With the recent passage of the Americans with Disabilities Act, public awareness of the personal and social aspects of disability is increasing. In this chapter we attempt to provide some ideas, recommendations, and suggestions to psychologists who are interested in the use of psychological testing in their work with individuals who have sustained an acute-onset physical disability.

The psychological assessment of personality and behavioral disorders following acquisition of physical disability warrants the concern of any practicing psychologist. Although psychometric assessment is considered a hallmark of psychology, inappropriate and insensitive use of psychological instruments with clientele limited in physical capacity can produce erroneous and misleading results and imprecise observations about the respondent. This is a particular concern in rehabilitation, as test interpretations are usually translated into treatment recommendations, disability determinations, and eligibility for federal and state rehabilitation services. Thus, the need to provide expert psychological assessment in this realm is paramount. Unfortunately, the practice of psychological assessment of persons with physical disability has been marked by several misunderstandings and uncertainties. Myerson (1957) observed that psychologists often administer psychometric instruments to persons with disability but interpret the scores as if the respondents were nondisabled. Although this issue has been recently addressed in the standardized

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administration of educational and aptitude tests (e.g., the Scholastic Aptitude Test, the General Aptitude Test Battery; Nester, 1993), few have questioned standardized administration of personality and psychopathology measures. Despite impairments with ambulation, vision, or sensory input, respondents are often bound to the same rules of administration applied to individuals without these limitations. Furthermore, the lack of appropriate norms and comparison groups, as well as the insensitivity of cookbook approaches to item content contaminated by the physical concomitants of acquired disability, limits test interpretation and application. Not surprisingly, then, a personality profile might reveal that a respondent with a physical disability was preoccupied with physical sensations or ailments. Critics have justifiably argued for the development of separate norms so that meaningful and appropriate comparisons can be made with peers who have similar physical limitations. Additionally, other established instruments might be administered, with caveats for considering the influence of the disability experience on responses to certain items.

Yet psychometric calibrations do not nullify the negative effects of prevailing uninformed professional views of persons with physical disability. Many clinical and counseling psychologists are trained to administer psychometric instruments with the explicit intention of detecting problematic areas for intervention (Wright & Fletcher, 1982). Ideally, the selection of any psychometric measure and assessment system should be intricately connected to a logical intervention program, generally (Kanfer & Saslow, 1967) and to rehabilitation, specifically (Glueckauf, 1993). Nevertheless, the impetus for psychological evaluation in the rehabilitation setting has been characterized by a preoccupation with the level of distress in reaction to acquired disability, the predisposing characteristics that might be related to the onset of disability, and the inevitable and deleterious impact of physical disability on personality functioning over time. For example, stage models—based primarily in Freudian psychodynamic conceptions—have consistently stipulated that the onset of a physical disability induces depression, which may or may not be preceded or followed by an array of other stagelike phenomena, including denial, compromise, and eventual acceptance (for a review of these models see Frank, Elliott, Corcoran, & Wonderlich, 1987). In part, these interpretations may be driven by the expectation that people with acquired disability are preoccupied with the limitations and concomitants imposed by the physical condition (Wright, 1983). Alternatively, these assumptions may reflect reckless generalizations from studies with small sample sizes.
(Bourestrom & Howard, 1965) or from personal observations of some distressed patients of rehabilitation units (Elliott & Frank, 1990; Elliott, Yoder, & Umlauf, 1990). At any rate, the association between psychopathology of some sort and physical disability is rarely questioned in many psychological training programs.

When conducting psychological assessment within the inpatient rehabilitation setting, it is critical that the trained psychologist keep in mind the concerns regarding confidentiality and the sharing of sensitive clinical information. In a landmark book regarding ethics within the criminal justice system, Monahan has presented the concept of “who is the client?” (Monahan, 1980). This same question needs to be carefully considered prior to any psychometric assessment with individuals who have a newly acquired disability in the inpatient rehabilitation setting.

There are many clients for whom the psychologists may be performing the task of psychometric assessment. In some cases, the client may be the attending physician, who has requested assessment and assistance in determining how best to work with a given patient. However, there also may be other questions and concerns related to who this client may actually be. It is quite possible that the client may be the entire inpatient rehabilitation team, excluding the patient. It is critical that the clinician be sensitive to the reality that psychological test data must be carefully interpreted within the context of the particular setting. The patient should always be considered part of the rehabilitation team, and interpretation and disclosure of test data should always be in the best interest of the patient. There are published studies regarding the use of psychological test feedback to patients in assisting implementation of change (Lewak, Marks, & Nelson, 1990); yet this same process has not yet been evaluated within the inpatient rehabilitation setting.

In many cases, assessment instruments may be applied primarily for a client other than the patient. If this is the case, this needs to be openly discussed and presented to the patient prior to the completion of the assessment proceedings. It is quite possible that an individual with an acute onset disability may be involved in litigation or the criminal justice system. In this scenario, the clinician should consider which assessment tools are used and also how those tools are interpreted and included in the patient’s medical record. In other cases, the psychologist may have a primary alliance with the team over and above the alliance with the patient. These concerns need to be carefully evaluated and examined in order to provide the most appropriate and honest appraisal of test selection and interpretation (Eyde, Robertson, & Kruege, 1993). In addition,
another "client" may be embodied in a program evaluation project. There may be complications regarding how research data are presented or included within the clinical setting. Client confidentiality and the appropriate sharing of information require informed consent and careful consideration regarding the audience who will entertain interpretations of test data. The rehabilitation psychologist may be the only individual adequately trained to understand the impact of sharing clinically sensitive data obtained from psychometric assessment tools.

In this chapter, we review many of the major measures of behavioral disorders and personality and their utility in the evaluation of individuals with acquired physical disabilities. We provide basic psychometric information for each instrument and refer to sources that can provide appropriate normative data for use with people with disabling conditions (if these are available). Caveats regarding the use of each instrument are offered. Our comments are based primarily on empirical research and clinical experience with adults who have acquired physical disability; although the instrumentation may vary, the assessment issues we address are pertinent to the psychological assessment of children and adolescents who incur physical disability (Richards, Elliott, Cotliar, & Stevenson, in press). Measures of psychopathology, including broad measures of psychological functioning (the Minnesota Multiphasic Personality Inventory, the Millon Clinical Multi-Axial Inventory, the Symptom Checklist-90, and the Brief Symptom Index) are reviewed. Measures specific to the assessment of depression are then surveyed. Finally, we review contemporary measures of trait and social–cognitive measures of personality constructs.

**Measures of Psychopathology and Maladjustment**

**Assessment of Psychological Adjustment**

*Minnesota Multiphasic Personality Inventory (MMPI)*

Use of the MMPI and the MMPI-2 has been extremely broad, varied, and useful for psychologists in many different settings. The original instrument was developed in the 1940s at the University of Minnesota. It is important to recognize that this instrument was designed primarily for screening psychiatric patients, and there have been relatively few normative studies done with disabled populations. Yet the MMPI has become one of the most widely used psychological testing instruments in behavioral health (Piotrowsky & Lubin, 1990). Fordyce (1964) was one of the
first to look at the use of the MMPI with individuals with spinal cord injuries (SCI). His initial work examined the different causes of injury and possible MMPI profiles that may be related to that type of injury. It is important to note that in this early study relatively low levels of pathology were found within the sample. Additionally, observed elevations were quite common when compared with other same age and same gender individuals (e.g., young college-aged males engaged in high-activity events). Thus, one of the early cautions in using the MMPI is that an appropriate comparison sample needs to be used in the clinical interpretation and decision-making process.

