Sam Goldstein
Jack A. Naglieri
*Editors*

# Assessing Impairment

## From Theory to Practice

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For Janet, Allyson, and Ryan. This work is dedicated to the thousands of people of all ages I have been privileged to work with and have learned so much from.

S. G.

This text is dedicated to Andrea (and my son-in-law Scott), Antonia, and Jack Jr. for their love and support over the years.

J. N.

Our thanks to Judy Jones for sharing our vision and willingness to break new academic ground. Thanks also to Kathleen Gardner for the management of this project and preparation of the final manuscript.

S. G. and J. N.

Our greatest glory is not in never failing, but in rising up to every time we fail.

*Ralph Waldo Emerson*

It is not because things are difficult that we do not dare, it is because we do not dare that they are difficult.

*Seneca*

The reasonable man adapts himself to the world. The unreasonable man adapts the world to himself. All progress depends upon the unreasonable man.

*George Bernard Shaw*

# Foreword

Impairment is a requirement for the diagnosis of most, if not, all Axis I psychiatric disorders in the Diagnostic and Statistical Manual for Mental Disorders (4th ed.) and is an inherent part of the very concept of disorder if relatively objective and evolutionary conceptualizations of it, such as those by Wakefield (1997), are to be of use to us. It is therefore with much satisfaction and considerable excitement that I approach the appearance of this book dedicated to issues related to the concept of impairment and its definition and measurement. My satisfaction derives from finally seeing a book-length discussion of these issues as they pertain to various domains of major life activities and to various psychiatric and psychological disorders. It is high time for an in-depth and scholarly treatment of the subject. And, my excitement arises from the breadth, detail, and scope of this wide-ranging new book and the much-needed information it sheds on this construct called impairment and its related issues. Drs. Goldstein and Naglieri are to be congratulated for bringing together a formidable array of accomplished authors offering us a variety of chapters and perspectives that address this construct and its controversies. Many thanks are owed to them for undertaking a project on what at first blush may seem like a boring, strictly academic topic, yet it is one that is exceptionally important to the field of mental health and mental disorders.

If impairment is the linchpin criterion in defining when an excess of deficiency in human behavior and cognition rises to the level of a mental or medical disorder, then that construct of impairment needs to come under serious scrutiny for how it is to be operationally defined. Issues of measurement and the construct validity of those measures are secondary ones that presume some satisfactory and useful operational definition of the construct exists. Until then, asking if a measure has construct validity is moot as there exists no reliable conceptual standard against which to judge it. If impairment is to be defined in any scientifically acceptable way, then that definition must include some objective standard or anchor point in reality against which we can all judge if that standard has been met. This cannot be achieved by definitions of impairment that are based purely on the dissatisfaction or unhappiness of the person claiming to be impaired in some domain of performing a major life activity. Personal suffering in and of itself is far too subjective and susceptible to the mere whim-worshipping of the individual to give this view more than passing consideration. And, as several chapters note here, using one's general intelligence as the platinum standard against which to judge all other human psychological traits or one's performance in various major life activities is fraught with numerous problems, not the least of which is that its conceptualization and measures of it were never originally intended to serve as the guiding light for judging strengths and weaknesses in all other human abilities. Intrapersonal disparities between any human psychological ability and IQ as the sole definition or standard of impairment would lead to people being judged impaired and hence disordered even when those psychological abilities still fell within the generally normal range of the population. This consequence alone makes a mockery of the very terms *impairment and disorder*.

No, we must do better than this in our search for an objective means to define both of these constructs. Following the hopefully now outdated perspective of postmodernism that says impairment and disorder are to be whatever the group, culture, or society wish them to be will also be a conceptual dead end as long as we seek even a quasi-objective standard for these terms. So, too, will be any notion that impairment, like its sister concept of disorder, should be defined as being judged as in need of treatment by others. This also is subjective as there is no external standard being used in any individual's judgment that permits us to determine if their judgment is, in fact, correct (accurate). If words are to mean anything and if there is an objective reality "out there" (there is or developing knowledge or even science would be impossible), then we must identify some standard outside any individual's mind against which the rest of us can judge for ourselves whether it has been met.

Herein rests the beauty of this text. It raises these and many other issues, offers an in-depth treatment of them and the related issue of measures of impairment, and proffers some guidance out of this conceptual thicket. I am personally enamored of the view, espoused here in several chapters such as those by Lovett, Gordon, and Lewandowski, that the term must be defined relative to the average person or population norm for performance in that domain of major life activity as it sets an objective benchmark against which one can judge impairment. And, I am also in agreement with Fabiano and Pelham and others that our judgment of effective treatments for disorders must do more to include measures of impairment and not just reductions in symptoms if we are to judge how well such treatments reduce the social consequences of those disorders. After all, isn't that the point of treatment? Symptoms alone are not enough to meet this standard of disorder. As I have defined these terms previously, such symptoms are the cognitive and behavioral expressions of an individual that may signal the presence of a disorder, while impairment means the consequences in reality that ensue from those expressions. Symptoms are what you do, impairments are the things that happen to you when you do them. Impairment is reflected in the ongoing dance between the individual's behavior and the individual's environment representing the judgment or voice of that environment (reality) in reply to the person's behavior toward it. To be distractible and prone to speeding with a motor vehicle are examples of behavior that may reflect symptoms (in this case, of attention deficit/hyperactivity disorder [ADHD]), not evidence of impairment. If such actions result in frequent traffic citations by police, increased crashes with motor vehicles, a suspension or revocation of one's license to drive, or a rise in one's insurance premiums, the latter clearly reflect degree of impairment as they represent the consequences in reality (both physical and, within that, social) that stem from these symptoms. Symptoms and impairments may be highly correlated, moderately so, or not significantly correlated, depending on such factors as the age of the person being evaluated (some impairments become increasingly linked to symptoms with age), the domain of impairment (symptoms may affect some major life activities but not others or do so far less likely), one's sex (the same symptoms in a woman may have a differential social impact in certain major life activities than in a man or vice versa, especially given the division of labor that may exist in some domains between the sexes), whether the symptoms are more or exclusively cognitive (such as obsessional thinking) than behavioral (speeding with a motor vehicle), how each is being measured (ADHD symptoms with rating scales and impairment using a high school transcript or Department of Motor Vehicle record), to name just a few such factors. The fact that symptoms do not correlate highly with outcomes in one particular domain while doing so in another major life activity does not undercut the concept of either disorder or impairment, although it is highly informative about the precise nature and pathways through which symptoms lead to various impairments.

These and many, many other issues are broached and thoughtfully considered by a splendid pool of chapter authors. As a result, I suspect this book may set the current standard for subsequent discussions of this issue. One can only hope that members of the work groups now constructing the fifth edition of the *Diagnostic and Statistical Manual* of the American Psychiatric Association and future work on the 11th edition of the *International Classification of Diseases* are paying attention to this work and these issues. To publish yet another edition of these works that includes the concept of impairment for diagnosing most disorders without so much as a single definition of this term or offering conceptual guidance to its users would be grossly negligent indeed. My sincere thanks to Drs. Goldstein and Naglieri and these chapter authors for tackling such an important issue in the field of mental disorders.

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# Preface

We have devoted our professional lives to the identification, assessment, and treatment of the developmental, cognitive, behavioral, and emotional problems that have an impact on a significant percentage of our population across the life span. In the mental health and educational fields alone, thousands of tests, procedures, and diagnostic criteria have been created with the goal of identifying adversities and making a positive difference in the lives of affected individuals. For many years, however, we have erroneously assumed that higher scores on our tests and absence or reduction in symptoms equated with less impairment and better quality of life. Impairment is not best predicted by symptoms or diagnoses. As many of the authors of this volume attest, we are still a very long way from understanding all of the powerful forces that ultimately combine to explain why some very disabled individuals lead lives of minimal impairment and vice-versa.

In our clinical practices, we meet and work with individuals who have diverse medical, mental health, and educational disabilities. Our experience has taught us a valuable lesson about impairment. Not all individuals with similar disabilities, disorders, or symptoms are equally impaired in everyday life. We have come to view with awe individuals with significant disabilities harnessing resources within themselves and their environment to live lives of minimal impairment. Our appreciation of just how important establishing a viable working definition of impairment is and providing a single resource for discussion on this topic led us to edit this volume. We anticipate that this examination of impairment and its relevance to diagnosis and treatment will help define a new era in the understanding of mental and educational disabilities. We are therefore indebted to the creative and visionary ideas of the many contributors to this volume. Their ideas and research will shape the future of this important field.

Sam Goldstein, Ph.D.
Jack A. Naglieri, Ph.D.

