

Assessment of General Personality and Psychopathology Among Persons With Eating and Weight-Related Concerns

Chi C. Chan, Melissa A. Napolitano, and Gary D. Foster

Considering the intricate and contiguous relationship between personality, behavior, and physiology, the assessment of persons with obesity and eating disorders would be incomplete without looking at these factors. This chapter focuses on issues and methods in assessing personality and psychopathology in this population. Personality is an individual's unique and long-term experience and behavior, with personality traits being consistent and expected reactions and behaviors (Comer, 2005). Psychopathology is defined as problematic patterns of thought, feeling, or behavior that are disruptive to an individual's well-being or functioning (Kowalski & Westen, 2005). Psychopathology can be viewed as a spectrum of psychological disturbances, ranging from minor abnormalities to personality disorders (rigid patterns of experience

and behavior that deviate markedly from the expected norm of the culture) to delusional psychoticism (Kowalski & Westen, 2005).

Early research in the populations with eating and weight concerns suggested that there was an obese personality characterized by dependency, immaturity, and negative affect (Rydén & Danielsson, 1983) but that the obese population does not show greater levels of psychological disturbance than the normal-weight population (Striegel-Moore & Rodin, 1986; Stunkard & Wadden, 1992; Wadden & Stunkard, 1985). Eating disorders have also been thought to be related to certain personalities and mood disorders, such as the need for control and depression (Bruch, 1973; Hudson, Pope, Jonas, & Yurgelun-Todd, 1983; Walsh, Roose, Glassman, Glades, & Sadik, 1985). These conclusions have been abandoned in favor

of later research suggesting that personality characteristics associated with obese persons may in fact be a result of being obese rather than its cause (Plante & Rodin, 1990). Cooper (1995) also suggests that depression most likely occurs subsequent to an eating disorder as opposed to being a causal factor. It has then been concluded that there is much heterogeneity in the obese (Friedman & Brownell, 1995) and the eating disorder (Vitousek & Stumpf, 2005) populations. Friedman and Brownell (1995) regarded these findings as “first-generation studies” and suggested that “second-generation studies” should aim at identifying those at risk and consequences within the obese population. Finally, Friedman and Brownell suggested that “third-generation studies” should investigate causality; this model can also be applied to the eating disorder group.

The question of what should be considered “normal” and “abnormal” personality and behavior has long been discussed in the field of psychology (Adams & Cassidy, 1993).

Although there is debate regarding this issue, which is beyond the scope of this chapter, assessment tools consisting of norms within certain populations (e.g., eating disordered, obese) can provide a context for evaluating and comparing different groups.

Fundamental Assessment Issues and Concerns

Cause and Effect

Perhaps the most difficult task in psychological assessment is uncovering the cause and effect of a phenomenon. Assessing personality and psychopathology in persons with obesity and disordered eating is no exception in that it has yet to be clarified whether the eating and weight disorder causes psychological distress or vice versa. Correlational studies have been useful in establishing that there is comorbidity between personality, psychopathology, and eating and weight disorders (e.g., Godt, 2002; Matos et al., 2002;

O'Brien & Vincent, 2003). There are also correlations between the level of psychopathology and the comorbidity of the disorder (e.g., more psychopathology in obese binge eaters than obese nonbingers; Picot & Lilenfeld, 2003) and with the severity of the disorder (Speranza, Corcos, Atger, Paterniti, & Jeammet, 2003). What correlational studies lack is the ability to identify causal relationships. For that purpose, more revealing are study designs where individuals with eating and weight disorders are assessed before treatment and after recovery. These studies have found some significant declines in scores for personality disturbances and psychopathology after recovery from an eating disorder, such as dependency (Ames-Frankel et al., 1992; Bornstein & Greenberg, 1991; Kennedy, McVey, & Katz, 1990) and impulsivity (Ames-Frankel et al., 1992). One study also found significant declines in clinical scale scores of the Minnesota Multiphasic Personality Inventory–(MMPI-2) 6 months to a year following bariatric surgery (Maddi et al., 2001).

In these cases, it is apparent that treatment was associated with improvements, but to identify a causal relationship, we must understand how the treatment worked (i.e., what did it treat?). Several different mechanisms are possible. First, the treatment may have altered the patients' problematic eating patterns, which, in turn, improved their psychological functioning. On the other hand, the treatment may have alleviated their psychological disturbances, which then improved their eating and/or weight disorder. This second conclusion can be argued against with evidence from studies where the personality disturbances improve quite early in therapy (Ames-Frankel et al., 1992; Garner et al., 1990) before the necessary amount of change in personality needed to affect eating habits can take place (Cassin & von Ranson, 2005). Furthermore, bariatric surgery for the obese affects their eating patterns more directly than their personality. More interesting are the results where some personality traits that deviate from the norm persist even after recovery, such as perfectionism, rigidity, obsessiveness (Srinivasagam et al., 1995), novelty seeking, and harm avoidance

(Bloks, Hoek, Callewaert, & van Furth, 2004; Klump et al., 2004), which may point to enduring traits that contributed to the eating and/or weight disorder.

State Versus Trait

An important consideration when assessing personality and psychopathology is the distinction between personality traits and current mental states. Personality assessments are aimed at finding persistent characteristics that exist independently of any current and temporary mental problems, but distinguishing between the two is difficult. This problem is exacerbated in the population with weight concerns and eating disorders. The fundamental issue in this group is food intake and behaviors used to control it—these individuals are tampering with their basic physiological need for nourishment necessary for proper brain and body functions. This will undoubtedly affect their performance on tests and interviews. This issue is most apparent in individuals with the restricting subtype of anorexia nervosa or those who are on severely restricted diets. The Minnesota starvation study by Keys and colleagues in the 1940s revealed stunning changes in previously healthy men who volunteered to be put on a semi-starvation diet. The subjects displayed significant changes in attitude, mood, and behavior, including increased impulsivity, aggression, and irritability. Their personality profile by the end of the semi-starvation period resembled the profile of restricting subtype anorexic patients (Vitousek & Manke, 1994). Other studies with humans and animals have also found that severe caloric restriction alters behavior and thought profoundly (Lore, Gottdiener, & Delahunty, 1986; Rohles & Wilson, 1974; Rowland, 1968; Schiele & Brozek, 1948; Swanson & Dinello, 1970). However, when they resume normal eating, these changes dissipate with increased nourishment (Keys, Brozek, Henschel, Mickelsen, & Taylor, 1950; Robinson & Winnik, 1973; Rowland, 1968; Schiele & Brozek, 1948).

Abnormal mental states resulting from caloric deprivation, or any type of deviation from a healthy eating pattern, can mimic or exaggerate personality disorders and psychopathology. Improvement in assessment after treatment may in fact be due to the normalization of the patients' chaotic eating habit, which then eliminates its state effect on their performance on test and interview (Vitousek & Stumpf, 2005). Researchers should be cautious when assessing this group of individuals and be aware that the assessment can be affected by their current abnormal eating behavior.

Self-Report Inventories Versus Diagnostic Interviews

Self-report inventories and diagnostic interviews are two ways of assessing personality and psychopathology, each with their own advantages and disadvantages. Self-report inventories are cost-effective, easy to administer, and time efficient. They are useful screening tools for psychiatric disorders, can be used to quantify symptom severity, and may be able to reliably distinguish between types of psychopathology (Peveler & Fairburn, 1990). The rating scales and scoring keys available with self-report inventories standardize the evaluation of the results. On the other hand, the cutoff score marking the presence or absence of a disorder can be problematic in their artificiality and arbitrariness (Vitousek & Stumpf, 2005). In comparison to diagnostic interviews, self-report inventories overestimate personality disorders (Cassin & von Ranson, 2005; Fichter & Quadflieg, 2000; O'Brien & Vincent, 2003). A meta-analysis by Cassin and von Ranson (2005) found that self-report measures of personality disorders among individuals with eating disorders were overestimated by up to 35 times.