A more serious concern regarding the use of the MMPI relates to the physical concomitants of a specific disability rather than emotional or psychopathological concerns. In the first study of item-related confounds on the MMPI, 12 items were identified that significantly differentiate individuals with and without spinal cord injury (Taylor, 1970). This concept was expanded in a later study to look at empirical, factor-analytic evaluation of the MMPI correction factor for persons with SCI (Kendall, Edinger, & Eberly, 1978). This latter study corroborated Taylor's initial findings and also expanded our interpretive insights with the MMPI among people with SCI. Essentially, both studies found that five uncorrected scales produce higher elevations (Scales 1, 2, 3, 4, and 8) among those with SCI. It is typically useful, then, to score the MMPI twice: once with these items included and once with them deleted. This multiple scoring provides a range of response patterns, giving the clinician greater insight into the impact of physical descriptor items that can confound interpretation.

In the MMPI-2, significant efforts were taken to revise outdated and confounding items from the original instrument (Butcher, Dahlstrom, Graham, Tellegen, & Kaemer, 1989). The MMPI-2 provides newer normative data, the deletion of certain items, and alterations of outdated items. There are also additional content scales and supplemental scoring profiles that provide better assessment of validity and reliability. However, the Taylor correction (1970) was not replicated for use with the MMPI-2 and to date has not been reevaluated. Because the item order from the MMPI to the MMPI-2 has changed, it may be time-consuming to translate the item-order change; several of the items from the original MMPI were either significantly changed in wording or omitted. However, there may be several clinical situations in which it may be extremely useful to examine the variation in clinical profiles using the Taylor correction. Thus, it may be a wise investment to score the profile twice to examine the range and variability on the items in the Taylor correction. Future re-
search could provide valuable information and enhance the use of the MMPI-2 in the clinical rehabilitation setting by examining the Taylor correction with this instrument.

Alternatively, many clinicians may find a recent study by Rodevich and Wanlass (in press) useful. These researchers clinically derived a T score correction procedure for MMPI-2 profiles from persons with SCI. Their correction procedure was developed in a different fashion than the original Taylor (1970) correction, and is therefore in need of replication. Nevertheless, Rodevich and Wanlass (in press) relied on expert raters to determine 28 items judged to be potentially confounded by the physical sequelae of SCI, and their sample size was larger than that in the Taylor (1970) study. The resulting procedure may be an efficient method for examining MMPI-2 profiles in the rehabilitation medicine setting.

Several authors have written about the difficulty in administering and developing computerized forms of the MMPI with individuals who have limited upper extremity capacity (Kewman & Lieverman, 1982; Richards, Fine, Wilson, & Rogers, 1983). The revised MMPI-2, as presented by National Computer Systems, allows for an interactive computer-based assessment that—with minor adaptations—allows someone with upper extremity impairment to complete the instrument with relatively few difficulties. However, the protocol has 567 questions and can be quite tiring for someone who has limited upper extremity capacity or for an individual who has retained physical capacity skills but is still in an acute-care status. Although no empirical data are available, there may be concerns regarding split-half reliability and consistency over time if this test is administered to someone who fatigues easily while sitting upright. There is a series of abbreviated MMPI scoring systems (Mini-Mult, MMPI-168, etc.), yet these have severe limits on validity and application regarding the prediction of specific personality factors. The incredible breadth, length, and variety of individual items is one of the primary reasons that MMPI is widely used.

Another issue stems from possible forensic or court-related testimony involving the patient (e.g., litigation, criminal proceedings). It is not uncommon for people injured in accidents (e.g., motor vehicle accident, faulty product, drinking and driving) to have an attorney assisting the patient in determining legal outcome. This might include a third-party lawsuit or criminal proceedings. In either case, it is not unrealistic for the psychologist to be subpoenaed to provide a professional opinion regarding the impact of the injury on the client. In these cases, the use of the
MMPI can provide a strong empirical basis for rendering an opinion (Kurleychek, 1983).

A more complicated issue with the MMPI concerns confidentiality and feedback. It is very common for the MMPI to be administered to inpatients in a hospital. Frequently, attending physicians request an evaluation of a patient’s psychological status. It is important to keep in mind that the patient’s mental set regarding who has access to this information can significantly influence the way in which the test is completed. If assessment results will be used as a part of a multidisciplinary team meeting, this needs to be carefully but honestly presented to the patient. It is clinically advisable to converse with the patient and provide direct, honest feedback about the test results (Lewak et al., 1990). To date, there have been no published studies regarding the ways in which psychological test data—such as the MMPI-2—affect the ways in which rehabilitation teams interact with a patient with a physical disability. Yet we have often observed psychology colleagues who present psychological interpretations from the MMPI in team rounds while neglecting to give such feedback to the client.

In summary, the MMPI-2 is a very powerful and useful instrument in assessing severe psychopathology, and it is a relatively valid and reliable tool in personality and psychopathological assessment. However, there are specific limits and concerns that the skilled clinician needs to take into consideration regarding interpretation and application of information garnered from the MMPI in the rehabilitation setting. Unfortunately, a thorough search of available computer databases (PsycLit, MEDLINE) reveals no contemporary research with the MMPI-2, physical disability, or medical rehabilitation. Clearly, further research regarding the physical descriptor factors within the MMPI-2 and subsequent normative data could prove very useful.

**Millon Inventories**

Millon has developed a very extensive and theoretically based set of assessment tools for use in clinical settings. The Millon Clinical Multiaxial Inventories (MCMI) provide a rapid assessment of both Axis I and Axis II diagnostic information. The MCMI-2 is one of the few psychological tests that can provide diagnostic information congruent with the criteria of the Diagnostic and Statistical Manual of Mental Disorders, third edition, revised (DSM-III-R); the recent MCMI-III presumably coincides with DSM-IV criteria. The Millon Behavioral Health Inventory (MBHI) can also provide information that allows the clinician to obtain a broader assessment of the patient’s attitudes toward health and health professionals. The pri-
mary strength of the Millon scales is the theoretical linkage to the diagnostic nomenclature. This strength can also be considered one of its weaknesses, as it is strongly oriented toward the detection of pathology. One of the caveats within the MCMI-2 manual stipulates the need for careful consideration of the patient population and why the test is being administered. The same concerns addressed in the introduction and the previous section on the MMPI should be taken into account when presenting information to the rehabilitation team as well as the patient.

A patient with a personality disorder on an inpatient unit can generate significant concerns for a rehabilitation staff. Any clinician who has worked with a patient with a severe borderline personality disorder on an inpatient unit knows the major turmoil that ensues when this patient becomes distressed, “splits” staff, or inappropriately discharges strong emotion. Thus, it can be helpful when a skilled clinician uses an instrument such as the MCMI-2 to assist in differentiating severe personality disorder from an individual who may be experiencing significant frustration and emotional distress that may accompany the inpatient experience in rehabilitation medicine.

