Evolution of the MMPI Instruments

The Minnesota Multiphasic Personality Inventory (MMPI) was developed by Hathaway and McKinley (1943) to facilitate psychodiagnosis. Although the MMPI has often been described as being constructed in an atheoretical vacuum, this was actually not the case. The then contemporary descriptive nosological system and a combination of psychodynamic and behavioral theory all played a role in generating the test's items and scale construction (Ben-Porath, 2006). In developing the instrument, Hathaway and McKinley gathered almost 1,000 potential items by examining the literature concerning the major psychiatric diagnoses of the time complemented by their own extensive clinical experience. They administered the candidate items to various groups of psychiatric patients, as well as a normative group consisting of approximately 750 individuals, primarily skilled laborers and farmers, many of whom were visitors to the University of Minnesota Hospital. The authors then developed scales using an empirical keying method, which assigned items to a particular diagnostic scale if they discriminated sufficiently between members of a specific diagnostic group (e.g., depression) and the normal group. This procedure yielded the eight original MMPI Clinical Scales.

Despite the (at the time) cutting edge scale development methodology, initial evidence suggested MMPI Clinical Scales were insufficiently effective in predicting membership in specific diagnostic categories (Hathaway, 1960). However, the MMPI underwent a transformation from an instrument designed to predict diagnostic taxonomies to one that relies on empirically derived correlates in assessing symptomatology and personality patterns. The call for establishing empirical correlates for the MMPI was made by Meehl (1945, 1954), who suggested that the test would be optimally used if such correlates were established. These recommendations were subsequently followed by Meehl's (1956) call for a “good cookbook,” which could be used to inform clinicians about the empirical correlates of the MMPI scales. This transformation allowed for the MMPI to become the most frequently used self-report inventory measuring personality and psychopathology (Lubin, Larsen, & Matarazzo, 1984; Piotrowski & Keller, 1989) as well as the most researched (Reynolds & Sundberg, 1976).

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1Although there are ten basic clinical scales, Scale 5 (Masculinity/Femininity) and 0 (Social Introversion) were added at later stages, and are not considered part of the eight original scales.
By the 1970s, it was becoming increasingly apparent that some changes were in order for the MMPI. In 1982, the University of Minnesota Press, the test's publisher, formed a restandardization committee to coordinate the revision of the MMPI and collection of a new normative sample that would be more appropriate for the varying settings in which the instrument was used. This committee had two major goals: to improve the test while maintaining continuity with the original version to the extent possible and to ensure that the large amount of research generated on the original MMPI could still be applied with the revision. The result of the restandardization project was the Minnesota Multiphasic Personality Inventory-2 (MMPI-2; Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989). The MMPI-2 not only retained the original Clinical and Validity scales but also included a new normative sample (described later), additional validity scales assessing response inconsistency, and a set of content scales assessing the major domains of the MMPI item pool. Today, the MMPI-2 is widely used in a variety of settings (Archer et al., 2006; Camara, Nathan, & Puente, 2000) and remains the most frequently investigated psychological test (Butcher & Rouse, 1996).

During the same time period the MMPI was being revised to the MMPI-2, the University of Minnesota Press also commissioned the development of a revised version of the MMPI specific for use with adolescents. Revision efforts in this area were motivated by needs to address numerous concerns regarding the appropriateness and applicability of scores and interpretations derived from an instrument developed and normed in an adult population in describing adolescents (Archer, 1987; Williams, 1986). The result of this process was the creation of the Minnesota Multiphasic Personality Inventory-Adolescent Version (MMPI-A; Butcher et al., 1992). Butcher et al. (1992) highlighted that development of the MMPI-A was focused not only on retaining those aspects of the MMPI that were the most useful (e.g., the basic Clinical scales) but also on adding key innovations introduced in the revised adult version of the instrument (e.g., use of Uniform T-scores, the Content scales, and measures of response inconsistency). They also addressed other concerns by reducing the number of items scored on the test from 560 to 478, altering or deleting items that contained inappropriate, outdated, or confusing language, and adding items and developing scales covering specific aspects of adolescent development and psychopathology. The MMPI-A is the most widely used, objective self-report measure of adolescent personality and psychopathology (Archer & Newson, 2000), as well as one of the most widely researched measures of adolescent psychopathology (Baum, Archer, Forbey, & Handel, 2009).

Finally, the most recent version of the MMPI instruments is the Restructured Form of the MMPI-2 (MMPI-2-RF; Ben-Porath & Tellegen, 2008; Tellegen & Ben-Porath, 2008). Initial development constituted the restructuring of the eight original clinical scales (Tellegen et al., 2003). Recognizing the substantial strengths of the clinical scales, which included extensive empirical validation and decades of clinical experience among practitioners, it had been known for a long time that the scales themselves were not psychometrically optimal as measures of diagnostic constructs (Tellegen et al., 2003; Tellegen & Ben-Porath, 2008). The primary step in developing these scales was to identify and extract a common general emotional distress dimension (labeled demoralization) that saturates the clinical scales, elucidate distinct target constructs from each scale, and thereby improve their convergent and discriminant validity. This resulted in a set of nine Restructured Clinical scales (RC scales; Tellegen et al., 2003), including a measure of demoralization and eight other scales assessing key components of the basic Clinical scales (except Scale 5 and 0), scored on both the MMPI-2 and the MMPI-2-RF.

After the RC scales had been introduced to the MMPI-2, work continued on several other psychometrically efficient scales for a new version of the inventory—the MMPI-2-RF (Ben-Porath & Tellegen, 2008; Tellegen & Ben-Porath, 2008). This version of the MMPI was designed to take advantage of the clinically useful variance of the MMPI-2 item pool in an efficient and psychometrically up-to-date manner. Scales developed
for the MMPI-2-RF were intended to assess (a) constructs not directly measured by the RC scales, (b) facets of the broader RC scales, or (c) distinctive core components from the original clinical scales not covered by the RC scales. A set of higher-order scales was also developed to provide a hierarchically organized interpretative framework for the test (Tellegen & Ben-Porath, 2008). Lastly, the MMPI-2-RF contained revised versions of standard MMPI-2 Validity scales, as well one new validity scale assessing somatic over-reporting. This latest edition of the MMPI instruments has displayed promising construct validity and maps onto contemporary models of personality and psychopathology (Graham, 2011).

Administration of the MMPI-2, MMPI-2-RF, and MMPI-A

The MMPI-2 and MMPI-2-RF should only be administered to those who are 18 years of age or older (Ben-Porath & Tellegen, 2008; Butcher et al., 2001). Younger individuals should be administered the adolescent version of the test, the MMPI-A (Butcher et al., 1992). All versions of the MMPI family of instruments are available from Pearson Assessments (pearsonassessments.com). The MMPI-2/MMPI-A/MMPI-2-RF should be administered in a quiet and comfortable place for the test-taker. It takes about one to one and a half hours to administer the tests in standard booklet and answer sheet form for individuals of normal intellectual functioning (Graham, 2011). Complicating factors such as disabling psychopathology, low reading level, or lower intellectual functioning may result in a longer time, such as 2 hours or more. Administration by computer using standard software available through Pearson Assessments reduces the amount of time needed to complete the inventory.

There are certain test conditions that may preclude an individual from taking one of the MMPI-based instruments. The manual authors (Ben-Porath & Tellegen, 2008; Butcher et al., 1992, 2001) recommend that individuals who have less than a sixth grade reading level not be administered the MMPI-2, MMPI-2-RF, or MMPI-A in the standard format. However, some persons with limited reading ability can complete the test if it is presented using a standard audio version of the test available on cassette or CD. Other conditions that might preclude administration of one of the MMPI instruments include altered cognitive states or confusion stemming from brain impairment, as well as severe psychopathology.

There are special factors that should be accounted for during administration of the MMPI-A in order to reduce or prevent problems and difficulties that are common with adolescent test-takers (Archer & Krishnamurthy, 2002; Butcher et al., 1992). Most importantly, for adolescent test-takers, who are often being assessed due to a parent’s request rather than the adolescent’s, the test-user should attempt to engage the adolescent as a joint participant in the testing process. This includes establishing rapport prior to testing, as well as soliciting from the adolescent what types of information that he or she would like to learn from taking the test. Second, it should be recognized that many adolescents will struggle to complete the 478 items with adequate effort due to fatigue and distractibility. As such, it will be especially important during administration of the MMPI-A to provide a quiet environment, direct supervision, and frequent breaks. In some cases, it may be appropriate to break administration of the MMPI-A into two or more shorter sessions.

Basic Description of the MMPI-2

The MMPI-2 is a 567-item true/false self-report inventory (Butcher et al., 2001). Its large normative sample consists of 1,138 men and 1,462 women of diverse ethnic backgrounds and from different regions of the United States. The standard scales of the MMPI-2 currently include 9 Validity Scales, 10 Clinical Scales (and 51 subscales), 9 Restructured Clinical (RC) Scales, 15 Content Scales (and 28 Content Component Scales), 15 Supplementary Scales, and 5 Personality Psychopathy Five (PSY-5) Scales. Many other scales have been developed or proposed for the test; however, only the
standard scales just mentioned are recommended for use by the publisher.