Diagnostic interviews have been regarded as a superior form of evaluation (Hill, Harrington, Fudge, & Rutter, 1989; Modestin, Erni, & Oberson, 1998). Interviews allow for a more dimensional and accurate assessment

(Vitousek & Stumpf, 2005) and are most helpful when the construct of interest is complex (Hill et al., 1989). Unlike self-report inventories, information can be obtained by directly observing behaviors, reactions, and overall face-to-face interaction (Groth-Marnat, 2003). Still, there are some downfalls to interviews. They can be time-consuming, which may become a problem when an individual needs to be assessed on multiple occasions (Loeb, Pike, Walsh, & Wilson, 1994). Furthermore, for the assessment to be accurate, the evaluation must be conducted by one or more trained interviewers, which raises the cost and limits the type of person who is able to conduct the interview. Finally, the reliability and validity of this method may pose a problem, depending on the extent of the structured nature of the interview (Groth-Marnat, 2003).

Assessment Issues With Populations

Race, Ethnicity, and Culture

Many personality assessment instruments used today were developed and standardized largely on White Americans (e.g., MMPI-2, Temperament and Character Inventory [TCI], Beck Depression Inventory [BDI]; Dana, Aponte, & Wohl, 2000). When assessing individuals from different ethnic or cultural backgrounds, the appropriateness of the instruments is an important consideration. Many tests have been translated to multiple languages for individuals who are unfamiliar with the language of the original test. For example, the MMPI-2 has been translated to more than 150 languages (Butcher, 2004). Although translated versions of tests are readily available, the quality and equivalence of the translation must be considered (Cheung, 2004). Studies on the validity of translated measures have reported mixed results that vary with the combination of measure and cultural group. For instance, the use of translated

versions of the MMPI-2 in various Asian countries has generated different results (see Butcher, Cheung, & Kim, 2003), and differences were found between American Indian and U.S. MMPI-2 norms (Pace et al., 2006), as well as between New Zealand students and SCL-90-R norms (Barker-Collo, 2003). Even beyond the language barrier, general discrepancies in outlook, attitude, and lifestyle can invalidate the extension of measures across cultural groups. Thus, this issue can manifest even in populations with a common language, as is the case with the “melting pot” of the United States. Dana (1996) suggests that “culturally competent assessment includes culture-specific styles of service delivery, use of the client’s first language, and an evaluation of the client as a cultural being prior to test administration using cultural orientation categories” (p. 472). This third factor determines whether certain instruments are appropriate for their assessment (Dana, 1996).

Gender

Gender differences in various personality traits and tendencies have been found in a number of previous research studies (e.g., Byrnes, Miller, & Schafer, 1999; Goodwin & Gotlib, 2004; Maier, Lichtermann, Minges, & Heun, 1992). Research on the population with weight-related concerns has predominantly focused on women. Most studies on eating disorders have been conducted with only female subjects (e.g., Blouin et al., 1996; Jiménez-Murcia et al., 2007; Spindler & Milos, 2007). The few studies that have incorporated both sexes have found differences in scores on several traits (e.g., perfectionism, novelty seeking, harm avoidance) for males and females with eating disorders (Fassino et al., 2001; Joiner, Katz, & Heatherton, 2000). However, Fernández-Aranda et al. (2004) found difference only in the Harm Avoidance scale of the TCI. Obese samples have been more diverse, but women still outnumber men (e.g., Ro, Martinsen, Hoffart, Sexton, & Rosenvinge, 2005;

Ryden et al., 2003; Sullivan, Cloninger, Przybeck, & Klein, 2007). In comparing obese men and women, Ryden et al. (2003) found that obese and nonobese women scored higher than men in anxiety, although effect size was small.

Norms

Among cultural and gender differences, many other factors such as socioeconomic status and life situations can affect assessment (Bathurst, Gottfried, & Gottfried, 1997; Rychlak & Boland, 1973). One of the ways to address assessment issues with populations is to develop pertinent norms for comparison. A substantial number of studies have been dedicated to developing applicable norms for different populations (e.g., Bathurst et al., 1997; Hessel, Schumacher, Geyer, & Brähler, 2001; Lucio, Ampudia, Duran, Leon, & Butcher, 2001; Miettunen et al., 2004). Gender differences are addressed in some assessment inventories that have separate normative data for men and women (i.e., MMPI-2, TCI). To clarify relationships between variables, one must find an appropriate comparison group (Vitousek & Stumpf, 2005).

Assessment Instruments

Table 1.1 and Table 1.2 present a list of relevant personality and psychopathology assessment instruments. These measures were selected based on the amount of research on obesity and eating disorders that has used them. A simultaneous search, using the search terms “obes* or binge eat* or anorexi* or bulimi* or eating disorder,” along with the name of the instrument, on the PsychINFO, MEDLINE, and PsychARTICLES databases in August 2007 returned the reported number of studies. There are limitations to this data-driven method for instrument inclusion, however, by distilling the most widely used instruments using an objective criterion (i.e., frequency of citations), readers will be able to select the measure most appropriate for their use. For descriptive purposes, we decided to group the instruments into measures of either personality or psychopathology, although there is significant overlap in the categories, and some measures have subscales for both. Due to space limitations, we are not able to provide extensive reviews for all of the measures listed in these tables.

Table 1.1 Overview of Personality Assessment Instruments

<i>Personality Assessment Instruments</i>	<i>Authors</i>	<i>Brief Description</i>	<i># Citations: Obesity and Binge Eating</i>	<i># Citations: Eating Disorders</i>
Minnesota Multiphasic Personality Inventory (MMPI-2) ^{a,b}	Hathaway and McKinley (1942); Butcher, Dahlstrom, Graham, Tellegen, and Kaemmer (1989)	567 true/false questions examine personality to detect a wide variety of psychiatric problems.	150 ^c /15	196 ^c /18
Rorschach ^a	Rorschach (1921/1942)	Assesses personality and emotional functioning based on subject's response to 10 inkblots.	74	131

(Continued)

Table 1.1 (Continued)

<i>Personality Assessment Instruments</i>	<i>Authors</i>	<i>Brief Description</i>	<i># Citations: Obesity and Binge Eating</i>	<i># Citations: Eating Disorders</i>
Temperament and Character Inventory (TCI) ^a	Cloninger, Svrakic, and Przybeck (1993)	226 true/false questions identify the overall personality by assessing seven dimensions of temperament and character.	21	98
Tridimensional Personality Questionnaires (TPQ)	Cloninger (1987)	100 true/false questions that analyze three dimensions of personality: novelty seeking, harm avoidance, and reward dependence.	2	16
Karolinska Scale of Personality (KSP)	Schalling, Åsberg, Edman, and Orelund (1987)	135 items rated on a 4-point scale assess stable personality traits.	9	8
Personality Diagnostic Questionnaire–Revised (TPQ-R)	Hyer and Rieder (1987)	152 true/false items measure the <i>DSM-III-R</i> criteria for Axis II personality disorders.	2 ^c /6	6 ^c /10
NEO Personality Inventory Revised (NEO-PI-R)	Costa and McCrae (1992)	240 items measure personality traits and NEO-PI's Big Five personality factors: neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness.	3	7
Personality Assessment Inventory (PAI)	Morey (1991)	344 items with 22 nonoverlapping scales measure personality and psychopathology.	2	3

a. Extensively reviewed here.

b. Short form reviewed here.

c. Number of studies using original or other revised versions of the instrument.