Unfortunately, there are no available empirical studies to provide normative data for the use of the Millon scales in the rehabilitation setting. Because this is an unstudied area, the clinician needs to be very careful regarding inferences made based on these types of tests. Several items on the MCMI and MCMI-2 describe physical sensations that can reflect actual experiences following traumatic injury (e.g., “Lately, I’ve been sweating a great deal and feel very tense,” “I very often lose my ability to feel any sensations in parts of my body,” “I have a hard time keeping my balance when walking”). The confounding effects of these items on profiles gleaned from patients in the rehabilitation setting is unknown.

One study in progress is examining the use of the MBHI on the inpatient SCI unit (Moverman, 1993). Essentially, the MBHI can provide useful screening data to the rehabilitation team regarding an individual patient’s health attitudes and personality factors that may influence the patient’s compliance and cooperation with the rehabilitation program. This ongoing study concerns the utility of this tool as a primary screening instrument, rather than psychodiagnostic tool per se.

In summary, the Millon scales may be useful in determining DSM-III-R diagnostic data in a rapid and easily administered format. However, there are significant clinical concerns regarding how these data will be shared within the medical setting. Patients may be pathologized by the rehabilitation team on the basis of Millon results. Further research should
provide more updated normative data regarding the incidence, prevalence, and scale elevations for people in the inpatient and outpatient rehabilitation setting.

**Derogatis Scales of Psychological Functioning**

The Symptom Checklist-90-R (SCL-90-R; Derogatis, 1977) and the Brief Symptom Inventory (BSI; Derogatis & Spencer, 1982) were designed to assess the intensity of several psychological complaints. The SCL-90-R contains 90 items that are rated on a scale from 0 (*not at all*) to 4 (*extremely*). There are nine clinical scales measuring Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism. Three global distress indices are generated from the overall item responses: The Global Severity Index, Positive Symptom Distress Index, and Positive Symptom Total. Test–retest reliability coefficients for the duration of 1 week range from .78 to .90; internal consistency coefficients have ranged from .77 to .90 (Derogatis, 1977). The Global Severity Index (GSI) has been considered by the author as the best overall measure of global psychological distress: It is an index of the depth of the problems reported by the respondent. The Positive Symptom Distress (PSD) measure is purported to reflect the intensity of the problems reported. Finally, the Positive Symptom Total (PST) provides a count of the number of positive symptoms endorsed by the respondent. The SCL-90-R is a pencil-and-paper questionnaire, requiring respondents to read each item and respond directly onto the questionnaire. Raw scores are transposed into clinical scores with the use of the normative data provided in the manual. Validity coefficients for each scale are provided in the manual.

The BSI is a 53-item self-report measure of psychological distress derived from the SCL-90-R. The authors maintain that the BSI is appropriate for medical populations (Derogatis & Melisaratos, 1983). Each item on the BSI is rated on a 5-point scale (ranging from 0 = *not at all* to 4 = *extremely*). Respondents are required to indicate the degree to which they have experienced a particular symptom in the previous week. The authors report adequate internal consistency coefficients for the 9 subscales ranging from .71 to .85 (Derogatis & Spencer, 1982), and similar coefficients have been found in other research (.75 to .89; Boulet & Boss, 1991). The authors report adequate test–retest reliabilities (.68 to .91 over a 2-week period), and correlates with other psychological measures (e.g., the MMPI) support the convergent, discriminant, predictive, and construct validity of the BSI (Derogatis & Melisaratos, 1983). As in the case of the SCL-90-R,
The BSI provides three global indices of distress (the GSI, the PSD, and the PST). The BSI has evidenced relatively high scale-by-scale correlations with the SCL-90-R.

The SCL-90-R has been used in a variety of methods in the rehabilitation setting. For example, the SCL-90-R subscales were used as dependent variables in a study of persons with limb amputations and distress as a function of age and time since amputation (Frank et al., 1984). Means and standard deviations for this sample are available in that report. Generally, the large majority of patients with spinal cord injury report adequate adjustment on the basis of SCL-90-R scores (Buckelew, Frank, Elliott, Chaney, & Hewett, 1991). If a score of .65 is considered to be an elevation of clinical concern, it is notable that Buckelew et al. (1991) found no single subscale score to warrant the interpretation of significant distress, based on their sample of 106 persons with SCI. In a fine-grain analysis of the reliability and validity of the SCL-90-R in a rehabilitation setting, Buckelew and colleagues found the internal consistency coefficients varied considerably between items that measured cognitive—affective status and other items that assessed more somatic complaints (Buckelew, Burk, Brownlee-Dufeck, Frank, & DeGood, 1988). Furthermore, the interitem correlations displayed some variation between the different samples (people with SCI, those with chronic pain, and a control group of college students).

In one important preliminary study of psychological aspects and rehabilitation outcome, Malec and Neimeyer (1983) found the SCL-90-R depression scale to be significantly predictive of length of hospitalization among persons with spinal cord injury, and GSI scores were significantly predictive of patient self-care skills. Additionally, the SCL-90-R depression scale and the GSI evidenced significant correlations with the Beck Depression Inventory (.89 and .86, respectively). Another study has found GSI scores to be lower among patients with internal expectancies for health outcomes (Frank, Umlauf, et al., 1987). People with SCI and who are experiencing higher levels of life stress have evidenced significantly higher SCL-90-R profiles than those individuals with lower levels of life stress, regardless of the time since the onset of SCI (Frank & Elliott, 1987). Cross-sectional and longitudinal research have found that patients with SCI who have elevated profiles on the SCL-90-R demonstrate less adaptive coping strategies in response to their injury, including wish-fulfilling fantasy, emotional expression, self-blame, and threatenization (Buckelew, Baumstark, Frank, & Hewett, 1990; Hanson, Buckelew, Hewett, & O’Neal, 1993).

Applications of the Brief Symptom Inventory have determined that
this measure does not provide a parallel profile of the SCL-90-R when used with individuals with SCI (Tate, Kewman, & Maynard, 1990). Tate et al. (1990) found that BSI profiles for 79 people with SCI were significantly higher on all scales than the normative sample provided by the test developers, and scores from the Obsessive–Compulsive, Interpersonal Sensitivity, Depression, Psychoticism, and GSI scales from the BSI were significantly lower than scores on the SCL-90-R among persons with SCI. Many of the items endorsed on the BSI might reflect somatic symptoms that are common physical concomitants of SCI. In an extension of this work, Tate, Forchheimer, Maynard, Davidoff, and Dijkers (1993) determined that the BSI depression scale is a sensitive index of depression among those with SCI (Tate et al., 1993). This study also found the reliability coefficients of the BSI ranged from .74 to .87 for the sample, and the BSI depression scale was significantly correlated (.53) with the Zung self-rating depression scale (Zung, 1965). However, these authors could not replicate the nine factor solution reported by the developers of the BSI with the sample of people with SCI. The BSI depression scale had a high degree of specificity toward the prediction of depression (87%) for this sample. More recently, BSI norms for people with spinal cord injury have been developed (Heinrich, Tate, & Buckelew, 1994), and a correction factor is currently being developed for BSI profiles from patients with spinal cord injury (Tate, personal communication, February, 1994).

