respectively, from .049 to 2.188 and from .047 to 4.260 for linearly independent scales. These values indicate that the distributions are "relatively close" to normal (West, Finch & Curran, 1995).

In determining the number of factors to extract, parallel analysis, eigenvalue criteria and scree plot determined that four factors should be retained for linearly dependent scales. Regarding linearly independent scales, the results are ambiguous. Parallel analysis recommended that three factors should be retained, whereas the scree plot suggested a maximum of four factors and eigenvalue criteria proposed a five-factor solution. Comparing the eigenvalues from real data and random data obtained by parallel analysis, the difference between the two values for the fourth factor is very small (real data eigenvalue = 1.136, random data eigenvalue = 1.193). We therefore decided to extract four factors for linearly dependent scales and three through five factors for linearly independent scales to evaluate the best solution.

Linearly Dependent Scales

To test the initial adequacy of the data and the degree of relatedness of the linearly dependent scales, we computed the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's sphericity test: KMO was .933 and Bartlett's test of sphericity was significant. The extracted factors explained 70.97% of the total variance before direct oblimin rotation (factor 1 = 49.25%, factor 2 = 12.51%, factor 3 = 5.16%, factor 4 = 4.05%). Table 2 shows the pattern matrix. Factor 1 is composed of the Depressive (2B), Dependent (3), Negativistic (8A), Masochistic (8B), Schizotypal (S), Borderline (C), Anxiety (A), Somatoform (H), Dysthymia (D), Posttraumatic Stress (R), Thought Disorder (SS) and Major Depression (CC) scales. This factor seems to be characterized by anxiety and mood disorders and could suggests an internalizing dimension. However, this factor seems to represent a general state of psychological distress (*General Maladjustment*). Factor 2 includes positive loadings of the Antisocial (6A), Aggressive (6B), Alcohol Dependence (B) and Drug Dependence (T) scales and negative loading of the Compulsive (7) scale. The second factor seems to suggest an externalizing disorder dimension and an impulsive personality style on the one hand and a controlled behavior on the other (*Aggression/Social Deviance*). The Schizotypal (S), Paranoid (P) and Delusional Disorder (PP) scales have positive factor loadings on factor 3. The third factor reveals elements of paranoia, disturbed thinking and social detachment and probably represents *Paranoid/Delusional Thinking*. The Schizoid (1) and Avoidant (2A) scales have positive factor loadings on factor 4 whereas the Histrionic (4) and Narcissistic (5) scales have negative loadings on the same factor. The last factor is bipolar with social imperturbability and emotional instability at one extreme and severe relationship deficits and emotional detachment at the other, reflecting *Emotional Instability versus Schizoid Detachment*.

Linearly Independent Scales

For linearly independent scales, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was .934 and Bartlett's test of sphericity was significant. Before direct oblimin rotation, the three-factor solution explained 46.65% of the total variance (factor 1 = 35.38%, factor 2 = 7.67%, factor 3 = 3.59%), extracting four factor the explained total variance was 50.02% (factor 1 = 35.52%, factor 2 = 7.91%, factor 3 = 3.67%, factor 4 = 2.92%), while the five-factor solution accounted for 52.95% of the total variance (factor 1 = 35.62%, factor 2 = 8.01%, factor 3 = 3.82%, factor 4 = 2.99%, factor 5 = 2.50%).

Table 1 – Mean Weighted Raw Scores of the MCMI-III for Men (*n* = 313), Women (*n* = 568), and the entire sample (N = 881)

