

Development of the MMPI and MMPI-2

GENERAL DESCRIPTION OF THE MMPI/MMPI-2

The Minnesota Multiphasic Personality Inventory (MMPI) is the most widely used objective personality inventory in the world (Greene, 2000; Lubin, Larsen, & Matarazzo, 1984; Lubin, Larsen, Matarazzo, & Seevers, 1985). Even from its beginnings, the MMPI has enjoyed popularity and has been ranked as a leading personality instrument (Archer, 1997). Taught in the majority of clinical psychology training programs (Dahlstrom & Moreland, 1983; Watkins, 1991), the test is used by most psychologists who conduct assessments as part of their clinical and consulting practice (Dahlstrom, 1992b; Moreland & Dahlstrom, 1983). The MMPI has also been the subject of extensive research interest. According to Butcher and Owen (1978), 84% of the research in the personality inventory domain has been with the MMPI. The test has been the undisputed leader in the number of test references produced each year (Reynolds & Sundberg, 1976), and Dahlstrom, Welsh, and Dahlstrom (1975) listed close to 6,000 MMPI references in their *MMPI Handbook*. More recently, an examination of the *Eleventh Mental Measurements Yearbook*, published in 1992, reveals 2,913 published refereed MMPI journal articles since the last published review in the 1978 *Yearbook*, an average of about 4 MMPI articles per week for 14 years! Butcher (1987b) counted over 10,000 books and articles produced on the test, and that estimate is certainly higher now given the continued pace of publications.

The widespread use of this test is attributable to several factors, including its simplicity of scoring and administration, an objective response format important for research designs, a large item pool (from which at least 800 additional scales have been derived), many useful applications, and thousands of empirically established correlates. In fact, it is difficult to imagine many settings in which psychologists perform assessment and treatment functions where the MMPI has

not been used. Inpatient and outpatient mental health facilities often employ psychologists to make diagnostic and treatment decisions, and the MMPI is typically included in psychological test batteries or even administered independently. Many clinical practitioners routinely use the MMPI to screen new patients in their office practice for maladjustment and to help formulate treatment plans. Psychologists use the test in medical settings to evaluate the presence of psychological components in physical complaints and to assist in predicting response to various treatments (Osborne, 1979).

Industrial-organizational and clinical psychologists, whose responsibilities involve matching individuals to particular employment positions or screening individuals for psychopathology, also use the MMPI. For example, because the MMPI is sensitive to emotional maladjustment in individuals other than identified patient groups, it is often used in personnel selection situations in which high-risk occupations require careful screening of applicants. People in positions of public trust, such as airline flight crews, law enforcement officers, nursing staff, ministerial candidates, and nuclear power plant operators, are typically administered the MMPI (Butcher, 1979). Research applications with the MMPI, either as the sole subject of study or as one of the major dependent measures in an investigation, range from cross-cultural studies of response patterns to evaluating treatment effects to making forensic decisions (Friedman, Webb, & Lewak, 1989; Rothke & Friedman, 1994; Rothke et al., 1994).

The original MMPI consists of 566 numbered statements,¹ each of which can be answered true or false on an answer sheet, or, in the original card deck form, the test takers sort their responses into "T" for true, "F" for false, or Cannot Say categories. An item is scored as Cannot Say if it is marked both true and false on the answer sheet, left blank, or sorted into the Cannot Say category in the card deck form.

There are several methods for scoring a completed test. The answer sheet is either hand scored or read by a special scanner machine. Some MMPI users enter the responses from the answer sheet into a computer that is programmed to score, and sometimes to interpret, the test. More recently, some test takers enter their responses using a keyboard directly into a computer, which instantly scores the test.

For the original MMPI thirteen standard scales are scored, regardless of the scoring method. The following are the original 3 validity scales and 10 *standard clinical scales*. Note that the convention adopted here is that the eight scales numbered 1–4 and 6–9 will be referred to as the *basic clinical scales* or, more simply, as the *basic scales*. When speaking of the entire set of clinical scales given on the main profile form, including Masculinity–Femininity (*Mf*, or Scale 5) and Social Introversion (*Si*, or Scale 0), we refer to the *standard clinical scales* or more simply, the *standard scales*.