Summary

Although many clinicians have acclimated to the routine use of broad-based measures of psychopathology and maladjustment, time constraints and physical limitations of patients in the rehabilitation setting dictate a judicious application of these instruments in medical rehabilitation. The MMPI-2, for example, may not be an appropriate device for assessing inpatients with a newly acquired disability. Other disciplines and therapists will vie for time to conduct thorough evaluations for comprehensive rehabilitation, and the patient may be physically unable to leave the hospital room or maintain a sitting position to complete the questionnaire. Furthermore, a psychologist may find more specific, refined instruments more compatible with a bedside interview. Individuals with relatively uneventful behavioral patterns may produce flat profiles, giving a clinician very little to say regarding personality functioning and treatment recommendations. Other devices—such as the BSI and SCL-90-R—may provide no more than a calibration of a patient’s current level of distress. Finally, many patients may simply find the content of some items to be
intrusive, offensive, or irrelevant, and the worth of psychological service 
may be held suspect. Judicious use of these tools is urged, with careful 
regard to the preinjury history of the patient and the needs of the par-
ticular clinical setting. The MMPI may be best suited for outpatient services 
in which the psychologist has limited opportunity to observe patient be-
behavior. Similarly, the Millon scales may be ideal in elucidating medical 
and psychosocial adjustment issues when evidence of maladjustment has 
been documented, particularly when neglect and noncompliance with 
therapeutic regimens is suspected.

Assessment of Depression

Given the long history of clinical preoccupation with depressive symp-
tomatology in the rehabilitation literature, this behavioral phenomenon 
has received extensive clinical and empirical attention. Unfortunately, 
many of the clinical studies have relied on anecdotal observations and are 
thus highly biased (for critical review see Frank, Elliot, et al., 1987). No-
table studies that have used standardized, reliable diagnostic systems have 
repeatedly found that depression—as a clinical syndrome with clearly 
defined parameters—is not an inevitable reaction to the onset of acquired 
physical disability (Frank, Kashani, Wonderlich, Lising, & Visot, 1985; 
Fullerton, Harvey, Klein, & Howell, 1981; Howell, Fullerton, Harvey, & 
Klein, 1981; Kashani, Frank, Kashani, Wonderlich, & Reid, 1983). These 
studies indicate, however, that a significant minority of persons with phys-
ical disability display depressive behaviors at some time following the onset 
of injury. Furthermore, interview systems may sometimes be clinically 
cumbersome and time consuming. Therefore, the use of self-report in-
struments as screening devices in the rehabilitation setting is highly de-
sirable. Several popular measures of depression have been scrutinized in 
this regard.

The Center for Epidemiological Studies—Depression Scale (CES-D)
The CES-D was designed to measure depressive symptomatology in the 
general population (Radloff, 1977). This questionnaire contains 20 items 
designed to assess current levels of depressive behavior, with a particular 
emphasis on the impact of depressed mood. Items are keyed on a 4-point 
scale, ranging from rarely or none of the time to most or all of the time. Re-
pondents indicate how often they experienced each symptom in the 
preceding week. Scores on the instrument range between zero and 60, 
and a score greater than 16 has been found to differentiate depressed
from nondepressed adults in community samples (Craig & Van Natta, 1978). Radloff (1977) has reported internal consistency coefficients ranging from .84 to .90 in several field applications. Turner and McLean (1989) reported an alpha coefficient of .88 for a sample of individuals with physical disabilities \((N = 731;\) Turner & McLean, 1989).

Studies utilizing the CES-D in the investigation of depression following spinal cord injury have yielded interesting yet disparate results. For example, Schulz and Decker (1985) found the mean score on the CES-D \(9.7\) was very similar to the average score reported by the general population \(9.2\). However, a study of a larger sample of community residing adults with SCI found the mean score for this group to be higher than that of the general population, and the average score of the female respondents was significantly higher than that of the male respondents \(14.7\) and \(11.1\), respectively; Fuhrer, Rintala, Hart, Clearman, & Young, 1993). The CES-D scores of persons with amputations has been found to be slightly higher than those of the general population \(11.31;\) Rybarczyk et al., 1992). In the most thorough study of the CES-D among people with acquired physical disabilities to date, Turner and McLean (1989) found that individuals with severe physical disabilities had a higher mean score than those with less severe disabling conditions \(16.65\) and \(11.05\), respectively). Additionally, these researchers noted a variation in scores as a function of age, but gender differences were minimal. Finally, these scores were higher than those of a community sample, and the authors concluded that individuals with physical disability should be considered at risk for the development of depressive symptomatology.

Empirical research has also revealed meaningful correlates of CES-D scores. For example, decreased levels of social support have been associated with higher CES-D scores among community residing persons with SCI (Rintala, Young, Hart, Clearman, & Fuhrer, 1992; Schulz & Decker, 1985). Schulz and Decker (1985) found that higher CES-D scores were associated with poor self-assessed health status and decreased perceptions of control over one’s life. Fuhrer et al. (1993) found CES-D scores were significantly predictive of social integration, occupation, and mobility as measured by the Craig Handicap Assessment and Reporting Technique (Whiteneck, Charlifue, Gerhart, Overholser, & Richardson, 1992) after controlling for the variance attributable to self-reported functional independence and functional level of disability. Finally, systematic research by Rybarczyk and colleagues (Rybarczyk et al., 1992; Rybarczyk, Nyenhuis, Nicholas, Cash, & Kaiser, in press) has found that those who experienced greater social discomfort following leg amputation evidenced
higher CES-D scores. Thus, the CES-D appears to have considerable clinical and theoretical value for use in the rehabilitation setting.

**Beck Depression Inventory (BDI)**

The BDI is a 21-item self-report measure of depressive symptoms and their severity (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). Each item has a 4-point response option to note the degree of severity. Research has displayed relatively high correlations between the BDI and other self-report measures of depression (e.g., Tanaka-Matsumi & Kameoka, 1986). Respondents are to describe their experience on each item for the preceding week. Items are rated on a 0 (*not at all*) to 3 (*extreme form of each symptom*) scale. The BDI has adequate internal consistency (.84) and correlations with other depression measures among college students range from .54 to .68 (Tanaka-Matsumi & Kameoka, 1986). A total score is derived by summing the responses to each particular item.

The BDI has been used in several clinical and theoretical investigations of adjustment to acquired physical disability. Malec and Neimeyer (1983) found the BDI total score to be significantly predictive of length of inpatient stay among 28 patients. The average score for their sample was 11.04. The BDI was also correlated highly with the SCL-90-R GSI score (.86), the SCL-90-R depression scale (.96), the MMPI-168 factor score (.83), and the D scale from the MMPI (.77). Frank and Elliott (1987) found that patients experiencing high levels of life stress had significantly higher depression scores than patients with SCI with lower levels of life stress (11.81 and 5.2, respectively). Similarly, Frank et al. (1984) found that younger individuals had higher BDI scores than older individuals as time progressed following amputations. Umlauf and Frank (1983) found that patients with higher BDI scores expected to be hospitalized longer and had lower levels of functional independence and mobility than those with lower scores. In a second study, patients with spinal cord injury who had the highest expectations of recovery of functional abilities reported the lowest BDI scores of three patient subgroups, and they displayed a greater change in activities of daily living following rehabilitation (Umlauf & Frank, 1987). Longitudinal research has demonstrated that differences between people with SCI and community-residing adults without disability are pronounced immediately following discharge from inpatient rehabilitation, but these differences can dissipate within the course of a year (Richards, 1986).