	Women			Men			Total		
MCMI-III Scale	**M**	**SD**	**Median**	**M**	**SD**	**Median**	**M**	**SD**	**Median**
1 (Schizoid)	9.5	4.7	9	7.9	4.7	8	8.9	4.8	9
2A (Avoidant)	9.9	5.8	9	8.1	5.8	7	9.3	5.9	9
2B (Depressive)	11.0	6.4	11	8.4	5.8	8	10.1	6.3	9
3 (Dependent)	10.3	5.7	10	7.8	5.5	7	9.4	5.8	9
4 (Histrionic)	11.9	5.3	12	13.7	5.4	14	12.5	5.4	13
5 (Narcissistic)	12.6	4.7	12	13.8	4.6	14	13.0	4.7	13
6A (Antisocial)	7.6	4.1	8	7.8	4.3	7	7.7	4.2	8
6B (Aggressive)	10.0	5.1	10	9.3	5.3	9	9.8	5.2	10
7 (Compulsive)	13.5	4.6	13	14.6	4.5	15	13.9	4.6	14
8A (Negativistic)	11.3	5.8	11	10.3	5.4	10	10.9	5.7	11
8B (Masochistic)	8.1	5.3	8	5.7	5.0	4	7.3	5.3	7
S (Schizotypal)	7.7	5.5	6	6.2	5.5	5	7.2	5.6	6
C (Borderline)	9.5	5.7	9	7.6	5.4	7	8.8	5.6	8
P (Paranoid)	8.2	5.6	8	7.3	5.8	7	7.9	5.7	7
A (Anxiety)	9.0	5.1	9	7.4	5.4	7	8.5	5.3	8
H (Somatoform)	7.1	4.4	7	5.6	4.5	5	6.6	4.5	6
N (Bipolar): manic	6.8	4.0	7	6.3	4.0	6	6.6	4.0	6
D (Dysthymia)	9.9	5.7	10	8.0	5.8	7	9.2	5.8	9
B (Alcohol Dependence)	5.5	3.5	5	5.3	3.7	5	5.4	3.6	5
T (Drug Dependence)	4.3	3.4	4	4.7	3.9	4	4.5	3.6	4
R (Posttraumatic Stress)	8.8	5.8	8	6.7	5.6	5	8.0	5.8	7
SS (Thought Disorder)	9.3	5.7	9	7.8	5.7	7	8.8	5.8	8
CC (Major Depression)	9.5	5.9	10	7.1	5.9	6	8.6	6.0	8
PP (Delusional Disorder)	3.5	3.5	2	2.9	3.3	2	3.3	3.4	2

Table 2 – Rotated Pattern Matrix for the MCMI-III Linearly Dependent Scales

MCMI-III Linearly Dependent Scales	Communality Extraction	Factor 1	Factor 2	Factor 3	Factor 4
1 (Schizoid)	.643	.308	.036	.295	**–.484**
2A (Avoidant)	.844	.291	.082	.300	**–.629**
2B (Depressive)	.802	**.838**	.016	–.027	–.128
3 (Dependent)	.631	**.668**	.031	.029	–.191
4 (Histrionic)	.802	.010	–.094	–.103	**.892**
5 (Narcissistic)	.661	–.219	.132	.389	**.612**
6A (Antisocial)	.966	.002	**.934**	.118	.003
6B (Aggressive)	.607	.221	**.471**	.311	.110
7 (Compulsive)	.344	–.016	**–.625**	.200	.023
8A (Negativistic)	.608	**.632**	.161	.138	.012
8B (Masochistic)	.714	**.597**	.121	.136	–.247
S (Schizotypal)	.795	**.475**	.042	**.474**	–.179
C (Borderline)	.815	**.798**	.281	–.050	.022
P (Paranoid)	.857	.100	–.003	**.859**	–.144
A (Anxiety)	.742	**.832**	–.041	.118	.046
H (Somatoform)	.671	**.864**	–.130	.004	.023
N (Bipolar): manic	.580	**.435**	.217	.304	.388
D (Dysthymia)	.844	**.949**	–.020	–.142	–.068
B (Alcohol Dependence)	.564	.117	**.649**	.103	–.059
T (Drug Dependence)	.537	–.115	**.735**	.083	.005
R (Posttraumatic Stress)	.715	**.797**	–.009	.127	.038
SS (Thought Disorder)	.838	**.914**	.045	–.012	.023
CC (Major Depression)	.768	**.908**	–.056	–.075	–.037
PP (Delusional Disorder)	.684	.027	.054	**.793**	.024

Note. Bold is used for factor loadings above or equal .40.

Furthermore, in all the solutions some scales did not yielded a factor loading of at least .40: Alcohol Dependence (B) and Delusional Disorder (PP) scales in the three-factor solution, the Schizoid (1), Masochistic (8B) and Alcohol Dependence (B) scales in the four-factor solution, and Schizoid (1), Antisocial (6A), Compulsive (7) and Masochistic (8B) scales in the five-factor solution. Additionally, some factor did not fulfill the requirement of three variables per factor (Anderson & Rubin, 1956; McDonald & Krane, 1977, 1979; Rindskopf, 1984). Overall, all the solutions revealed some problems, indicating that linearly independent scales, although they have better psychometric properties, are difficult to interpret.