Table 1.2 Overview of Psychopathology Assessment Instruments

<i>Psychopathology Assessment Instruments</i>	<i>Authors</i>	<i>Brief Description</i>	<i># Citations: Obesity and Binge Eating</i>	<i># Citations: Eating Disorders</i>
Beck Depression Inventory Second Edition (BDI-II) ^a	Beck, Ward, Mendelson, Mock, and Erbaugh (1961); Beck, Steer, Ball, and Ranieri (1996)	Total score of 21 items rated on a 3-point scale indicates depression ranging from normal mood to severe depression	250 ^b /9	538 ^b /12
Symptoms Checklist 90–Revised (SCL-90-R) ^a	Derogatis (1994)	90 items rated on a 5-point scale measure 9 symptom subscales and 3 overall indices	32 ^b /38	87 ^b /97
Structured clinical interview for <i>DSM</i> disorders (SCID)	Spitzer, Williams, Gibbon, and First (1990)	Semi-structured interview for diagnosis of all <i>DSM</i> disorders	50	16 ^b
Hamilton Rating Scale for Depression (HAM-D)	Hamilton (1960)	21 items are rated by interviewer during a structured interview to determine severity of depression	32	88
State-Trait Anxiety Inventory (STAI) ^a	Spielberger, Gorsuch, Lushene, Vagg, and Jacobs (1983)	40 items rated on a 4-point scale measures emotional state and underlying trait	46	78
Millon Clinical Multiaxial Inventory (MCMI-III) ^a	Millon (1994)	175 true/false items assess all <i>DSM-IV-R</i> personality disorders and 4 personality styles	14 ^b /1	23 ^b /3
Profile of Mood States (POMS) ^a	McNair, Lorr, and Droppleman (1992)	65 mood-related adjectives rated on a 5-point scale to assess subject's mood state	23	20
Self-Rating Depression Scale (SDS)	Zung (1965)	20 items rated on a 4-point scale measures severity of depressive symptoms	9	27

a. Extensively reviewed here.

b. Number of studies using original or revised versions of the instrument.

Below are eight extensive reviews of measures that have been used in more than 10 studies (either as original or revised versions) for assessment of both obesity and binge eating as well as eating disorders. The studies mentioned in the research applications section are chosen to represent the use of the instrument in the area as a whole, and readers should note that the section is not by any means comprehensive. The prices are estimates and are subject to change. Although we have suggested that interviews (e.g., Structured Clinical Interview for DSM

Disorders) can provide more accurate and individualized information, we have decided to provide detailed reviews only of self-report inventories as these inventories can be administered to a larger sample size in a cost- and time-efficient manner. In addition, analyzing the stability of interviews is beyond the scope of this chapter. For interested readers, more information on one such structured interview (i.e., the Structured Clinical Interview for DSM Disorders; Spitzer, Williams, Gibbon, & First, 1990) is available online at www.scid4.org.

Personality

The Minnesota Multiphasic Personality Inventory—Second Edition (MMPI-2)

The MMPI-2 (Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989) is the current revised and standardized version of the original MMPI (Hathaway & McKinley, 1942). The MMPI is one of the most widely used self-report inventories in psychology (Camara, Nathan, & Puente, 2000) and is frequently used in the assessment of populations with weight concerns. It was originally designed to assess a wide range of the more important dimensions of personality with scores that could be quantified (Hathaway & McKinley, 1942). After almost 50 years of use in its original form, the MMPI Restandardization Project (Butcher et al., 1989) introduced the MMPI-2. The revision included rewriting test items and developing new norms for all of the scales. Extensive research has already established the psychometric stability of the original MMPI. Thus, initial research on the MMPI-2 focused on the comparability of the two versions. A host of research generally agrees that they are equivalent (Ben-Porath & Butcher, 1989; Gaston, Nelson, Hart, Quatman, & Rojdev, 1994; Graham, 1990; Harrell, Honaker, & Parnell, 1992; Rojdev, Nelson, Hart, & Fercho, 1994).

The test consists of 567 items that take approximately 60 to 90 minutes to complete. Each item is a short statement to which the subject answers true, false, or cannot say. Results can be interpreted by comparing the subject's answers, scores, and profiles with those of normal and psychiatric groups. The test contains 9 validity scales, 5 superlative self-presentation subscales, 10 clinical scales, 9 restructured clinical (RC) scales, 15 content scales, 27 content component scales, 20 supplementary scales, 31 clinical subscales, and 5 supplementary scales (see Butcher et al., 2001, for a complete list of scales and subscales). An abbreviated format consists of the first 370 items, which is sufficient to obtain scores for the basic validity scales and the clinical scales. Butcher et al. (2001) provide extensive psychometric statistics for MMPI-2 scales and subscales. However, since most research on obesity, eating disorders, and weight concerns have focused and found significant results on the content and clinical scales (Gleaves & Eberenz, 1995; Klinger, 2000; Pryor & Wiederman, 1996; Youssef et al., 2004), and since the new restructured clinical scale (RC scale; Tellegen et al., 2003) has been shown to have better

internal consistency and convergent and discriminate validity than the basic clinical scale (Sellbom & Ben-Porath, 2005; Simms, Casillas, Clark, Watson, & Doebbeling, 2005; Tellegen et al., 2003; Wallace & Liljequist, 2005), this section reports statistics on those three scales.

Reliability. Butcher et al. (2001) present reliability statistics separately for men and women of the normative sample. For the content scales, internal consistency coefficient alphas ranged from .72 (Fears and Type A) to .86 (Depression) for men and from .73 (Anger) to .86 (Depression) for women. Test-retest reliability over a 9-day interval ranged from .78 (Bizarre Mentation) to .91 (Social Discomfort) for men and from .79 (Type A) to .91 (Work Interference) for women. For the clinical scales, internal consistency ranged from .34 (Paranoia) to .85 (Psychasthenia and Schizophrenia) for men and from .37 (Masculinity/Femininity) to .87 (Psychasthenia) for women. Test-retest reliability over a 1-week interval ranged from .67 (Paranoia) to .93 (Social Introversion) for men and from .54 (Schizophrenia) to .92 (Social Introversion) for women. For the RC scales, internal consistency ranged from .63 (RC6, Ideas of Persecution) to .87 (RCd, Demoralization) for men and from .62 (RC2, Low Positive Emotions) to .89 (Demoralization) for women. Test-retest reliability over a 1-week interval ranged from .76 (RC2, Low Positive Emotions and RC3, Cynicism) to .91 (RC7, Dysfunctional) for men and from .54 (RC6, Ideas of Persecution) to .90 (RCd, Demoralization) for women. In another study, Matz, Altepeter, and Perlman (1992) studied college students with the MMPI-2 and found that internal consistency alpha coefficients ranging from .39 to .91 and a test-retest interval over a mean of 21 days yielded coefficients ranging from .60 to .90.

Validity. Barthlow, Graham, Ben-Porath, and McNulty (1999) tested the incremental validity of the content scales with a sample of 274 men and 425 women outpatient mental health patients. Hierarchical regression analysis found incremental validity for seven scales for men and three scales for women. Palav, Ortega, and McCaffrey (2001) also found the content scales to be useful in identifying symptoms beyond the clinical scales alone. The clinical scales have been criticized for their overlapping items and lack of discriminate validity (Helmes & Reddon, 1993), which led Tellegen and colleagues to develop the RC scales in 2003. Sellbom and Ben-Porath (2005) compared the RC scales with the Multidimensional Personality Questionnaire (MPQ; Tellegen, 1982) and found that the two scales correlated as expected for different constructs. To further increase validity of the measure as a whole, the validity scales of the MMPI-2 evaluate the extent to which the test taker is answering questions in a way that allows the results to be interpreted accurately. The scores on the other scales are analyzed based on the scores of the validity scales.

