

Comparability of MMPI-2-RF with the MMPI-2 in Assessing Psychiatric Patients: A Shortfall

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Abstract

Assessment of mental health problems with MMPI instruments has a long tradition in Italy beginning in 1948. This study examined how the Minnesota Multiphasic Personality Inventory Restructured Form (MMPI-2-RF) compares with MMPI-2 in evaluating Italian psychiatric patients. We obtained a sample of psychiatric inpatients that were referred to the University Hospital in Rome, Italy who were administered the MMPI-2. This study examines the utility of the MMPI-2-RF, and how its performance compares with MMPI-2 scales in this contemporary clinical sample. We examined whether the new MMPI-2-RF scales are sensitive to mental health symptoms that are addressed by the original MMPI scales, and whether the MMPI-2-RF scales are sensitive to gender specific symptoms. These data show the limitations of the MMPI-2-RF in mental health assessment. The MMPI-2-RF scales have little relationship to the traditional MMPI-2 measures and are more highly related to several MMPI-2 content scales; in addition, they have lower sensitivity to mental health problems than the MMPI-2 clinical scales. Finally, the use of non-gendered norms in the MMPI-2-RF results in potential interpretive bias since men and women respond differently on a number of scales but are interpreted as equivalent using non-gendered norms.

Introduction

When new assessment instruments are published it is important that the populations focused upon and problems that are addressed are well conceived and that the psychometric measures are substantially researched and validated. These assessment requirements are especially important when the new instrument is similarly named as a currently widely used instrument and is being marketed by the test publisher as “the new standard,” as in the case of the Minnesota Multiphasic Personality Inventory-Restructured Form or MMPI-2-RF (see discussions by Friedman & Nichols, 2017; Isakson, 2007). The developers of the MMPI-2-RF (Tellegen & Ben-Porath, 2008) used 60 percent of the items from the Minnesota Multiphasic Personality Inventory-2 (MMPI-2) and the original norms developed for the MMPI-2 in 1989. However, the measures contained within the Restructured Form are different and do not address the original MMPI constructs. This study was developed to evaluate how the MMPI-2-RF compares with MMPI-2, from which it was partially derived, in an Italian psychiatric population. The evaluation of the MMPI-2-RF and the MMPI-2 in Italy is an important undertaking. There is a long tradition of using the MMPI instruments in Italy.

Reda (1948) developed the initial Italian translation of the original MMPI that came to be widely used in psychological assessment of Italian patients.

Personality Constructs Measured by the Restructured Scales

At the core of the MMPI-2-RF is a set of scales published in 2003, the Restructured Clinical scales, that were developed in an effort to improve the original MMPI clinical scales (Tellegen et al., 2003). The process of developing these measures involved eliminating items from the clinical scales because they were considered to weaken them and to cause unnecessary item overlap. Instead of improving the clinical scales, the revision procedures employed actually converted the clinical scales to a very different and homogenous set of content scales. For example, the RC3 scale “drifted” so far from the original Hy scale as to be a completely different measure -- only five items are shared by Hy and RC3, and these are scored in the opposite direction on RC3 from the original Hy scale (Butcher et al., 2006).

The Restructured Clinical scales were initially extensively criticized in the research literature because of their drift away from the original MMPI scales (Butcher, Hamilton, Rouse, & Cumella, 2006; Nichols, 2006). The RC scales cannot be interpreted on the basis of previous empirical studies of the original MMPI scales as the RC scales represent new measures whose meanings now must be determined empirically (Simms, Casillas, Clark, Watson, & Doebbeling, 2005). The RC scales performance was found to result in low sensitivity at detecting psychopathology (Wallace & Liljequist, 2005). Moreover, the Restructured Scales did not predict behavior as well as MMPI-2 clinical and content scales (Binford & Liljequist, 2008). Recently, Fariña, et al., (2017) determined that the MMPI-2-RF defensiveness measures did not perform as well as the validity scales on the MMPI-2.

Additionally, the RC scales were found to be redundant measures of other scales that are already contained on the MMPI-2. Rouse et al. (2008) conducted a study to examine the relationships of the RC scales to other scales on the MMPI-2. Using 25 samples of patients (N=78,159) who had been administered the MMPI-2 across diverse clinical settings, they found that each RC scale was highly correlated with a Supplementary, Content, or Personality Psychopathology 5 (PSY-5) scale rather than with the clinical scale from which they were derived. Rouse and colleagues found that: RC1 (Somatic Complaints) correlated .90 with Health Concerns Content scale (HEA); RC2 (Low Positive Emotions) correlated .78 with the Introversion/Low Positive Emotionality PSY-5 scale (INTR); RC3 (Cynicism) correlated .91 with the Cynicism Content scale (CYN); RC4 (Antisocial Behavior) correlated .78 with the Addiction Admission scale (AAS); RC6 (Ideas of Persecution) correlated .76 with the Psychoticism PSY-5 scale (PSYC); RC7 (Dysfunctional Negative Emotions) correlated .88 with the Welsh Anxiety Scale A; RC8 (Aberrant Experiences) correlated .89 with the Bizarre Mentation Content (BIZ scale); and RC9 (Hypomanic Activation) correlated .66 with the Cook and Medley (1954) Hostility scale (Ho).