The BDI has been criticized for having items that may be confounded by the physical sequelae of acquired physical disability. These items relate
to physical appearance, ability to work, weight loss, and the report of physical problems such as constipation. Many of these symptoms commonly occur following the onset of physical disability (Peck, Smith, Ward, & Milano, 1989). Other evidence suggests that although somatic items on depression scales such as the CES-D and the BDI may bias prevalence estimates of depression on patients with chronic physical conditions, correlations between depression scores and other psychological variables are not likely to be adversely inflated (Blalock, Devellis, Brown, & Wallston, 1989).

**Inventory to Diagnose Depression (IDD)**
The IDD is a 22-item self-report instrument developed to measure depressive behavior (Zimmerman, Coryell, Corenthal, & Wilson, 1986). This instrument contains an attractive feature unknown in other self-report depression inventories. It is designed to provide (a) categorical diagnoses of major depressive disorder (MDD) according to DSM-III criteria and DSM-III-R criteria, (b) binary decisions about the presence or absence of individual symptoms, and (c) severity estimates of depressive symptomatology. Test-retest reliabilities and internal consistency markers have been impressive in comparison with interview systems and other self-report measures of depression. For example, test-retest reliabilities have ranged from .91 to .93 (Zimmerman et al., 1986; Zimmerman & Coryell, 1987). These studies also report internal consistency coefficients of .92. Comparisons with interview systems and other self-report measures of depression have revealed correlations ranging from .80 to .87 (Zimmerman, Coryell, Wilson, & Corenthal, 1986; Zimmerman & Coryell, 1987). The IDD requires a respondent to indicate the severity of each symptom of depression on a 5-point Likert scale. The sum of these responses provides a total severity score that serves as a single index of depressive behavior. The IDD items are designed so that a binary decision can be made regarding the presence or absence of a symptom, according to clinical severity. For example, an item score of zero represents an absence of disturbance, a score of 1 represents some clinical severity, and a score of 2 or more is considered to be a positive symptom endorsement (Zimmerman et al., 1986).

Several studies have related the IDD total scores to psychological and demographic variables of interest. Elliott and Harkins (1991) found that individuals with spinal cord injury complaining of persistent pain had elevated IDD scores in comparison with those patients without pain. Goal-directed, problem-focused orientations have been found to be important
characteristics of persons with SCI who report fewer problems as measured by the IDD (Elliott, Godshall, Herrick, Witty, & Spruell, 1991; Elliott, Witty, Herrick, & Hoffman, 1991). Higher IDD scores have also been associated with decreased leisure activities (Elliott & Shewchuk, 1995), lower assertiveness (Elliott, Herrick, et al., 1991), lower levels of social support (Elliott, Herrick, Witty, Godshall, & Spruell, 1992), and an increased likelihood to develop secondary complications among persons with SCI (e.g., decubiti, urinary tract infections; Herrick, Elliott, & Crow, 1994).

Frank et al. (1992) found the endorsement of dysphoria—represented by symptoms of negative self-evaluations, depressed affect, and suicidal ideation—constituted a core element of depression common to persons with SCI, individuals with rheumatoid arthritis, college students, and community-residing adults. This study also indicated that 11% of a sample with SCI met clinical criteria for major depressive disorder, in comparison with 4% of the community-residing adults and 14% of patients with rheumatoid arthritis. In a Bayesian analysis of individual symptoms to assess diagnostic value to predict depression among persons with SCI, endorsement of lack of interest or pleasure was the best diagnostic indicator of depression for persons with paraplegia. Symptoms efficiently predicting major depressive disorder for persons with paraplegia and those with quadriplegia included psychomotor disturbance, appetite change, and sleep disturbance (Clay, Hagglund, Frank, Elliott, & Chaney, in press). However, inability to concentrate best predicted the presence of major depressive disorder among persons with quadriplegia. These studies suggest that the contribution of somatic items on the IDD may be less important to the identification of depression among persons with acquired physical disability than originally assumed.

**Zung Self-Rating Depression Scale (Zung)**
The Zung scale (Zung, 1965) has 20 items that are rated on a 1 (*some of the time*) to 4 (*all of the time*) Likert scale. The Zung scale was developed to assess the severity of psychological and physiological manifestations of depression. Acceptable alpha coefficients have been documented (e.g., .81; Tanaka-Matsumi & Kameoka, 1986). Validity coefficients with other measures of depression have ranged from .61 to .81 (Schaefer et al., 1985). Evidence indicates that the Zung scale has better validity coefficients with DSM-III criteria for depression than other popular self-report measures (Schaefer et al., 1985). A Zung score greater than 55 is considered in-
indicative of a diagnosis of major depression (Schaefer et al., 1985; Zung, 1965).

In the most comprehensive study to date of the Zung scale in a rehabilitation setting, Davidoff et al. (1990) found the mean score for a sample of people with SCI was significantly higher than the average score from a community sample (49 vs. 37.1). A somatic subscale score from the Zung was calculated, and the score for those with spinal cord injury was predictably higher than the average score for the control group (16.6 vs. 11.6). However, the affective subscale score was also higher for those with spinal cord injury (22.6 vs. 18.1). Demographic variables and characteristics related to type of injury and injury onset were unrelated to Zung scores among people with SCI. Further study revealed no significant differences between mean scores on a battery of neuropsychological tests between patients with SCI categorized as either depressed or nondepressed on the basis of the Zung scale (Davidoff, Roth, Thomas, & Doljanak, 1990). Finally, a recent study has concluded that the Zung may be a very effective tool for identifying individuals with SCI who are at risk for developing clinical levels of depression during or following hospitalization (Tate et al., 1993).

Summary
The heightened clinical and research focus on depression enables us to make several observations regarding the utility of these measures. The CES-D has an established value as a research instrument, but clinicians preferring a thorough screening device may prefer administering the Zung. This instrument contains fewer items potentially confounded by physical disabilities and has a higher correlation with interview methods for diagnosing depression. Other clinicians, who have the time and investment in face-to-face interviews with persons with newly acquired disabilities, may use the Inventory to Diagnose Depression as a semistructured interview. The IDD covers criteria necessary for determining clinical diagnoses for major depression; in an initial interview a clinician may inquire further about the history and course of each symptom. Such information may be pivotal in selecting appropriate medical and psychosocial interventions. In comparison, the Beck Depression Inventory may be too confounded by somatic-based items; nevertheless, it is relatively easy to administer and may be used repeatedly to monitor adjustment over time (e.g., Richards, 1986).

It may be particularly important to scrutinize reported problems in separate domains of cognitive (low self-worth, lack of pleasure, hope-
lessness, etc.), affective (sad, mood, irritability, etc.), and somatic (sleep disturbance, appetite disruption) complaints to determine effective intervention in the rehabilitation setting. Sleep disturbance—a common complaint among persons with recent onset SCI—can induce mood disturbance and decreased energy that can potentially impair motivation and performance in therapies. These may be addressed with psychopharmacological interventions. Cognitive aspects of depression may warrant psychological interventions. Thus, discarding somatic items on depression scales can potentially eliminate valuable information for the rehabilitation team effort. It is recommended that the psychologist carefully review symptom patterns on any depression measure and rely less on any total score.