Referring to solutions with regard to the interpretability of the factors, we found that the four-factor solution seemed to be the best. Table 3 shows the pattern matrix. The Depressive (2B), Dependent (3), Borderline (C), Anxiety (A), Somatoform (H), Dysthymia (D), Posttraumatic Stress (R), Thought Disorder (SS) and Major Depression (CC) scales load on factor 1. This factor is similar to the first factor based on linearly dependent scales, so we labelled it *General Maladjustment*. Factor 2 is composed by the Narcissistic (5), Antisocial (6A), Aggressive (6B), Schizotypal (S), Paranoid (P), Bipolar: manic (N) and Delusional Disorder (PP) scales. The second factor is congruent with the Paranoia/Delusional Thinking factor, but it seems to be characterized also by narcissism, sadistic features and impulsive behaviors with a state of psychotic decompensation. So we called it *Decompensated Narcissism/Paranoia*. The Compulsive (7) scale has a negative loading on factor 3 whereas the Drug Dependence (T) scale has a positive loading on the same factor, so it may represent S*ocial Deviance*. Lastly, the Avoidant (2A) scale has a negative loading on factor 4, whereas the Histrionic (4) scale has a positive loading on the same factor. This factor resembled the last factor of the solution based on linearly dependent scales, which is *Emotional Instability versus Schizoid Detachment*.

Comparing factors based on linearly dependent and independent scales (Table 4), the congruence coefficients **Φ** between factors indicated excellent similarity for factors 1 and 4 of both types of scales, good similarity for factor 2 of the linearly dependent scales and factor 3 of the linearly independent scales, and fair similarity for factor 3 of the linearly dependent scales and factor 2 of the linearly independent scales. These results seem to confirm the similarity in the factor structure of the MCMI-III between the overlapping and non-overlapping scales in the Italian version of the inventory.

Gender differences

Because of the **Φ** values obtained for the linearly dependent and independent scales in the entire sample were good, we performed PFA with direct oblimin rotation only on linearly dependent scales to test the potential differences in the MCMI-III factor structure between men and women. The KMO measures were respectively .932 for men and .928 for woman and Bartlett's sphericity test was significant in both cases. The amount of explained variance before direct oblimin rotation was 71.85% for men (factor 1 = 51.54%, factor 2 = 10.90%, factor 3 = 5.66%, factor 4 = 3.76%) and 70.45% for women (factor 1 = 47.45%, factor 2 = 13.41%, factor 3 = 5.06%, factor 4 = 4.53%). Table 5 provides **Φ** values between factor solutions for men and women. **Φ** values were greater than .95 for factors that should have been congruent suggesting a good similarity between the factor structures.

Cross-Cultural Invariance

We tested cross-cultural invariance by computing **Φ** values between our factor solution based on linearly dependent scales with direct oblimin rotation and the results obtained by the abovementioned researchers. Referring to the solution reported by Rossi et al. (2007), **Φ** values were 1.00 for factors 1, 2 and 3, and .99 for factor 4. Then we compared our results with three-factor solutions found by Haddy et al. (2005) and Craig and Bivens (1998). We could not perform the Procrustes rotation because of the different number of factors of the two solutions. In the first comparison, **Φ** values were .87 for factor 1, .91 for factor 2 and .78 for factor 3. Our fourth factor did not reach significant congruency with any factors. In the second comparison, **Φ** values were .85 for factor 1, .88 for factor 2 and .74 for factor 3. Again, our fourth factor did not reach significantly congruency with any factor. On the whole, factors 1 and 2 showed fair to good similarity to those reported in other studies, whereas factors 3 and 4 were congruent only with those found in Rossi's four-factor model.

As for the linearly independent scales, only Haddy et al. (2005) published factor loading values based on non-overlapping scales. Thus, we compared our results with the authors' three-factor solutions (*High versus Low Psychopathology; Decompensated Narcissism/Paranoia; Low versus High Emotional Constraint*). As a result, **Φ** values were .89 for factor 1 and .91 for factor 2, while factors 3 and 4 did

Table 3 – Rotated Pattern Matrix for the MCMI-III Linearly Independent Scales

MCMI–III Linearly Independent Scales	Communality Extraction	Factor 1	Factor 2	Factor 3	Factor 4
1 (Schizoid)	.443	.295	.215	−.146	−.372
2A (Avoidant)	.641	.257	.345	−.076	**−.509**
2B (Depressive)	.651	**.618**	.146	−.129	−.205
3 (Dependent)	.458	**.543**	.110	−.008	−.153
4 (Histrionic)	.557	−.002	.189	−.104	**.722**
5 (Narcissistic)	.431	.014	**.617**	.067	.166
6A (Antisocial)	.386	.067	**.463**	.318	.044
6B (Aggressive)	.300	.008	**.544**	−.026	.034
7 (Compulsive)	.220	.066	.150	**−.446**	.023
8A (Negativistic)	.532	**.443**	.346	−.197	−.066
8B (Masochistic)	.542	.377	.344	.016	−.260
S (Schizotypal)	.678	.311	**.578**	.003	−.144
C (Borderline)	.634	**.680**	.150	.080	−.050
P (Paranoid)	.625	−.005	**.777**	−.092	−.178
A (Anxiety)	.625	**.715**	.155	.031	.068
H (Somatoform)	.542	**.797**	−.086	.020	.048
N (Bipolar): manic	.464	.069	**.543**	−.024	.380
D (Dysthymia)	.683	**.891**	−.170	−.062	−.028
B (Alcohol Dependence)	.184	.122	.100	.369	−.002
T (Drug Dependence)	.342	−.019	.115	**.566**	−.025
R (Posttraumatic Stress)	.405	**.500**	.208	.102	.062
SS (Thought Disorder)	.622	**.729**	.100	−.054	−.003
CC (Major Depression)	.689	**.922**	−.203	.077	.007
PP (Delusional Disorder)	.351	.080	**.480**	.214	−.061