Validation studies for the MMPI-2-RF in international contexts have relied upon scale correlations with external information (e.g., Moultrie & Engel, 2017) or internal reliability estimates (see.g., van der Heijden, Egger, & Derksen, 2008). This study examines the predictive ability of the MMPI-2-RF and the MMPI-2 scales in describing patients in contemporary clinical diagnostic samples to provide a perspective on how well the MMPI-2-RF scales perform compared to the clinical scales of the traditional MMPI-2.

Gender Differences in Personality

The research and theoretical literature show clear differences in the mental health symptoms and behaviors of men and women as described extensively in the Diagnostic and Statistical Manual (DSM-5) (American Psychiatric Association, 2013). There is an extensive body of research on gender differences in personality, psychopathology, cognition, and social behavior (e.g., Beiler-May, Williamson, Clark, & Carter, 2017; Feingold, 1994; Guimond, 2008; Gurtman & Lee, 2009; Willingham & Cole, 1997; Worrell & Robinson, 2009). Moreover, a number of MMPI based studies have included comparisons of gender differences in personality and behavior (e.g., Alavi, Nodushan, & Eftekhari, 2014; Fow, Sittig, Dorris, & Breisinger, 1994; Han, Park, Weed, Lim, Johnson, & Joles, 2013; Hovanitz & Kozora, 1989; Roma, Ricci, Kotzalidis, Abbate, Lavadera, Versace, Pazzelli, Togliatti, Girardi, & Ferracuti, 2014). An understanding of gender differences in personality is important for assuring fair and balanced assessment of women in particular given the potential for discriminatory practices. In personality assessment, gender differences are typically evaluated by using gender-specific comparison groups and separate validation samples of men and women for personality scales. However, there are notable exceptions when non-gendered norms have been developed and used in clinical decision-making. Several personality measures use the same normative comparison sample for assessing for both men and women, including the Personality Assessment Inventory (Morey, 1991) and the MMPI-2-RF (Tellegen & Ben-Porath, 2008). Personality assessment measures that compare a patient's symptoms and problems using non-gendered norms are likely to misclassify the problems reported by men versus women. A recent article by Bolinsky et al. (2016) confirms the problems in using non-gendered norms in personality assessment. They conducted a study comparing males vs females in a large sample of college students (N=411 males and 918 females) using the MMPI-2-RF and found significant differences between these groups on 40 of the 51 MMPI-2-RF scales. They concluded that:

Results demonstrated that this pattern of higher scores among college students remains a concern when using the MMPI-2-RF. Of particular concern is the finding that women's scores appear to be more affected by the use of non-gendered norms on the MMPI-2-RF than do the scores of men. Caution is urged when interpreting MMPI-2-RF results obtained from college students, particularly women. (Bolinsky, et al., 2016, p. 81)

In this study, we examine different response rates for men and women among the psychiatric patients to determine if male patients differ from women on the MMPI-2-RF measures.

Method

For this study, we obtained a sample of psychiatric inpatients that were referred to the Department of Neurosciences and Mental Health of the Policlinico Umberto I University Hospital - Sapienza University, Rome, Italy, during the period January 2010 - April 2017. Our goal was to collect data for at least 50 cases for each diagnostic category without deciding at the outset which would be used. Briefly, the choice of these categories was based on definite clinical diagnosis, sample size ($n \geq 50$), and completion of the MMPI-2/MMPI-2-RF. The psychiatric diagnosis was formulated according to DSM-IV-TR after the patient had completed somatic and psychiatric assessment, carried out within 12 hours after admission and lasting about 60 minutes. Each assessment was performed by one of eight senior psychiatrists from the Acute Psychiatric Ward, with an average experience in consultation of 16 yrs, and was reviewed by one or two senior supervisors. The diagnostic categories and descriptive statistics of the sample are shown in Table 1.

Table 1
Descriptive Statistics of the Sample

| GROUP | Schizophrenia | Depressive disorders | Somatic symptoms disorders | Borderline personality disorders | Total |
|-----------------------------|---------------|----------------------|----------------------------|----------------------------------|-------------|
| AGE (yrs) | | | | | |
| Count | 54 | 64 | 63 | 51 | 232 |
| Mean | 36.65 | 39.58 | 46.27 | 37.25 | 40.20 |
| St.Dev | 14.62 | 13.80 | 10.90 | 11.23 | 13.24 |
| St.Err | 1.99 | 1.73 | 1.37 | 1.57 | .87 |
| Min - Max | 17 - 74 | 17 - 69 | 20 - 70 | 18 - 57 | 17-74 |
| GENDER | | | | | |
| Female | 29 (53.7%) | 41 (64.1%) | 43 (68.3%) | 25 (49.0%) | 138 (59.5%) |
| Male | 25 (46.3%) | 23 (35.9%) | 20 (31.7%) | 26 (51.0%) | 94 (40.5%) |
| MARITAL STATUS | | | | | |
| Married | 14 (25.9%) | 19 (29.7%) | 38 (60.3%) | 11 (21.6%) | 82 (35.3%) |
| Single | 40 (74.1%) | 45 (70.3%) | 25 (39.7%) | 40 (78.4%) | 150 (64.7%) |
| EDUCATION ATTAINMENT | | | | | |
| Elementary School | 3 (5.6%) | 1 (1.6%) | 2 (3.2%) | 4 (7.8%) | 10 (4.3%) |
| Middle School | 17 (31.5%) | 13 (20.3%) | 14 (22.2%) | 9 (17.6%) | 53 (22.8%) |
| High School | 24 (44.4%) | 30 (46.9%) | 24 (38.1%) | 24 (47.1%) | 102 (44.0%) |
| University | 10 (18.5%) | 20 (31.3%) | 23 (36.5%) | 14 (27.5%) | 67 (28.9%) |