The validity scales are an essential component of the MMPI-2. Some were first introduced when the original MMPI was published to address a challenge inherent in self-report inventories: their susceptibility to misleading responding and scoring error. More specifically, these scales were designed to assess various forms of response bias, including nonresponding, inconsistent responding, acquiescent and counter-acquiescent responding, over-reporting, and under-reporting. The clinical scales were developed, as reported earlier, to assess major diagnostic syndromes, but are currently focused on the assessment of various forms of psychopathology symptoms and not diagnostic in nature. To disentangle multiple scale elevations and better focus test interpretations, code types (two or three most elevated scales in the profile) are frequently generated from the clinical scale profile. The test-user can also consult the Harris-Lingoes and Si subscales to determine which aspect constructs assessed by Clinical scales should be emphasized (Ben-Porath, Hostetler, Butcher, & Graham, 1995; Harris & Lingoes, 1995). The restructured clinical (RC) Scales (Tellegen et al., 2003) were developed to remove a common demoralization factor that saturates the original Clinical Scales, elucidate distinct target constructs from each scale, and thereby improve their convergent and discriminant validity (Tellegen et al., 2003). The content scales (Butcher, Graham, Williams, & Ben-Porath, 1990) were developed through a series of rational-conceptual and empirical analyses modeled after Wiggins's (1969) original set of Content Scales for the MMPI. They are designed to facilitate test interpretation by providing a reliable indication of the individual's self-presentation and expanding the content domains represented by the original Clinical Scales. Content component scales (Ben-Porath & Sherwood, 1993) were developed to assist in identifying which aspects of Content scale interpretation are most relevant in describing the test-taker. The supplementary scales are a collection of MMPI-2 measures developed over the test's history. The personality psychopathologyfive (PSY-5; Harkness, McNulty, & Ben-Porath, 1995) scales were designed to measure five-dimensional personality constructs that describe normal to abnormal range personality traits. MMPI-2 scales that measure anxiety symptoms will be discussed in more detail in the following section.

### MMPI-2 Scales Associated with Anxiety Symptoms

Table 10.1, intended to be a quick reference, provides a list and basic description of each of the MMPI-2 scales that indexes some form of anxiety symptomatology. In this table, we also provide basic internal consistency reliability estimates from the test's normative sample. In this section, we focus specifically on the MMPI-2 scales associated with anxiety.

### Clinical Scales

There are two clinical scales that are particularly relevant to the assessment of anxiety symptoms: Scale 7 (Psychasthenia or Pt) and Scale 0 (Social Introversion or Si). The former scale was developed by selecting items that differentiating a group of patients with Psychasthenia symptoms—a psychiatric syndrome characterized by obsessiveness, tension, and anxiety, from a group of nonpatient individuals (McKinley & Hathaway, 1942). Because the Psychasthenia group was small, Hathaway and McKinley (1942) also correlated the candidate scale with all remaining items in the MMPI pool to ensure a longer and more internally consistent scale. Later research supported that Scale 7 did indeed measure symptoms of anxiety, distress, tension, and self-doubt, but also a substantial amount of general maladjustment (e.g., Dahlstrom, Welsh, & Dahlstrom, 1972; Graham, 2011).

Scale 0 (Si) is a 70-item scale that was developed by Drake (1946) to assess social introversion/extroversion. Later research has supported the use of Scale 0 for assessing the individuals' experiences in social situations, especially as it relates to introversion and social maladjustment.
Table 10.1  Scale names, number of items, reliability, and description for MMPI-2 and MMPI-2-RF scales related to anxiety symptoms

<table>
<thead>
<tr>
<th>Scale</th>
<th>Abbreviation</th>
<th>Number of Items</th>
<th>Reliability&lt;sup&gt;1&lt;/sup&gt; (men/women)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMPI-2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scale 7: Psychasthenia</td>
<td>Pt</td>
<td>48</td>
<td>0.85/0.87</td>
<td>General anxiety, obsessive-compulsive thinking, and nonspecific emotional distress</td>
</tr>
<tr>
<td>Scale 0: Social Introversion</td>
<td>Si</td>
<td>69</td>
<td>0.82/0.84</td>
<td>Introversion, shyness, social alienation, social inadequacy, and nonspecific emotional distress</td>
</tr>
<tr>
<td>Shyness/Self-Consciousness</td>
<td>S11</td>
<td>14</td>
<td>0.81/0.84</td>
<td>Social anxiety, feelings of inadequacy, interpersonal sensitivity</td>
</tr>
<tr>
<td>Democraticization</td>
<td>RC8</td>
<td>24</td>
<td>0.87/0.89</td>
<td>Non-specific emotional distress, depressed mood, general anxiety</td>
</tr>
<tr>
<td>Low Positive Emotions</td>
<td>RC9</td>
<td>17</td>
<td>0.82/0.83</td>
<td>Low positive temperament, anhedonia</td>
</tr>
<tr>
<td>Dysfunctional Negative Emotions</td>
<td>RC7</td>
<td>24</td>
<td>0.81/0.83</td>
<td>Negative emotions, including anxiety, worry, guilt, anger, and fears</td>
</tr>
<tr>
<td>Anxiety</td>
<td>ANX</td>
<td>23</td>
<td>0.82/0.83</td>
<td>General anxiety, anxious apprehension, worry, and emotional distress</td>
</tr>
<tr>
<td>Fears</td>
<td>FRS</td>
<td>23</td>
<td>0.72/0.75</td>
<td>General fearfulness, panic, general anxiety, phobic fear</td>
</tr>
<tr>
<td>Generalized fearfulness</td>
<td>FRS&lt;sub&gt;1&lt;/sub&gt;</td>
<td>12</td>
<td>NR</td>
<td>General fearfulness, nervousness, phobic anxiety</td>
</tr>
<tr>
<td>Multiple Fears</td>
<td>FRS&lt;sub&gt;2&lt;/sub&gt;</td>
<td>10</td>
<td>NR</td>
<td>Fear of many specific stimuli (e.g., animals, natural disasters); specific fearfulness</td>
</tr>
<tr>
<td>Obsessiveness</td>
<td>OBS</td>
<td>16</td>
<td>0.74/0.77</td>
<td>Obsessive thinking, rumination, indecisiveness, inefficacy</td>
</tr>
<tr>
<td>Social Discomfort</td>
<td>SOD</td>
<td>24</td>
<td>0.83/0.84</td>
<td>Social introversion, anxiety, avoidance, and withdrawal</td>
</tr>
<tr>
<td>Shyness</td>
<td>SOD&lt;sub&gt;2&lt;/sub&gt;</td>
<td>7</td>
<td>NR</td>
<td>Social anxiety; Shyness and discomfort in social situations</td>
</tr>
<tr>
<td>Keane PTSD scale</td>
<td>PK</td>
<td>46</td>
<td>0.85/0.87</td>
<td>Post-traumatic distress, with an emphasis on dysphoria</td>
</tr>
<tr>
<td>Neuroticism/Neuroticism</td>
<td>NEGE</td>
<td>33</td>
<td>0.84/0.84</td>
<td>Predisposition for experiencing negative emotions, including anxiety, worry, guilt, anger, and fears</td>
</tr>
<tr>
<td>MMPI-2-RF</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dysfunctional Negative Emotions</td>
<td>RC7</td>
<td>24</td>
<td>0.81/0.83</td>
<td>See MMPI-2</td>
</tr>
<tr>
<td>Stress/Worry</td>
<td>STW</td>
<td>7</td>
<td>0.52/0.60</td>
<td>Anxious apprehension, preoccupation with disappointments, and worry about misfortunes and finances</td>
</tr>
<tr>
<td>Anxiety</td>
<td>AXY</td>
<td>5</td>
<td>0.42/0.46</td>
<td>Anxiety, fright, nightmares, sleep difficulties</td>
</tr>
<tr>
<td>Behavior-Restricting Fears</td>
<td>BRF</td>
<td>9</td>
<td>0.44/0.49</td>
<td>Fears that inhibit normal activity, generalized fearfulness</td>
</tr>
<tr>
<td>Multiple Specific Fears</td>
<td>MSF</td>
<td>9</td>
<td>0.69/0.71</td>
<td>Many specific fears, such as animals and acts of nature</td>
</tr>
<tr>
<td>Shyness</td>
<td>SHY</td>
<td>7</td>
<td>0.74/0.77</td>
<td>Social anxiety, including feeling embarrassed and uncomfortable around others</td>
</tr>
<tr>
<td>Negative EMOTIONALITY/NEUROTICISM</td>
<td>NEGE&lt;sub&gt;r&lt;/sub&gt;</td>
<td>20</td>
<td>0.76/0.78</td>
<td>See MMPI-2</td>
</tr>
</tbody>
</table>

<sup>1</sup>Internal consistency reliability (Cronbach's alpha) from MMPI-2 normative sample. NR: not reported in MMPI-2 manual (Butcher et al., 2001)
including anxiety (e.g., Sieber & Meyers, 1992; Ward & Perry, 1998). Scale 0 has three subscales intended to assist in clarifying clinically significant elevations, including S1 (Shyness/Self-Consciousness), S2 (Social Avoidance), and S3 (Alienation—Self and Others; Ben-Porath et al., 1995), with the S1 subscale being most sensitive to social anxiety (cf. Sieber & Meyers, 1992).