Norms. The normative sample is a nationwide adult community group consisting of 2,600 individuals (1,462 men and 1,138 women). The demographics of the normative sample represent that of the U.S. national population, increasing its external consistency. Graham (1990) presents detailed normative sample data.

Availability. Pearson Assessments is the exclusive distributor of the MMPI, MMPI-2, and the adolescent version, the MMPI-A. All materials can be purchased via its Web site at www.pearsonassessments.com. The purchaser must submit a Test User Qualification Form (http://ags.pearsonassessments.com/assessments/test_user_form2.asp). User qualification for the MMPI includes having a licensure to practice psychology independently, being a full member of the American Psychological Association or the National Association of School Psychologists, having a

doctoral or master's degree that provided training, or having proof that the individual has been granted permission to administer the test. The manual and 10 test booklets total approximately \$90.00. Scoring services include mail-in service or scoring software, ranging from around \$42.00 to \$89.00. Packages are also available.

Limitations. Although the MMPI-2 is an improvement from the original MMPI, there are still questionable issues regarding the new use of uniform *T* scores versus linear *T* scores, the retention of a large amount of the original test items, and its clinical diagnostic utility (Horvath, 1992). The entirely empirical foundation of the MMPI-2 has also been criticized: Helmes and Reddon (1993) suggest that recent advances in psychological theories should be used in the revision. In terms of evaluating persons with weight and eating disorders, there may be some inconsistencies in the research. Studies using the original MMPI generally found distinctions between patients with anorexia nervosa and bulimia nervosa (Casper, Hedeker, & McClough, 1992; Vitousek & Manke, 1994), yet one study by Scott and Baroffio (1986) assessing anorexia, bulimia, and morbid obesity suggests that there was no clinically significant difference among the overall profiles of the groups, but they did differ from the control group in that the scores were significantly lower in almost all of the clinical scales. Later research with the MMPI-2 (Cumella, Wall, & Kerr-Almeida, 2000; Pryor & Wiederman, 1996) found little or no significant difference between anorexia nervosa and bulimia nervosa. These inconsistent results may be due to studies using different significant *p* values or using inpatient or outpatient groups.

Research Applications. Studies have shown that the MMPI-2 is useful in classifying individual profiles of eating disordered subgroups, even if elevations do not reach the clinical level (Vitousek & Manke, 1994). Restricting subtype anorexics' MMPI-2 scores especially appear to differ from other eating disorders (Cumella et al., 2000; Vitousek & Manke, 1994). Klinger (2000) also found the MMPI-2 useful in predicting weight loss and program completion in obese individuals. The amount of weight loss was correlated with the Hypochondriasis, Hysteria, and Psychopathic Deviant scales (weight loss of 5 body mass index [BMI] in 104 weeks) as well as Depression, Paranoia, and Schizophrenia (weight loss of 8 BMI in 104 weeks). Research on obesity and eating disorders with the MMPI-2 is limited, however, as many studies (e.g., Ragazzoni & Riva, 1996; Valtolina, 1996; Wadden, Foster, Letizia, & Wilk, 1993) have used the original MMPI. More research using the MMPI-2 in patients with eating and weight disorders will be helpful in determining its utility.

MMPI-2 Short Form

Despite its popularity and positive psychometric evaluations, the utility of the MMPI-2 may be compromised by its length. Clinicians may lack the time to administer 567 items that take 60 to 90 minutes, and the test taker may lack the time and/or ability. Therefore, Dahlstrom and Archer (2000) developed a short form of the MMPI-2 by using test records from the restandardization sample of 2,600 men and women as well as a sample of 632 records from persons beginning treatment at a psychiatric service. They found correlations on the basic scales (i.e., the main validity scales L [Lie], F [Infrequency], and K [Correction] and all of the clinical scales) between the scores on the first 180 items and the scores of the entire test to be high, ranging from .78 to .98 for the restandardization sample and .82 to .99 for the psychiatric sample.

A search for the MMPI-2 short form in the literature revealed only six citations, none of which included samples in the population with eating and weight-related concerns. This may be due to the fact that it is relatively new and that psychometric evaluations have found problems with its reliability and validity (Gass & Gonzalez, 2003). Two published evaluations on two different populations (Gass & Luis, 2001; Gass & Gonzalez, 2003) found that although correlations were high between the short form and the abbreviated or original form, when analyzed further, many of the scales of the MMPI-2 short form were unreliable, with scores varying in accuracy with each scale. An area of positive evaluation was in the validity scales, where acceptable reliability and validity have been reported for the L, F, and K items, with a correct classification rate of 77% (Cassisi & Workman, 1992) compared with the full Validity scale of the MMPI-2. Administration of the full MMPI-2 is highly recommended, but the MMPI-2 short form may be of some use in special circumstances.

Rorschach

The Rorschach (1924) is a projective method that was developed to examine personality and psychological functioning. Since the introduction of this measure, there has been much criticism and controversy surrounding its validity, reliability, and standardization for administration, scoring, and interpretation (e.g., Garb, Wood, Lilienfeld, & Nezworski, 2005; Pick, 1956; Weiner, 2001). However, this method has been used frequently in the area of weight concerns and eating disorders (e.g., Bornstein & Greenberg, 1991; Elfhag, Carlsson, & Rossner, 2003; Elfhag, Rossner, & Carlsson, 2004; Salorio et al., 2003). In fact, it was the second most cited measure in our search (see Table 1.1). Therefore, given its popularity, it is important to review the psychometric properties of this measure and its application in this area of research.

The premise of the Rorschach is based on the idea that when presented with an ambiguous stimulus and asked to interpret it, a person will mostly likely project his or her own personality and feelings onto the stimulus or situation (Rorschach, 1924). The Rorschach contains 10 standard inkblots to which the person responds. These inkblots are made by randomly smearing or dripping ink on a paper and folding it in half to make it symmetrical and do not inherently represent anything. Hence, whatever the subject sees within these inkblots is thought to be a projection of his or her own feelings. To address the criticism of the lack of a standard protocol for administering and scoring the test (Pick, 1956), Exner (1991, 1993) created the Comprehensive System (CS) to standardize the assessment and coding procedures. With this new system comes a new line of studies on its psychometric stability (e.g., Acklin, McDowell, Verschell, & Chan, 2000; McGrath et al., 2005; Meyer et al., 2002; Meyer, Mihura, & Smith, 2005; Sultan, Andronikof, Reveillere, & Lemmel, 2006).

Reliability. The "percentage of agreement" approach that Exner (1993) used has been criticized for its validity in determining interrater reliability (Wood, Nezworski, & Stejskal, 1996a). The debate on whether this is a valid method continues. A more recent study of interclinician reliability was performed by Meyer et al. (2005). Three to eight clinicians scored 55 patient protocols over four data sets. The mean interrater aggregated judgment reliability between three clinicians using a rating scale was .88. The mean reliability of individual interpretive judgment was .79. Exner and Weiner (1995) found test-retest correlations above .75 for most of the variables. A meta-analysis by Gronnerod (2003) found a generally high level of temporal stability using the CS.

Validity. Evaluating the validity of the Rorschach and the CS is a difficult task. Few studies clearly report Rorschach CS validity. Garb et al. (2005) reviewed these studies and, based on their criteria that "(1) studies on a score should be methodologically sound, (2) significant results should be replicated by independent investigators, and (3) results should be consistent across studies" (p. 106) concluded that only a handful of indices and variables have been validated by research. It should be noted that these criteria have been criticized for being too stringent (Perry, 2003). Nonetheless, more research is necessary for validation.