Note. The values in brackets are column percentages for each separate group.

Regarding the comparisons of the distribution of the MMPI-2 and MMPI-2-RF scales (parent clinical, content, and supplementary), carried-out separately for each diagnostic group and for the entire sample, we used Student's *t*-test for dependent groups (i.e., the paired *t*-test).

To compare the male to female distribution of the MMPI-2-RF scales, we used one-way analysis of variance (ANOVA 1-way). The correlations between the MMPI-2 and MMPI-2-RF scales have been investigated through Pearson's linear correlation coefficient (*r*). Where not differently indicated, the adopted cutoff for clinical significance (rejection of the null hypothesis) was set at $p=0.05$.

Results

The Results of the Intercorrelation Analyses. The profiles of the MMPI-2-RF and MMPI-2 scales and the most prominent content or supplementary scales for the combined sample of Italian psychiatric patients are shown in Figure 1. The comparison of MMPI-2-RF and MMPI-2, as shown in Figure 1, left profile, indicate that, in general, the RC scales show an overall lower level of sensitivity to mental health problems than the MMPI-2 clinical scales.

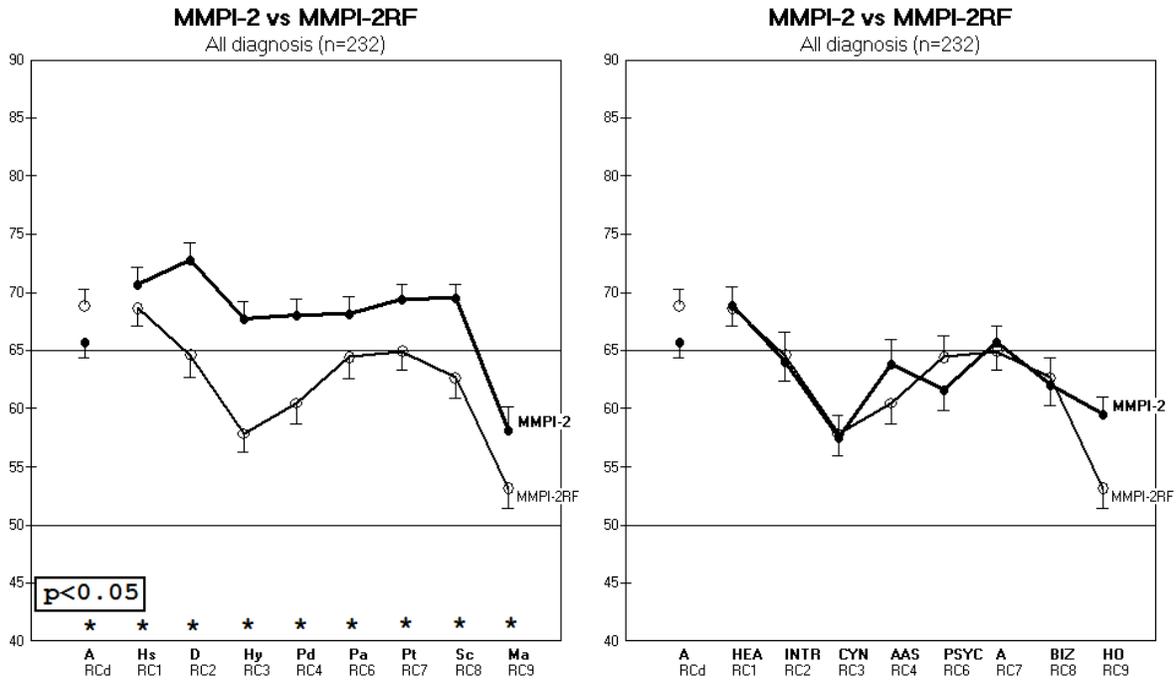


Figure 1 RC Scales to their parent scale, Content, Supplementary, PSY-5 Scales of MMPI-2 (Mean±2SE).