Note. Bold is used for factor loadings above or equal .40.

Table 4 – Coefficients of Congruence (Φ) between Factors Based on linearly dependent scales and Factors based on linearly independent scales

	Factors Based on Linearly Dependent Scales			
Factors Based on Linearly Independent Scales	**1**	**2**	**3**	**4**
1	**1.00**	.10	.11	−.19
2	.36	.47	**.93**	.03
3	−.04	**.95**	−.08	.01
4	−.18	−.06	−.29	**.98**

Note. Bold is used for coefficients of congruence between factors that are congruent.

Table 5 – Coefficients of Congruence (Φ) between Factors Solution for Men and Women Estimated with PFA

	Men			
Women	**1**	**2**	**3**	**4**
1	1.00	.25	−.22	−.28
2	.04	.29	**−.99**	−.10
3	.12	**.98**	−.18	−.32
4	−.08	.07	−.01	**.97**

Note. Bold is used for coefficients of congruence between factors that are congruent.

not reach a significant level of congruency. As before, only factors 1 and 2 displayed a fair similarity to those found in a three-factor model.

DISCUSSION

The relevance of studying cultural invariance, sex differences and, more in general, factor structure has been acknowledged by many authors (Reise, Smith, and Furr, 2001; ten Berge, 1986). In the present study, we pursued these objectives by performing different exploratory factor analysis, using the Italian version of the MCMI-III. We found a four-factor solution for both linearly dependent and independent scales. The first factor, *General Maladjustment*, closely resembles that reported in literature independently of the number of factors extracted. The second factor (Aggression/Social Deviance) is the other factor that is similar in the Dutch (Rossi et al., 2007) and American (Craig & Bivens, 1998; Haddy et al., 2005) cultures, while Paranoid/Delusional Thinking and Emotional Instability versus Schizoid Detachment factors are similar only to those reported by Rossi et al. (2007). Furthermore, with regard to linearly independent scales, we found that *General Maladjustment*

and *Decompensated Narcissism/Paranoia* factors were significantly congruent, respectively, with High versus Low Psychopathology and Decompensated Narcissism/Paranoia factors (Haddy et al., 2005). In comparing the factor solution based on overlapping scales between man and women, we observed that the factors are similar in both cases, demonstrating that the factor structure of the MCMI-III is not different for man and women. Overall, the comparison of our results with previous factor analytic studies may confirm that the Italian version of the MCMI-III has a factor structure that is similar to those of other countries.

As highlighted by Haddy et al. (2005), the differences between linearly dependent and independent factors are difficult to interpret. Linearly independent scales may be better from a psychometric point of view, but they can lose significance according to Millon's theory of Personality Disorders and Clinical Syndromes. It is also noteworthy that Cuevas et al. (2008) found that models based on overlapping scales fitted worse than those based on non-overlapping scales. Our results suggest the opposite. Parallel analysis, eigenvalue criteria and scree plot identified different numbers of factors to be retained and the explained total variance was less than expected. Furthermore, some scales did not yield a factor loading of at least .40 and some factors did not fulfill the requirement of three variables per factor. All these elements suggest that further analysis should be conducted to explain these differences in the Italian version of the inventory.

One potential limitation associated to this study is that we did not perform a multigroup confirmatory factor analysis (MCFA) in evaluating the cross-cultural invariance of the factor structure of the MCMI-III. Given that researchers from different countries have found three to four factors using the MCMI as a whole, we preferred an exploratory approach to assess the factor structure of the MCMI-III. Our findings suggested that the factor structure of the MCMI-III is invariant across countries, thus further studies may investigate this aspect using MCFAs. In conclusion, given that the MCMI-III is frequently used in clinical settings, when questions arise about specific personality disorders characterizing some individuals, the investigation of its psychometric properties may also provide a useful contribute to an accurate diagnosis.

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