VALIDITY SCALES

Lie (*L*)

Infrequency (*F*)

Correction (*K*)

CLINICAL SCALES

- Scale 1 Hypochondriasis (*Hs*)
- Scale 2 Depression (*D*)
- Scale 3 Hysteria (*Hy*)
- Scale 4 Psychopathic Deviate (*Pd*)
- Scale 5 Masculinity–Femininity (*Mf*)
- Scale 6 Paranoia (*Pa*)
- Scale 7 Psychasthenia (*Pr*)
- Scale 8 Schizophrenia (*Sc*)
- Scale 9 Hypomania (*Ma*)
- Scale 0 Social Introversion (*Si*)

The validity scales were developed to assist in recognizing test records produced by uncooperative or deceptive participants with various test-taking attitudes (e.g., faking good or faking bad) or participants who had difficulty comprehending or reading the test items. The clinical scales were developed primarily to assist in identifying the type and severity of abnormal psychiatric conditions. A secondary goal was to provide an objective means of estimating therapeutic effects and other changes in the status of patients' conditions across time (Dahlstrom, Welsh, & Dahlstrom, 1972). The raw scores on each of the validity and clinical scales are converted to *T* scores by plotting them onto a profile sheet, thereby yielding a series of comparable scores. It is the pattern of these scale scores that is usually interpreted. The *T* scores provide the clinician an opportunity to examine how the test taker compares to different populations, including, most importantly, a standardized group of normal individuals. A more detailed description of *T* scores is provided later in this chapter.

HISTORICAL DEVELOPMENT OF THE MMPI

In an important historical overview of the MMPI, W. Grant Dahlstrom (1992b), summarized a series of studies by C. Landis and his colleagues at the New York State Psychiatric Institute in the 1930s (Landis & Katz, 1934; Landis, Zubin, & Katz, 1935; Page, Landis, & Katz, 1934; see also Greene, 1980, 2000); these studies strongly reinforced the skepticism at that time of professionals relying on personality testing as an aid in assessment and diagnosis because the existing personality tests, according to Landis, lacked validity. Specifically, those objective tests relied on individuals' willingness and capacity to accurately report their feelings and experiences and also depended on their reading and intellectual ability to comprehend the inventory. These concerns sensitized clinicians to the need for improving the validity of objective personality tests.

Despite the tenor of the times, or perhaps because of it, Starke R. Hathaway and J. C. McKinley teamed up to develop a new inventory capable of overcoming the limitations inherent in the existing personality tests. Hathaway, a clinically experienced physiological psychologist, and McKinley, a neuropsychiatrist, both at the Medical School at the University of Minnesota, were joined in their later

efforts by Paul E. Meehl, also a psychologist. Hathaway and McKinley were originally motivated to design a test that could serve as an aid "in diagnosing persons classified as constitutional psychopathic inferiors" (Hathaway, 1939, p. 117); assist "in assessing the psychological factors associated with physical problems or disease seen in a medical practice" (McKinley & Hathaway, 1943, p. 161); and as a corollary, "measure the effectiveness of insulin therapy" (Hathaway, 1964, p. 204) in schizophrenia, which was in widespread use by the late 1930s. The test also came to be seen as an aid in determining levels of psychiatric impairment and changes in the patients' condition over time, as well as in measuring the effects of psychotherapy (Dahlstrom et al., 1972).

Although the MMPI was originally published in 1942 (David S. Nichols, personal communication, January 13, 2000) by the University of Minnesota Press, the authors actually began their work on the test in the late 1930s. There were several subsequent revisions of the MMPI manual through 1983. Colligan, Osborne, Swenson, and Offord (1989) reported that the first article describing the inception of the MMPI was provided by Hathaway and McKinley in a 1940 publication entitled "A Multiphasic Personality Schedule (Minnesota): I. Construction of the Schedule." Hathaway and McKinley strove to correct many of the problems hampering the effectiveness of previously existing personality inventories. Previous personality inventories were constructed using a rational basis with a focus on content validity, and lacked scales designed to measure the participant's test-taking attitude (e.g., defensiveness or overreporting of symptoms). An example of one such psychological inventory is the Woodworth (1920) Personal Data Sheet, also called the Psychoneurotic Inventory. World War I created a strong need to screen for maladjustment among draftees, and Woodworth developed a 116-item self-rating scale to detect neurotic maladjustment. The items consisted of statements that Woodworth believed reflected neurotic symptoms. If a participant answered a certain number of items in the deviant direction, a psychiatric interview was conducted. A fundamental assumption inherent in the test was that the items measured what Woodworth assumed they measured. Items were chosen on rational grounds; that is, if the items appeared content-relevant to neuroticism, they were included in the scale. Over time, it became clear that items selected on a rational basis did not always indicate deviant behavior in the way Woodworth expected. Another unwarranted assumption in the Woodworth Personal Data Sheet, and similar tests, was that the participant would, and could, honestly and accurately describe him- or herself. This is not always the case; self-deception and social desirability factors operate to influence the person's responses to test items. Although the Woodworth Personal Data Sheet was not completed early enough to allow its use before World War I ended, it did set the stage for other similarly constructed inventories that achieved widespread use after the war (Anastasi, 1982). The Bell (1934) Adjustment Inventory and the Bernreuter (1933) Personality Inventory were derived from the Woodworth Personal Data Sheet and were also criticized for their excessive reliance on a rational approach to test construction and for the face valid nature of the test items (Colligan et al., 1989).