As shown in Table 2, the RCd scale is highly associated with the Welsh Anxiety scale (.83) indicating that it is largely comprised of anxiety related symptoms. The authors of the RC scale removed much of this factor from the clinical scales in their development of the RC scales (Tellegen et al., 2003). This procedure reduced the anxiety factor in the RC scales by eliminating the demoralization items for the construction of the RC scales. The removal of the anxiety items from each of the RC scales resulted in this important element of psychopathology not being sufficiently addressed in the symptom scales that make up the original MMPI clinical scales. This procedure thereby lowers the relationship between the RC scales and the MMPI-2 clinical scales. Several examples of the low relationship between the MMPI-2 clinical scale score and the RC scale reflect this change in what the constructs are measuring. For example, the MMPI-2 clinical scale Hy is negatively correlated at -.19 with the RC3; the clinical scale Pd is correlated only .51 with the RC4 and the clinical scale Pt is correlated at only .60 with RC7.

Table 2
Correlations of RC Scales to their parent scale of MMPI-2

| RCd | RC1 | RC2 | RC3 | RC4 | RC6 | RC7 | RC8 | RC9 |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| A | Hs | D | Hy | Pd | Pa | Pt | Sc | Ma |
| 0.8351 | 0.7908 | 0.7590 | -0.1965 | 0.5172 | 0.8039 | 0.6045 | 0.7641 | 0.7349 |
| p<0.001 | p<0.001 | p<0.001 | p=0.003 | p<0.001 | p<0.001 | p<0.001 | p<0.001 | p<0.001 |

Note. The cited values are (r Pearson's coefficients and prob(r)).

On the other hand, the majority of the Restructured Scales are more highly related to one of the Supplementary, Content, and Personality Psychopathology 5 (PSY-5) measures rather than with the clinical scales of MMPI-2 from which they were derived (see Figure 1, right profile). As shown in Table 3, the most prominent scale relationships for the RC scales are congruent with those found by Rouse et al. in 2008, including that the RC1 scale is correlated at .92 with the content scale HEA; RC2 is correlated at .85 with the PSY-5 Scale INTR; RC3 is correlated at .87 with the content scale CYN; RC4 is correlated at .75 with the substance abuse content scale AAS; RC6 is correlated with the PSY-5 scale PSYC at .87; the RC7 scale is correlated at .81 with the Welsh A scale; RC8 is correlated at .90 with the content scale BIZ; and RC9 is correlated at .72 with the Ho scale.

Table 3

Correlations of RC Scales and Content & Supplementary Scales of MMPI-2

| RCd | RC1 | RC2 | RC3 | RC4 | RC6 | RC7 | RC8 | RC9 |
|---------|---------|---------|---------|---------|---------|---------|---------|--------|
| A | HEA | INTR | CYN | AAS | PSYC | A | BIZ | HO |
| 0.8351 | 0.9251 | 0.8500 | 0.8724 | 0.7579 | 0.8741 | 0.8189 | 0.9055 | 0.7205 |
| p<0.001 | p<0.0 |

Note. The cited values are (r Pearson's coefficients and prob(r)).

Difference Between RC Scales to Their Parent Scale of MMPI-2. The MMPI-2 and MMPI-2-RF profiles (Mean±2SE) and significant differences ($p<0.05$) between parent scales for each clinical group are shown in Figure 2.

SCHIZOPHRENIA: compared to their respective parent scales, RC scales show a shrinkage of the affective (mood) component (D-Ma). These results are particularly important in that the RC scales significantly miss the mood swings between depressive and dysphoric/agitated periods. Notably, the depressive component linked to schizophrenic disorders (schizophrenia spectrum disorders) is not addressed by the RC scales (see Table 4 below).