**Restructured Clinical Scales**

There are several RC scales germane to assessing anxiety symptoms. One of these scales is RC7 (Dysfunctional Negative Emotions), which focuses on core negative emotionality markers, such as anxiety, fear, guilt, and anger. Although RC7 is the scale that is considered most useful in the general assessment of anxiety symptoms, because they measure broad affective dimensions relevant to unipolar mood and anxiety disorders, RCd (Demoralization) and RC2 (Low Positive Emotions) should also be considered in the assessment of some forms of anxiety symptomatology. These scales were developed by Tellegen et al. (2003) who recognized the methods of scale creation used for the MMPI clinical scales resulted in substantial saturation of those scales with general maladjustment and distress common to most psychiatric disorders. Tellegen et al. (2003) suggested demoralization could be isolated and accounted for if conceptualized through Tellegen’s (1985) framework of positive and negative emotionality, where demoralization corresponds to the pleasantness-unpleasantness vector between these two orthogonal affective dimensions. Tellegen’s model links depression to low positive emotionality and anxiety to high negative emotionality. Therefore, as a first step in RC scale construction, demoralization markers were identified based on factor analyses of Clinical Scales 2 and 7. Demoralization items were then factor analyzed with item from respective clinical scales to derive distinct core components for each of them. A final set of nonoverlapping RC scales were developed from these core components.

**Content Scales**

Butcher et al. (1990) developed four content scales that are relevant to the measurement of anxiety symptomatology: Anxiety (ANX), Fears (FRS), Obsessiveness (OBS), and Social Discomfort (SOD). The FRS and SOD scales have two content component scales (FRS: Generalized Fearfulness and FRS: Multiple Fears; SOD: Introversion and SOD: Shyness) that can assist with further delineation (Ben-Porath & Sherwood, 1993). Among the SOD component scales, Shyness is more sensitive to social anxiety (Ben-Porath & Sherwood, 1993). Each of these scales were rationally derived by identifying target constructs, nominating test items to measure each construct, and having judges rate the degree to which items indeed reflected the intended construct. Statistical approaches were also used to refine the scales’ internal reliability.

**Supplementary Scales**

There are two supplementary scales, originally developed for the MMPI and later revised for the MMPI-2, that were developed to assess anxiety. Welsh’s Anxiety (A) scale (Welsh 1965; Welsh and Dahlstrom 1956) assesses the largest factor emerging from factor analytic studies of the MMPI, which is generalized maladjustment. Despite the scale’s label, it is not a specific measure of anxiety at all, but rather captures the demoralization component described earlier. Indeed, the correlation between Welsh’s A and the RCd scale is greater than 0.90 in most clinical samples (e.g., Rouse, Greene, Butcher, Nicholas, & Williams, 2008). It is not recommended for use in the assessment of anxiety. The second scale is Keane, Malloy, and Fairbank’s (1984) PTSD scale (PK), which was developed in a Veterans Affairs sample by identifying items that differentiated a group of carefully diagnosed psychiatric patients with PTSD from those without. Notably all PTSD patients had some form of combat trauma.
Personality Psychopathology Five Scales

There is one PSY-5 scale that is relevant to the assessment of anxiety: Neuroticism/Negative Emotionality (NEGE). This scale was designed to measure a dispositional tendency to experience a wide range of negative emotions, including anxiety and fear, particularly with a pathological range (Harkness et al., 1995). These authors developed the NEGE scale using a combination of rational-replicated selection, where lay raters were asked to deduce which MMPI-2 items reflected the PSY-5 constructs (including NEGE), and a series of rationale and statistical refinements.

MMPI-2: Applied Recommendations

In the following sections, we provide conceptual and empirically informed guidelines for how to use the MMPI-2, and in particular, the scales just described, in the assessment of anxiety symptoms. Rather than strictly adhering to the categorical perspective outlined in the American Psychiatric Association's current edition of the Diagnostic and Statistical Manual (DSM-IV-TR, 2000), we group anxiety symptoms in accordance with a variety of empirically supported models of anxiety symptoms. In general, these models emphasize a broad general negative emotionality/demoralization factor, in addition to specific anxiety factors (e.g., Brown, 2007; Watson, 2005; Zinbarg & Barlow, 1996). Further, some research has indicated that depression and general anxiety are genetically indistinguishable (Kendler, 1996) and that they are structurally (both genotypically and phenotypically) separate from other anxiety disorders, particularly those with a fear-based component (e.g., Kendler, Prescott, Myers, & Neale, 2003; Krueger & Markon, 2006). Thus, the domains we emphasize here are negative affect/generalized trait anxiety, post-traumatic stress, social anxiety, obsessive-compulsivity, and phobic fear. Although an argument could easily be made for a separate panic or interoceptive anxiety domain, the MMPI-2 instruments are unlikely to capture these types of symptoms specifically.

Negative Affect/Trait Anxiety

Several MMPI-2 scales perform quite well in the assessment of negative affect/trait anxiety. As described earlier, Scale 7 is more likely to be a good overall measure of general maladjustment and negative emotionality, rather than any specific form of anxiety. Numerous studies have reported that Scale 7 is correlated with depressive symptomatology at least as strongly as anxiety—findings that have been reported and replicated in private practice clients (e.g., Sellbom, Graham, & Schenk, 2005), outpatient mental health clients (e.g., Graham, Ben-Porath, & McNulty, 1999), psychiatric inpatients (e.g., Arbisi, Ben-Porath, & McNulty, 2002), and college counseling settings (e.g., Sellbom, Ben-Porath, & Graham, 2006) to mention a few.

The restructured version of Scale 7, RC7, measures dysfunctional negative emotions in a more discriminant way. Several studies have indicated that this scale clearly has a dispositional component, as evidenced by large correlations with temperament domains such as Neuroticism and Negative Emotionality (Sellbom & Ben-Porath, 2005; Sellbom, Ben-Porath, & Bagby, 2008b; Simms, Castillas, Clark, Watson, & Doebbeling, 2005), which makes it similar to the PSY-5 NEGE scale (e.g., Bagby, Sellbom, Costa, & Widiger, 2008; Harkness, McNulty, Ben-Porath, & Graham, 2002). Several studies have also found that RC7 and NEGE are substantially correlated with symptom inventories or therapist symptom ratings (e.g., Arbisi, Sellbom, & Ben-Porath, 2008; Forbey & Ben-Porath, 2008; Harkness et al., 2002; Sellbom, Ben-Porath, & Bagby, 2008a) and trait measures of general anxiety (Egger, De May, Derksen, & van der Staak, 2003; Forbey & Ben-Porath, 2008; Harkness et al., 1995; Sellbom et al., 2008b; Trull, Ueseda, Costa, & McCrae, 1995). Thus, when RC7 and/or NEGE are elevated in an MMPI-2 protocol, the individual is very likely to be prone to experience a wide range of negative emotions including anxiety, anger, guilt, and fear.

The content scales can be particularly useful in honing in on what types of negative emotions are experienced by the individual. With regard to generalized anxiety, the ANX content scale is
likely to be most useful. Research has indicated that this scale is more strongly associated with symptoms and trait measures of generalized anxiety more so than other negative emotions, such as anger or fear, in both college and clinical samples (e.g., Ben-Porath, McCully, & Almagor, 1993; Graham et al., 1999). Moreover, Strassberg (1997) reported very large correlations between ANX and the Trait Anxiety scale from the State-Trait Anxiety Inventory in both US and Australian college samples. Strassberg (1997) and Barthlow, Graham, Ben-Porath, and McNulty (1999) showed that the ANX scale added incremental validity to Scale 7 in predicting self-reported and therapist-rated symptoms of general anxiety.

In sum, Scale 7, and more specifically so, RC7 and NEGE provide good measurement and indication of an individual's propensity toward experiencing a wide range of negative emotions. The ANX scale provides more specific measurement of general trait anxiety, where individuals who score high on this scale are likely to report excessive rumination and worry. They also tend to feel overwhelming stress about current and future events, as if they are “losing” their mind, or that something dreadful is bound to occur.

Post-traumatic Stress

The MMPI and MMPI-2 has a long-standing history of assessing symptoms of PTSD. Initially, such assessment focused on examining average clinical scale profiles (see e.g., Lyons & Wheeler-Cox, 1999; Penk et al., 1988; Wise, 1996, for reviews). Some research has indicated that the 2–8 code types (defined as clinical scales 2 and 8 being the most elevated in the profile) were the most frequent in PTSD patients; however, in most studies this code type occurs in less than 20% patients with PTSD (cf. Penk et al., 1988). Furthermore, most of these studies have indicated highly variable results using clinical scale profiles, rendering little specificity to actually identifying post-traumatic stress with any particular code type or profile (cf. Wise, 1996). For this reason, we focus on the specific scales reviewed earlier and indicated as relevant to the assessment of anxiety.