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**Jack A. Naglieri, Ph.D.,** is professor of psychology and faculty in the school psychology program at George Mason University. Prior to his current position, he was professor of school psychology and psychology at the Ohio State University, where he taught from 1982 to 2000. He also is a Fellow of APA Division 16 and recipient of the 2001 APA Division 16 Senior Scientist Award, and he holds an appointment as a senior research scientist at the Devereux Center for Resilient Children. The author of more than 250 scholarly papers, chapters, books, and tests, he has focused his efforts since the late 1970s on theoretical and psychometric issues concerning intelligence, cognitive interventions, resilience, and IDEA reauthorization.

Drs. Goldstein and Naglieri are co-editors-in-chief of the Encyclopedia of Child Development. They are coauthors of the *Practitioners Guide to Assessing Intelligence and Achievement*. With Sally Ozonoff, they have coedited *Assessment of Autism Spectrum Disorders*. They have developed multiple assessment tools including the Autism Spectrum Rating Scale and are currently collecting data for a clinical tool to assess impairment across the life span to be published by Multi-Health Systems.

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# Chapter 1
# Defining the Evolving Concept of Impairment

Sam Goldstein and Jack A. Naglieri

In Western medicine, the medical model guides diagnosis and treatment in all aspects of medicine and mental health. The purpose is to identify treatments for diagnoses based on evidence of specific symptoms assumed to suggest problems inherent within one or more organs of the human body. The medical model has driven research and theory about physical and mental health problems on the basis of causation, symptom relief, and cure and in some cases has been quite successful (e.g., tuberculosis, measles, etc.). As the fields of medicine and psychology have evolved, interest in the degree of impairment, regardless of the diagnosis, has increased.

Until very recently, functional impairment has not been a major focus in diagnosis or treatment in either physical or mental health problems. This interest has been sparked by an emerging body of literature that has suggested that symptoms and functional impairment need to be considered separately in making diagnostic decisions and evaluating treatment response (Bird et al., 1996) because symptoms and impairment appear to be separate (e.g., orthogonal) concepts (Barkley et al., 2006; Eriksen & Kress, 2005). These findings suggest that the lives of individuals who do not meet specific symptom criteria may be just as impaired and disrupted as the lives of individuals who meet various criteria. Further, many who may meet symptom count for a specific diagnosis may not be significantly impaired. It is therefore not surprising that in the most recent revision of the American Psychiatric Association's (APA's) *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision* (APA, 2000) a requirement of significant impairment is noted in more than 70% of the disorders listed as a criterion for diagnosis (Lehman, Alexopoulous, Goldman, Jeste, & Ustun, 2002. Given trends that are demonstrating an increased incidence of mental health and physical symptoms across the population (Castle, Aubert, Verbrugge, Khalid, & Epstein, 2007), it is not unexpected that there is an increasing need to demonstrate functional impairment as part of the diagnostic process. In addition, in this volume a foundation is given to further appreciate why understanding impairment is by far the most important and greatest challenge facing medical, educational, and mental health care providers today. This assumes, of course, that impairment can be defined.

Webster's New College Dictionary (2008) dictionary defines the word *impair* as "the state or fact of being impaired," which means to be weakened or damaged based on the Latin word *pejor* meaning worse. To be impaired means to be unable to perform whatever daily activities are required. But, exactly how does impairment relate to symptom count and severity of a specific condition? How do symptoms and impairments contribute to disability, handicap, and deficits in adaptive functioning? It is our intent in this comprehensive volume to begin addressing these and other critical issues in this emerging area of research and practice. If our assessment is correct, there has and will continue to be an increasing focus on functional impairment in medical and mental health diagnosis and treatment. The need to appreciate the available literature in this area and even more so to address many unanswered questions is paramount. Yet, there is no agreement on even the simplest of nomenclature issues about impairment. The term *impairment* is used differently by medical, mental health, and educational professionals. Without a clear definition, the task of quantifying a method for evaluating impairment will be difficult and the application of this important construct in clinical practice further delayed. The contributions in this volume highlight these issues and begin to lay a foundation to develop a consensus model of functional impairment and, more importantly, the role of impairment in diagnosis and

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treatment. Table 1.1 summarizes terminology that is relevant to the study of impairment.

The complexity of the measurement of functional impairment is no better demonstrated than in the difference of definitions for the term *impairment*. In the medical model, impairment specifically refers to some adverse level of physical functioning within the body. In the mental health model, impairment refers to the functional limitations imposed as the result of some psychological disorder. In the mental retardation field, impairment would appear to be related to the level of adaptive behavior and intellectual deficit. In the educational arena, impairment has traditionally been defined as a discrepancy between expected level of performance and actual level of performance (Individuals with Disabilities Improvement Act [IDEA], 2004) without much attention paid to whether an individual can adapt and still manage to function effectively within an educational arena despite such a discrepancy. Finally, within the field of resilience research, resilience and impairment can be expected to be inversely related. The more difficulty an individual experiences in the face of adversity, the less resilient the individual is and thus the more impairment is evidenced. Table 1.2 summarizes these cross-disciplinary differences.

We can take a simple example of a child's activity level to illustrate these differences. A parent is asked to evaluate whether he or she believes his or her child is overactive. The parent endorses a high level of activity. This represents a symptom. In and of itself, it does not necessarily speak to any level of impairment. The parent is then asked whether the child's excessive activity level causes problems and, if so, in what situations? The parent endorses the dinner table as a source of problems. At this point, we know that the symptom presents in a specific situation to a significant degree. The level of impairment is still unknown. The parent is then asked whether the child is capable in any situation

**Table 1.1** Key definitions

| Key term | Definition |
|---|---|
| Impair | To weaken or damage |
| Impaired | To be unable to perform whatever daily activities are required |
| Impairment | The state or fact of being impaired |
| Symptoms | A physical or mental feature regarded as indicating a condition of disease; a sign of the existence of something of an undesirable situation |
| Disability | A physical or mental condition that limits a person's movements; a disadvantage or handicap; with respect to an individual, a physical or mental impairment that substantially limits one or more of the major life activities of such individual, a record of such an impairment, or being regarded as having such an impairment (Individuals with Disabilities Improvement Act [IDEA], 2004) |
| Disabled | Having a physical or mental condition that limits a person's movements, senses or activities |
| Injury | The fact of being injured, harmed, or damaged |
| Injured | To suffer physical harm or damage of one's body |
| Adaptive | Making something suitable for a new use or purpose; modifying to a new condition |
| Adaptive behavior | A type of behavior that is used to adapt to another type of behavior or situation |

**Table 1.2** Existing conceptualizations of impairment

| Condition | Definition |
|---|---|
| Mental health | The consequences that ensue for an individual as a result of symptoms (Barkley et al., 2006) |
| Medical | A significant deviation loss or loss of use of any body, structure, or function in an individual with a health condition disorder or disease (*International Classification of Diseases [ICD] (2007)*) |
| Mental retardation | Limited intellectual ability and adaptive behavior as expressed in conceptual, social, and practical skills (American Association on Intellectual and Developmental Disabilities [AIDD], 2008) |
| Educational | A discrepancy between actual and expected performance |
| Resilience | Lack of capacity to function effectively in the face of adversity |

of sitting still, and the parent responds affirmatively. The parent notes, however, that at the dinner table the child does not sit still. The parent is further asked if the child knows how to properly use dinner utensils and feed him- or herself. The parent again responds affirmatively. At this point, it is clear that the child possesses adaptive skills. That is, the child knows what to do but, as the parent describes, is not doing what he or she knows. This represents a failure to exhibit adaptive behavior but in and of itself is still short of providing the needed information about functional impairment. The parent is then asked to describe what takes place during dinner. Because of the child's symptom severity, an insufficient number of calories is consumed, and food is spilled. This phenomenon represents the impairment caused by this child's hyperactive behavior.

## Why Should We Care About Impairment?

### *Impairment as a Diagnostic Criterion*

Lewandowski, Lovett, and Gordon note in chapter 2 of this volume that, despite the inclusion of an impairment criterion in two thirds of mental health diagnoses, it remains uncertain whether clinicians adhere to this practice. As Gordon, Lewandowski, Murphy, and Dempsey (2002) noted, it appears that most clinicians count symptoms when making diagnoses rather than making directed efforts to assess impairment. Chapter 2 authors address important issues about the relationship between symptoms and impairment, inquiring whether individuals who have greater behavioral manifestations of certain conditions may have more negative life consequences. They conclude that in general this is the case, but it remains the fact that far too many variables remain to be addressed before a thorough understanding is developed between symptom count, severity, and functional impairment.