Because of Hathaway's reservations about the rational approach to inventory construction, he used an empirical method (the criterion keying method) to construct the MMPI. As Anastasi (1982) noted, the MMPI represents the

outstanding example of this test construction methodology. In this method, test items are administered to two or more groups of participants—a criterion group selected for homogeneity with respect to a certain diagnosis, cluster of features, traits, or other characteristics (e.g., schizophrenia) and a normal comparison group that does not share the same characteristics or shares them only in base-rate amounts. Items to which the criterion and comparison groups respond differently are included on the scale being developed, and items to which the responses of the two groups are similar are not included. Scales constructed in this fashion are typically named after the criterion group. Scoring the scales is accomplished by assigning 1 point to each item answered in the direction that is marked significantly more frequently by the criterion participant; that is, if a higher proportion of individuals with hysteria than normals answered true to an item, a response of true to that item would be given 1 point on the Hysteria scale, and a response of false would be given 0 points. The higher the raw score a person receives on a scale, the more items he or she has answered in the direction of the criterion group.

Using this criterion keying method, Hathaway and McKinley began their construction of the MMPI by compiling more than 1,000 self-reference statements from a wide variety of sources, including psychiatric examination forms, psychiatric textbooks, previously published attitude and personality scales, clinical reports and case summaries, and their own clinical experience.² From these resources, they eventually adopted an item pool of 550 separate statements that could be answered true or false.³ The statements were judged to be easily readable, and ranged in content from phobias, religious attitudes, and general health to social attitudes and affects (Dahlstrom et al., 1972). Using this pool of 550 items, Hathaway and McKinley proceeded to construct scales by contrasting the responses of normal and clinical criterion groups.

The normal reference group consisted of 724 friends and relatives of patients being seen at the University of Minnesota Hospital outpatient department who were willing to complete the test. The normals were all White, belonged to what was termed “the underprivileged” classes, and came from all parts of Minnesota (McKinley & Hathaway, 1940). According to Dahlstrom and Welsh (1960), “the subjects were approached in the halls and in waiting rooms of the hospital, and invited to participate in the research project” (p. 44). Additional normal and patient groups consisted of high school graduates attending pre-college conferences at the University of Minnesota ($n = 265$), medical patients from the University of Minnesota Hospital ($n = 254$), skilled Work Project Administration (WPA) personnel ($n = 265$), and inpatients with varied diagnoses in the psychiatric unit (then called the Psychopathic Unit) at the University of Minnesota Hospital ($n = 221$). Normal participants (other than the medical patients) who were then under the care of a physician were excluded from the normative samples; all other participants were included. Dahlstrom et al. (1972) pointed out the importance of the normal reference groups by stating that

the performance of these men and women on each of the component scales in the MMPI is used as the basis for the norms in the test profile. Each subject taking the MMPI, therefore, is being compared to the way a typical man or woman endorsed

those items. In 1940, such a Minnesota normal adult was about 35 years old, was married, lived in a small town or rural area, had had eight years of general schooling, and worked at a skilled or semiskilled trade (or was married to a man with such an occupational level). (pp. 7–8)

Hathaway and McKinley found their original sample of normals to correspond well in age, gender, and marital status to the Minnesota population in the 1930s census (Dahlstrom, et al. 1972).⁴ However, it is now generally accepted that “the original MMPI norm group appears to have over-represented lower educational and occupational groups” (Dahlstrom, 1993, p. 9). We address this important limitation later in this chapter.