Several clinical scales have been associated with post-traumatic stress (e.g., 2, 7, 8; Penk et al., 1988; Scheibe, Bagby, Miller, & Dorian, 2001; Wise, 1996). Given what these scales have in common, it is likely that demoralization, like that assessed by the RC7 scale, is what accounts for this strong association. Indeed, Wolf et al. (2008) recently found that RC7 was the strongest predictor of PTSD symptoms among clinical and RC scales. Moreover, confirmatory factor analyses (e.g., Palmieri, Marshall, & Schell 2007; Simms, Watson, & Doebbeling, 2002) have indicated support for a four-factor structure of PTSD symptoms in which dysphoria (nonspecific distress) makes up the largest factor. This finding likely explains the high comorbidity for PTSD with other disorders (particularly major depression) and that it tends to load with major depressive disorder, dysthymic disorder, and generalized anxiety disorder on a distress disorder factor (e.g., Slade & Watson, 2006). Furthermore, RC7 was associated with a very large effect size in the differentiation of distress and fear psychopathology (Sellbom et al., 2008a).

Although demoralization is likely to account of the most variance in PTSD, it is not a specific predictor of such symptoms. Scale 7, RC7, ANX, and NEGE are also likely to be highly sensitive to post-traumatic stress (Miller, Kaloupek, Dillon, & Keane, 2004; Miller et al., 2010; Scheibe et al., 2001; Sellbom et al., 2008a; Wolf et al., 2008). Scale 7 and ANX were associated with the largest effect sizes among the clinical and content scales (RC and PSY-5 scales were not included in this study) in differentiating PTSD and non-PTSD patients in a workplace trauma sample (Scheibe et al., 2001). Moreover, McDevitt-Murphy, Weathers, Fland, Eakin, and Benson (2007) found that Scale 7 and ANX were able to differentiate PTSD from Social Phobia, but not depression. However, no study has found any of these scales to differentiate from depression or generalized anxiety (McDevitt-Murphy et al., 2007; Sellbom et al., 2008a), indicating that they are more generally sensitive to negative affect and trait anxiety, and not specific to post-traumatic stress.

The only scale on the MMPI-2 designed to specifically assess post-traumatic stress is Keane
have been associated (e.g., 2, 7, 8; Penk,by, Miller, & Dorian, what these scales have at demoralization, like scale, is what accounts a. Indeed, Wolf et al. RCd was the strongest am among clinical and irritatory factor analy-, & Schell 2007; eling, 2002) have indi-actor structure of PTSD hobia (nonspecific dis-ss factor. This finding somorbidity for PTSD ically major depre-ss with major depres-sion, and generalized illness disorder factor 06). Furthermore, RCd/ large effect size in the and fear psychopatho-s.

on is likely to account TSD, it is not a specific as. Scale 7, RC7, ANX, y to be highly sensitive liller, Kaloupek, Dillon, 2010; Scheibe et al., Wolf et al., 2008). Scale d with the largest effect and content scales (RC t included in this study) d non-PTSD patients in le (Scheibe et al., 2001). rphy, Weathers, Flood, 77) that Scale 7 differentiate PTSD from epression. However, no ese scales to differentiate lifed anxiety (McDevitt- born et al., 2008a), indi-e generally sensitive to anxiety, and not specific e MMPI-2 designed to traumatic stress is Keane et al.’s (1984) PTSD scale (PK). The results for this scale have been variable and dependent on the popula-sion examined. In their initial study of combat veterans, Keane et al. (1984) found that the scale correctly identified 84% of individuals with PTSD in a cross-validation sample. Subsequent research with veteran samples who have been exposed to trauma samples have cross-validated the positive findings for PK (e.g., Kirz, Drescher, Klein, Gusman, & Schwartz 2001; Munley, Bains, Bloem, & Busby, 1995; Watson, Kucala, & Manifold, 1986). Most recently, Wolf et al. (2008) found that the PK was associated with a larger effect size (d=1.65) than any of the clinical or RC scales in differentiating veterans with PTSD from those diagnosed with other psychiatric disorders. It also added incremental utility in differentiating the groups above and beyond all the other scales, including RCd.

Despite the apparent utility of the PK scale in combat veteran samples, the scale has fared less well when examined in other samples. Kirz et al. (2001) found (using discriminant function anal-ysis) that the PK scale was much less useful in differentiating PTSD patients and non-PTSD trauma patients in individuals with a history of sexual trauma versus combat trauma (65% and 78% overall correct classification, respectively). Scheibe et al. (2001) found that PK differentiated claimants with and without PTSD in a workplace trauma sample, but its associated effect size estimate (d=1.16) was not as large as that of Scale 7 and ANX. Moreover, these authors also conducted logistic regression analyses and found that PK failed to add incremental utility to the clinical and content scales in differentiating PTSD and non-PTSD claimants.

There is increasing evidence that the PK scale primarily measures nonspecific emotional distress (the PTSD dysphoria component) in nonveteran samples (see e.g., Lyons & Wheeler-Cox, 1999). McDevitt-Murphy et al. (2007) found that PK did not differentiate between PTSD and Major Depressive Disorder in a civilian sample. Graham et al. (1999) found that the PK scale most strongly correlated with a history of depression and therapist ratings of depressed mood in an outpatient mental health sample.

In sum, scales on the MMPI-2 are likely to be most useful in identifying the dysphoria component associated with PTSD, which tends to overlap with other distress disorders (depression, GAD). For patients with history of DSM-IV-TR (APA, 2000) Criteria A trauma, elevations on Scales 2, 7, 8, RCd, RC7, ANX, and PK should warrant further assessment of PTSD, but none of these scales are specific to this disorder. In combat veteran samples, PK does appear to have some significant utility in differentiating PTSD from other disorders, and a raw score of 28 is associated with optimal classification accuracy (Litz et al., 1991).

Social Anxiety

The measurement of social anxiety on the MMPI-2 requires two components: negative emotionality (reflecting anxiousness) and shyness. For the MMPI-2, Scale 7 and, more specifically so, RC7 provide good indices of the general fearfulness factor (Sellbom et al., 2008a), especially when other negative emotions (e.g., sadness, anger) can be ruled out. Furthermore, research has indicated that low positive temperament is an important distinctive component of both major depressive disorder and social phobia (Brown, 2007; Brown, Chorpita, & Barlow, 1998; Sellbom et al., 2008a). Thus, measurement of low positive emotionality, which reflects in part a reduced capacity to condition pleasure from social stimulation (e.g., Tellegen & Waller, 1992), could be useful in the assessment of social anxiety. Sellbom et al. (2008a) and Tellegen et al. (2006) have shown that RC2 (Low Positive Emotions) is preferentially associated with depression among distress disorders and social phobia among fear disorders.1

1The PSY-5 domain Introversion/Low Positive Emotionality could also be useful in this assessment, but it measures both the broad introversion domain and low positive emotionality with the same scale. As argued above, it is important to break these measurements into more specific component in assessing social anxiety on the MMPI-2. The same argument can be made for assessment of social anxiety with the MMPI-2-RF, which is discussed in the next major section.
In addition to elevations on scales reflecting anxiousness, fearfulness, and low positive temperament, scales specific to social anxiety need to be elevated. As mentioned, Scale 0 and SOD provide measurement of the broad domain of social introversion and have both been linked to social anxiety, feelings of insecurity and inadequacy in interpersonal contexts, and shyness, but also broad symptoms of anxious and depressed affect (e.g., Graham et al., 1999; Sieber & Meyers, 1992; Ward & Perry, 1998). Therefore, we recommend that the subscales for Scale 0 and SOD also be examined for a more specific measurement of social anxiety. Among the Scale 0 subscales, S11 is more specific to measuring social anxiety and interpersonal sensitivity than the other two subscales (Ben-Porath, Hostetler, Butcher, & Graham, 1989; Graham et al., 1999; Sieber & Meyers, 1992; Ward & Perry, 1998). For instance, Sieber and Meyers (1992) found that S11 displayed good convergent and discriminant validity in the measurement of shyness and social anxiety, whereas the other subscales were more associated with broader sociability and introversion. Among the SOD content component scales, SOD1 tends to be associated with the same descriptors as its parent scale, whereas SOD2 is more specific to shyness, interpersonal sensitivity, and inability to create good first impressions in a large outpatient mental health sample (Ben-Porath & Sherwood, 1993; Graham et al., 1999).

In sum, the assessment of social anxiety with the MMPI-2 is promising as there are several indices that reflect aspects of social anxiety symptoms. Elevations on RC7 and RC2 may reflect a dispositional proclivity toward experiencing social anxiety (but also depression), and Scale 0 and SOD, particularly when S11 and SOD2 are also elevated, can provide specific characterization of this negative emotionality as having a social anxiety component.