### *Impairment as the Target*

As the authors of most of the chapters included in this volume note, the true measure of quality of life is not found in symptom count but in one's ability to successfully perform daily activities. Walker reports in chapter 11 that accurate assessment of a disability, in particular in the vocational arena, should be the primary concern of professionals as well as public policy makers and society in general. The enormous direct and indirect costs to the population at large are driven by these functional impairments, not symptom count or severity. Walker notes that the critical link between impairment and disability is functional capacity. Disability evaluation must accurately assess functional capacity to truly understand the impact of an injury or handicap on everyday life. He points out the traditional limitations in assessment of impairment, focusing primarily on the traditional medical model of physical capability rather than everyday life.

### *Knowing What to Do or Doing What You Know*

As Ditterline and Oakland describe in chapter 4, some individuals may not know what to do, yet others may know what to do but fail for one reason or another to do so in a functional way. Understanding functional impairment requires an appreciation of the interaction between physical capability, past learning, mental health, and most importantly, environmental factors. As these authors note, each influences the other. An individual may, absent any level of disability, have not had opportunities to learn and develop functional skills. Thus, failure to exhibit functional skills may not be a function of disability but lack of ability. Further, in the face of a specific health or mental health disorder, this person may be even more impaired than someone with a history of functioning capably prior to the onset of their illness.

As Eagle describes in chapter 3, impairment has a widespread impact that extends beyond the individual. Family functioning routines, activities, and relationships between family members are ultimately impacted. Thus, as Eagle points out, conceptualization and understanding of impairment must take on an ecological perspective. Some families may have a number of adversities and fewer resources, which can increase the likelihood of impairment in any of its members when problems are encountered. The issue of impairment is also relevant throughout the life span. In chapter 10, Tuokko and Ritchie address the issue of impairment in the geriatric population.

## *Additional Problems in Assessment of Impairment*

As of this writing, there is no comprehensive, valid, reliable, evidence-based system to assess impairment. Research on interrater reliability reflects that most efforts to measure impairment suffer from problems (Brigham, Uejo, Dilbeck, & Walker, 2006), making evaluation results inconsistent across clinicians.

Despite multiple laws directed at protecting the rights and avoiding discrimination of those with disabilities, impairment rarely plays a role in determining, appreciating, or evaluating the need for accommodation and support.

The issue of the reference point for establishing impairment (e.g., comparison to the average person standard, perhaps) continues to be debated.

## Conclusion

It is our intent that this volume begins the important process of creating a consensus for an integrated, cross-disciplinary, conceptual model of impairment. Such a model must include defensible definitions of terminology, methods of assessment, and most important, methods to measure treatment success. We believe this volume advances this agenda and sets the stage for important future work and enhanced clinical practice.

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# Chapter 2
# Measurement of Symptom Severity and Impairment

Lawrence J. Lewandowski, Benjamin J. Lovett and Michael Gordon

Brenda, a fifth grader with a measured IQ in the gifted range (135), has reading skills that are only slightly above average (a standard score of 108). There is a significant discrepancy between her ability and her level of achievement. Does this mean that Brenda has a learning disability in the area of reading? Is a score of 108 a deficit in relation to most people? The reading score may be a relative weakness, but does Brenda need special education services and test accommodations?

Howard, a law school graduate who cannot seem to pass the bar exam, has concerns about his attention and concentration abilities, reports this to his doctor, and receives a diagnosis of attention deficit/hyperactivity disorder (ADHD). Is a diagnosis made in young adulthood and based on self-reported symptoms enough evidence to formulate such a diagnosis? Is a law school graduate likely to be impaired relative to most people, and should his recent diagnosis qualify him for testing accommodations the next time that he takes the bar exam?

Brenda and Howard's cases raise many of the questions inherent in the definition of impairment and the relationship of symptoms to impairment. In this chapter, we examine the relationship between measures of symptoms and impairment. In particular, we review this relationship with regard to ADHD. We offer three reasons for focusing on this disorder. First, much recent research has examined symptom-impairment relationships here, so the empirical base is larger than it is elsewhere. Second, ADHD is a disorder for which impairment is especially important due to the high frequency of symptoms in people both with and without the disorder (e.g., Lewandowski, Lovett, Gordon, & Codding, 2008). Finally, ADHD rarely occurs by itself (Barkley, 2006), and this high comorbidity leads the ADHD researcher to naturally examine groups of participants with many different psychiatric problems. Before turning to research on ADHD, however, we briefly review research in child psychopathology more generally and discuss some of the general issues in the measurement of impairment.

## Impairment as a Diagnostic Criterion

Since the publication of the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-III*) by the American Psychiatric Association (APA) in 1980, clinicians and researchers have been made aware of the importance of impairment in addition to the number and severity of symptoms in considering a patient's psychiatric diagnosis. Since 1980, the *DSM* has been revised several times, but its focus on impairment has remained the same. Specifically, impairment has remained a part of the diagnostic criteria for most mental disorders. The most recent revision, the text revision of the fourth edition (*DSM-IV-TR*; American Psychiatric Association, 2000) included a "clinical significance criterion" of impairment in more than 70% of the disorders, requiring clinically significant impairment in functioning in order for a diagnosis to be made (Lehman, Alexopoulos, Goldman, Jeste, & Ustun, 2002).

Despite this inclusion of an impairment criterion, whether clinicians adhere to it in practice is uncertain. Although little research has examined this, it appears that most clinicians look to the *DSM* for descriptions of the *symptoms* of the various disorders, which are discussed in more detail than impairment (Gordon, Lewandowski, Murphy, & Dempsey, 2002). Even clinical scientists and other scholars sometimes overlook this important aspect of the *DSM*. Indeed, many critiques of *DSM*-based diagnostic systems (e.g., Eriksen & Kress, 2005; Kutchins & Kirk, 1997) accuse them of focusing exclusively on symptoms and neglecting the individual's life context.

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Barkley et al. (2006) distinguished between symptoms and impairment by defining the former as "the behavioral expressions associated with the disorder" and the latter as "the consequences that ensue for the individual as a result of these behaviors" (p. 2). If we take these definitions as being useful, we can ask about the relationship between symptoms and impairment by asking whether individuals who have more behavioral manifestations of some type of psychopathology necessarily have more negative life consequences. That is, do those individuals who have more signs of a disorder also experience more negative consequences due to those signs? We can also then ask whether all individuals who have signs associated with a disorder also have any significant negative consequences. These questions help us to evaluate whether it is useful to make impairment part of diagnostic criteria for a disorder since, if symptom severity and impairment are identical or correlate almost perfectly, assessing one is tantamount to assessing both, but if the relationship is contingent and far from perfect, each must be assessed separately. Also, it may be the case that treatment interventions need to be informed differentially by both symptoms and negative life consequences. Treating impulsivity and treating drunken driving may call for quite different interventions.

In the child psychiatric literature, there is now a fair amount of research examining the relationship, and this research generally supports the need for examining impairment as distinct from symptoms. In one study, Angold, Costello, Farmer, Burns, and Erkanli (1999) examined 1,015 children aged 9 to 13, comparing children who exhibited enough psychiatric symptoms to meet the revised third edition of the *DSM* (*DSM-III-R*; APA, 1987) criteria for at least one disorder to those who exhibited subclinical levels of symptoms. These investigators found that the lives of children who did not meet *DSM* symptom criteria were just as disrupted as the lives of children who met symptom criteria, and that a substantial number of children did meet *DSM-III-R* criteria for a diagnosis but were not impaired.

A study by Bird and colleagues (1996) also suggested that both symptoms and functional impairment need to be considered separately when making diagnostic decisions. Their study compared two global measures of impairment, the Children's Global Assessment Scale (CGAS; Shaffer et al., 1983) and the Columbia Impairment Scale (CIS; Bird et al., 1993). In the process of comparing these measures, the investigators found that each correlated only moderately with symptom counts, again indicating that symptoms and severity are related but distinct constructs.

Other researchers have examined the symptoms-impairment relationship by determining incidence estimates for a disorder based on symptoms and then investigating whether those estimates shrink significantly when an impairment criterion is added. In one study utilizing this analytic technique, Bird et al. (1988) found that 49.5% of children in a community sample met *DSM* criteria for at least one disorder when symptoms alone were required for a diagnosis, but when an additional criterion of moderate impairment was applied, the prevalence went down to 17%. Shaffer et al. (1996) found similar results in that 4.5% of their large sample met ADHD criteria based on reports of symptoms, but only 2.8% did when parent reports of impairment were considered in the diagnostic decision.