The clinical criterion (abnormal) groups consisted of carefully selected psychiatric patients and participants representing the following major diagnostic categories: hypochondriasis, depression, conversion hysteria, psychopathy, paranoia, psychasthenia, schizophrenia, and hypomania. Two other groups were later added to develop two additional scales for the MMPI. One of these groups consisted of normal college women used to develop a Social Introversion scale (*Si*), and the other group consisted of “homosexual invert males” (Hathaway, 1956/1980, p. 110) used to develop the Masculinity–Femininity scale (*Mf*).

Very shortly after the MMPI gained widespread acceptance, criticisms were made regarding the narrowness of the original standardization group used to obtain normal values for the scales. The 724 normals who were recruited as participants while accompanying patients to the hospital consisted of Whites, disproportionately of Scandinavian, German, and Irish descent, who were almost exclusively from the Minnesota, North Dakota, South Dakota, Iowa, and Wisconsin areas. Nichols (1992b) stated that “the phrase ‘Minnesota farmers’ became the standard term of opprobrium for this largely rural, eighth-grade-educated skilled or semi-skilled northern Midwestern group of Scandinavian origins” (p. 562). The generalizability of such norms to other areas of the country was repeatedly questioned, and the implications of such limited norms have been well described by Pancoast and Archer (1989). In general, normal groups that have taken the MMPI since its original publication have typically scored about 0.5 *SDs* (5 *T*-score points) above the mean, causing test users to have to downwardly calibrate the scores of most normals so as to avoid overinterpreting or overpathologizing their test results. Pancoast and Archer combined various MMPI samples for normal men and women from over 5 decades to demonstrate the inadequacy of the original norms. Their data demonstrate the relative elevation of all other normal samples above the mean of the original normals. Their results also suggest that the scores of normals subsequent to those used in the original standardization generally have not changed across 5 decades of MMPI use, which when considered along with the relative elevation, underscores the fact that the original norms were not an adequate representation of the U.S. population.⁵

Colligan and his colleagues (Colligan, Osborne, Swenson, & Offord, 1983; Colligan et al., 1989), at the Mayo Clinic in Rochester, Minnesota, attempted to provide more contemporary and accurate norms than those provided by the original group of normals. Colligan et al. (1983) tested a contemporary sample of normal

individuals in rural Minnesota to compare the results with the original standardization group. In a critique of their work, Greene (1985) noted important differences between the mean scores on the standard MMPI scales for their contemporary and original samples, generally ranging from 1 to 6 *T*-score points.⁶

Colligan and his colleagues have provided norms for a variety of scales in addition to the basic validity and clinical scales, including Wiggins' (1966) content scales (Colligan & Offord, 1988), Barron's (1953) Ego Strength scale (Colligan & Offord, 1987b), and MacAndrew's (1965) Alcoholism scale (Colligan & Offord, 1987a). Although their norms have not been widely adopted, their efforts further sensitized other MMPI researchers to the need for contemporary norms. Readers interested in using the Colligan et al. data can do so by referring to their useful text (Colligan et al., 1989) containing numerous conversion tables that compare the old norms with their contemporary sample. Readers using their norms, however, must remember that their sampling is not representative of the U.S. population. For a more representative national sample of the nation, the reader is advised to use the recently restandardized MMPI, which will soon be described.

The expansion of the MMPI into settings such as general medicine, forensic and child custody evaluations, outpatient psychotherapy, assessment of disability, and personnel screening has accentuated the inadequacy of the original norms. It appears that the original normals reflected a fixed reference group rather than a true normative sample, and practical implications of such a major deficiency are important to consider. For example, because so-called normals would score slightly higher on the test, they were vulnerable to being "screened out" of sensitive employment positions (e.g., flight crew or nuclear power plant operators) where strict cutoff scores (*T* score above 70) were used. Another problem in the use of the original normal groups was the double duty they were forced to perform. That is, although the item responses by the normals provided the needed contrast for the original criterion groups on which the MMPI clinical scales were developed, this use made the normals inappropriate for the establishment of test norms:

By making the Minnesota normals serve as both a source of contrast for pathological samples and the reference for normative standards, the latter function was compromised. Forcing the normals to perform this double duty, in effect, purged them of their normal levels of abnormality. (Nichols, 1992b, p. 562; see also Pancoast & Archer, 1989)