Norms. The normative sample has been revised several times due to representative problems, invalidity, and duplications (Exner & Erdberg, 2005). The current published normative sample consists of 600 adult nonpatients, 300 men and 300 women. A new revision has begun due to the need for a more current normative sample as well as discrepancies found between the data in this current version and that of a study with graduate students by Shaffer, Erdberg, and Haroian (1999). This project is still in progress, and current findings can be found in Exner and Erdberg (2005). However, the sample is not yet large enough to be representative.

Availability. The Rorschach inkblots can be purchased from Pearson Assessments at www.pearsonassessments.com. Instructions on administering and scoring are available in Exner and Erdberg (2005). The purchaser must submit a Test User Qualification Form (http://ags.pearsonassessments.com/assessments/test_user_form2.asp). User qualification for the Rorschach includes having a licensure to practice psychology independently, being a full member of the American Psychological Association or the National Association of School Psychologists, having a doctoral or master's degree that provided training, or having proof that the individual has been granted permission to administer the test. Rorschach plates are \$110.00, and 100 summary forms are \$55.00. A workbook to aid in interpretation using the Comprehensive System by John Exner is \$58.00.

Limitations. This measure should be used with caution due to the uncertainty that still surrounds it. Wood, Nezworski, and Stejskal (1996a) critically examined the CS and questioned its theory, and psychometric stability. This led to a heated discussion involving a number of researchers. The debate is beyond the scope of this section, but interested readers should refer to the following articles in order: Wood et al. (1996a); Exner (1996); Wood, Nezworski, and Stejskal (1996b); Meyer (1997a); Wood, Nezworski, and Stejskal (1997); and Meyer (1997b). Furthermore, the CS does not address the fundamental issues with the theory of the test. Questions about the usefulness of projective methods (Lilienfeld, Wood, & Garb, 2000), whether the Rorschach is indeed a perceptual task as the creator's original theory indicates (Leichtman, 1996), and the correct usage of the technique (Wood, Nezworski, & Garb, 2003) still remain.

Research Applications. Despite criticism, the Rorschach and Exner's CS have been used extensively in research on obesity and eating disorders with significant results. For example, Bornstein and Greenberg (1991) found that eating-disordered females display more dependency issues than do obese and normal-weight psychiatric patients. Another study with the Rorschach CS have found that obesity and binge eating were associated with believing that body size has a psychological function (e.g., being part of an identity) and irregular or chaotic eating (Elfhag, Carlsson, & Rossner, 2003). Smith, Hillard, Walsh, and Kubacki (1991) found heightened

thought disturbances (SZCI index) in bulimics as well as more ambivalent (i.e., inconsistent) coping styles (EB scale) in bulimics when compared to controls. Elfhag, Barkeling, Carlsson, and Rossner (2003) used the Rorschach CS to assess the microstructure of eating (i.e., specific eating behaviors) and found that the initial eating rate was higher with more signs of stress overload and more response to external stimuli.

The Temperament and Character Inventory (TCI)

The TCI (Cloninger, Przybeck, Svrakic, & Wetzel, 1994) assesses temperament and character with seven independent dimensions. This measure was developed by adding to the previously established Tridimensional Personality Questionnaire (TPQ; Cloninger, 1987). The TPQ measured temperament and consisted of the Novelty Seeking (NS), Harm Avoidance (HA), and Reward Dependence (RD) dimensions, which were all included in the TCI for the temperament inventory. The Persistence (P) dimension was later identified as a fourth dimension of temperament and was also added to the TCI. Cloninger, Svrakic, and Przybeck (1993) then developed the three dimensions for assessing character, which is based on the idea of self-concept as an individual, as part of humanity, and as part of the universe. These are the Self-Directedness (SD), Cooperativeness (C), and Self-Transcendence (ST) dimensions, respectively. Combining all seven dimensions, the TCI assesses personality with a self-report inventory that consists of 240 true or false items.

Reliability. Cloninger et al. (1994) reported TCI internal consistency coefficients for a community sample ranging from .65 (Persistence) to .89 (Cooperativeness). Coefficients are also available for inpatients, college students, and outpatients, with Persistence repeatedly having the lowest internal consistency. All other dimensions yielded coefficients above .70. Test-retest correlations over a 6-month interval ranged from .54 (Novelty Seeking) to .75 (Self-Transcendence) for psychiatric inpatients and from .71 (Reward Dependence) to .83 (Self-Transcendence) for psychiatric outpatients.

Validity. The TCI has five validity scales and one honesty question that were designed to detect any invalid answers. These scales take into account the number of rare answers, consecutive answers, persistent true answers, and consistent answers to determine their validity. Bayon, Hill, Svrakic, Przybeck, and Cloninger (1996) administered the TCI and the Millon Clinical Multiaxial Inventory (MCMI-II) to 109 psychiatric outpatients and found a strong convergent validity, with the TCI accounting for much of the variance of the MCMI-II. Puttonen, Ravaja, and Keltikangas-Jarvinen (2005) found support for the predictive validity of the TCI with 91 subjects, especially for the Novelty Seeking and Harm Avoidance scales.

Norms. Normative data for the TCI are available for several populations. The community sample consisted of 150 men and 150 women. Mean scores for the seven scales are as follows: Novelty Seeking, $M = 9.7$, $SD = 3.7$; Harm Avoidance, $M = 7.6$, $SD = 4.5$; Reward Dependence, $M = 9.5$, $SD = 3.1$; Persistence, $M = 3.4$, $SD = 1.5$; Self-Directedness, $M = 17.6$, $SD = 5.1$; Cooperativeness, $M = 19.6$, $SD = 4.6$; and Self-Transcendence, $M = 8.3$, $SD = 3.9$ (Cloninger et al., 1994). Data for Norwegian physicians, inpatients, and college students are also available (see Cloninger et al., 1994).

Availability. The TCI can be purchased online at <https://psychobiology.wustl.edu> from the Washington University in St. Louis. There is no qualification requirement to purchase the TCI. The manual and test booklet is \$85.00, and a computerized scoring system with all materials included is \$400.00.

Limitations. The TCI has similar limitations to other self-report inventories. This measure lacks psychometric evaluation in the English version; therefore, no specific limitations have been mentioned. However, the TCI has been translated into multiple transcultural versions, including Japanese (Tomita et al., 2000), Spanish (Gutiérrez et al., 2001), and Dutch (Duijsens, Spinhoven, Goekoop, Spermon, & Eurelings-Bontekoe, 2000), and their evaluations have deemed the TCI satisfactory.

Research Applications. Lower scores in Self-Directedness have been found in patients with obesity and binge-eating disorder (Fassino et al., 2002; Sullivan et al., 2007), as well as individuals with anorexia or bulimia (Fassino et al., 2001; Klump et al., 2000) when compared with healthy controls. Higher Harm Avoidance has been found in eating-disordered patients (Fassino et al., 2002) and obese individuals (Fassino et al., 2002; Sullivan et al., 2007). Obese patients have been found to score higher in Novelty Seeking than controls and lower on Cooperativeness (Fassino et al., 2002). Comparing subtypes of obesity, obese binge eaters scored even lower in Self-Directedness than obese nonbingers (Sullivan et al., 2007). Within subtypes of eating disorders, patients with bulimia scored lower in persistence than those with anorexia (Grave et al., 2007). Cognitive-behavioral therapy for patients with both types of eating disorders and eating disorder not otherwise specified has been found to normalize some scores by lowering Persistence and Self-Transcendence and raising Self-Directedness (Grave et al., 2007).

