

## Use of the MMPI-2 in the Outpatient Assessment of Women With Anorexia Nervosa or Bulimia Nervosa

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Past research has shown that women with eating disorders commonly display clinical elevations on several scales of the Minnesota Multiphasic Personality Inventory (MMPI; Hathaway & McKinley, 1983), so the MMPI may be useful for the differentiation of women with Anorexia Nervosa from those with Bulimia Nervosa. In the study presented here, 116 women diagnosed with either Bulimia Nervosa or Anorexia Nervosa completed the Minnesota Multiphasic Personality Inventory-2 (Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989). Multivariate analyses failed to reveal any differences among the diagnostic subtypes. Consideration of profile code types was suggestive of possible group differences that mirror those discussed in previous literature on the personality features of women with eating disorders. Results are discussed with regard to past research and the clinical utility of the MMPI in the outpatient assessment of women with Anorexia Nervosa or Bulimia Nervosa.

The study of comorbid psychopathology and personality features among women with eating disorders has been the focus of a growing body of research (see Johnson & Wonderlich, 1992, and Vitousek & Manke, 1994, for reviews). Investigation of comorbidity frequently has involved differences between anorexic and bulimic individuals. Both types of eating disorders include preoccupation with body weight and shape, but Anorexia Nervosa differs from Bulimia Nervosa with regard to the patient's actual body weight (see American Psychiatric Association [APA], 1994, for spe-

cific diagnostic criteria). Anorexia Nervosa is characterized by maintenance of a relatively low body weight (at least 15% below expected) and cessation of menstrual cycles.

The presence of binge-eating and/or purging does not itself distinguish Bulimia Nervosa from Anorexia Nervosa. According to diagnostic criteria in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed. [DSM-IV]; APA, 1994), Anorexia Nervosa consists of both a Restricting type (absence of binge-eating or purgation) and a Binge-Eating/Purging type, whereas Bulimia Nervosa now consists of both a Purging type and a Non-purging type. This diagnostic scheme including subtypes represents a distinct change from earlier approaches (see Pryor, 1995, for review).

Some research on the psychopathology and personality of women with eating disorders has included the Minnesota Multiphasic Personality Inventory (MMPI; Hathaway & McKinley, 1983), a widely used instrument from which several clinically predictive scales are derived (cf. Graham, 1990; Greene, 1991). The results of past research suggest that women with Anorexia Nervosa may score differently from women with Bulimia Nervosa (Vitousek & Manke, 1994).

Specifically, it has been suggested that restricting anorexics typically score in the subclinical range on the MMPI (e.g., Hendren, 1983; Scott & Baroffio, 1986; Wilbur & Colligan, 1981). In their review of research on personality characteristics of individuals with eating disorders, Vitousek and Manke (1994) noted that "no published mean profile of restricters has shown more than one clinical scale exceeding 70" (p. 140). When individuals with Anorexia Nervosa have evidenced clinical elevations, they typically have generated profiles indicative of depression, anxiety, and social withdrawal with Scale 2 (Depression) typically the highest scale score (e.g., Casper, Hedeker, & McClough, 1992; Edwin, Andersen, & Rosell, 1988; Leon, Lucas, Colligan, Ferninande, & Kamp, 1985; Norman & Herzog, 1983).

Vitousek and Manke (1994) noted that MMPI profiles of binge-eating/purging patients with Anorexia Nervosa generally indicate greater psychopathology than do those generated by restricters. Published mean profiles for binge/purgers with Anorexia Nervosa typically consist of from three to six scales in the clinical range (e.g., Casper et al., 1992; Edwin et al., 1988; Norman & Herzog, 1983; Shisslak, Pazda, & Crago, 1990, but see Scott & Baroffio, 1986, for an exception).

The MMPI findings on individuals with Bulimia Nervosa have been less consistent than those for patients with Anorexia Nervosa. Whereas some researchers have found mean profiles indicative of moderate psychopathology among bulimics (e.g., Casper et al., 1992; Hatsukami, Owen, Pyle, & Mitchell, 1982; Mizes, 1988; Shisslak et al., 1990; Williamson, Kelley, Davis, Ruggiero, & Blouin, 1985), others have found manifestations of severe psychopathology (e.g., Bulik, Beidel, Duchmann, Weltzin, & Kaye, 1992; Norman & Herzog, 1983; Parmer, 1991; Pyle, Mitchell, & Eckert,

1981). In general, variability has been the hallmark of MMPI profiles among individuals with Bulimia Nervosa (Vitousek & Manke, 1994). For example, Root and Friedrich (1989) found no single modal MMPI profile in their bulimic sample and identified eight different two-point code types that collectively classified most individuals.