By not using a new sample of normals to establish the normative standard, Hathaway and McKinley introduced a serious constructional deficiency in the design of the test.⁷ The importance of proper cross-validation is well recognized, but the test constructors did not cross-validate the original keying of items (Helmes & Reddon, 1993). An important consequence of omitting a cross-validation sample involves the basic metric or measurement unit that the MMPI uses to indicate deviation from the norm. Dahlstrom and Tellegen (1993) stated,

The effect of such an omission would be to anchor the *T*-score values on each of the basic scales *too low* and to employ a *T*-score unit that was *too short*, because the

standard deviations would be artificially small on these scales. The impact of inappropriate anchoring and scaling on the scales of the MMPI would be to introduce an excess of false positive scores (i.e., some individuals who are not pathological would earn significantly elevated *T*-scores on one or more of the profile scales. (p. 3)

Another factor that seems to have slightly affected the original MMPI norms relates to the frequency of omitted items by the original normals. Pancoast and Archer (1989) reported a high rate of item omissions (14 items for men and 15 items for women) as calculated from the item endorsement frequencies presented by Dahlstrom and Welsh (1960). The original MMPI test instructions permitted participants to omit items, whereas later users of the test discouraged such omissions. Later samples of adult normals probably reflect an increased compliance with these later instructions, given that participants omit very few items (e.g., Clopton & Neuringer, 1977). The effects on the original norms from item omissions is estimated to have lowered mean *T* scores by about 1 *T*-score point (Pancoast & Archer, 1989). This would still leave about a 4-*T*-score-point difference, on average, between the subsequent groups of normals and the original group, thereby supporting the idea that the original normals were atypical of the general population. Regarding the new sample of contemporary normals assembled for the restandardization of the MMPI, Dahlstrom and Tellegen (1993) stated that

it is possible that the adults in the MMPI-2 re-standardization samples were more willing to give definitive answers to the component items in the inventory than was the case in the original normative groups. If so, this effect would also serve to raise the raw scores and lower the *T*-scores in the norms for the MMPI-2. (p. 3)

Finally, the decision to exclude from the normal sample anyone "under a physician's care" may have contributed to the sample's problematic nature. As Nichols (1992b) pointed out, this criterion was not operative in the revision of the MMPI leading to the MMPI-2. Excluding all participants under a physician's care introduces more atypicality into the original normal group.

In addition to inappropriate and obsolete norms, other internal problems affected contemporary use of the MMPI. Many items had become outdated and difficult to understand or were objectionable to individuals completing the test. For example, many test takers found some items pertaining to bodily functions to be intrusive or offensive (e.g., "I have had no difficulty in starting or holding my bowel movements"). Many items asking test takers about their religious beliefs (e.g., "I believe there is a God") were also experienced as offensive by some people. The need to modernize the language (e.g., eliminate sexist language) or improve the grammar in many items has also long been recognized. Another complaint voiced by some test takers referred to the 16 repeated items (Gallucci, 1986); these test takers were irked by their perception that these items were put into the test to entrap them (actually the items were repeated to facilitate early machine scoring).

A problem invisible to test takers but noticeable to test interpreters was the lack of percentile equivalency across the linear *T* distributions for the standard scales, thereby making it difficult to make percentile inferences from scale elevations

(Caldwell, 1991; Tellegen & Ben-Porath, 1992; Ward, 1991). The need for a means to directly compare scores across different scales was evident but was not appropriate with the original MMPI (see "Uniform T Scores" later in this chapter for a more detailed explanation of T scores).

Finally, the last reason for revising the MMPI stemmed from the need to revitalize the existing item pool by introducing items and scales that reflect more current diagnostic and therapeutic concerns (Duckworth, 1991a). For example, items relevant to substance abuse, family functioning, readiness for treatment or rehabilitation, and one's ability to return to work were needed. Additionally, scales that could augment the existing validity scales in detecting unreliable and invalid profiles would enhance the usefulness of the instrument. Toward all these ends, the MMPI restandardization project was initiated.