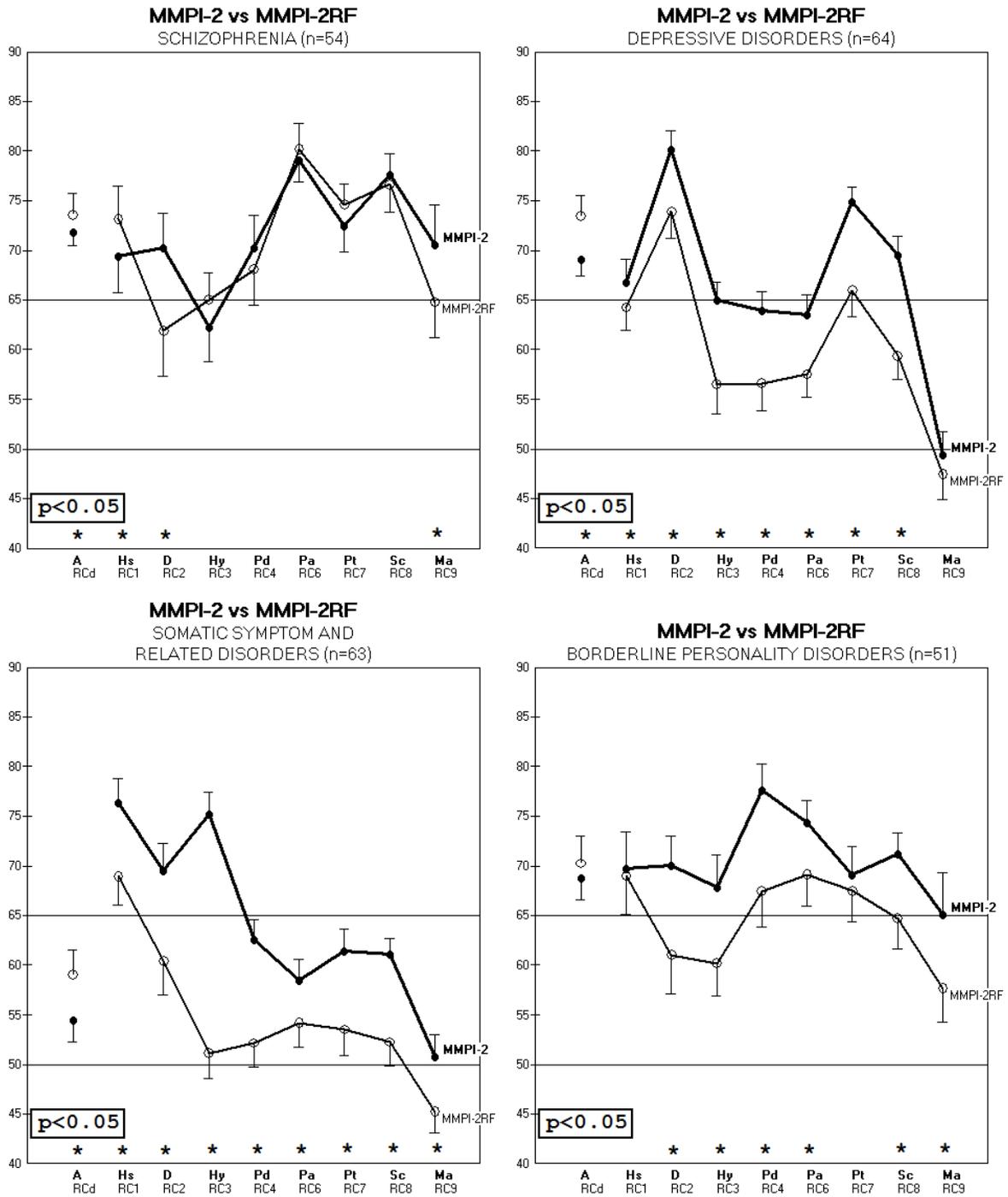


Figure 2 MMPI-2 and MMPI-2-RF profiles for each group (Mean ± 2SE).

Table 4
MMPI-2 and MMPI-2-RF profiles in Schizophrenia group

| Schizophrenia (n=54) | | | | | | | | | |
|-----------------------------|-------|-------|------|-----------|-------|-------|------|---------|----------|
| MMPI-2 | | | | MMPI-2-RF | | | | | |
| | Mean | SD | SE | | Mean | SD | SE | T-Test | P(T) |
| A | 71.85 | 5.23 | 0.71 | RCd | 73.61 | 7.97 | 1.08 | 2.0747 | 0.0429 * |
| Hs | 69.43 | 13.43 | 1.83 | RC1 | 73.17 | 11.98 | 1.63 | 3.8145 | 0.0004 * |
| D | 70.31 | 12.69 | 1.73 | RC2 | 61.91 | 16.74 | 2.28 | -5.5076 | 0.0000 * |
| Hy | 62.28 | 12.88 | 1.75 | RC3 | 65.04 | 9.84 | 1.34 | 1.2062 | 0.2331 |
| Pd | 70.22 | 12.15 | 1.65 | RC4 | 68.09 | 13.12 | 1.79 | -1.0996 | 0.2765 |
| Pa | 79.13 | 8.17 | 1.11 | RC6 | 80.19 | 9.47 | 1.29 | 1.2912 | 0.2023 |
| Pt | 72.44 | 9.68 | 1.32 | RC7 | 74.61 | 7.61 | 1.04 | 1.5630 | 0.1240 |
| Sc | 77.67 | 7.56 | 1.03 | RC8 | 76.65 | 10.54 | 1.43 | -0.8033 | 0.4254 |
| Ma | 70.56 | 14.74 | 2.01 | RC9 | 64.80 | 13.25 | 1.80 | -3.4842 | 0.0010 * |

Note. The values are (paired t test, and * term significant at a=0.05).

DEPRESSIVE DISORDERS (MAJOR DEPRESSIVE DISORDER): also in this diagnostic group, RC scales show reduced clinical significance in comparison to their parent scales; in particular, RC 8 very appreciably underestimates all aspects linked to interpersonal shutdown, to the feeling of social and emotional alienation, to difficulties in communicating one’s own experience, to the current state of confusion and bewilderment experienced by these patients, and to Ego Mastery (Cognitive and Conative) difficulties. Finally, RC7 does not effectively detect to the same extent all tendencies to continuous preoccupation, rumination, uncertainty, low self-esteem, and blockade of initiative that Pt is able to demonstrate (see Table 5 below).