**Obsessive-Compulsivity**

The research on measuring obsessive-compulsive symptoms with the MMPI-2 is limited. Early research with the MMPI found that Scale 7 was positively correlated with obsessive-compulsive symptoms (cf. Dahlstrom et al., 1972), which is also consistent with more contemporary research (e.g., Ben-Porath et al., 1993; Graham et al., 1999; Tellegen et al., 2006). RC7, which is less saturated with nonspecific distress, is also slightly more strongly correlated with symptoms of obsessive-compulsive disorder relative to Scale 7 in some studies (e.g., Forbey & Ben-Porath, 2008; Tellegen et al., 2006). Nonetheless, as indicated earlier, this scale cannot directly differentiate between obsessive-compulsive symptoms and other forms of anxiety either.

The OBS content scale exhibits good criterion-related validity in that it is strongly correlated with other self-report inventories measuring OCD symptoms (e.g., Ben-Porath et al., 1993; Forbey & Ben-Porath, 2007; Graham et al., 1999). However, it does not appear to be specific to such symptoms as previous research has indicated that scores on this scale are equally related to measures of generalized anxiety and depression (Ben-Porath et al., 1993; Graham et al., 1999). It is likely that this scale is capturing the rumination, intrusive/obsessive thinking, and indecisiveness components that appear to be common to these disorders.

**Phobic Fear**

Several MMPI-2 scales are sensitive to phobic fear symptoms, including Scale 7, RC7, NEGB, and the FRS content scale (e.g., Forbey & Ben-Porath, 2007, 2008; Tellegen et al., 2006). As indicated earlier, the first three are not specific to indexing fearfulness, and therefore will not be useful in differentiating between such symptoms and other forms of anxiety. Several studies have found that RC7 showed moderate to large correlations with various measures of agoraphobia, social phobia, and specific phobia in both clinical and nonclinical samples, but correlations with generalized anxiety, post-traumatic stress, and depression were sometimes larger (Forbey & Ben-Porath, 2008; Sellbom et al., 2008a; Tellegen et al., 2006). Sellbom et al. (2008a) further indicated that RC7 was uniquely associated with
fear psychopathology (symptoms of agoraphobia, social, and specific phobias), but not associated with distress psychopathology, in a model accounting for the covariation with demoralization. In other words, these authors indicated that the high correlation between RC7 and non-anxiety measures was likely due to overlap with demoralization. Thus a significant and distinct portion of the variance in RC7 is related to fearfulness, and an MMPI-2 profile in which RC7 is elevated, but RCd is not, indicates substantial likelihood of phobic fear symptomatology.

The FRS content scale is the most specific measure of phobic fear on the MMPI-2. Research on the utility of this scale in assessing phobic fear has been fairly limited. Graham et al. (1999) found scores on the FRS scale were more strongly correlated with therapist ratings of phobic anxiety than anything else in a very large clinical sample. Moreover, Ben-Porath et al. (1993) demonstrated that FRS was most strongly correlated with phobic anxiety in women than any other form of negative emotionality, but that this scale had an equally strong association with obsessive thinking among men. The content component scales do not seem to be particularly useful in clarifying FRS elevations in terms of the assessment of phobic anxiety (Graham, 2011), but Graham et al. (1999) did find that FRS was more specific to phobic anxiety in women, whereas FRS seemed to be associated with more general apprehensive, obsessive thought, and diagnoses of schizophrenia, in addition to fearfulness. Thus, the FRS scale is likely to be the best indicator of phobic fear, but more research with external criteria of diagnostic nature is needed before this scale is used routinely for this purpose.

**Basic Description of the MMPI-2-RF**

The MMPI-2-RF is a 338-item true/false self-report inventory, which is conceptually and empirically linked to contemporary models of personality and psychopathology. The test uses the non-gendered version of MMPI-2 normative sample (Ben-Porath & Forbey, 2003). The standard scales of the MMPI-2-RF include 8 Validity Scales, 3 Higher-Order (H-O) Scales, 9 Restructured Clinical (RC) scales, 23 Specific Problem (SP) scales, 2 Interest scales, and 5 revised Personality Psychopathology Five (PSY-5) Scales. A majority of the scales of the MMPI-2-RF are organized in a hierarchical fashion with higher-order scales at the top, RC scales in the middle, and SP scales at lowest level.

The eight validity scales consist of seven revised versions of scales from the MMPI-2, as well as one new scale designed to assess over-reporting of somatic symptoms. The three higher-order scales represent measurement of the broad domains of psychopathology related to internalizing, externalizing, and thought disturbance that have been consistently identified in the empirical literature, including large epidemiological studies (e.g., Kotov, Gamez, Schmidt, & Watson 2010; Krueger & Markon, 2006; Vollebergh et al., 2001). The nine restructured clinical (RC) scales are identical to their MMPI-2 counterparts described earlier. The 23 specific problems (SP) scales were developed primarily not only to assist in clarifying H-O and RC scale interpretation but also to measure clinical and personality domains not sufficiently covered by the RC scales. The SP scales include five Somatic/Cognitive, nine Internalizing, four Externalizing, and five Interpersonal scales. The two interest scales measure two distinct core components derived from the original MMPI-2 clinical Scale 5 (Mascularity/Femininity)—Physical/Mechanical and Aesthetic/Literary interests. Finally, the MMPI-2-RF includes a set of revised PSY-5 scales (Harkness & McNulty, 2007; Harkness et al., 2002) that are identical in domain coverage to their MMPI-2 counterparts.

**MMPI-2-RF Scales Associated with Anxiety Symptoms**

The scales within the internalizing hierarchy would be most useful to assessing anxiety symptoms and are listed and described in Table 10.1. This table also includes reliability information derived from the MMPI-2-RF Normative sample. Because the RC scales on the MMPI-2-RF are
identical to those featured on the MMPI-2, and the PSY-5 scales are very similar, we will only describe the Specific Problems (SP) scales associated with anxiety symptoms here. However, applied recommendations are provided for all MMPI-2-RF scales applicable to the assessment of anxiety later in this chapter.

Specific Problems Scales

There are five MMPI-2-RF SP scales that various aspects of anxiety. Per Ben-Porath and Tellegen (2008), Stress/Worry (STW) measures anxious apprehension, preoccupation with disappointments, and worry about misfortunes and finances. Individuals who score high on this scale are likely to be stress-reactive and engage in obsessional, ruminating thinking. Anxiety (AXY) is another measure of anxiety, but of more intense and pervasive nature compared to STW. AX Y measures intense frights, intrusive ideation, sleep difficulties, and symptoms associated with post-traumatic distress. Behavior-Restricting Fears (BRF) describe fears that inhibit normal activity, such as agoraphobia, as well as generalized fearfulness. Multiple Specific Fears (MSF) cover a diverse range of many specific fears, such as animals and acts of nature. Finally, Shyness (SHY) is an interpersonal (rather than internalizing) SP scale that measures social anxiety, including feeling embarrassed and uncomfortable around others.

**MMPI-2-RF: Applied Recommendations**

It should be noted that the MMPI-2-RF is a relatively new instrument, and with the exception of the RC scales, there are few peer-reviewed studies on its scales that are focused on the measurement of anxiety symptoms. However, the MMPI-2-RF Technical Manual (Tellegen & Ben-Porath, 2008) provides extensive data supporting the validity of MMPI-2-RF scale scores using samples from diverse settings (e.g., outpatient and inpatient clinical, forensic, medical) with various criterion modalities (e.g., self-report, therapist ratings, etc.). In the following, we use the same framework for applied recommendations as we did for the MMPI-2.

**Negative Affect/Trait Anxiety**

As reviewed for the MMPI-2 section, RC7 and NEGE-τ are both associated with a wide range of negative emotions, including symptom ratings and trait measures of anxiety (e.g., Harkness et al., 1995, 2002; Sellbom et al., 2008b). An examination of correlations for these scales with a variety of trait measures of neuroticism, negative emotionality, and anxiety revealed that both measures have very large correlations (0.60+) across many different types of samples (Tellegen & Ben-Porath, 2008). As such, both scales are likely measuring substantial trait-based negative effect. As mentioned earlier, RC7 is substantially correlated with measures of generalized anxiety disorder [e.g., 0.62 with Generalized Anxiety Disorder Questionnaire-IV (Newman et al., 2002; Sellbom et al., 2008a)] and more so than with any other form of internalizing psychopathology. However, an examination of both symptom and trait correlates of this scale (and NEGE-τ) reveals associations with a wide range of negative emotions beyond anxiety, including fear and anger.

The STW and AX Y SP scales of the MMPI-2-RF are likely to be more specific to general and distress-related anxiety. STW is focused on anxious apprehension and worry as well as rumination, whereas AX Y focuses more on intense anxiety and arousal (Tellegen & Ben-Porath, 2008). In some preliminary data, we have recently found that STW is the best individual predictor of GAD-Q-IV in a college sample (Lee & Sellbom, 2011). Moreover, Sellbom and Gervais (2010) examined the relative utility of the MMPI-2-RF internalizing SP scales in differentiating between major depression, GAD, and PTSD in a large clinical disability sample. Using structural

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1Note the MMPI-2 version of the Neuroticism/Negative Emotionality scale is referred to as NEGE, while NEGE-τ refers to the version scored on the MMPI-2-RF.
Anxiety

(PI-2 section, RC7 and ed with a wide range of iding symptom ratings anxiety (e.g., Harkness om et al., 2008b). As for these scales with of neuroticism, nega- ity revealed that both ge correlations (0.60+) es of samples (Tellegen s such, both scales are tral trait-based negative ier, RC7 is substantially r of generalized anxiety h Generalized Anxiety V (Newman et al., 2002; d more so than with any izing psychopathology, n both of symptom and le (and NEGE-r) reveals range of negative emo- nding fear and anger. SP scales of the MMPI- re specific to general and STW is focused on anx- vory as well as rumina- es more on intense Tellegen & Ben-Porath, ary data, we have recently ial predictor of sampl (Lee & Sellbom, om and Gervais (2010) of the MMPI-2-RF les in differentiating on, GAD, and PTSD in a sample. Using structural of the Neuroticism/Negative d to as NEGE, while NEGE-r on the MMPI-2-RF.