## Measurement of Impairment

Before examining research on ADHD as an illustrative example of complex symptom-impairment relationships, we take a brief detour to consider the measures of impairment that are frequently used in this literature. Unlike the *DSM*-based checklists used in the assessment of symptoms, there is no type of impairment measure that has become the standard. Instead, a wide variety of measures has been used to assess clinical impairment, including clinician ratings, parent and teacher reports, as well as counts of negative life events (e.g., number of arrests). Our overview of various impairment measures is not meant to be exhaustive, and we refer the reader to more comprehensive reviews of these instruments (Canino, Costello, & Angold, 1999; Costello, Angold, & Keeler, 1999; Winters, Collett, & Myers, 2005). Table 2.1 presents the major features of eight different impairment instruments, showing both the availability and diversity of impairment measures.

Measures of impairment are typically divided into *unidimensional* (or *global*) scales, which yield a single score interpreted as the individual's overall level of impairment, and *multidimensional* (or *domain-specific*) measures, which yield several scores, each pertaining to a different domain of functioning. In general,

**Table 2.1** Selected standardized measures of clinical impairment

| Instrument and source | Dimensionality | Procedure | Standardization |
|---|---|---|---|
| Adaptive Behavior Assessment System-Second Edition (Harrison & Oakland, 2003) | Multidimensional | Comprehensive rating scale indicating whether the individual is able to do certain behaviors and how frequently they are performed | Well standardized on nationally representative sample; for school-aged children, the normative sample was over 1,600 |
| Brief Impairment Scale (Bird et al., 2005 ) | Multidimensional | Brief (23-item) rating scale yielding scores for three areas of functioning: interpersonal relations, school/work, and self-fulfillment | Several samples have been used, but none are meant to be nationally representative; various cut scores are proposed based on the sample norms, but at the present time, criterion-referenced score interpretation is superior |
| Child Behavior Checklist Social Competence Scale (Achenbach, 1991a ) | Multidimensional | Parent rates children's competence in the areas of school, sports/hobbies, and social relationships as above average, average, or below average | Excellent standardization on very large, nationally representative samples of clinically referred and nonreferred children |
| Children's Global Assessment Scale (Bird, 1999) | Unidimensional | Clinician uses other assessment data and background information to make a judgment concerning overall functioning, assigning the child a score between 1 and 100 | No normative sample used in development, but cut scores are available based on large-sample trials of the scale |
| Home Situations Questionnaire (Barkley, 1997 ) | Unidimensional | Parent notes whether rule-breaking and oppositionality occurs in any of 16 settings and the degree to which each setting is a problem situation for the child; the number of problem situations and mean severity are calculated | Limited norms are available, but a criterion-referenced interpretation of scores is preferred |
| Impairment Rating Scale (Fabiano et al., 2006) | Multidimensional | For each of six (school) or seven (home) domains, teacher or parent places a mark along a line representing a continuum of impairment; an average score across domains can also be calculated | Normative data have not been reported, so criterion-referenced interpretation is required |
| School Situations Questionnaire (Barkley, 1997) | Unidimensional | Teacher notes whether child presents problems in any of 12 school settings and the degree to which each is a problem situation for the child; the number of problem situations and mean severity are calculated | Limited norms are available, but a criterion-referenced interpretation of scores is preferred |
| Social Adjustment Inventory for Children and Adolescents (John, Gammon, Prusoff, & Warner, 1987) | Multidimensional | 77-item scale administered in semistructured interview format by trained clinician; covers four areas: school functioning, spare-time activities, peer functioning, family functioning | Normative data have not been reported, so criterion-referenced interpretation is required |

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unidimensional scales are more helpful for research purposes than in clinical practice, for which scores that average across different areas (e.g., academic functioning and social functioning) can mask impairments that should serve as the focus of behavioral interventions (cf. Pelham & Fabiano, 2001). Moreover, Winters et al. (2005) noted that unidimensional scales are more likely than multidimensional scales to confound symptoms and impairment since symptoms of psychopathology are more likely to overlap conceptually with a total impairment score than with any individual area of functioning.

One commonly used unidimensional measure is the CGAS (Bird, 1999). Assessing a child using the CGAS requires first gathering a wide variety of data on the child and then using this information to assign the child a score between 1 and 100, with higher scores indicating higher levels of functioning (and thus lower levels of impairment). Paragraph-long descriptions are given for each range of 10 points (e.g., 31 to 40), and a degree of clinical judgment is used to assign the final score within each 10-point range. Despite this apparently somewhat subjective procedure, the CGAS exhibits good psychometric characteristics (Canino et al., 1999; Winters et al., 2005). Its interrater reliability is .84, and its test-retest reliability over a 19-day interval is .83. Moreover, validation studies have found substantial correlations between CGAS scores and *DSM* Axis V (Global Assessment of Functioning) scores and total scores of symptoms from the Child Behavior Checklist (CBCL; Achenbach, 1991a).

There are many more multidimensional than unidimensional scales measuring impairment; one representative measure is the Social Adjustment Inventory for Children and Adolescents (SAICA; John, Gammon, Prusoff, & Warner, 1987). The SAICA is a semistructured interview administered by a clinician to either a parent or directly to the child. The 77 questions load on several subscales, including spare-time activities, peer problems, and sibling relationships. The internal consistency of the scale's total score is low, but given the heterogeneous content, this is to be expected. The interrater agreement is considerably higher, and validation studies have included findings of a significant difference between children with and without ADHD. However, the clinical utility of the SAICA is limited by the lack of a normative sample (Winters et al., 2005); although scores can be used to track progress during an intervention, they are difficult to interpret when used in diagnosis.

Other multidimensional measures derive from Achenbach's (e.g., 2000) empirical assessment system, and the two most prominent impairment measures found in the system are the CBCL Competency scales (Achenbach, 1991a) and the corresponding Teacher Report Form (TRF) Adaptive Functioning scales (Achenbach, 1991b). Pelham, Fabiano, and Massetti (2005) concluded that measures as simple and as inexpensive as the CBCL and the TRF are sufficiently correlated with more comprehensive measures such as achievement that have been used to measure impairment. Empirically derived scales such as the CBCL and TRF assess the symptoms of several childhood disorders (e.g., anxiety, depression, oppositional defiant, ADHD) in addition to impairment, making them more efficient than *DSM-IV*-based scales that only measure symptoms of a single disorder (Pelham et al.).

One other multidimensional measure is also worth describing in detail: the Impairment Rating Scale (IRS; Fabiano et al., 2006). The IRS is unlike any of the other impairment measures reviewed here; for each of several domains, the respondent (a parent or teacher) places an "X" along a line that symbolizes a continuum of impairment severity, ranging from "no problem/definitely does not need treatment or special services" to "extreme problem/definitely needs treatment or special services." The parent version has different domains (e.g., relationship with siblings) than the teacher version (e.g., influence on classroom functioning). Although further research must be done, initial results are promising. Fabiano and colleagues reported good psychometric characteristics, including differentiation of children with and without ADHD.

Standardized measures of impairment have psychometric characteristics comparable to those of symptom-rating scales. Moreover, like symptom-rating scales, there are many different kinds of impairment measures, each with its own advantages and disadvantages. Diagnosticians working with specific clinical issues (e.g., comorbidities, certain demographic groups, treatment planning) can search the available pool of measures for one that meets their needs. Similarly, researchers examining symptom-impairment relationships can select a measure of impairment that seems most relevant to the symptoms that they are interested in measuring. In the research reviewed next, a variety of impairment measures were utilized within ADHD populations.

## Relationship of ADHD Symptoms and Impairment

The inclusion of an impairment criterion in diagnosis is particularly important in the assessment of ADHD as compared to many other mental disorders. In disorders such as schizophrenia, the symptoms are severe and distinct enough from normal behavior that the explicit consideration of impairment may be less critical. For example, psychotic symptoms are so deviant from normal that they automatically yield impairment in some aspects of daily living. We do not have to split hairs in diagnosis when a person is hallucinating and out of touch with reality since it is difficult to conceive of an environment where those symptoms would not lead to impairment in functioning. However, not all symptoms of all disorders necessarily cause significant impairment. High-functioning people who live apparently unimpaired lives may experience many of the symptoms of ADHD. As such, the relationship between symptoms and impairment merits special attention in the case of ADHD.

Gordon and colleagues (2006) conducted the most comprehensive analysis of the relationship between symptoms and impairment by reanalyzing data from four large-scale studies. The first study reviewed by Gordon and colleagues, the Massachusetts General Hospital (MGH) Longitudinal Families Study (Biederman et al., 1992, 1999), included 280 children with ADHD diagnoses (based on *DSM-III-R* criteria) and 240 non-ADHD controls; half of the participants in each group were girls, and all of the children were between 6 and 17 years of age. Children with ADHD were recruited from referrals to a pediatric psychopharmacology clinic at the MGH and from a local health maintenance organization (HMO), whereas control participants were selected from outpatients at pediatric medical clinics. The MGH Longitudinal Families Study used many different measurement instruments. However, in the Gordon and colleagues' reanalysis, data from the Attention subscale of the CBCL (Achenbach & McConaughy, 1987) and the Schedule for Affective Disorders and Schizophrenia Epidemiologic version for School-Age Children (K-SADS-E; Orvaschel & Puig-Antich, 1987) were selected as the symptom measurements, whereas the SAICA (John et al., 1987) and the Competence subscales of the CBCL (Activities, Social, and School) were considered as the measures of impairment.