Table 5
MMPI-2 and MMPI-2-RF profiles in Depressive Disorders Group

| Depressive disorders (n=64) | | | | | | | | | |
|------------------------------------|-------|------|------|-----------|-------|-------|------|----------|----------|
| MMPI-2 | | | | MMPI-2-RF | | | | | |
| | Mean | SD | SE | | Mean | SD | SE | T-Test | P(T) |
| A | 69.14 | 7.06 | 0.88 | RCd | 73.44 | 8.26 | 1.03 | 5.6629 | 0.0000 * |
| Hs | 66.83 | 9.04 | 1.13 | RC1 | 64.28 | 9.48 | 1.19 | -3.1705 | 0.0024 * |
| D | 80.13 | 7.70 | 0.96 | RC2 | 73.91 | 10.92 | 1.36 | -5.7181 | 0.0000 * |
| Hy | 64.97 | 7.43 | 0.93 | RC3 | 56.52 | 12.00 | 1.50 | -4.5290 | 0.0000 * |
| Pd | 63.97 | 7.71 | 0.96 | RC4 | 56.61 | 10.94 | 1.37 | -5.2977 | 0.0000 * |
| Pa | 63.53 | 7.93 | 0.99 | RC6 | 57.53 | 9.12 | 1.14 | -5.7138 | 0.0000 * |
| Pt | 74.94 | 5.52 | 0.69 | RC7 | 65.98 | 10.78 | 1.35 | -7.1293 | 0.0000 * |
| Sc | 69.56 | 7.28 | 0.91 | RC8 | 59.38 | 9.34 | 1.17 | -12.6871 | 0.0000 * |
| Ma | 49.44 | 9.32 | 1.17 | RC9 | 47.44 | 9.96 | 1.25 | -1.7298 | 0.0886 |

Note. The values are (paired t test, and * term significant at a=0.05).

SOMATIC SYMPTOMS AND RELATED DISORDERS (SOMATOFORM DSM-IV/IV-TR/ DISORDERS, SOMATIC SYMPTOM DISORDER – CONVERSION DISORDER): in this group we observe the complete loss of the 1-3/3-1 Code-Type and of all its empirical correlates, i.e., one of the main MMPI-2 profile characteristics of these disorders, consistently with the already stressed transformation of the meaning of the original Hy Scale in RC3 (showing an inverse correlation with its parent scale). Furthermore, an element of further interest is the lack of detection of the depressive component by RC2 (see Table 6 below).

Table 6
MMPI-2 and MMPI-2-RF profiles in Somatic Symptoms and Related Disorders Group

| Somatic symptoms and related disorders (n=63) | | | | | | | | | |
|--|--------|-------|------|-----|-----------|-------|------|----------|----------|
| | MMPI-2 | | | | MMPI-2-RF | | | T-Test | P(T) |
| | Mean | SD | SE | | Mean | SD | SE | | |
| A | 54.52 | 8.99 | 1.13 | RCd | 59.05 | 10.01 | 1.26 | 5.9795 | 0.0000 * |
| Hs | 76.40 | 9.26 | 1.17 | RC1 | 68.98 | 11.76 | 1.48 | -8.7469 | 0.0000 * |
| D | 69.54 | 10.70 | 1.35 | RC2 | 60.44 | 13.57 | 1.71 | -8.1226 | 0.0000 * |
| Hy | 75.22 | 8.76 | 1.10 | RC3 | 51.14 | 10.07 | 1.27 | -14.2720 | 0.0000 * |
| Pd | 62.54 | 8.19 | 1.03 | RC4 | 52.17 | 9.67 | 1.22 | -8.6070 | 0.0000 * |
| Pa | 58.43 | 8.75 | 1.10 | RC6 | 54.19 | 9.68 | 1.22 | -3.5277 | 0.0008 * |
| Pt | 61.37 | 8.87 | 1.12 | RC7 | 53.54 | 10.45 | 1.32 | -7.2544 | 0.0000 * |
| Sc | 61.11 | 6.34 | 0.80 | RC8 | 52.27 | 9.50 | 1.20 | -8.9374 | 0.0000 * |
| Ma | 50.76 | 9.02 | 1.14 | RC9 | 45.25 | 8.60 | 1.08 | -4.7375 | 0.0000 * |

Note. The values are (paired t test, and * term significant at $\alpha=0.05$).

BORDERLINE PERSONALITY DISORDERS: in this last group of participants, whose diagnosis is by definition associated, among others, to marked mood instability, the affective component is totally undersized by RC scales and lacks completely the actual clinical significance that the MMPI-2 has been able to show. Even the histrionic, exhibitionist components of both physical and psychological symptomatology, as evidenced by the Hy Scale, which is linked to aspects of relational manipulation/exploitation, are completely lost with the MMPI-2-RF. Finally, the Pd and, especially, the Sc MMPI-2 scales, which among others are linked to the feeling of personal and emotional social alienation, show a much higher clinical relevance than their respective RC scales (see Table 7 below).