Post-traumatic Stress

Based on the extensive MMPI-2 discussion, it is clear that RC7, and to a lesser degree, RC7 and NEGE-r are likely to be implicated in this distress disorder. These scales are likely to capture some of the nonspecific distress symptoms and general negative emotionality associated with this disorder (e.g., Miller et al., 2004; Simms et al., 2002). However, these scales are not specific to post-traumatic stress, and elevations on these scales suggest consideration of a wide variety of emotional distress and anxiety-related symptomatology. The scale that is the most strongly associated with PTSD symptoms, and more so than with any other types of internalizing psychopathology, is AXY. For example, Tellegen and Ben-Porath (2008) provide correlations between the MMPI-2-RF scales and the Detailed Assessment of Post-traumatic Stress (DAPS; Briere, 2001) in a large civil forensic disability sample. AXY showed stronger correlations with most DAPS subscales than any other scale on the test. Furthermore, we have found that the AXY scale is the best predictor of a global PTSD latent scale (as indicated by scores from multiple PTSD measurements) among the internalizing SP scales, as well as latent factors representing all three symptom clusters of PTSD symptoms outlined in the DSM-IV-TR ([APA, 2000]; Sellbom, Lee, Ben-Porath, Arbisi, & Gervais, 2012). As just mentioned, AXY is also the only scale that contributes to the differentiation of a latent PTSD construct from latent constructs representing depression and generalized anxiety (Sellbom & Gervais, 2010).

In sum, elevations on RC6 and RC7 should raise possible consideration of a range of distress disorders, particularly those of an anxious nature if RC2 is not elevated. Furthermore, if a DSM-IV-TR (APA, 2000) Criterion A stressor has been identified, a concurrent elevation of the AXY scale should direct this consideration toward PTSD (and even more so if STW is not elevated).

Social Anxiety

As indicated for the MMPI-2, RC7 and RC2 may reflect a dispositional proclivity toward negative and low positive temperament, which have been implicated in social anxiety and depression (Brown, 2007; Brown et al., 1998). The MMPI-2-RF also features an interpersonal SP scale that is particularly relevant to the assessment of social anxiety—Shyness (SHY). This scale was developed primarily via factor analyses of items derived from SII and SOD2. Tellegen and Ben-Porath (2008) present impressive validity results that indicate that this scale is associated with both anxiety and social inhibition. In both medical and mental health outpatients, this scale is the most strongly correlated with the Fear Questionnaire (Marks & Matthews, 1979) subscale Social Fear. Furthermore, Lee and Sellbom (2011) show that SHY is most strongly associated with social anxiety and more so than any internalizing SP scale in a college sample. This scale was also minimally correlated with measures of depression, GAD, PTSD, and other specific phobias. The same pattern of association between self-report of social avoidance and distress and SHY, but not internalizing SP scales, was reported by Forbey, Lee, and Handel (2010) in a college student sample. Thus, in sum, elevations on RC7 and RC2 with a concurrent elevation of SHY should raise significant consideration of social anxiety.
Obsessive-Compulsivity

There are not scales specifically related to OCD symptomatology on the MMPI-2-RF. As mentioned for the MMPI-2 section, RC7 shows moderate to large correlations with symptom measures of obsessive-compulsive disorder (Forbey & Ben-Porath, 2008; Sellbom et al., 2008a; Tellegen et al., 2006) and therapist ratings of obsessive-compulsive symptoms in mental health clients (Tellegen et al., 2003). Of the SP scales, STW contains items that reflect some obsessive-compulsive thinking in addition to general anxious apprehension. Tellegen and Ben-Porath (2008) show that STW has the strongest correlation with therapist ratings of obsessive-compulsive compared to all other internalizing SP scales in a large outpatient mental health sample. However, as indicated earlier, RC7 cannot directly differentiate obsessive-compulsive symptoms from other forms of anxiety or general negative emotions and preliminary evidence suggests the same is true for STW. Thus, elevations on both RC7 and STW should raise the possibility of obsessive-compulsive symptoms, but other, external information will be needed for more specificity.

Phobic Fear

As noted earlier for the MMPI-2, several studies have found that RC7 has moderate to large correlations with various measures of agoraphobia, social phobia, and specific phobia in both clinical and nonclinical samples and is uniquely associated with fear psychopathology (Forbey & Ben-Porath, 2008; Sellbom et al., 2008a; Tellegen et al., 2006). As such, an MMPI-2-RF profile in which RC7 is elevated, but RCd is not, indicates substantial likelihood of phobic fear symptomatology.

There are two MMPI-2-RF SP scales that can provide more specific and complimentary assessment of phobic fear: BRF and MSF. The latter scale is more strongly associated with harm avoidance (the dispositional tendency to avoid dangerous activities or situations), whereas BRF scale is more broadly related to generalized phobic anxiety and fearfulness (Tellegen & Ben-Porath, 2008). The two scales also have a discriminant pattern of associations with different types of phobic fears. In clinical and nonclinical settings, BRF is more specific to agoraphobia than MSF, assessing anxiety that inhibits normal activities (Lee & Sellbom, 2011; Tellegen & Ben-Porath, 2008). These same studies indicate MSF is more strongly correlated with measures of specific phobias (e.g., animals, blood/injury, natural disasters). These scales also have good discriminant validity, as evidence has suggested they are strongly related to measures of phobic fear and are have substantially smaller associations with measures of distress symptomatology (Lee & Sellbom, 2011; Sellbom & Gervais, 2010; Tellegen & Ben-Porath, 2008).

Basic Description of the MMPI-A

The MMPI-A is a 478-item true/false self-report inventory designed to assess the social, emotional, and behavioral functioning of adolescents between the ages of 14 and 18 (Butcher et al., 1992). The normative sample of the MMPI-A is a large, nationally representative sample, consisting of 805 boys and 815 girls between the ages of 14 and 18 who were randomly recruited from schools in the United States. The adequacy of MMPI-A scores based on the normative sample in various demographic groups has been supported in previous research (e.g., Schinka, Elkins, & Archer, 1998).

The MMPI-A contains scales similar to those scored on the MMPI-2, with the exception of RC scales, which have not been developed for the MMPI-A. Specifically, there are seven validity scales scored on the MMPI-A, assessing methods of responding to items that would prevent the test-user from gaining a representative picture of the test-taker's psychological functioning (Butcher et al., 1992). Like the MMPI-2, the MMPI-A contains ten, basic clinical scales that were maintained during the revision process from the MMPI (Butcher et al., 1992). These scales are intended to provide a broad overview of the problems and difficulties being reported by the adolescent. Following the methods used to develop the MMPI-2 content scales, Williams, Butcher,
Ben Porath, and Graham (1992) developed 15 content scales to provide a method of assessing the basic content domains of the MMPI-A item pool. The content scales were intended to provide additional methods of clarifying the adolescent’s self-presentation and identifying which interpretative statements should be emphasized (Butcher et al., 1992). The MMPI-A also contains a set of six supplementary scales that were either carried over from the MMPI or added to the test during development (Butcher et al., 1992). These scales are intended to enhance the clinical picture of the adolescent provided by the clinical and content scales by assessing important areas not covered with other MMPI-A scales. Lastly, the MMPI-A contains adolescent versions of the personality psychopathology five (PSY-5; McNulty, Harkness, Ben-Porath, & Williams, 1997) scales that were originally developed for the MMPI-2.

### MMPI-A Scales Associated with Anxiety Symptoms

Table 10.2 lists all MMPI-A scales that are associated with the assessment of anxiety on the MMPI-A. This table is intended to provide a quick reference for the reader and includes a basic description of the scale, as well as reliability information from the normative sample.

### Clinical Scales

Clinical scales relevant to the assessment of anxiety scored on the MMPI-A include Clinical scale 7 (Psychasthenia; Pt) and scale 0 (Social Introversion; Si). Scale 7 on the MMPI-A is identical in composition to its MMPI predecessor (Butcher et al., 1992). As discussed in reference to the MMPI-2, Scale 7 was originally created to detect Psychasthenia symptoms (McKinley & Mathaway, 1942), but was later recognized as a measure of nonspecific distress and trait anxiety (e.g., Dahlstrom et al., 1972; Graham, 2011). Content of Scale 7 items includes questions regarding the experience of anxiety, obsessive thoughts, problems with concentration, and somatic complaints, as well as general unhappiness and poor self-esteem. Scale 0 on the MMPI-A is a minimally revised version of its MMPI predecessor. As described earlier, Scale 0 was developed by Drake (1946) to assess sociability, with subsequent research supporting use of this scale for assessing the individuals’ experiences in social situations, especially as it relates to introversion and social maladjustment (e.g., Dahlstrom et al., 1972; Graham, 2011). Scale 0 has three subscales intended to assist in clarifying clinically significant elevations, including S1 (Shyness/Self-Consciousness), S2 (Social Avoidance), and S3 (Alienation—Self and Others; Butcher et al., 1992).