Measures of Personality

Measures of nonpathological, "normal" personality in the rehabilitation setting have not been covered in the clinical and the theoretical literature as much as the instruments surveyed earlier in this chapter. Clinical preoccupation with aberrant behaviors culminating in or subsequent to the onset of acquired disability have dominated the attention of clinicians and theorists alike. Therefore, very few comments can be made based on prior empirical studies with nonpathological personality instruments in rehabilitation, despite the attractive qualities of these measures and the obvious appropriateness of these devices for use with this clientele. We briefly review several trait and social—cognitive measures of individual differences.

Trait Measures of Personality

Neuroticism, Extroversion, and Openness Personality Inventory (NEO-PI)
The NEO-PI (Costa & McCrae, 1985) is a measure of trait aspects of personality. The NEO-PI is based on the five-factor model of personality that has recently stimulated considerable research (Digman, 1990). As defined by the developers, the five-factor model of personality consists of Extroversion, Neuroticism, Openness to Experience, Conscientiousness, and Agreeableness. Neuroticism refers to a general disposition toward the experience of negative affectivity, a sense of vulnerability, emotional instability, maladaptive coping, unrealistic ideas, and excessive cravings. Extroversion is defined as the propensity for interpersonal interaction,
stimulation, and positive affectivity. Openness to Experience encompasses the appreciation of experience, intellectual curiosity, and aesthetic sensitivity. Agreeableness refers to the individual's interpersonal orientation in terms of thoughts, feelings, and actions, including trust, altruism, and sympathy. The Conscientiousness scale assesses preferences for structure, organization, self-discipline, and motivation in goal-directed behavior.

The NEO-PI consists of 181 items that are rated on a 5-point scale (ranging from strongly disagree to strongly agree). Internal consistency coefficients range from .85 to .93 for the Neuroticism, Extroversion, and Openness to Experience scales; coefficients range from .76 to .86 for the Agreeableness and Conscientiousness scales, respectively (Leong & Dollinger, 1990). Test–retest coefficients acquired from an adult sample at 3- and 6-year intervals indicate temporal stability for the five scales, with coefficients ranging from .64 to .85 (McCrae & Costa, 1991). Substantial study has correlated the five studies with a variety of similar and dissimilar measures to establish convergent and divergent validity (Costa & McCrae, 1985).

Although the NEO-PI has been well-received, it has yet to be systematically studied in the rehabilitation environment. In the one application to date, Rohe and Krause (1993) found that individuals with SCI scored higher on the fantasy subscale and the Openness to Experience factor than a normative sample; those with SCI also scored higher on the excitement-seeking facet of the Extroversion factor. However, those with SCI scored lower on two other facets of Extroversion (assertiveness, activity) and on the Conscientiousness factor than the normative sample. The clinical implications of these data have yet to be explored, and results may certainly be specific to the population sampled by the researchers. It is notable that no significant differences occurred on the Neuroticism scale, which contains several items that could have been potentially confounded by their reference to physical sensations and complaints. According to the developers of the NEO-PI, Neuroticism should predict emotional distress among persons with acquired disability, and Conscientiousness scores may be associated with adherence to therapeutic regimens. Nevertheless, these possibilities require empirical scrutiny.

**Sixteen Personality Factor Questionnaire—Form E (16PF)**
The 16PF-Form E is a personality inventory based on the factor analytic description of personality promoted by Cattell (Cattell, Eber, & Tatsuoka, 1970). Form E has 128 items with a fixed, forced-choice response format. It measures 16 primary normal personality characteristics and five second-
order dimensions. The second-order dimensions—Extroverted, Adjusted, Tough-Minded, Independent, and Disciplined—are thought to parallel the “big five” factors assessed by the NEO-PI (McCrae & John, 1992). The Form E manual has extensive normative data for individuals with a wide array of physical impairments (Eber, Cattell, & IPAT Staff, 1985).

The use of the 16PF and its psychometric properties among persons with various disabilities has been discussed in some detail elsewhere (Brookings, Bolton, & Young, 1994; Bolton & Brookings, 1993a). The 16PF is often favorably considered for several reasons. The personality dimensions assessed by the 16PF appear to be relatively independent of psychopathology (Bolton & Dana, 1988) and self-concept (Bolton, 1979) among persons with physical disabilities, sensory impairments, behavioral disorders, and mental retardation. The purported primary and secondary factors have been replicated among these clients (Bolton, 1977), and the profile scores have been meaningfully related to vocational interest patterns (Bolton, 1986). A computerized scoring package has been developed for use with similar clientele (Bolton, 1987).

Several observations can be made regarding the use of the 16PF with people who incur physical disabilities. Prior research supports the basic structure and psychometric adequacy of the instrument with this population, and thus it can provide a cogent description of personality that can be potentially useful to the person, the psychologist, and the rehabilitation team. The utility of these dimensions in light of the broad research on personality, generally, and the relation to indices of adjustment and performance criteria germane to rehabilitation medicine settings is less clear. There are many unresolved issues concerning the theoretical properties of the 16 factors in the extant literature. Consequently, clinicians employing the 16PF rely primarily on research conducted by Cattell and his colleagues to draw meaningful inferences about presumed behaviors and characteristics of respondents. When the 16PF has been studied in other arenas (e.g., substance abuse rehabilitation), it is often used in an atheoretical fashion. Perhaps contemporary research will examine correlates of the secondary factors as proxies of the “big five” personality dimensions with behavioral health and rehabilitation populations.

Finally, the 16PF scores may not be sensitive predictors of environment-specific behaviors (e.g., work satisfactoriness; Bolton & Brookings, 1993b) among those with disabilities. Despite this shortcoming, Brookings et al. (1994) advise that the 16PF can be a useful component of an overall
assessment package with vocational rehabilitation clients. Research examining the relation of 16PF scores to rehabilitation outcomes among those with acquired physical disabilities is certainly warranted.

**Personal Styles Inventory**

The Personal Styles Inventory is designed to measure normal-range characteristics according to a circumplex model. The characteristics assessed by this inventory are considered commonplace, everyday behaviors that are easily recognized and interpreted by clients (Kunce, Cope, & Newton, 1993). Personal styles are measured in three key subsystems including styles of expressing emotions, behaving, and thinking. Each style is explained in terms of its relationship to two major personality dimensions, including extroversion (vs. introversion) and stability (vs. change). Furthermore, scores are presented in terms of a client’s “natural” proclivity (termed basic behavior), and present manifestations of these styles (termed current behavior). Thus, the model defines eight global personality traits and demarcates an individual’s current preference on each dimension in contrast to fundamental characteristics.

All scores on this instrument are described in terms of everyday behaviors. High and low scores on each scale indicate only the strength of the style, and no single item is uniquely sensitive to any form of psychopathology. Additionally, none of the items refer to physical problems or health-related complaints.

The instrument has been subjected to considerable psychometric investigation, and adequate reliability and validity coefficients are presented in the manual (Kunce et al., 1993) and in introductory overviews (Kunce, Cope, & Newton, 1991). Of striking importance is the emphasis on the nonpathological assessment of personality characteristics in three broad domains (thinking, emotional expression, and behavior) on the dimensions of extroversion and preference for change.