In our study, we sought to investigate the usefulness of the MMPI-2 (Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989) in the distinction of women with Anorexia Nervosa from women with Bulimia Nervosa, as well as distinguishing among subtypes of eating disorders. The results of past research with the MMPI imply important distinctions between bulimics and restricters. However, past researchers using the MMPI among eating-disordered samples generally used univariate analyses wherein group comparisons were conducted separately on each MMPI scale. To the extent that the MMPI scales are intercorrelated, univariate analyses of group differences on each scale would overrepresent the number of unique differences among groups. In this study, we investigated potential differences in MMPI-2 scale scores among the subtypes of eating disorders using multivariate analyses. In that way we determined the unique power of the MMPI-2 clinical scales in distinguishing among subtypes of women with eating disorders.

## METHOD

### Participants

Participants were 116 women evaluated consecutively at the University of Kansas School of Medicine Eating Disorders Clinic who met *DSM-IV* diagnostic criteria (APA, 1994) for either Anorexia Nervosa (Restricting type,  $n = 22$ ; Binge-Eating/Purging type,  $n = 20$ ) or Bulimia Nervosa (Purging type,  $n = 64$ ; Nonpurging type,  $n = 10$ ). The mean age of the sample was 26.49 years ( $SD = 7.72$ ).

### Measures

*Personality/psychopathology.* All patients completed the MMPI-2 (Butcher et al., 1989), a 567-item, self-report inventory in which the respondent indicates whether each statement is generally true or false for them. The 567 individual items are scored to derive 3 validity indices as well as 10 basic clinical scales. Raw scores on each scale are converted to  $T$  scores and values 65 and greater are considered clinically significant (Graham, 1990; Greene, 1991). For information on the MMPI-2 scales, see Graham or Greene.

## Procedure

All participants underwent 2-hr diagnostic assessments conducted by clinicians experienced in the evaluation and treatment of eating disorders consisting of separate semistructured interviews conducted by a psychologist and a psychiatrist. Diagnoses, using *DSM-IV* criteria, were based on information gathered in these interviews and were consensually derived among members of the clinical team involved in the assessment. Subsequently, patients completed the MMPI-2.

## RESULTS

In accordance with established practices (Graham, 1990; Greene, 1991), some MMPI-2 profiles were not included in analyses due to increased likelihood of being invalid. Some MMPI-2 experts consider a profile invalid if any of the three validity indices have a corresponding *T* score greater than 70 (Graham, 1991), yet a *T* score greater than 70 on Scale *F* may indicate psychosis (Butcher et al., 1989). We decided to take a moderately conservative approach to determining profile validity and, in our analyses, profiles were included if the *T* scores were less than 72 on Scale *L*, less than 80 on Scale *F*, and less than 72 on Scale *K*. Sixteen profiles did not meet these inclusion criteria and were dropped from the effective sample. Given the distribution of the total sample among the four subtypes of eating disorders, the 16 respondents who generated invalid profiles did not appear to cluster in particular diagnostic categories (Anorexia Nervosa, Restricting type,  $n = 4$ ; Anorexia Nervosa, Binge-Eating/Purging type,  $n = 2$ ; Bulimia Nervosa, Purging type,  $n = 9$ ; Bulimia Nervosa, Nonpurging type,  $n = 1$ ).

Because scores on the clinical scales of the MMPI-2 are likely to be correlated, subgroups were compared using logistic regression analysis (Norusis, 1990) wherein the 3 validity scales and 10 clinical scales were entered into analyses simultaneously to predict diagnostic category. Given the small number of patients with Bulimia Nervosa, Nonpurging type ( $n = 9$ ), individuals with either type of Bulimia Nervosa were combined.