### Content Scales

Content scales relevant to the assessment of anxiety include Anxiety (A-ansx), Obsessiveness (A-obx), and Social Discomfort (A-sod), as well as corresponding content—component scales (Ben-Porath, Graham, Archer, Tellegen, & Kaemmer, 2006; Butcher et al., 1992, 2001; Sherwood, Ben-Porath, & Williams, 1997). All three of these scales closely correspond to their MMPI-2 counterparts (Butcher et al., 1992, 2001). The A-ansx scale measures general anxiety symptoms, including worry and rumination, somatic experiences related to anxiety (e.g., tension), and generalized distress. A-obx assesses difficulties in decision making, worry, rumination, and intrusive thoughts. Lastly, A-sod includes items concerning discomfort in social situations and introversion, as well as social avoidance. The A-sod content scale has two Content—Component scales, A-sod, (Introversion) and A-sod, (Shyness; Ben-Porath et al., 2006; Sherwood et al., 1997).

### Supplementary Scales

There is one supplementary scale relevant to the assessment of anxiety scored on the MMPI-A, Welsh’s Anxiety (A) scale (Welsh, 1965; Welsh and Dahlstrom, 1956). This scale was maintained on the MMPI-A during the revision process from the MMPI, containing 35 of the original 39 items (Butcher et al., 1992). As described earlier for the MMPI-2, this scale assesses generalized distress...
<table>
<thead>
<tr>
<th>Scale</th>
<th>Abbreviation</th>
<th>Number of Items</th>
<th>Reliability (boys/girls)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale 7: Psychasthenia</td>
<td>Pt</td>
<td>48</td>
<td>0.84/0.86</td>
<td>General anxiety, obsessive–compulsive thinking, and non-specific emotional distress</td>
</tr>
<tr>
<td>Scale 0: Social Introversion</td>
<td>Si</td>
<td>62</td>
<td>0.79/0.80</td>
<td>Social shyness, avoidance, and problems, as well as some symptoms of depression</td>
</tr>
<tr>
<td>Shyness/Self-consciousness</td>
<td>Si</td>
<td>14</td>
<td>NR</td>
<td>Social Introversion and Shyness</td>
</tr>
<tr>
<td>Anxiety</td>
<td>A-anx</td>
<td>21</td>
<td>0.76/0.80</td>
<td>General anxiety, anxious apprehension, worry, obsessive–compulsive thinking, and emotional distress</td>
</tr>
<tr>
<td>Obsessiveness</td>
<td>A-obs</td>
<td>15</td>
<td>0.72/0.72</td>
<td>Content related to obsessive thinking and compulsive behaviors, related to general maladjustment</td>
</tr>
<tr>
<td>Social Discomfort</td>
<td>A-sod</td>
<td>24</td>
<td>0.77/0.78</td>
<td>Social introversion, anxiety, avoidance, and withdrawal</td>
</tr>
<tr>
<td>Shyness</td>
<td>A-sod2</td>
<td>10</td>
<td>0.60/0.68</td>
<td>Shyness and discomfort in social situations</td>
</tr>
<tr>
<td>Welsh Anxiety scale</td>
<td>A</td>
<td>35</td>
<td>0.87/0.89</td>
<td>Generalized distress and maladjustment</td>
</tr>
<tr>
<td>Neuroticism/Negative Emotionality</td>
<td>A-nege</td>
<td>22</td>
<td>0.74/0.76</td>
<td>Predisposition for experiencing negative emotions, including anxiety, worry, guilt, anger, and fears</td>
</tr>
</tbody>
</table>

*Internal consistency reliability (Cronbach’s alpha) from MMPI-A normative sample. NR: not reported in MMPI-A manual (Butcher et al., 1992)*
and includes items regarding the experience of being distressed, overwhelmed, and hopeless, as well as feelings of anxiety and worry. Although we prefer RCd as a measure of generalized distress common to psychopathological conditions on the MMPI-2, there is no RCd counterpart on the MMPI-A. However, previous research has suggested the A scale on the MMPI-2 correlates quite highly with the RCd scale in across samples (e.g., Sellbom et al., 2006). As such, this scale can be viewed as an imperfect proxy for assessing the demoralization construct on the MMPI-A.

**Personality Psychopathology Five Scales**

From the PSY-5 scales and relevant to the assessment of anxiety is the Negative Emotionality/Neuroticism Scale (A-nege) and Introversion/Low Positive Emotionality scale (A-intr). A-nege scale contains 22 items and was designed to assess a broad affectively based, predisposition for experiencing negative emotions (e.g., anxiety, nervousness, and guilt; McNulty et al., 1997). Although we preferred RC2 as a proxy for low positive temperament on the MMPI-2 (because of specificity), there is no RC2 counterpart on the MMPI-A. We therefore believe that A-intr can serve as a good proxy for this temperament domain. However, while the MMPI-2 and MMPI-A versions of the PSY-5 share a majority of their items and were designed to assess the same construct using similar methods, these two versions of the PSY-5 scales should not be considered equivalent as they were developed independently of one another and no studies have examined the similarities between descriptors based on adolescent and adult versions.

**MMPI-A: Applied Recommendations**

**Assessing Negative Affect/Trait Anxiety**

High scores on Clinical scale 7, A-anx Content scale, and on A-nege PSY-5 scale are the best indicators of general trait anxiety on the MMPI-A. Specifically, previous research has suggested that Scale 7 in adolescents can be best conceptualized as assessing not only generalized anxiety but also somatic complaints and generalized distress. For example, in a sample of adolescent outpatients, significant associations were demonstrated between scores on Scale 7 and characterizations of the adolescent as anxious, tense, nervous, and self-critical (Lachar, 1990, c.f., Butcher et al., 1992). Gallucci (1994) demonstrated significant associations between scores on Scale 7 and therapist rated levels of self-criticism and self-doubt. Results of this study also suggested adolescents with high scores on Scale 7 were likely to be rated as having difficulty making decisions, as well as be prone to guilt. However, in keeping with the MMPI-2 literature, research has also demonstrated that this scale is associated with nonspecific distress, including depressed mood, suicidality, self-harm, and low self-esteem (e.g., Cashel, Rogers, Sewell, & Holliman 1998; Forbey, Ben-Porath, & Davis, 2000; Wrobel & Lachar, 1992).

As with the MMPI-2, the A-nege scale is likely to be a purer indicator of negative emotionality with less saturation by nonspecific emotional distress. The A-nege scale was intended to assess a wide range of negative emotions, including anxiety, fear, anger, and guilt (Ben-Porath et al., 2006). McNulty et al. (1997) provided initial evidence for the validity of scores on this scale in a mixed inpatient and outpatient clinical sample. Their results indicated scores on A-nege were related to having a documented history of internalizing problems, including things like social withdrawal, identity issues, low self-esteem, depression, suicide ideations/gestures, tension/nervousness, somatic complaints, eating problems, and concentration difficulties. Behavior checklists and therapist-provided ratings also supported the characterization of A-nege as a scale assessing anxious tendencies (e.g., guilt, fears, and worries). Subsequently, Veltri et al. (2009) replicated most of these descriptors, indicating that boys in forensic settings with high A-nege scores could be described as overanxious, while girls with high A-nege scores experienced fatigue and low levels of energy, as well as thoughts and behaviors related to self-injurious or suicidal actions.
The A-anx content scale likely provides the most specific assessment of generalized anxiety on the MMPI-A. This scale measures cognitive, physical, and emotional experiences related to anxiety. Results of initial empirical examinations presented in the MMPI-A Technical Manual (Butcher et al., 1992) provided support for the use of A-anx as a measure of general anxiety. These data suggested that individuals with high scores on A-anx could be described as having difficulties with tension, worry, and sleep (e.g., nightmares), as well as problems with concentration and staying on task. Independent research examining scale score correlates of A-anx in adolescent psychiatric inpatients (Arita & Baer, 1998; Veltri et al., 2009), as well as boys in a juvenile detention facility and other forensic settings (Cashel et al., 1998; Veltri et al., 2009), has supported that A-anx assesses markers of general anxiety. However, some studies have also suggested scores on this scale are related to general distress, somatic complaints, social withdrawal, obsessive–compulsive thinking, fearfulness, and depression in correctional, forensic, and mental health samples (Cashel et al., 1998; Rinaldo & Baer, 2003; Veltri et al., 2009).