MMPI RESTANDARDIZATION: THE MMPI-2

The project to restandardize the MMPI began in 1982, and the MMPI-2 was published in 1989, along with new test materials that consisted of hand-scoring templates, new answer and profile sheets, new test booklets, and different computer-scoring options, all of which are described in chapter 3.⁸ A new MMPI-2 test manual was also published (Butcher et al., 1989, p. 1). It describes the MMPI-2 as "a broad-band test designed to assess a number of the major patterns of personality and emotional disorders."⁹ The MMPI-2, which is the first revision of the test since its original publication in 1942, is intended for use with adults aged 18 and older.¹⁰

The MMPI-2 is not intended for use with adolescents. It was recognized by the MMPI-2 committee that adult norms would not be applicable to an adolescent form (Archer, 1984, 1987, 1988, 1997). A separate revision of the test was conducted for the sole purpose of developing an adolescent instrument derived from the MMPI-2 and was named the MMPI-A (Adolescent).¹¹ The test was released in 1992. A normative sample representative of the general teenage population was recognized as important for standardizing the MMPI-A, and a shorter version of the test was also considered to be an improvement given that the basic validity and clinical scales were essentially uncompromised. The MMPI-A manual contains detailed information on this instrument (Butcher et al., 1992). Readers seeking a comprehensive treatment of the MMPI-A may consult Robert Archer's *MMPI-A: Assessing Adolescent Psychopathology* (2nd ed.).¹²

The 478-item MMPI-A is intended for adolescents between the ages of 14 and 18, although some individuals who are less than 14 years old can be administered the MMPI-A if they possess the necessary reading level and comprehension abilities, as well as the necessary tolerance and willingness to complete a lengthy inventory. Archer's (1997) textbook should be consulted for administration guidelines for adolescents using the MMPI-A. Because the adolescent norms include 18-year-olds, a clinician who is testing an 18-year-old could use either the adolescent or the adult versions of the MMPI. A general rule as to which test to administer involves assessing characteristics such as the person's reading level and

ability, as well as whether the adolescent is living at home. In general, if the 18-year-old is living outside of the home and working or attending college, the adult version of the test is indicated, whereas if the person is not emancipated from his or her home environment, the MMPI-A should be considered.

To summarize, the MMPI-2 restandardization project ensured continuity with the original MMPI by minimizing changes in the composition of the original validity and clinical scales (Archer, 1997). This meant leaving the *K*-correction factor intact. A contemporary sample of normals replaced earlier outdated norms with new clinical data collected concurrently to assess the validity of new and modified scales. Items were replaced or modified in accordance with the mission of modernizing the language in the test (BenPorath & Butcher, 1989). New scales were created in order to measure contemporary clinical problems, and for this reason new items replaced many rarely scored or obsolete items. An improved metric replaced linear *T* scores to allow test interpreters to more accurately compare scale scores with each other.

It appears that the restandardization project was successful in meeting its goal of maintaining continuity with the original test. Despite initial concerns about the MMPI-2 revision, practitioners generally have adopted the modified test. In a survey of the entire membership of the Society of Personality Assessment regarding its use of the MMPI-2, Webb, Levitt, and Rojdev (1993) found a significant adoption of the MMPI-2 since its publication, with a trend they interpreted as suggesting that the majority of practitioners would be using the instrument within 6 months of their survey. Indeed, it does appear that the majority of individuals are taking advantage of the changes offered by the MMPI-2 (BenPorath, 1993).

EXPERIMENTAL FORM (AX) AND THE MMPI-2 BOOKLET

An experimental booklet (Form AX) was developed for the purpose of testing a new group of normal participants and was the basis for developing the new MMPI-2 booklet. Form AX included all 550 original MMPI items followed by an additional 154 new experimental items.¹⁵ The restandardization committee identified several items that required modification to improve clarity. Eighty-two of the original MMPI items were rewritten for Form AX in order to improve or modernize their language and were empirically studied by BenPorath and Butcher (1989) to assess the psychometric impact of the modifications. These authors administered Form AX to college students along with the original MMPI 1 week later (in a counterbalanced design) to determine the effects of the item changes. They also administered the original test twice to a separate group of participants to serve as a baseline for comparison purposes. Although there were some minor shifts in item endorsements (only nine items), "no significant changes were noted among items rewritten due to sexist language, minor rewording, grammatical changes, ambiguous items, or religious content" (BenPorath & Butcher, 1989, p. 650). Their data also showed that no item-scale correlations changed significantly as a result of rewriting the items. In effect, they found that they could improve the face validity of many items without unduly affecting the operating characteristics