In this MGH data set, the correlations between symptoms and impairment never exceeded $r = .43$ and therefore accounted for no more than 19% of the variance. In addition, based on impairment criteria established for the SAICA (having a score below the fifth percentile of the control group), Gordon et al. (2006) concluded that only 23% of the ADHD sample were both symptomatic and impaired. Alternatively stated, more than three quarters of the children identified as having ADHD through the use of symptom counts would not have been diagnosed if the impairment criterion had been considered. It is noteworthy that these figures were derived using only a single measure of symptoms and a single measure of impairment; since in clinical practice multiple pieces of information from multiple informants are used, an even smaller proportion of the sample would likely have been rated both symptomatic and impaired by *all* informants.

In another study reanalyzed by Gordon et al. (2006), the Vermont Family Genetics Study (Hudziak, Copeland, Stanger, & Wadsworth, 2004), very similar results were found regarding the relationship between symptoms and impairment. This study included 187 children with ADHD and 183 randomly selected siblings of the ADHD participants, all between 6 and 18 years of age. Families were recruited from local pediatricians and psychiatrists and through newspaper advertisements and posters placed throughout the county. In this study, the symptom measures consisted of the Predominantly Inattentive and Hyperactive-Impulsive subscales of the Vermont Structured Diagnostic Interview (Hudziak et al., 2004), and the impairment measures again included the Competency scales of the CBCL. The correlations between symptoms and impairment were higher than those in the MGH study, but still none of the correlations accounted for more than 25% of the variance.

A third analysis described in Gordon et al. (2006) was conducted using patients from an outpatient mental health care center in Ontario, Canada, where the Brief Child and Family Phone Interview (BCFPI; Cunningham, Pettingill, & Boyle, 2004) was administered as part of standard intake procedure for approximately 1,900 consecutive referrals. Administration of this 30-minute structured phone interview to parents and teachers of children aged 3–18 yielded information on both symptoms and impairment. The subscale of symptoms that was most closely related to ADHD was called Regulating Attention, Impulsivity, and Activity Level and was composed of six items. Seven different subscales tapped impairment, and these included Child's Social Participation, Quality of the Child's Social Relationships, School Participation and Achievement, and Global Child/Youth Functioning. Similar to the results found the previous two data sets, each of the correlations between the ADHD-related symptoms and the impairment subscales accounted for no more than 17% of the variance. The impairment measures correlating the highest with the symptom measure were Quality of the Child's Social Relationships and Global Family Situation (each with a correlation of $r = .39$), and the Global Family Situation was not a direct measure of the *child's* level of impairment. Admittedly, had the impairment measures been combined, the relationship with symptoms might have been stronger, but since impairment in more than one area is required for a proper ADHD diagnosis, aggregating the subscale scores would have resulted in a measure with less diagnostic utility.

The fourth and final reanalysis conducted by Gordon et al. (2006) was the only analysis on adults with ADHD, and it used data from the Milwaukee Longitudinal Study (Barkley, Fischer, Smallish, & Fletcher, 2004). Data from this study were gathered from individuals 19–25 years of age who were originally included in the study as young children and who had been followed for at least 13 years. There were originally 158 subjects diagnosed as hyperactive as children and 81 community controls included in the study. Ninety-one percent of these were male, and 9% were female. The hyperactive group had been recruited from consecutive referrals to a child psychology service specializing in the treatment of hyperactive children at Milwaukee Children's Hospital, whereas the community control children had been recruited using a "snowball" technique (current participants help recruit new participants). Telephone interviews of both symptoms and impairment were conducted longitudinally at three points in a subject's life. A *DSM-IV*-based structured interview to assess ADHD served as the measure of symptoms, while a structured interview of adaptive functioning served as the measure of impairment. Overall, the results extended the finding of a weak relationship between symptoms and impairment. The average correlation coefficient was only $r = .25$, and none of the correlations accounted for more than 25% of the variance. Given that there was only a single measure of impairment, and that for adult participants multiple measures of impairment across diverse life activities are even more important, the true relationship between symptoms and *clinical* levels of impairment is likely even weaker than the data reported here.

Based on these four secondary data analyses, Gordon and colleagues (2006) concluded that there appeared to be a weak relationship between ADHD symptoms and impairment in all four data sets reviewed. The largest correlation found between symptoms and any specific measure of impairment was $r = .65$ (accounting for about 42% of the variance). However, the majority of the correlations were much smaller, accounting for no more than 10% of the variance. Based on these data, Gordon et al. concluded that symptoms and impairment were distinct dimensions of ADHD that should be recognized accordingly in making diagnostic decisions. However, as has been emphasized, all four of these data sets were analyzed with only a single measure of symptoms and a single measure of impairment, and the need to take a multidimensional approach to impairment measurement was recognized by the same research team in subsequent articles.

As a follow-up to the work of Gordon and colleagues (2006), a study was conducted (Barkley et al., 2006) addressing this issue of the multidimensional nature of impairment. Three ADHD data sets were examined in this study; two of these had also been included in Gordon and colleagues' earlier article: data from the Milwaukee Longitudinal Study (Barkley et al., 2004) and data from the outpatient mental health care center in Ontario, Canada. The third data set was from work conducted by Barkley and Murphy (2006) and included 149 adults with clinical diagnoses of ADHD, 97 adults referred to the same clinic who did not have ADHD (but did have other varieties of psychopathology, mainly anxiety and mood disorders), and 109 community control adults. The participants were all between 17 and 69 years of age ($M = 35$), and 52% were male. Several ADHD symptom measures were used, including a clinical interview, self-report rating scales, scales completed by others who knew the participant well, employer ratings, and recall of childhood symptoms). Various self-rated and other-rated impairment measures were also used. Examples of some of the impairment measures included ever retained in school, difficulty keeping friends, car crashes, and low grade point average (see Barkley, Murphy, & Fischer, 2008).

Whereas Gordon and colleagues considered each measure of impairment individually, Barkley and colleagues (2006) aggregated impairment across domains to create an omnibus index of impairment within each data set. Impairment indices were determined using either dichotomously scored variables (e.g. "ever involved in a teenage pregnancy either as mother or father"), or cutoff criteria (e.g., more than seven citations on their official driving record). These investigators found that analyzing the data sets with the use of impairment indices significantly increased the correlations between symptoms and impairment. Previous correlations from the review by Gordon and colleagues had ranged between .01 and .65, but in Barkley and colleagues' analyses, the correlations ranged between .43 and .88, with the majority greater than .70. That is, when impairment was aggregated across multiple measures and domains, the relationship between symptoms and impairment was found to be approximately twice as strong.

Another recent study, conducted by Fabiano et al. (2006), also investigated the relationship between ADHD symptoms and impairment. This study was designed to test the psychometric properties of the IRS (see preceding section) specifically developed to assess ADHD impairment based on both parent and teacher report. A series of four analyses was conducted using over 3,200 children from preschool to fifth grade and recruited from various elementary schools as well as from a medication efficacy trial. The Diagnostic Interview Schedule for Children (DISC; Shaffer et al., 1996) and the Disruptive Behavior Disorders Rating Scale (DBD; Pelham, Gnagy, Greenslade, & Milich, 1992) were used as symptom measures, and the CGAS (Shaffer et al., 1983) was used as an impairment measure in addition to the IRS. Children were labeled as having ADHD based on parent and teacher report, although the *DSM-IV* impairment criterion (Criterion D) was not included in the identification of these children.

Fabiano et al. (2006) found moderate-to-high correlations between symptoms and impairment ($r = .58$ to .93) in clinical populations. However, when the same analyses were conducted with a random sample of children from various elementary schools, the correlations between symptoms and impairment were much lower ($r = .17$ to .53). Although the IRS was found to be a valid and reliable measure to assess impairment in a child with ADHD, this series of studies demonstrated the variability with which symptoms and impairment are related since the extent to which these variables were related was dependent on the sample and the source of the ratings (parent or teacher). Interestingly, the study also showed that the IRS added incremental validity beyond a diagnosis made based on symptoms alone. An $R^2 = .31$ was found using average teacher symptom ratings alone to predict CGAS scores. This increased to $R^2 = .38$ (a statistically significant increase) when teacher IRS ratings were added to the equation.