Comparing the general diagnostic categories of Anorexia Nervosa ( $n = 36$ ) to Bulimia Nervosa ( $n = 64$ ) revealed an insignificant regression equation (Model  $\chi^2 = 18.64$ ,  $df = 13$ ,  $p < .14$ ). In other words, patients with Anorexia Nervosa did not differ from patients with Bulimia Nervosa with regard to scores on the validity or clinical scales. Comparing patients with Anorexia Nervosa, Binge-Eating/Purging type ( $n = 18$ ), to patients with Bulimia Nervosa ( $n = 64$ ) also revealed an insignificant regression equation (Model  $\chi^2 = 17.34$ ,  $df = 13$ ,  $p < .19$ ). Also, the patients with Anorexia Nervosa, Restricting type ( $n = 18$ ), and patients with Bulimia Nervosa ( $n = 64$ ) did not differ (Model  $\chi^2 = 14.29$ ,  $df = 13$ ,  $p < .36$ ). Last, there were no differences between the patients in the Restricting ( $n = 18$ ) versus

Binge/Purging ( $n = 18$ ) subgroups of Anorexia Nervosa (Model  $\chi^2 = 16.94$ ,  $df = 13$ ,  $p < .21$ ).

Given that the diagnostic groups did not differ in their scores on the validity or clinical scales of the MMPI-2, the mean scale scores and the proportion of respondents who scored  $T = 65$  or greater on each scale are presented in Table 1 for the entire sample. Elevations on Scales 2 and 7 were quite common, indicating depression and acute or chronic emotional distress (Graham, 1990; Greene, 1991). Figure 1 displays the mean profiles for each of the four subtypes and readily shows the high degree of correspondence among the diagnostic groups.

Many would argue that the value of MMPI-2 data lies not in simple consideration of individual scale scores, but rather in the consideration of code types or patterns of elevated clinical scales within each profile. There are several two- and three-point code types that have been recognized and well-researched in clinical settings (cf. Graham, 1990; Greene, 1991; Meyer, 1993). To explore the code types generated by the women in our sample, we determined the clinical code type for each profile, doing so blind to diagnosis. Two- and three-point codes were defined by the existence of distinct clinical elevations ( $T \geq 65$ ) on two or three clinical scales (Graham, 1990; Greene, 1991). Single scale elevations ("spikes") were defined as clinical elevation on one of the scales with all other clinical scale scores falling below  $T = 65$ . If several scales evidenced similar levels of clinical elevation (Graham, 1990), the profile was labeled "no meaningful code type" (p. 88). We found that 89 of the 100 profiles could be described as either "within normal limits" (no clinical scale  $T \geq 65$ ; Greene, 1991, p. 259) or indicative of a one-, two-, or three-point code type (see Table 2).

This sample evidenced a variety of code types, and no one diagnostic group appeared to monopolize any particular code type. The most common profiles for all diagnostic groups included elevations on the first three scales

TABLE 1  
Mean Scores and Number of Respondents Who Scored  $T \geq 65$  for Each of the MMPI-2 Clinical Scales

<i>MMPI-2 Clinical Scale</i>	<i>M</i>	<i>SD</i>	<i>n With T Scores ≥ 65</i>
1 (Hypochondriasis)	63.60	12.86	43
2 (Depression)	72.90	14.68	72
3 (Hysteria)	64.70	15.27	50
4 (Psychopathic Deviate)	65.48	10.69	54
5 (Masculinity-Femininity)	49.04	9.90	7
6 (Paranoia)	62.37	11.58	40
7 (Psychasthenia)	69.76	12.06	66
8 (Schizophrenia)	63.05	10.43	52
9 (Hypomania)	48.17	9.28	5
0 (Social Introversion)	60.56	11.80	36

Note.  $N = 100$ .