Table 7

MMPI-2 and MMPI-2-RF profiles in Borderline personality disorders group.

| Borderline personality disorders (n=51) | | | | | | | | | |
|--|-------|-------|------|-----|-----------|-------|------|---------|----------|
| MMPI-2 | | | | | MMPI-2-RF | | | | |
| | Mean | SD | SE | | Mean | SD | SE | T-Test | P(T) |
| A | 68.84 | 7.91 | 1.11 | RCd | 70.25 | 9.80 | 1.37 | 1.8529 | 0.0698 |
| Hs | 69.75 | 13.18 | 1.85 | RC1 | 69.00 | 14.06 | 1.97 | -0.8556 | 0.3963 |
| D | 70.04 | 10.60 | 1.48 | RC2 | 61.04 | 14.03 | 1.96 | -6.3815 | 0.0000 * |
| Hy | 67.86 | 11.57 | 1.62 | RC3 | 60.18 | 11.81 | 1.65 | -3.3642 | 0.0015 * |
| Pd | 77.59 | 9.40 | 1.32 | RC4 | 67.47 | 12.90 | 1.81 | -5.7979 | 0.0000 * |
| Pa | 74.37 | 8.07 | 1.13 | RC6 | 69.14 | 11.22 | 1.57 | -5.0942 | 0.0000 * |
| Pt | 69.14 | 10.05 | 1.41 | RC7 | 67.49 | 11.23 | 1.57 | -1.3693 | 0.1770 |
| Sc | 71.20 | 7.51 | 1.05 | RC8 | 64.73 | 11.15 | 1.56 | -5.4183 | 0.0000 * |
| Ma | 65.06 | 15.37 | 2.15 | RC9 | 57.65 | 12.14 | 1.70 | -4.7593 | 0.0000 * |

Note. The values are (paired t test, and * term significant at a=0.05).

TOTAL GROUP: all RC scales significantly under predict all psychopathological aspects with respect to their parent scales (see Table 8 below).

Table 8

MMPI-2 and MMPI-2-RF profiles in total group

| All diagnoses (n=232) | | | | | | | | | |
|------------------------------|-------|-------|------|-----|-----------|-------|------|----------|----------|
| MMPI-2 | | | | | MMPI-2-RF | | | | |
| | Mean | SD | SE | | Mean | SD | SE | T-Test | P(T) |
| A | 65.74 | 10.17 | 0.67 | RCd | 68.87 | 10.89 | 0.71 | 7.8422 | 0.0000 * |
| Hs | 70.67 | 11.74 | 0.77 | RC1 | 68.66 | 12.14 | 0.80 | -3.9557 | 0.0001 * |
| D | 72.75 | 11.36 | 0.75 | RC2 | 64.63 | 14.90 | 0.98 | -12.7493 | 0.0000 * |
| Hy | 67.76 | 11.27 | 0.74 | RC3 | 57.84 | 12.04 | 0.79 | -8.3752 | 0.0000 * |
| Pd | 68.03 | 11.01 | 0.72 | RC4 | 60.47 | 13.44 | 0.88 | -9.4459 | 0.0000 * |
| Pa | 68.16 | 11.64 | 0.76 | RC6 | 64.45 | 14.15 | 0.93 | -6.7113 | 0.0000 * |
| Pt | 69.40 | 10.05 | 0.66 | RC7 | 64.94 | 12.68 | 0.83 | -6.5357 | 0.0000 * |
| Sc | 69.51 | 9.27 | 0.61 | RC8 | 62.64 | 13.40 | 0.88 | -12.0352 | 0.0000 * |
| Ma | 58.15 | 15.13 | 0.99 | RC9 | 53.13 | 13.47 | 0.88 | -7.2602 | 0.0000 * |

Note. The values are (paired t test, and * term significant at a=0.05).

Analysis of Gender Differences. Analyses were conducted to examine potential gender differences on the RC scales to determine the appropriateness of employing the same normative reference group to evaluate both men and women. As shown in Table 9, gender differences were found across the full range of RC scales with RC1 showing very significant differences (average for women was 13.95, men 11.12); RC4 (average for women was 6.13, men 8.50) and RC9 (average for women was 11.73, men 13.81).

Table 9
RC Scales: Gender differences

| | Males (n=94) | | | Females (n=138) | | | F-ratioP(F) | |
|-------|--------------|--------|--------|-----------------|--------|--------|-------------|---------|
| | Mean | St.Dev | St.Err | Mean | St.Dev | St.Err | | |
| RCd | 16.06 | 5.83 | 0.60 | 16.80 | 5.43 | 0.46 | 0.98 | 0.323 |
| RC1 * | 11.12 | 5.33 | 0.55 | 13.95 | 5.47 | 0.47 | 15.31 | 0.000 * |
| RC2 | 8.23 | 3.98 | 0.41 | 8.96 | 3.76 | 0.32 | 1.97 | 0.162 |
| RC3 | 9.62 | 3.59 | 0.37 | 9.17 | 3.57 | 0.30 | 0.86 | 0.355 |
| RC4 * | 8.50 | 4.59 | 0.47 | 6.13 | 3.54 | 0.30 | 19.64 | 0.000 * |
| RC6 | 4.80 | 3.85 | 0.40 | 4.60 | 3.71 | 0.32 | 0.15 | 0.697 |
| RC7 | 12.96 | 6.09 | 0.63 | 13.75 | 5.42 | 0.46 | 1.09 | 0.298 |
| RC8 | 5.96 | 4.52 | 0.47 | 5.84 | 4.21 | 0.36 | 0.04 | 0.840 |
| RC9 * | 13.81 | 6.13 | 0.63 | 11.73 | 5.30 | 0.45 | 7.55 | 0.006 * |

Note. The values are ANOVA1-way, and * term significant at $\alpha=0.01$).