A recent study by Gathje, Lewandowski, and Gordon (2008) examined the symptom-impairment relationship in a clinic-referred sample of 314 children (ages 5–17 years). These investigators found modest correlations (ranging from .26 to .32) between maternal reports of symptoms on an ADHD checklist and a composite impairment score (home, school, social, and recreational domains). The symptom-impairment relationship grew slightly stronger based on the cutoff score used to determine impairment (1, 1.5, 2 standard deviations above the mean). Correlations were higher between the CBCL (Achenbach, 1991a) Attention scale score (maternal report) and the impairment cutoffs (.42 to .47). They found that symptom count along with CBCL score, Peabody Picture Vocabulary Test (Dunn & Dunn, 1997) score, and gender all contributed significantly to the prediction of impairment. However, these variables collectively only accounted for 30% of the variance in impairment score.

Next, Gathje et al. examined the effects of both symptom and impairment variables on diagnostic classifications of ADHD. Of the sample of 314 students referred to the ADHD clinic, 81% met a liberal criterion for diagnosis based on maternal report on a *DSM-IV* checklist of ADHD symptoms. When additional criteria were added (CBCL Attention scale score greater than 65 and impairment measure scores of at least 1.5 standard deviations above the mean), the rate dropped to 19%. When an even more stringent criterion on the impairment measure (2 standard deviations above the mean) was required, the classification rate dropped to 2%. Clearly, then, diagnostic classifications are very different when they are based on symptoms alone versus symptoms plus impairment.

## Is ADHD Special?

After examining the literature on ADHD, in which the correlations between symptoms and impairment were found to be far from perfect and often quite modest, it is reasonable to ask whether ADHD is a special case. Certainly, the nature of ADHD symptoms—specifically, their being so common in the general population (e.g., Lewandowski et al., 2008; Murphy & Barkley, 1996)—suggests that they may be especially poor in serving as a proxy for (or a predictor of) impairment. However, although the research base is currently small, it appears that symptoms also do not necessarily bring impairment in other forms of psychopathology.

Consider the case of post-traumatic stress disorder (PTSD). After undergoing a traumatic event (e.g., sexual assault, military combat, childhood physical abuse, etc.), many individuals develop a set of symptoms that includes avoidance of cues related to the event, mental reexperiencing of the event (through, e.g., dreams, flashbacks), and a persistent heightened level of arousal or vigilance (Resick & Calhoun, 2001). Intuitively, these symptoms would seem to necessarily lead to impairment, but research suggests otherwise. Breslau and Alvarado (2007) examined data from two large community-based samples (*N*s were 2,181 and 1,698), focusing on those participants who had been exposed to traumatic events (excluding military combat). These investigators found that when the clinical impairment criterion (which is present for PTSD in the *DSM* criteria) was applied, the conditional probability of developing PTSD was 30% lower; that is, of those who had been exposed to trauma, the proportion who would be diagnosed with PTSD was 10.8% without the application of the impairment criterion, but only 7.8% with the impairment criterion applied. Even symptoms as serious as those associated with PTSD, then, may not always bring impairment along with them, necessitating a separate assessment of impairment.

The importance of impairment in assessment can even be seen in disorders for which "symptoms" are defined more broadly. Consider the case of learning disabilities, in which individuals, typically children, have trouble in specific academic skills, such as reading, writing, and mathematics. Even though the most common method of diagnosing learning disabilities involves looking for a discrepancy between a student's ability (typically measured by an IQ test) and his or her achievement in some academic skill area, the *DSM-IV* guidelines for "learning disorders" include what amounts to an impairment criterion, insisting that the problem "significantly interferes with academic achievement." However, the discrepancy criterion does not necessarily take into account the impairment guideline. For example, students with IQ scores in the above-average range (>130) yet scoring in the average range in achievement might have a discrepancy but not be considered impaired because they are performing at the typical level expected for their age and grade (Brody & Mills, 1997). These students, then, have the symptoms of a learning disability without the attendant impairment, and proposed systems to include impairment in the diagnosis (e.g., Lovett & Lewandowski, 2006) have been met with criticism (e.g., Gregg et al., 2007), as if a student's level of academic functioning is unimportant when determining whether an academic problem exists.

To summarize, symptoms and impairment are related, but distinct constructs, and the explicit inclusion of an impairment criterion when making a diagnosis has a large impact on the measured incidence of psychopathology. These conclusions, of course, only open up other questions. Just what degree of impairment should be necessary? How is impairment best measured and from which sources? Who should the reference group be when determining impairment, and should the appropriateness and uniqueness of the individual's personal goals be taken into account when deciding whether he or she is generally "impaired"? More research is clearly necessary to establish what will be, admittedly, only tentative answers on these points, making the relationship between symptoms and impairment a fertile field for further study.

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# Chapter 3
# The Role of Family and Situational Problems in Understanding and Reducing Impairment

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## Introduction

Impairment has a widespread impact on family functioning, routines, activities, and relationships between family members. Families provide an invaluable resource in assessing and addressing the needs of individuals experiencing impairment as well as those of other family members. Impairment manifests itself in many ways, but all forms are contextually relevant. An ecological perspective provides an alternative conceptualization of impairment to a biological, medical model. This framework extends the focus of assessment and intervention beyond the individual to other contexts within which the individual interacts. Two of the most important contexts in which that children interact are the home and school environments. Families have a great deal of knowledge and expertise regarding an individual's level of behavioral, social, and academic functioning in multiple settings.

There are several benefits for partnering with families during the assessment and intervention implementation process. First, incorporating information from family members during the assessment process provides for greater conceptualization of the impairment and how it may manifest during different family routines. It also allows professionals to gain an understanding of the family's strengths, needs, and available resources. Second, family members provide a great deal of support for intervention development. Understanding family roles, expectations, and routines allows for a contextual fit between interventions and the family environment. Third, family members can also play an essential role in intervention implementation. Developing a shared ownership for intervention implementation with the family can enhance treatment integrity and generalization of treatment effects across settings. Fourth, long-term support programs for individuals with impairment require extensive involvement of family members. Developing a professional-family partnership throughout the assessment and intervention process can promote empowerment within the family to become more self-sufficient in providing support and eliciting additional resources.

## Overview of Research

Although the role of families in the process of impairment assessment and intervention development has received extensive interest in current research endeavors, families have long been the interest of research studies in this area. Outlined below is a review of research that explores the relationship between impairment and family functioning as well as family involvement in the assessment and intervention development process.

### *Impairment and Family Environments*

Families represent extremely complex systems. All families have strengths and needs, and all families, at times, function well and poorly. The presence of impairment provides new challenges to all members of the family and affects a variety of family aspects. Conoley and Sheridan (2005) identified five different forms of family stressors related to impairment that may be experienced by families: multiple treatment settings, financial stress, effect of impairment on siblings, managing support networks, and family dysfunction.

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Not all family stressors fall within these categories, but these five represent a solid framework of stressors to assess and reduce. They are described in detail next.

### Multiple Treatment Settings

One of the greatest stressors for families supporting an individual with impairment is the extensive number of settings in which assessment and treatment may take place. Many impairments require the assistance of a specialist to provide a comprehensive evaluation. Often, these specialists are not located within immediate proximity of the family (Jackson & Haverkamp, 1991). In addition, the assessment process can be lengthy and can require multiple professionals and specialists in different disciplines and settings (Sloper & Turner, 1992). Thus, the assessment and eventual treatment process require a great deal of organization and coordination between services. This presents the family with the responsibility of rearranging their own schedules, paying traveling expenses, and expending their personal resources of time and energy. Added to this is the consideration that supports to address impairment are often implemented across several environments and include a team of service providers (e.g., physicians, social/caseworkers, physical therapists, occupational therapists, psychologists, counselors). Many impairments also involve a variety of treatment modalities, such as behavioral management, psychopharmacologic therapy, family therapy, and educational interventions (Gellerstedt & Mauksch, 1993).

### Financial Stress

Families requiring services resulting from impairment also tend to experience multiple situations that may increase financial stress (Mactavish, MacKay, Iwasaki, & Betteridge, 2007). The cost of providing services for families, especially those receiving services from multiple agencies, can place a strain on the family's economic viability. Traveling expenses, uncovered medical expenses, legal expenses, counseling expenses, rehabilitation expenses, and environmental modifications (e.g., alterations to the home) are all part of the picture for many families (Conoley & Sheridan, 2005). However, preliminary research indicates that a reduction of quality of life due to available financial resources may be experienced more by mothers than fathers of a child with impairment (Wang et al., 2004).