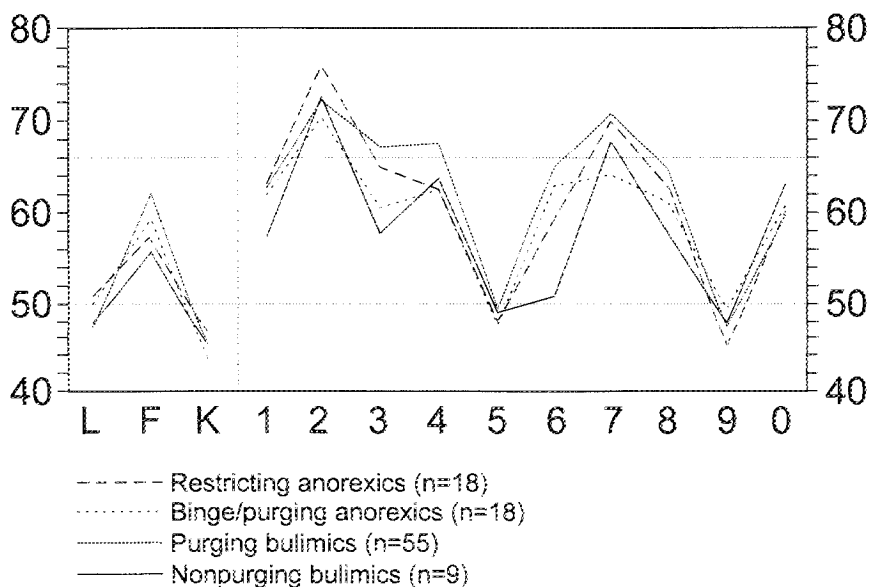


FIGURE 1 Mean MMPI-2 profiles for each of the four diagnostic subtypes.

TABLE 2  
Frequency of MMPI-2 Clinical Code Types Presented by Diagnostic Subtype

MMPI-2 Code Type	Restricting Anorexics	Binge and Purge Anorexics	Purging Bulimics	Nonpurging Bulimics
1-2-3/2-1-3/2-3-1	5 (27.8%)	5 (27.8%)	9 (16.4%)	0
1-3-2/3-1-2	1 (5.6%)	0	6 (10.9%)	0
2-0/0-2	1 (5.6%)	1 (5.6%)	1 (1.8%)	3 (30.0%)
2-6/6-2	1 (5.6%)	1 (5.6%)	3 (5.4%)	0
2-7/7-2	3 (16.7%)	2 (11.1%)	13 (23.6%)	2 (20.0%)
7-0/0-7	0	0	2 (3.6%)	0
Elevation: only on Scale 4	0	0	3 (5.4%)	1 (10.0%)
4-9	0	1 (5.6%)	1 (1.8%)	0
Elevation: only on Scale 5	0	1 (5.6%)	1 (1.8%)	0
Elevation: only on Scale 6	0	1 (5.6%)	4 (7.3%)	0
Elevation: only on Scale 7	0	0	0	0
WNL <sup>a</sup>	5 (27.8%)	5 (27.8%)	5 (9.1%)	2 (20.0%)
No meaningful code type	2 (11.1%)	1 (5.6%)	7 (12.7%)	1 (10.0%)
Totals	18 (100%)	18 (100%)	55 (100%)	9 (100%)

<sup>a</sup>Within normal limits (no clinical scale  $T \geq 65$ ).

(*1-2-3/2-1-3/2-3-1*) or significant elevation on Scale 7. Although the small number of subjects in each cell precludes formal statistical analysis, inspection of Table 2 suggests some possible differences among the groups. The *1-3-2/3-1-2* profile was evidenced almost exclusively by the purging bulimic group, and the *2-0/0-2* profile appeared most likely among the nonpurging bulimics. Elevations on Scales 4 or 6 occurred exclusively among those with Bulimia Nervosa or Binge-Eating/Purging Anorexia Nervosa. More than one fourth of the patients with Anorexia Nervosa displayed "normal" profiles with no clinical scale significantly elevated ( $T \geq 65$  or greater).

## DISCUSSION

Although many of our patients demonstrated substantial clinical elevations on the MMPI-2, multivariate analyses failed to reveal any differences among groups based on diagnostic subtypes. In fact, the mean profiles for each group were remarkably similar (see Figure 1). In general, women in our sample evidenced elevations on Scales 2 and 7, indicating depression and general emotional distress. This finding corresponds with our clinical observation that individuals do not usually present for evaluation and treatment unless motivated to do so by some degree of emotional distress, most commonly experienced as anxiety and dysphoria.

The informal analysis of profile code types by diagnostic group was suggestive of some differences among the subtypes. In general, the *1-2-3/2-1-3/2-3-1* code type was most common. Greene (1991) noted that this profile configuration is relatively common in medical settings, and Graham (1990) noted that this code type is indicative of depression with a host of somatic complaints. It is possible that somatic complaints have a realistic basis among patients with eating disorders as the caloric restriction, binge-eating, and purging inherent in the disorders result in physiological problems (Keys, Brozek, Henschel, Mickelsen, & Taylor, 1950; Mitchell, Pyle, Eckert, Hatsukami, & Lentz, 1983; Sansone & Sansone, 1994). Interestingly, scores on these first three scales have been found to decrease as anorexics gain weight (Skoog, Andersen, & Laufer, 1984). Graham (1990) also noted, "persons with this code are in conflict about dependency and self-assertion, and they often keep other people at an emotional distance" (p. 103). Clinicians have spoken to this experience of ambivalence and distrust in interpersonal relationships among women with eating disorders (e.g., Bruch, 1973; Friedrichs, 1988; Johnson & Connors, 1987).