The instrument may be particularly sensitive to the environmental press that individuals with stigmatizing conditions encounter following the onset of physical disability. For example, an individual may have a rather basic style in the three domains that is subsequently challenged by physical and psychological barriers that often accompany physical disability, or by the demands of the inpatient rehabilitation setting. This instrument may prove sensitive to the different reactions individuals have to the rehabilitation environment, value changes that can occur following the onset of disability, and the wide range of reactions to therapeutic regimens typically prescribed to persons with severe and permanent in-
juries. The manual provides case examples and insightful comments for applying the instrument in career assessment, counseling interventions (e.g., self-insight, reframing, interpersonal skills, defining personal goals), team building, and medical staff consultation (Kunce et al., 1993). Particular attention is given to rehabilitation issues in personal adjustment and vocational counseling (Kunce et al., 1993; pp. 51–56). The manual also contains normative data for comparative purposes. This instrument may have great potential for use with staff and patients in a rehabilitation setting.

Social-Cognitive Measures

Locus of Control (LOC)
The perceived degree of control over behavior reinforcement has been applied in several studies of reaction to acquired disability. Unfortunately, the nature of measurement has often varied, ranging from the use of unidentified locus of control (LOC) measures (e.g., Shadish, Hickman, & Arrick, 1981) to the use of domain-specific scales (e.g., a sex-related LOC measure; Linton, 1990). Although the use of domain-specific LOC measures is theoretically consistent with social learning models, it weakens the generalizability and clinical relevance of the research. Studies have found that an internal orientation has been related to lower depression scores (Shadish et al., 1981) and to shorter length of stay in rehabilitation hospital (Swenson, 1976). One program of research has used the Multidimensional Health Locus of Control Scale (MHLOC; Wallston, Wallston, & DeVellis, 1978). The MHLOC is an 18-item questionnaire to assess health-related expectancies for reinforcement. Individuals rate each item on a 6-point scale. Three subscales are provided: Internal, Chance, and Powerful Others. Ratings for items loading on each respective factor are summed to make up the three subscale scores. Internal consistency coefficients for the subscales have ranged from .67 to .77, and correlations with similar measures of generalized expectancies have ranged from .28 to .80 (Wallston et al., 1978). Relevant research indicates the test–retest coefficients for this scale over a 7-month period indicate that the Internal and Powerful Other subscales are relatively stable over time (.58 and .76, respectively), but the Chance subscale may lack temporal stability (.10; Winefield, 1982). Preliminary data indicated that the Chance and Internal subscales correlated significantly with health status in theoretically consistent directions (Wallston et al., 1978). The Internal and Chance subscales have been shown to be salient predictors of distress
and adjustment among persons with a variety of health concerns (Wallston, 1989).

Higher scores on the Internal subscale have been related to lower depression scores (Frank, Umlauf, et al., 1987), and external expectancies have been related to decreased mobility and activities of daily living (Umlauf & Frank, 1983, 1987) for rehabilitation patients. However, factor analytic work with a sample of patients in a rehabilitation medicine setting did not replicate the three-factor solution reported by the developers (Umlauf & Frank, 1986). These researchers found considerable overlap between the Chance and Powerful Others subscale items, indicating a general external factor. Notably, the Internal factor was replicated. Therefore, the Internal construct appears to be of particular merit in the assessment of persons with acquired disabilities.

**Problem Solving Inventory (PSI)**
The PSI is a measure of self-appraised problem-solving ability (Heppner, 1988). The PSI assesses the degree to which individuals perceive a high degree of confidence in their ability to solve everyday problems (the Problem Solving Confidence factor), their ability to regulate emotional reactions to problems (the Personal Control factor), and their general tendency to approach rather than avoid problems (the Approach–Avoidance factor).

The PSI contains 32 items that are rated on a 6-point Likert scale (1 = strongly agree to 6 = strongly disagree). Separate scores are derived for these factors and a total score is computed by summing the factor scores. Reliability estimates reveal that these constructs are internally consistent (alpha coefficients range from .72 to .90; N = 150) and stable over a 2-week period (test–retest correlations range from .83 to .89; N = 31; Heppner, 1988). Validity estimates have accumulated over several studies, revealing that the PSI total score and subscales are significantly related in predicted directions with a variety of self-report and observational measures (Heppner, 1988). Lower PSI scores denote a more positive appraisal of personal problem solving skills.

The PSI has been correlated in meaningful directions with several variables pertinent to rehabilitation. In one study, self-appraised effective problem solving was associated with lower depression scores and less psychosocial impairment secondary to disability among 90 individuals with SCI (Elliott, Godshall, et al., 1991). Effective problem solving was also associated with a greater willingness to behave assertively in tense situations among the sample. Other research has found self-appraised prob-
lem-solving skills can moderate the effects of social support to psychosocial functioning of individuals with SCI (Elliott, Herrick, & Witty, 1992). Herrick, Elliot, and Crow (in press) found that the tendency to approach and define problems was associated with a lower incidence of secondary complications among 53 people with SCI. The models of problem solving have particular clinical importance, as this perspective leans heavily on a cognitive–behavioral tradition that emphasizes the role of social learning in the acquisition of particular problem skills. Thus, individuals who score lower on problem-solving skills may benefit from cognitive–behavioral interventions designed to enhance their problem-solving repertoire (Nezu & Perri, 1989).

**Summary of Nonpathological Scales**

Many psychologists shy away from nonpathological personality measures for a variety of reasons. Some scales provide a relatively circumscribed, unidimensional assessment of personality functioning, thus limiting clinical utility. Other clinicians prefer to screen for evidence of psychopathology or emotional maladjustment. Yet many of these devices are geared toward intervention techniques that can be applied in the rehabilitation setting, and others yield information that may prove most useful in enhancing patient self-awareness and growth. These measures may be most helpful in exploring relative strengths and concerns for each respondent that could be addressed in rehabilitation programs. Ideally, informed psychologists will be attuned to the assessment of personal resources and capabilities in the psychological evaluation of persons with acquired disability, and nonpathological personality instruments will then be incorporated into assessment batteries.

**Clinical Applications**

When considering the utility of different instruments, the psychologist should carefully consider the needs of each client in the treatment setting. In the inpatient rehabilitation setting, for example, patients may be limited by their level of injury, endurance, and attention span. The psychologist may be compelled to conduct an in-depth bedside assessment with occasional disruptions and a lack of privacy. Nevertheless, it is imperative that the psychologist ascertain basic behavioral styles and current psychosocial status. Thus, a clinical interview may be significantly aug-
mented by the use of a broad-based measure of nonpathological personality predispositions and a more specific measure of psychological adjustment. For these reasons, the first author routinely administers the Personal Styles Inventory to patients admitted for initial rehabilitation, as this device has nonthreatening items and results can be easily communicated to staff and patient. The Inventory to Diagnose Depression is used as a semistructured interview, offering several opportunities to inquire about other relevant behavioral patterns and reactions (e.g., leisure interests, anxiety-related symptoms, sleep-related problems, concerns about sexuality) in the initial interview.

In contrast, the second author has conducted many psychological evaluations of outpatients involved in litigation surrounding the onset and course of the disability (e.g., tetraplegia acquired in a motor vehicle accident). These patients have typically been seen 1 year postinjury, and the representing attorney is very interested in testing results. In these situations, the MMPI (or MMPI-2), scored with and without the Taylor correction, is an extremely useful tool. With the multiple validity scales, the extensive research base, and the rich forensic literature, this tool is an excellent choice when the potential exists for expert witness testimony. Combined with a thorough clinical interview and review of medical records from hospitalization, the multiple “clients”—the patient, the attorney, the court, and the expert witness—can all be served.