### Effects on Siblings

Another potential stressor for families is the impact of impairment on siblings. Siblings respond to impairment in differing ways and at different times. The role of impairment on a sibling's development and functioning remains unclear. Control studies have documented an increase in behavioral problems in siblings of children with different forms of impairment (Breslau, 1983; Gath & Gumley, 1987). Alternatively, studies have also demonstrated that siblings of children with impairment are not at risk for problem behavior (McHale, Sloan, & Simmeonsson, 1986).

Parent and family factors appear to play a great role in the manner in which impairment affects siblings. To further explore this, Giallo and Gavida-Payne (2006) conducted research to evaluate factors attributing to sibling adjustment to impairment. They reported that the family degree of resilience and risk level were better predictors of sibling adjustment than the sibling's own coping ability and stress levels.

The manner in which siblings are cared for and disciplined by parents and caregivers is also a significant consideration. Parents have reported that they feel discomfort in providing different degrees of discipline among their children with and without impairment (Fox, Vaughn, Wyatte, & Dunlap, 2002). In addition, parents have also reported concerns that their children without impairment may perceive parental favoritism for siblings with impairment.

### Managing Support Networks

Families also have several support networks that they need to balance. These networks include formal supports, such as professionals and service providers, and informal supports, including friends and family. Families often receive information and advice from both formal and informal supports. At times, this information competes against each other, forcing family members to decide between the two. Potential criticism from relatives can also be a significant source of stress for the family (Miller, 1993).

Friends and relatives offer a great deal of support at the initial point of impairment (e.g., birth or trauma); however, over time these social networks taper their support to the family (Conoley & Sheridan, 2005). Over the long course of rehabilitation or treatment, individuals outside the immediate family begin to lessen their level of attention and availability.

Further, families may also find new support networks composed of parent support groups related to the nature of impairment. Typically, these groups are useful resources of information and advocacy related to the individual's social, behavioral, and academic functioning. However, sometimes members of the groups do not identify with the family based on differences in the nature of impairment. This is particularly true of families with an individual who has multiple impairments. For example, an individual with both cognitive and physical impairments may not match support groups for cognitive impairments or physical impairments alone. This also can add stress to the family as they struggle to find social support groups that identify with their particular situation.

### Family Dysfunction

Family functioning is heavily affected by a family's degree of resilience in the face of a crisis. The presence of impairment in a family tends to alter previous family roles, financial resources, family expectations, and family relationships. Impairment within a family can also increase stress, anxiety, depression, anger, blame, and hopelessness within family members (Heru & Ryan, 2002; Zarski, DePompei, & Zook, 1988). All of these changes can instigate difficulties in family functioning and potentially create dysfunction.

Although all families react to the presence of impairment in different ways, families with certain characteristics are more at risk for dysfunction than others. Adverse effects on family functioning are greater for (a) families who had poor family functioning before the advent of impairment and (b) families with parents who have existing psychological disorders (Wade, Drotar, Taylor, & Stancin, 1995). Families who are effective problem solvers, have a sense of strong family coherence, develop effective coping strategies, and have an ability to adapt are more likely to maintain strong family functioning in the presence of impairment (Ylven, Bjorck-Akesson, & Granlund, 2006).

## *Positive Behavioral Supports and Families*

There is a current emphasis on promoting positive behavioral supports within natural contexts, such as home or school environments (Fox et al., 2002). To accomplish this, collaboration among families, teachers, and professionals has become essential. It is only through effective communication and partnering with caregivers and educators that supports can be developed that fit the environment and context of these complex systems.

One of the early studies to assess positive behavioral supports in relation to family environment (Lucyshyn, Albin, & Nixon, 1997) involved the family of a 14-year-old with multiple disabilities. The researchers conducted a functional behavioral analysis that ensured a contextual fit by incorporating information provided by the family into hypothesis development and intervention implementation. Four specific family routines were targeted to identify six elements: (a) time and location; (b) people involved; (c) material resources; (d) structure and items to be completed; (e) family goals, values, and beliefs; and (f) typical interaction patterns. A comprehensive assessment was conducted, including an assessment of family ecology and a functional analysis. Behavioral support plans for each of the four routines were designed based on family strengths, resources, and goals. Direct behavioral observations and ratings of social validity indicated the support plans were effective in reducing problem behaviors and acceptable to the family. The contextual fit of the interventions also increased the family members' implementation of procedures with fidelity and consistency.

Fox, Vaughn, Dunlap, and Bucy (1997) also utilized a participatory action research framework when assessing positive behavioral supports with families. The researchers collaborated with a family of a 9-year-old child diagnosed with Cornelia de Lange syndrome and severe cognitive impairments. Before the development of any specific supports, a meeting was held with the family, teacher, grandparent, and research team to discuss the child's strengths, family's goals for his future, and common situations in which difficulties arose.

Information provided by the family allowed for a functional assessment of the child's behavior during family routines, leading to generated hypotheses of the behavioral function. After coaching and training from the researchers, the intervention procedures were administered by the child's mother across all targeted routines. Results demonstrated that the supports were effective in reducing disruptive behavior in multiple situations.

Using a case study format, Moes and Frea (2000) compared a contextually matched positive behavioral support intervention with a prescriptive treatment. They demonstrated that building supports based on the values and goals of the family provided more effective outcomes than the prescriptive approach. Results also indicated that the treatment developed from family input also produced greater generalization, maintenance, and treatment fidelity.

Koegel, Steibel, and Koegel (1998) conducted a study using a multiple-baseline research design across three families with children diagnosed with autism. Positive behavioral supports developed for all families were constructed based on contextually appropriate components. Measures of social validity indicated that positive behavioral supports provided in this manner were considered socially acceptable and valid by the families involved.

Fox et al. (2002) qualitatively evaluated the experiences of 20 family members involved with family-centered positive behavioral supports. The participants were involved with the Family Network Project, a support program for families with children diagnosed with developmental disabilities and behavioral concerns. Families involved with the project were recruited from underserved communities and participated in positive behavioral support interventions delivered through in-home services and group support. Through research interviews with participating families, three common themes emerged related to their experience with impairment. The first theme, "something is not right," was directly related to the assessment process and determining the nature of impairment. It was in these early stages that the family continued to seek answers for what was "wrong" with their child. Many families indicated some form of knowledge seeking to provide self-diagnosis or information gathering related to the impairment. The second theme, "a shoulder to cry on," described the families' experiences with formal and informal support. Both support from professionals and social supports from friends and other families were reported to be helpful and commonly used. Family members described professionals, friends, and relatives who provided emotional support and encouragement as the most helpful. The final and most pervasive theme, "it's a 24-hour, 7-day involvement," depicted how impairment affects the entire family system and nature of family functioning. Families reported some discomfort when responding to problem behavior related to the impairment. They also described difficulties in providing discipline and supports consistently across all children in the family.

## Guidelines for Assessment

Conducting a comprehensive assessment of impairment involves gaining a greater understanding of the contextual factors involved. An ecological-behavioral model for assessing impairment provides a perspective that includes immediate and surrounding contextual considerations within a developmentally appropriate framework. The goal is to understand the nature and degree of impairment within the current situation based on what is occurring in the immediate setting (i.e., proximal variables) *and* factors from outside settings (i.e., distal variables) that may also contribute significantly to the impairment. Approaches to assessing impairment may be effective in determining proximal variables (e.g., antecedents, consequences) that have an impact on impairment; however, many assessment processes do not extend to understand distal variables (e.g., family environment, school environment, experiences in other settings) that also may have an effect on exhibited behavior. The consideration of both proximal and distal variables is essential for developing a comprehensive assessment of impairment.

An ecological-behavioral model follows the frameworks provided by ecological systems theory (Bronfenbrenner, 1979) and behavioral theory. The ecological-behavioral model is an alternative to previous deficit models of impairment and conceptualizes problems as a mismatch between the individual and the environment, not solely within the individual. Thus, an individual's learning and behavior are viewed as a function of continuing interactions between individuals and the multiple settings in which they interact (Sheridan & Gutkin, 2000; Pianta & Walsh, 1996).

Bronfenbrenner (1979) identified four systems involved in an individual's development: (a) microsystem,

(b) mesosystem, (c) exosystem, and (d) macrosystem. The ecological environment consists of these interdependent systems embedded within each other, like a set of Russian dolls. Therefore, the contextual environment relevant for an individual's development does not simply consist of the immediate setting for these four systems are interrelated. Taken together, these systems provide a multitude of influences on impairment and are critical considerations in the assessment and support-building processes.