We found the *1-3-2/3-1-2* code type most often among the purging bulimics. This "Conversion V" has been well-described by clinicians (Meyer, 1993) and denotes individuals who lack insight into the psychological nature of their somatic problems. "Although these individuals tend to be rather sociable, they tend to be passive-dependent in relationships. It is important for them to be liked and approved of by others, and their behavior

typically is conforming and conventional" (Graham, 1990, p. 103). In comparing patients with Anorexia Nervosa to those with Bulimia Nervosa, others have noted that the latter group is generally more socially outgoing and extroverted, yet they lack interpersonal intimacy and are highly concerned with pleasing others (Andersen, Morse, & Santmyer, 1985).

In our study, elevations on Scales 4 or 6 were most commonly found among women who engaged in binge-eating/purging. Elevation on Scale 4 is indicative of problems with impulsivity (Graham, 1990; Meyer, 1993), and bulimic patients have been found to be more impulsive and evidence more impulse-related problems relative to patients who exclusively engage in caloric restriction (Johnson & Wonderlich, 1992; Vitousek & Manke, 1994). Moderate elevations on Scale 6 are said to indicate distrust, paranoia, and affective instability (Graham, 1990; Meyer, 1993). Others have noted that patients with eating disorders who engage in binge-eating/purging are more affectively labile and interpersonally sensitive than are their nonpurging counterparts (Garfinkel, Moldofsky, & Garner, 1980; Russell, 1979; Strober, 1981; Yellowlees, 1985).

The 2-0/0-2 configuration appeared most commonly among the nonpurging bulimics. This code type is indicative of shyness, introversion, and chronic depression (Graham, 1990; Meyer, 1993). It is possible that these women suffer from the social and psychological stigmatization attached to being overweight and not meeting cultural ideals for body shape. These women may be defined negatively by their weight and excluded from full participation in social activities. It is possible also that the exhibited introversion and chronic depression are side-effects of the dieting/binge-eating cycle (Kuehnel & Wadden, 1994; Wadden & Stunkard, 1985).

To conclude, in multivariate tests, membership in particular subtypes of eating disorders was unrelated to scores on any of the validity or clinical scales of the MMPI-2. Informal analysis of prominent profile configurations, or code types, revealed some potential differences among the diagnostic subtypes that corresponded to personality differences generally described in the literature. Notable was the finding that a substantial minority of patients, particularly among those with Anorexia Nervosa, evidenced a "normal" profile in the sense that none of the scale scores were clinically elevated ("within normal limits"). This lack of evidenced psychopathology among anorexics has been highlighted by others as well (e.g., Wilbur & Colligan, 1981).

Why did we fail to find differences among diagnostic groups when some earlier researchers have? Several possible answers to this question emerge. Past researchers used the MMPI whereas we used the MMPI-2. Also, as mentioned earlier, past comparisons between bulimics and restricters were conducted at the univariate level (conducting separate tests comparing each diagnostic group on each clinical scale). In this study, we conducted comparisons while controlling for scores on the remaining MMPI-2 scales. Our study also differed from past research with regard to diagnostic categories



and subtypes. We used the diagnostic criteria and subtyping designations outlined in *DSM-IV* (APA, 1994). However, there has been much diagnostic confusion in past research on eating-disordered samples (see Beumont, Garner, & Touyz, 1994; Pryor, Wiederman, & McGilley, in press).

The results of this study support our clinical experience using the MMPI-2 in the outpatient assessment of women with eating disorders. The MMPI-2 often does not seem to provide clinically useful material about these patients beyond what can be gathered in the intake interview. We do believe personality dynamics to be central in the understanding and treatment of eating disorders, but the personality dimensions relevant to these patients do not appear to be adequately assessed with the MMPI-2. One potential problem is that research has demonstrated that MMPI scores can be significantly elevated secondary to starvation and the concurrent physiological changes (Keys et al., 1950). Other measures of more stable and enduring personality traits may be more useful in assessment and treatment-planning with patients with eating disorders (e.g., see Bulik, Sullivan, Weltzin, & Kaye, 1995; Casper et al., 1992).

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