In sum, elevated scores on Scale 7 should raise considerations for high negative effect, which suggests increased vulnerability to experiencing trait anxiety. The A-anx scale will likely be the best indicator of the negative emotionality being reported as a result of anxious apprehension; a lack of elevation should raise consideration of other types of negative emotions, including fear and anger.

Assessing Post-traumatic Stress Symptoms

Unlike the MMPI-2, there have not been any scales developed to specifically assess symptoms of post-traumatic stress disorder (PTSD) for the MMPI-A. However, if a significant traumatic event has been identified during the assessment, evidence of the experience PTSD symptoms using the MMPI-A will be best examined through scales assessing the dysphoria symptom cluster identified in factor analyses of PTSD symptoms (see e.g., Palmieri et al., 2007; Simms et al., 2002) as well as negative emotionality that is associated with anxiety disorders more generally (e.g., Brown, 2007). Specifically, the MMPI-A scales described earlier in this chapter as measures of trait anxiety (e.g., Scale 7, A-nege, A-anx) are going to be helpful in establishing the presence of cognitive and physical symptoms of anxiety. The other key component of PTSD symptoms, dysphoria, can be identified using Welsh’s Anxiety (A) scale. On the MMPI-A, Welsh’s Anxiety (A) scale is the best predictor of undifferentiated emotional discomfort and has clearly been linked to such in a variety of clinical settings (Archer, 2005; Archer, Gordon, Anderson, & Giannetti, 1989; Veltri et al., 2009). Thus, in sum, the MMPI-A is unlikely to be useful in specifically capturing post-traumatic stress, but elevations on A, Scale 7, A-nege, and A-anx in the context of a DSM-IV-TR (APA, 2000) Criterion A trauma history should warrant consideration of such symptoms.

Assessing Obsessive-Compulsivity

Scales 7, A-anx, and A-obs are most likely to be sensitive to obsessive–compulsive symptoms in adolescents. More general descriptors of Scale 7 and A-anx were presented earlier in this chapter. In addition to those general descriptions, at least for boys, previous research has demonstrated that scores on Scale 7 and A-anx are associated with the experience of intrusive, obsessive thoughts and compulsive behaviors (Cashel et al., 1998). However, based on content alone, the most specific scale for assessing obsessive–compulsive symptoms is A-obs scale. This content scale contains items that are highly face valid, including questions regarding the experience of unreasonable worry, ruminative thinking, indecisiveness, and fears for the future (Butcher et al., 1992). Unfortunately, no empirical studies have examined the association between obsessive–compulsive symptom reports and A-obs scores. In fact, initial validity results presented in the MMPI-A Technical Manual (Butcher et al., 1992) provide support only for the use of A-obs as a measure of
general maladjustment, as well as dependent, anxiety-driven behavior in boys and suicidal ideation in girls. Rinaldo and Baer (2003) demonstrated that A-obs adds incrementally to the Clinical scales in the prediction of anxiety and anger. Importantly, subsequent research has suggested that A-obs is related to suicidal ideation and behaviors in both boys in correctional and forensic settings and girls in inpatient treatment settings (Cashel et al., 1998; Veltri et al., 2009). Thus, in sum, elevations on Scale 7, A-anx, and A-obs should raise consideration of obsessive-compulsive symptoms (in addition to general trait anxiety), but clinicians should be aware that these scales are not specific to such symptomatology.

Assessing Social Anxiety

As with the MMPI-2, social anxiety symptoms are best captured on the MMPI-A via a combination of scales indicating difficulties due to general anxiety, as well as social discomfort, anxiety, and avoidance. The general trait measures of anxiety described earlier (e.g., Scale 7, A-nege) will be helpful in identifying cognitive and somatic experiences of anxiety symptoms, as well as general distress and impairment. Moreover, a low positive temperament, which is associated with social anxiety (e.g., Brown, 2007), can be indexed via A-intr. The symptoms specific to social interactions, including anxiety and discomfort in social situations, as well as social avoidance, can be most specifically indexed by Scale 0 and the A-sod content scale.

Williams and Butcher (1989) found in a sample of 844 adolescents from outpatient and inpatient treatment settings that Scale 0 was significantly related to being socially withdrawn and timid. In addition, Wrobel and Lachar (1992) indicated that for both boys and girls, scores on Scale 0 were associated with parent ratings of having few friends, difficulties making friends, and being shy with others. Characterizations of high scorers as socially withdrawn, but also generally anxious and distressed, have been suggested by subsequent research examining scale score validity in clinical treatment samples of adolescents, as well as adolescent boys in forensic settings (Forbey et al., 2000; Veltri et al., 2009; Wrobel & Lachar, 1992).

Because Scale 0 is heterogeneous and somewhat saturated with emotional distress and aspects of introversion unrelated to social anxiety, the Si subscales (Butcher et al., 1992; Graham, 2011) can further differentiate social anxiety from general introversion and sociability. Si1 (Shyness/Self-consciousness) elevations indicate that emphasis should be placed on descriptions of the adolescent as shy, easily embarrassed, and uneasy in social situations, more so than the other two subscales. Although empirical research has not established which of these subscales is best used in identifying social anxiety symptoms, the scale is sufficiently similar to the MMPI-2 version that it is likely that this scale is specific to such. Future research will need to confirm this statement.

The Social Discomfort (A-sod) Content scale and its related Content-Component scales can also provide evidence of social anxiety symptoms. Results of initial empirical examinations presented in the MMPI-A Technical Manual (Butcher et al., 1992) provided support for the use of A-sod as a measure of social discomfort and withdrawal. Subsequent research supported this characterization, suggesting significant associations between scores on A-sod and self-reported problems in social interactions, as well as introversion, social withdrawal, and distress (Arita & Baer, 1998; Cashel et al., 1998; Forbey et al., 2000). Clarification of which A-sod descriptors to emphasize during interpretation is facilitated by the Content-Component subscales, A-sod1 (Introversion) and A-sod2 (Shyness; Ben-Porath et al., 2006). In cases where A-sod1 (Introversion) is elevated, aspects of social discomfort, withdraw, and avoidance should be emphasized. In cases where A-sod2 (Shyness) is elevated, the social introversion and shyness aspects of A-sod interpretations should have more emphasis. However, no studies have empirically examined whether specific configurations of these two content-component scales are indicative of social anxiety symptoms.
In sum, although conclusions are currently tentative due to lack of sufficient empirical research, Scales 7, A-nege, and A-intr indicate the likelihood of negative and low positive temperament in adolescence likely to be linked to social anxiety (Brown, 2007). Scale 0 and A-sod, and particularly, S11 and A-sod2, should more specifically raise considerations of social anxiety.

Assessing Phobic Fear

Unlike current adult versions of the MMPI, the MMPI-A does not contain any scales directly assessing fearfulness. The potential for phobic anxiety should be raised when Scale 7 and particularly A-nege are elevated in the absence of other depression and anxiety indicators (e.g., A-anx, A-sod, A-ang, A-obs). However, additional fearfulness assessment is necessary for confirmation, particularly, since such symptoms can occur in conjunction with other forms of anxiety and emotional distress.

Conclusions

As reviewed in this chapter, it should be clear that the MMPI family of instruments have a long-standing and rich base of empirical research supporting the ability of their scales to assess symptoms of anxiety disorders. Nonetheless, it has probably not escaped the reader that we are cautious about our recommendations concerning the assessment of anxiety symptoms with the MMPI instruments. The most significant issue concerns specificity. In general, the various scales highlighted in this chapter tend to be quite sensitive to a variety of symptoms, but (with a few exceptions) not very specific. Several of the scales reviewed do not differentiate between specific forms of anxiety or in some instances negative emotions more broadly. In some instances, there are no scales specifically designed to detect a type of anxiety symptoms (e.g., phobic fears for MMPI-A).

Despite our caution, we are not recommending against the use of the MMPI instruments in clinical practice. On the contrary, we highly recommend it! Scales on the MMPI-2/RF/A are some of the most extensively researched scales available to clinicians (e.g., Butcher & Rouse, 1996). Further, scale elevations can yield a vast amount of information and are useful obtaining a broad, overarching picture of the individual, not just about anxiety, but many other symptoms of psychopathology and personality traits as well (see e.g., Graham, 2011). Instead, what we would like to leave the reader understanding is that scale elevations and patterns of those elevations on MMPI-2/RFA scales should raise consideration about different forms of anxiety symptomatology, but specific diagnoses should not be assigned on the basis of MMPI information alone. Any information derived from self-report inventories should be corroborated by other sources.

The MMPI-2, MMPI-2-RF, and MMPI-A have scales that are quite promising in the assessment of anxiety symptoms, but future research is necessary to further inform their use. There are very few studies that have examined the degree to which scales on these three inventories differentiate between different types of anxiety (see e.g., Sellbom et al., 2008a; Tellegen et al., 2006). Lee and Sellbom (2011) and Sellbom and Gervais (2010) have begun such work with the MMPI-2-RF, but these findings should be considered tentative until subjected to replication. Furthermore, it is evident that the MMPI-A has lagged behind its adult counterparts in research output, and more research is needed beyond just empirical correlate studies that currently saturate the literature. Studies on the diagnostic efficiency, especially with regard to differential diagnoses, are sorely needed.

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