Discussion

The majority of the Restructured Scales are more highly associated with content-based measures in the MMPI-2 than they are with the clinical scales from which they were derived. Moreover, they show less sensitivity in detecting psychopathology than their parent scales, as shown in our comparisons of the 4 clinical groups. The results of this study are also highly congruent with the results obtained by Rouse et al. (2008) on the relationships between the RC scales and show that the RC scales do not perform as the authors intended but are simply content-based measures that already exist in the MMPI-2 but under a different name.

The MMPI-2-RF does not provide the diagnostic information that is provided by the MMPI-2. These data support the general conclusions about the limitations of the MMPI-2-RF in assessment practice. The MMPI-2-RF scales have little relationship to the traditional MMPI-2 measures and should not be considered replacements as proclaimed in marketing statements for the MMPI-2-RF (Friedman & Nichols, 2017). Several recent textbooks on the MMPI-2 have provided similar conclusions about the limitations of the MMPI-2-RF in psychological assessment compared with the MMPI-2 (Butcher, 2011; Friedman, Bolinsky, Levak, & Nichols, 2015; Graham, 2012; Greene, 2012; Nichols, 2012). For example, one of the developers of the Restructured Clinical scales, John Graham, pointed out in his textbook “In settings where the goal of assessment is a comprehensive understanding of the test takers, this author would choose the MMPI-2 because it is his opinion that interpretations based on the MMPI-2 can yield a more in-depth analysis of personality and psychopathology.” (Graham, 2012, p. 415).

The use of non-gendered norms in assessing women and men for mental health problems is not supported in this study. Men and women clearly differ in the way they experience and describe personal problems on psychological tests. The analysis addressing the potential gender differences in this psychiatric population confirmed that men and women experience and acknowledge different symptoms in established psychiatric disorders. Therefore, the use of non-gendered norms in psychological testing, as with the MMPI-2-RF, is inappropriate and likely results in inaccurate assessment of symptoms for men and women in some disorders.

Recent research has shown that the MMPI-2-RF has not captured as extensive a following as the developers anticipated since it was introduced ten years ago. Recent analyses of test usage data have provided information that the MMPI-2 outperforms the MMPI-2-RF in test usage even with the

extensive marketing the publisher has made for the past ten years. The administrations of the MMPI-2-RF appear to have stabilized around 39% while the MMPI-2 accounts for 61% of all administrations of the adult instruments. In contrast, according to figures in the publisher's 1995 royalty statement, the MMPI-2 achieved near universal professional acceptance in the years following its introduction in 1989 (Williams & Lally, 2016). In addition, there has also been reluctance among psychological test users to accept the MMPI-2-RF for making important decisions that can affect the lives of others. In an evaluation of current published studies, Williams, Butcher, and Paulson (in press) found that the MMPI-2 was most dominant in personality assessment research from 2003 to 2016 with its total of 1,646 publications, the PAI was the second most widely researched inventory with 880 publications, followed by the MCMI with 411, and the MMPI-2-RF with 322 (Williams, Butcher, & Paulsen, in press).

The more extensive use of the MMPI-2 over other personality instruments is also noted in a recent survey conducted by Mihura, Roy, and Graceffo (2016). They surveyed clinical psychology doctoral training programs, and found that the MMPI-2 was the most popularly taught adult self-report inventory (92% of programs), followed by the PAI (76%), the MCMI-III (70%), and the MMPI-2-RF (67%). The reluctance of many psychologists to use the MMPI-2-RF is further noted by some organizations. Based upon a research study of their job applicant population's MMPI-2 performance, the Federal Aviation Administration of the U. S. government (FAA, 2013) has recommended the use of the MMPI-2 in employment selection of air traffic controllers and airline pilots and that "The MMPI-2-RF is not an approved substitute" (see FAA, *Guide for Aviation Medical Examiners*, 2013).

Important assessment decisions are being made about people using the MMPI-2-RF— an instrument that does not sufficiently address the mental health problems as the MMPI-2 does. Very few published studies have examined the relationship between MMPI-2-RF and the traditional MMPI-2 scales from which the core scales (Restructured Scales) were derived and that the test publisher has marketed as the new standard when it was released to the public. The present study is limited in that only a single clinical population of inpatient psychiatric patients were included in the evaluation. The relationship between the MMPI-2-RF and the MMPI-2 measures needs to be more fully explored for assessing mental health problems in other important applications such as selecting applicants in high risk occupations, assessing clients in forensic evaluations and in the most widely used setting— outpatient mental health— in order to provide psychologists the information needed to become aware of the constructs being measured and those that have been eliminated through use of the MMPI-2-RF. Future research on the MMPI-2-RF should address the relationship between the new scales and the traditional MMPI-2 measures from which they were derived.

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