Psychopathology

Beck Depression Inventory–II (BDI-II)

The BDI (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) is one of the most prominent instruments for assessing depression. Psychometric analysis revealed shortcomings, which led to an amended version, the BDI-IA (Beck & Steer, 1993), and the most current version, the BDI-II (Beck, Steer, & Brown, 1996). The BDI-II is a self-report inventory consisting of 21 items that is rated on a 4-point scale. The items have a heading that is the target of assessment (e.g., sadness, crying) followed by four statements (0–4) varying in intensity of the target assessment that subjects must select based on their feeling during the past week, including the day of the test. The final score is the sum of the score of each item. A total score of 0 to 13 is considered minimal or normal, 14 to 19 is mild, 20 to 28 is moderate, and 29 to 63 is severe (Beck, Steer, & Brown, 1996).

Reliability. Beck, Steer, Ball, and Ranieri (1996) found a high internal consistency coefficient alpha of .92 with a sample of 140 psychiatric outpatients. Arnau, Meagher, Norris, and Bramson (2001) studied 340 primary care patients and found a coefficient alpha of .94. In a sample of college students in 1996, the coefficient alpha was .93 (Beck, Steer, & Brown, 1996).

and .90 for a sample in 2004 (Storch, Roberti, & Roth, 2004). Test-retest reliability over a 1-week interval for 26 outpatients was .93 (Beck, Steer, Ball, et al., 1996).

Validity. The BDI-II was found to be more positively correlated with the Hamilton Psychiatric Scale for Depression (Riskind, Beck, Brown, & Steer, 1987), with $r = .71$, than with the Hamilton Rating Scale for Anxiety (Riskind et al., 1987), with $r = .47$ (Beck, Steer, & Brown, 1996). Krefetz, Steer, Gulab, and Beck (2002) reported that the scores for adolescents diagnosed with major depressive disorder (MDD; $M = 30.09$, $SD = 12.80$) is significantly higher than those for adolescents without the diagnosis for MDD ($M = 17.56$, $SD = 11.27$).

Norms. Beck, Steer, and Brown (1996) reports a normative sample consisting of 500 outpatients, 317 women and 183 men. The average age of the sample ranged from 13 to 86 with a mean of 37.20. Whites represented the majority of this sample (91%). There is also a normative sample of 120 undergraduate college students.

Availability. The BDI-II is published by Harcourt Assessments, Inc. Materials can be purchased via its Web site at www.harcourtassessment.com. Qualification requirements include a licensure or certification to practice in the respective state in a related field or a doctorate degree with appropriate training. The BDI-II complete kit, including the manual and 25 record forms, is \$99.00.

Limitations. The BDI-II and its predecessors have been subjected to much psychometric scrutiny and have consistently indicated above-satisfactory reliability and validity. However, it is important to note that the authors of the measure did not intend for it to serve as a diagnostic tool. It is meant to detect the presence and severity of depressive symptoms. The cutoff scores provided are designed to serve as general guidelines, and Beck, Steer, and Brown (1996) suggest that the scores be analyzed within the context of the individual case. Furthermore, the BDI has been criticized for its lack of representative norms (Richter, Werner, Heerlein, Kraus, & Sauer, 1998).

Research Applications. A long line of research has associated depressive symptoms with obesity (e.g., Bornstein, Schuppenies, Wong, & Licinio, 2006; Cahill & Mussap, 2007; Moore, 2004) as well as eating disorders (Bravata, Storch, & Storch, 2003; Gee & Troop, 2003; Rejeski et al., 2006). Therefore, the BDI-II is a useful tool in assessing persons with problematic eating behaviors. It is often used in conjunction with other measures to subtype eating disorders (Eipe, 2005; Fontenelle, Mendlowicz, Moreira, & Appolinario, 2005), assess changes in mood and thought after treatment or stimuli (Blouin et al., 1996), or correlate eating behavior and emotions (Bravata et al., 2003).

Symptoms Checklist 90 Revised (SCL-90-R)

The SCL-90-R (Derogatis, 1994) was originally derived from the Hopkins Symptom Checklist (HSCL; Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974) and was revised from its first prototype, the SCL-90. The SCL-90-R is a 90-item self-report questionnaire. The items are 90 descriptions of symptoms that are rated on their severity using a 5-point scale from 0 = *not at all* to 4 = *extremely*. The test takes about 10 to 15 minutes to complete. It is scored on nine

different dimensions of symptoms: somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. There are also three global indices: global severity index (assesses the extent of present psychiatric distress), positive symptom index (number of symptoms present), and positive symptom distress index (assesses the intensity of the symptoms).

Reliability. Derogatis (1994) reports internal consistency for psychiatric outpatients ranging from .79 (Paranoid Ideation) to .90 (Depression). Derogatis, Savitz, and Maruish (1999) report internal consistency for symptomatic volunteers ranging from .77 (Psychoticism) to .90 (Depression). A more recent study comparing paper-and-pencil versus computerized administration of mental health questionnaires in a nonpatient sample of 245 found paper-and-pencil internal consistency ranging from .40 (Hostility) to .95 (Psychoneuroticism). Test-retest over a 1-week interval yielded coefficients from .78 (Hostility) to .90 (Phobic Anxiety; Wijndaele et al., 2007).

Validity. Convergent validity of the SCL-90-R has been validated by multiple studies comparing its dimensions with other psychological measures. It has been correlated with appropriate MMPI-2 scales (Green, Handel, & Archer, 2006), and its Depression dimension has been correlated with depression inventories such as the Inventory for Depressive Symptomatology–Self-Rated (IDS-SR; $r = .84$; Corruble, Legrand, Duret, Charles, & Guelfi, 1999; Rush, Gullion, Basco, & Jarrett, 1996) and the Beck Depression Inventory ($r = .80$; Peveler & Fairburn, 1990). It has also been found to perform well in predicting comorbid psychiatric disorders with alcoholism (Benjamin, Mossman, Graves, & Sanders, 2006).

Norms. The SCL-90-R provides four normative groups for comparison. Table 1.3 presents demographic data for the normative groups. Detailed normative data can be found in Derogatis (1994).

Table 1.3 Demographic Data for SCL-90-R Normative Samples

<i>Population</i>	<i>n</i>	<i>Male</i>	<i>Female</i>	<i>Ethnic/Socioeconomic Profile</i>
Norm A: Psychiatric outpatients	1,002	425	577	Approximately 67% White Skewed towards low socioeconomic status (SES)
Norm B: Nonpatients	1,000	494	480	Stratified random sample from a large U.S. eastern state
Norm C: Psychiatric in patients	313	1/3	2/3	55.7% White 43.6% Black. 7% other
Norm D: Nonpatient adolescents	806	40%	60%	Primarily middle-class Whites

SOURCE: Derogatis (1994). Copyright ©1994 by National Computer Systems.

Availability. The SCL-90-R is published by National Computer Systems, Inc. All materials can be purchased at www.pearsonassessments.com. The purchaser must submit a Test User Qualification Form (http://ags.pearsonassessments.com/assessments/test_user_form2.asp). User qualification for the SCL-90-R is level M on its Web site, which includes a specialized degree in the health care field and a licensure or certification, or proof of a granted right to administer tests. The manual and five test booklets are about \$47.00.