Other situations may dictate domain-specific measures. Some patients return to the inpatient setting years after injury onset with debilitating complications from neglect and poor adherence to self-care regimens. Individuals with spinal cord injuries, for example, are susceptible to decubitus ulcers (i.e., pressure sores) if they do not adhere to regimens for periodic pressure reliefs and daily skin checks. Patients who develop these conditions may have deficiencies in systematically defining and solving problems generally (Herrick, 1991). Others may feel little control over health outcomes and may harbor fatalistic attributions about their health. Thus, an evaluation may be enriched with the inclusion of the Problem Solving Inventory and one of the Health Locus of Control scales. However, other patients with these conditions may be too preoccupied with outstanding characterological issues. A recent case seen by the first author involved a 26-year-old man with three diagnosed pressure ulcers in a period of 7 years, each requiring expensive surgical repair and postoperative care. Responses to the Millon Clinical Multiaxial Inventory revealed significant elevation (over a base rate of 75) on the histrionic—gregarious and the dependent—submissive scales. Other evaluations of
patients with decubiti and suspected neglect have revealed significant elevation on scales pertaining to narcissistic, passive–aggressive, sociopathic, and schizoidal tendencies. Presumably, these characterological problems contribute to inabilities to engage in routine, daily health maintenance behaviors. Profiles on the MCMI (and MCMI-2) may lend insight into patient dynamics that impede adherence and provide staff direction for meaningful psychosocial interventions.

Concluding Remarks and Unresolved Issues

Many issues remain elusive in the assessment of individuals with physical disabilities at this point. Some of these issues pertain to issues specific to those with mobility impairment; others reflect problems encountered by practicing psychologists in our diverse society. Most of them have yet to be illuminated with programmatic, insightful research.

To a great extent, we have glossed over possible confounds that might exist in the lack of standardized administration of instruments with persons with mobility deficits. Several instruments have been adapted for computer applications with persons who have mobility impairments (e.g., the MMPI), and some questionnaires may be administered in an interview format (e.g., the IDD). The degree to which the means of administration confounds response patterns is basically unknown. Although there has been some literature on the possible differences between self-report and interviewer-administered versions of the MMPI, this has not been replicated with our population of interest. This is a potential confound in any assessment practice, and we do not know if different administration procedures radically affect the results of the instruments we have covered in our discussion.

Physical disability may exert an influence as well on other aspects of psychological assessment. Profiles on the MMPI can be artificially elevated by reasonable concerns about physical functioning, and correcting for these response patterns can restore a sense of normalcy to the profile in comparison to normative data. However, honest attention and frank openness about physical functioning and certain sensations may in fact be adaptive among those with severe physical disabilities. The lack of attention and openness about such matters may indicate an unwillingness to attend to such matters, or a careless disregard for one’s physical health. This type of surveillance may be critical in maintaining health and staving off secondary complications (e.g., decubitus ulcers, infections) that often
result from personal neglect and poor adherence to behavioral regimens. It may be that we may err in our attempt to normalize profiles without taking into consideration the unique demands that might accompany a severe physical disability.

Furthermore, our lack of sensitivity to the environmental press imposed on individuals with disability may alter response patterns. We simply do not know the degree to which personality is affected by the acquisition of a physical disability and resulting environmental press that follows in its wake. Ultimately, this is an issue that can never be completely resolved: Longitudinal research would provide limited insight into possible changes on response patterns from the time of onset to some point in time after injury. There is evidence, however, that indicates measurable behaviors persist after the onset of physical disability. For example, recent programmatic work has found that individuals with significant blood alcohol levels at time of injury report more significant substance abuse problems preinjury (Heineman, Mamott, & Schnoll, 1990) and many resume their patterns of substance use within the first postinjury year (Heineman, Keen, Donohue, & Schnoll, 1988). Additionally, vocational interest patterns have demonstrated remarkable stability over several years among a sample of persons with SCI (Rohe & Athelstan, 1982). It is possible that certain behavioral patterns, then, persist following the onset of physical disability and over time.

Unresolved issues concerning predictive validity may circumscribe our ability to make meaningful predictions about these instruments and the occurrence of future behaviors. Several global social–cognitive variables have been associated with self-reported levels of distress and adjustment, but we have yet to understand the relation of these constructs to secondary complications indicative of behavioral adherence to therapeutic regimens (e.g., decubitus ulcers). Commonplace personality constructs may provide a general description about an individual but very little insight about future behaviors in a specific context. Bolton and Brookings (1993b) found that behaviorally based observational ratings were better prospective predictors of work satisfaction than 16PF scores. Observational ratings tied to clearly defined behavioral criteria may be better indicators of later performance in specific environments than self-report personality variables.

An unexplored issue germane to our diverse society pertains to cultural sensitivity. Much has been written about the impact of ethnicity on the assessment process, generally; research has yet to examine these issues in the rehabilitation setting. National trends indicate that more people
of African American and Hispanic heritage are acquiring severe physical
disability, and these persons are more likely than Caucasians to incur
disability from acts of violence (Elliott, Richards, DeVivo, Jackson, &
Stover, 1994). Preliminary evidence indicates that people of African
American descent are less likely to be employed following disability than
Caucasians with similar conditions (James, DeVivo, & Richards, 1993),
and rehabilitation outcomes may be meaningfully related to an array of
environmental and personality characteristics (e.g., ethnicity of the service
provider, self-esteem; Asbury, Walker, Belgrave, Maholmes, & Green,
1994). It is imperative that future researchers closely examine cultural
factors in assessment and outcomes for rehabilitation efforts to be deliv-
ered efficiently to these clients.

Finally, the selective attention to certain presumed tendencies and
affective reactions has needlessly limited our sensitivity to other problems
among people with acquired physical disabilities. Anecdotal research, in
particular, has focused on depressive behaviors; empirical research has
often sought to identify the “imprudent, impulsive, and excitement seek-
ing” tendencies of those who might jeopardize their health by risk-taking
activities prior to injury (e.g., Fordyce, 1964; Rohe & Krause, 1993).
Thorough research that uses more objective and specific measures of
“imprudence” and sensation-seeking have failed to support this latter
hypothesis (Ditunno, McCauley, & Marquette, 1985) and it is likely that
all of these studies are quite sensitive to sampling and the vagaries of
catchment areas for separate clinics.

More important, clinicians suspect that anxiety disorders are com-
mon in the rehabilitation medicine setting. There are several plausible
reasons for this. Many persons sustain physical disability in acts of violence
(e.g., assaults) and trauma (e.g., falls, motor vehicle accidents). Symptoms
of posttraumatic stress disorder and other anxiety syndromes are observed
among persons victimized by violence, crime, and naturally occurring
traumatic events (Norris & Kaniasty, 1994; Resnick, Kilpatrick, Dansky,
Saunders, & Best, 1993). Many of the social anxieties reported by indi-
viduals with severe physical disability parallel specific diagnostic criteria
for generalized social phobia (e.g., fear of being watched, fear of embar-
rassing accidents; Dunn, 1977; Dunn & Herman, 1982). No systematic
research has examined the incidence, prevalence, and correlates of anx-
iety disorders among persons with acquired physical disability, and the
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