Limitations. Groth-Marnat (2003) suggested that the SCL-90-R not be regarded as a measurement of personality but more as a measure of current symptoms. While Derogatis and Cleary (1977) found evidence of “theoretical-empirical” agreement, or construct validity, in almost all of the scales, others have suggested that this measure be used as an overall indicator of distress because of concerns with its divergent validity and factor structure (Cyr, McKenna-Foley, & Peacock, 1985; Rauter, Leonard, & Swett, 1996; Vassend & Skrondal, 1999). Many factor-analytic studies attempting to replicate the original nine-factor model of the SCL-90-R have failed, generally reporting fewer factors (many reported only one large factor) as well as factors that are different from the original nine (e.g., Bonyng, 1993; Rauter et al., 1996; Vassend & Skrondal, 1999). Despite problems with factor structure, Rief and Fichter (1992) found that the average hit rate for distinguishing between patients with dysthymia, anxiety disorders, and anorexia nervosa was 67%. Peveler and Fairburn (1990) found the Global Severity Index (GSI) score sensitivity to be 77% and the specificity to be 91% for detecting the presence of bulimia.

Research Applications. Mills and Andrianopoulos (1993) used the SCL-90-R to evaluate obese patients in outpatient treatment and found that patients with early or childhood-onset obesity showed more psychopathology than those who developed obesity later in life ($r = -.40$). Ro et al. (2005) found decreases in SCL-90-R-measured psychopathology after 2 years of treatment for eating disorders. These studies used the GSI to measure an overall level of psychopathology. The GSI is perhaps the most useful global index of the SCL-90-R. It is a combined measure of the severity or extent of all psychiatric distress symptoms, yielding one number that summarizes the test. If the assertion is true that the test measures only one large factor and is best used to assess general distress, then it appears as though the GSI score will be sufficient. Generally, a GSI T-score above 63 is evidence of a clinically significant level of psychopathology (Groth-Marnat, 2003).

State-Trait Anxiety Inventory

The concept of state versus trait was discussed earlier in this chapter—specifically, that it is important to distinguish between the two to assess personality accurately. Cattell and Scheier (1961) initially proposed the idea of differentiating between a state form and a trait form of anxiety. Thereafter, a host of research followed (e.g., Hodges & Spielberger, 1969; Johnson, 1968; Johnson & Spielberger, 1968). These studies generally administered a test of state anxiety (e.g., a checklist of adjectives that the subject fills out based on his or her feeling “at that moment” or physiological measures such as monitoring heart rate and blood pressure) and a test of trait anxiety (e.g., Taylor Manifest Anxiety Scale [TMAS]; Taylor, 1953) before and after an anxiety-provoking situation and found a clear distinction between state and trait anxiety.

The State-Trait Anxiety Inventory (STAI) began as a test with a single set of items with one set of instructions to complete them according to how they felt at the moment (state) and another set of instructions to complete them based on how they generally felt (trait). This was then revised so that the two measures had their own individual items for more accuracy. A final revision took into account psychometrics and a clearer concept of anxiety. The current version of the STAI (Spielberger, 1983) is a 40-item self-report inventory. Twenty items are designated to assess state anxiety and 20 for trait anxiety. Subjects rate items on a 4-point scale from 1 = *not at all* to 4 = *very much so*.

Reliability. Kabacoff, Segal, Hersen, and Van Hasselt (1997) reported an internal consistency coefficient alpha of .92 for the state scale and .90 for trait. Spielberger (1983) reported trait anxiety test-retest reliability for college students ranged from .73 to .86. Coefficients for state anxiety ranged from .36 (females) to .51 (males). This difference is expected given that state anxiety was designed to assess fluctuating states.

Validity. Tanaka-Matsumi and Kameoka (1986) established convergent validity by finding correlations between the STAI and the Zung Self-Rating Anxiety Scale (Zung, 1971) to be .60 for state and .69 for trait anxiety. Correlations with the TMAS (Taylor, 1953) were .53 for state and .79 for trait anxiety. On the other hand, the study did not have evidence for divergent validity. Correlations between the STAI and depression inventories such as the Beck Depression Inventory and Zung Self-Rating Depression Scale (Zung, 1965) were also high, with correlations ranging from .60 to .61 for state anxiety and .73 to .74 for trait anxiety. However, studies of geriatric patients did find that patients with anxiety disorders scored higher on the STAI than did normal controls (Kabacoff et al., 1997; Stanley, Beck, & Zebb, 1996).

Norms. The STAI has a number of normative samples for comparison, including employees of the Federal Aviation Administration, military recruits, university students, and high school students. Detailed normative data can be found in Spielberger (1983).

Availability. The STAI is published by Mind Garden, Inc. All materials can be purchased on its Web site at www.mindgarden.com. There is no qualification requirement to purchase the materials. The manual and a package of 25 inventory booklets are \$30.00 each.

Limitations. Psychometric analysis has credited the STAI with the ability to distinguish between state and trait anxiety. However, its ability to assess the anxiety construct alone as it was designed has been questioned. As a long line of research has suggested, depression and anxiety are highly correlated and often comorbid conditions, and differentiating the two constructs is difficult (Clark & Watson, 1991; Lovibond & Lovibond, 1995; Watson, 2000). As was mentioned above, the STAI has been correlated with measures of depression. Bieling, Antony, and Swinson (1998) studied the structure of the STAI and found that it measured not only anxiety but depression and other negative affects as well. Although effective in discriminating between state and trait anxiety, this instrument should be used with the awareness that it may be assessing constructs other than pure anxiety.

Research Application. Matos et al. (2002) found that binge-eating disorder (BED) was more frequent in obese individuals with high trait anxiety than moderate trait anxiety. Other studies

using the STAI have found that individuals with eating disorders generally score higher than controls on both the state and trait scales (Mizes, 1988; Pollice, Kaye, Greeno, & Weltzin, 1997; Wagner et al., 2006). Even after treatment, elevated anxiety continued to be found in bulimics (Stein et al., 2002) and anorexics (Wagner et al., 2006). The STAI also helps to associate certain behaviors with either state or trait anxiety. Weltzin, Bulik, McConaha, and Kaye (1995) studied anxiety in bulimics and found that patients who abused laxatives scored higher on the state scale than those who did not, but not on the trait scale.

Profile of Mood States

The Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1992) is a 65-item self-report inventory that was designed to measure transient or fluctuating mood states. It is often used in clinical, medical, and counseling settings to track treatment changes. Items are affective adjectives (e.g., lively) rated on a 5-point scale from 0 = *not at all* to 4 = *extremely*, referring to how participants have been feeling during the past week, including the day of the test. It identifies six different mood dimensions: tension-anxiety, depression-rejection, anger-hostility, vigor-activity, fatigue-inertia, and confusion-bewilderment. Each dimension consists of 7 to 15 adjectives, which are summed to obtain a score for each dimension.

Reliability. McNair et al. (1992) reported good internal consistency of coefficient alphas ranging from .84 or greater (vigor-activity and confusion-bewilderment) to above .90 for all of the other dimensions. Test-retest reliability over a 20-day interval ranged from .65 to .74. In another study, Salinsky, Storzbach, Dodrill, and Binder (2001) administered the POMS to 72 healthy participants. Test-retest correlations over a 12- to 16-week interval ranged from .39 (Fatigue) to .77 (Confusion).

Validity. McNair et al. (1992) have found the POMS to be significantly correlated with depression and anxiety. Malouff, Schutte, and Ramerth (1985) administered the POMS Depression Scale and the Beck Depression Inventory to 131 adult participants and found a correlation of .81. Nyenhuis, Yamamoto, Luchetta, Terrien, and Parmentier (1999) also found a significant correlation of .69 between the two. Correlation between the POMS Tense Scale and the State-Trait Anxiety Inventory State scale was .72, and the Trait scale was .70 (Nyenhuus et al., 1999). Constructs that were not expected to correlate with each other indeed did not (see Nyenhuis et al., 1999).

Norms. The normative sample was 1,000 outpatients. Normative data are available in McNair et al. (1992). Nyenhuis et al. (1999) developed normative data for nonpatients and a geriatric sample. In the adult sample ($n = 400$), mean scores and standard deviations for women are as follows: Tension, $M = 8.2$, $SD = 6.0$; Depression, $M = 8.5$, $SD = 9.4$; Anger, $M = 8.0$, $SD = 7.5$; Vigor, $M = 18.9$, $SD = 6.5$; Fatigue, $M = 8.7$, $SD = 6.1$; and Confusion, $M = 5.8$, $SD = 4.6$. For men, scores are as follows: Tension, $M = 7.1$, $SD = 5.8$; Depression, $M = 7.5$, $SD = 9.2$; Anger, $M = 7.1$, $SD = 7.3$; Vigor, $M = 19.8$, $SD = 6.8$; Fatigue, $M = 7.3$, $SD = 5.7$; and Confusion, $M = 5.6$, $SD = 4.1$.

Availability. The POMS is published by Multi-Health Systems, Inc., and test materials can be purchased on its Web site at www.mhs.com. Purchasers must complete a Purchaser Qualification

Form at the MHS Web site. Qualifications require that the user has completed graduate-level courses in tests and measurement or documented equivalent training. The POMS standard kit, including a technical manual and 25 POMS Standard Quikscore Forms, is \$55.00.

Limitations. Lower test-retest correlations may seem a problem, but since the POMS was designed to assess changing mood states, the test-retest correlation is not expected to be high. The sensitivity of the POMS has been questioned by some researchers. Spielberger (1972) suggested that POMS is helpful in assessing relatively persistent mood states. Other researches indicate that the sensitivity of the POMS may depend on the initial mood state at the baseline of an intervention (Cramer, Nieman, & Lee, 1991; Nieman, Custer, Butterworth, Utter, & Henson, 2000).

Research Application. The POMS is frequently used for keeping track of mood changes during intervention of obesity or eating disorders. Carels, Berger, and Darby (2006) studied postmenopausal, obese, sedentary women and found lower scores in the Tension, Depression, Anger, and Confusion dimensions after graded exercise. Melanson, Dell'Olio, Carpenter, and Angelopoulos (2004) also found changes in POMS scores in obese adults after exercise counseling on the Depression, Vigor, Fatigue, and Confusion dimensions. On the other hand, Nieman et al. (2000) did not find any mood states difference in their study on obese women. The POMS has also been used to measure the effects of certain stimuli on eating moods such as sugar (Reid & Hammersley, 1998) and stress (Malkoff, 1996).

Millon Clinical Multiaxial Inventory—Third Edition

The Millon Clinical Multiaxial Inventory—Third Edition (MCMI-III; Millon, 1994) was developed on a theoretical foundation established by the author (Choca, 2004), unlike many other empirically derived measures reviewed here (e.g., MMPI-2, SCL-90-R). It is a 175-item, true-false self-report inventory with 24 clinical scales clustered into six groups: Validity scale, modifying indices, personality style scales, severe personality scales, clinical syndrome scales, and severe clinical syndrome scales.

Reliability. Test-retest reliability for the MCMI-III, based on the standardization sample, ranged from .82 (Debasement of the modifying indices) to .90 (Somatoform of the clinical syndrome scales). The manual also presents internal consistency coefficient alphas ranging from .66 (Compulsive of the personality style scales) to .90 (Major Depression of the severe clinical syndrome scales). Other studies, however, reported lower internal consistency (R. J. Craig & Olson, 1998; Hyer, Brandsma, Boyd, & Millon, 1997). Hyer et al. (1997) reported a coefficient alpha of .54 for the Posttraumatic Stress scale.

Validity. The Validity scale of the MCMI-III was designed to detect whether test answers were valid enough for proper interpretation. Schoenberg, Dorr, and Morgan (2006) examined whether the MCMI-III could differentiate student dissimulators from psychiatric patients and found an overall hit rate of 76% to 77%. Another test studied whether the MCMI-III could detect random responding and found that 50% of examinees who respond randomly will go undetected (Charter & Lopez, 2002). Since the MCMI-III has been viewed as very similar to the

MMPI-2, many studies have compared the two scales and found generally good convergent validity (Egger, De Mey, Derksen, & van der Staak, 2003; Rossi, Van den Brande, Tobac, Sloore, & Hauben, 2003).

Norms. The developmental sample for the MCMI-III consisted of 600 individuals: 86% were White, 9% African American, 3% Hispanic, and 1% other. The standardized sample was 1,079 psychiatric patients (see Millon, 1994).

Availability. The MCMI-III is published by National Computer Systems, Inc. All materials can be purchased through Pearson Assessments via its Web site at www.pearsonassessments.com. The purchaser must submit a Test User Qualification Form (http://ags.pearsonassessments.com/assessments/test_user_form2.asp). User qualification for the MCMI-III is coded as a level 3 on its Web site, which includes having a licensure to practice psychology independently, being a full member of the American Psychological Association or the National Association of School Psychologists, having a doctoral or master's degree that provided training, or having proof that the individual has been granted permission to administer the test. The manual and 10 test booklets total about \$82.00.

Limitations. The divergent validity of the MCMI-III has been found problematic with the Anxiety scale. Blais et al. (2003) found it to be more highly correlated with measures of depression such as the BDI ($r = .56$) and the Hamilton Rating Scale for Depression (HAM-D; $r = .53$) versus a measure of anxiety, the HAM-A ($r = .42$). Góngora (2006) compared the diagnostic accuracy of the MCMI-III and the Structural Clinical Interview II (SCID-II) for personality disorders in patients with bulimia. The study found that the prevalence rate for personality disorders was similar using both instruments (68% for SCID-II and 67.2% for MCMI-III), but the personality disorders diagnosed were different. Furthermore, the fact that the MCMI was developed on a theoretical basis may raise concerns about its empirical properties. It has frequently been compared and contrasted to the MMPI, a solidly empirical instrument. For more information, see Choca (2004), who discusses the advantages and disadvantages of each instrument.

Research Application. The MCMI-III is a relatively new version and has not been used extensively in assessing obesity and eating disorders. S. E. Craig (1997) differentiated eating disorder and personality types with the MCMI-III and reported that anorexics with the restricting subtype and anorexic bulimics tend to display Passive Aggressive, Depressive, Paranoid, Schizoid, and Self-Defeating personality patterns, while bulimics tend to display Histrionic and Narcissistic personality patterns. The MCMI-III has also been used to evaluate the role of relationship attachment to obesity (Marsh, 2006).

Closing Comments and Suggestions

Significant progress has been made over the past century that is allowing us a much better understanding of the population with weight and eating concerns. Research has established some general personality profiles and psychopathology that manifest repeatedly in this group (e.g., perfectionism, obsessiveness). These findings allude to areas where clinicians can begin to focus on when treating these individuals. However, research in this area still has a long way to

go and many difficulties to overcome. The assessment instruments mentioned have been invaluable in our advancement so far, but improvements in validity are necessary to further clarify and pinpoint problem areas. Furthermore, researchers should take into account more often the heterogeneity of persons with eating and weight disorders. Eating concerns aside, this group is as diverse as any other population. The appropriate comparison groups will yield priceless information. Past research has been mostly correlational, giving an idea of associations between certain personalities and eating disorders. Now that those certain traits have been established to be prevalent in this population, future research should aim to uncover the direction of causality or at least begin to disentangle the complex relationship between personality, psychopathology, and eating/weight disorders.

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