The *microsystem* consists of the relationship between the child and the child's immediate environment. Examples of this environment can include either the family or the classroom setting. It is important to note that the microsystem is the interaction between the child and the environment, not just the child or environment on its own. The *mesosystem* reflects the interaction between two different environments in which the child interacts. As such, a mesosystem can be comprised of the interaction between the home and school settings. The *exosystem* refers to an environment or context, in which the child is not involved, that has an impact on other members of a major ecosystem. In doing so, the exosystem has an impact on the child's development in the immediate setting. This includes such factors or events at a family member's place of work or a teacher's home life. The fourth system, the *macrosystem*, consists of the larger overall context. This includes cultural and societal emphases and patterns, on which all other ecologies are based, such as (a) the overall societal attitudes, traditions, and beliefs and (b) the overarching political, legislative, and economic policies of society.

Behavioral theory, based on operant conditioning, contends that all behavior is governed by consequences and antecedents. *Antecedents* are events in the environment that cue an individual to exhibit a particular behavior. *Consequences* are the actions in the environment that occur after a behavior is exhibited. Although antecedents cue behavior, the occurrence of a behavior is controlled by the consequences of performing a behavior. If the consequence of a behavior is desired by the individual, then the individual is more likely to perform the behavior in the future. If the consequence is undesired, then it is less likely that the behavior will occur again. There are two categories of consequences within operant conditioning: reinforcement and punishment. Consequences are *reinforcing* if they increase the likelihood of a behavior's occurrence in the future; alternatively, consequences are *punishing* when they reduce the probability of future occurrence. Problem behavior related to impairment can be effectively addressed by evaluating the nature and influence of consequences and antecedents.

**Table 3.1** Guidelines for incorporating family members and situational factors in the assessment process

- Develop a collaborative partnership
- Address issues related to diversity
- Assess family functioning
- Utilize a family centered-approach
- Assess previous courses of action
- Conduct functional behavioral assessment with family
- Link assessment to intervention

The steps outlined in Table 3.1 indicate guidelines for conducting an assessment of impairment within an ecological-behavioral framework. This process utilizes a collaborative partnership with the family to assess situation problems and how the impairment is manifested. All of these steps emphasize different considerations during the assessment process and are critical for establishing a more comprehensive understanding of the context surrounding the impairment. These guidelines may be followed in many ways, but the core considerations are presented next.

## *Develop a Collaborative Partnership*

The first step for including family members within a comprehensive assessment of impairment is to develop a collaborative partnership with the family. A *collaborative partnership* with families is defined as

> the establishment of a truly respectful, trusting, caring, and reciprocal relationship in which [professionals] and family members believe in each other's ability to make important contributions to the support process: share their knowledge and expertise; and mutually influence the selection of goals, the design of behavior support plans, the design of behavioral support plans, and the quality of family-practitioner interactions" (Lucyshyn, Horner, Dunlap, Albin, & Ben, 2002, p. 12).

This is a critical philosophical shift for many professionals. To partner with families, one has to approach assessment with the fundamental belief that everyone has expertise to share. Family members have extensive expertise in the history of an individual's impairment, how the impairment is exhibited in different settings, the functioning of the family, family need and resources, what has been attempted before to address or manage the impairment, and the goals for seeking services for the impairment. Professionals have expertise in approaches to assessment, professional judgment, information needed to be attained, and summarizing multiple sources of information (e.g., indirect and direct forms of assessment).

In addition to collaborating to gain more information from the family, the emphasis should be on developing a partnership with the family. This provides an egalitarian approach to assessment and should continue through intervention development, implementation, and evaluation. A systematic way for family members to be involved through the assessment process should be developed. Often, this includes established structured interviews of family members, but it should also incorporate a free-flowing conversational component to allow for open-ended questions that may be easier for families to provide in a less-threatening questioning style (Turnbull & Turnbull, 1991). Further, family members should be allowed and encouraged to participate fully in the assessment process. This may require modifying language in the assessment process to reduce professional jargon and substitute common language for technical terms (Lucyshyn, Kayser, Irvin, & Blumberg, 2002). A full collaboration with the family throughout this process ensures a complete contextual perspective of an individual's impairment.

## *Address Issues Related to Diversity*

The American society is one of the most diverse in the world. However, the American culture is based upon a Euro-American worldview. This worldview contains the following beliefs and values: individualism, competition, mastery and control over nature, a separation of science and religion, time as a unitary and static construct, and religion based on Christianity (Katz, 1985). Human service providers have been criticized for maintaining an individualized approach to assessing and addressing impairment (Quinn, 1995). This perspective is limiting and does not provide critical information regarding the influence of the family and community (Swenson, 1995).

A foundation to working effectively with diverse families is for professionals to develop their own cultural competence. This begins with a self-awareness assessment of one's own cultural background and framework. Through this process, an individual becomes aware of personal values, priorities, and expectations. For professionals assessing impairment, this includes evaluating their goals for assessment and intervention, their role as the assessor/professional, their meaning of impairment for individuals and families, their perspective of how families should be structured, and what they consider to be effective styles of communication and parenting (Brassard & Boehm, 2007). Only through this self-evaluation can professionals be able to identify whether a difference in worldviews may exist between themselves and the people with whom they work.

In addition, professionals need to refrain from making assumptions about the priorities, goals, and resources of individuals and families from diverse linguistic and cultural backgrounds (Brassard & Boehm, 2007). Each family and community are different despite linguistic or cultural similarities, and it is extremely detrimental to approach any situation based on perceived stereotypes. In the same manner that professionals self-assess beliefs, they should assist families to verbalize their perspectives. The goal is to identify common and shared beliefs, goals, and expectations. Without determining shared goals, it is difficult to develop a collaborative partnership.

Communication with families from linguistically and culturally diverse backgrounds is also extremely important and can pose some challenges. Effective communication strategies allow for as much reciprocal dialogue as possible among individuals, families, and professionals. First, professionals often need to modify the terminology used in conducting assessments. Jargon and professional terminology can impede the understanding of the individual who is providing or receiving the information. Second, different families have different communication styles, both verbal and nonverbal. Not all families from diverse backgrounds are comfortable with probing and direct questioning from the person conducting the assessment (Chen, Downing, & Peckham-Hardin, 2002). In these situations, more informal and casual questioning can be beneficial. Further, families from diverse backgrounds favor informal contacts with individuals instead of formal meetings (Harry, 1992), indicating the importance for professionals to build relationships with the family (Chen et al., 2002). Third, it is sometimes essential to utilize an interpreter to facilitate communication between professionals and family members. It is always recommended to use a qualified interpreter rather than a family member. When using an interpreter, it is preferred for all parties to look at each other as they are talking instead of the interpreter. It is also extremely important to consider how specific words may be transferred from one language to another. Many times, nuances are not able to transfer, and unwanted connotations may be added, making it important to for everyone to have effective communication with the interpreter to ensure the best possible communication.

Gaining an understanding of the family's values, beliefs, resources, and expectations allows the professional to truly assess the context surrounding the impairment. Developing an understanding of culture enables a person to view the world "through the eyes" of that person. Thus, being "multicultural" refers to being "multivisional" in perspective or extending one's ability to understand other people (Soriano, Soriano, & Jimenez., 1994). *Multiculturalism* refers to a "broad range of significant differences (race, gender, sexual orientation, ability, and disability, religion, class, etc.) that so often hinder communication and understanding among people" (Sue & Sue, 1999, p. 1064). This approach to a comprehensive assessment allows for intervention development to fit within the context of the individual and family.

## *Assess Family Functioning*

Family functioning plays a critical role in the manner in which impairment is exhibited, maintained, or managed by the individual and its affect on other members of the family. It is widely accepted that family functioning is a multidimensional construct that is highly influenced by the relational processes within families. Common factors related to family functioning that should be assessed include family cohesion, family involvement, family adaptability, parenting styles, and a family belief system. In general, each of these aspects of functioning fall along a continuum with optimal functioning and family resilience existing within moderate degrees outside the extremes.

### Family Cohesion

The concept of *family cohesion* represents "family members' close emotional bonding with each other as well as the level of independence they feel within the family system" (Turnbull & Turnbull, 1997, p. 108). Levels of emotional connectedness between family members are influenced by the culture, age, and stage of life of the family member and vary significantly between and within families. Family cohesion exists on a continuum, ranging from enmeshed (very high), to very connected (moderate to high), to connected (moderate), to somewhat connected (moderate to low), to disengaged (very low) (Olson & Gorall, 2003). Interactions that are enmeshed are characterized by an overidentification with the family, resulting in extreme levels of consensus and limited individual autonomy and independence. Families that are disengaged are marked by high autonomy and low bonding, depicting little attachment to the family system. Families that have a balance between enmeshment and disengagement tend to have healthier levels of functioning (Olson & Gorall, 2003).

### Family Involvement

The extent to which family members value and display interest in the activities of other family members defines the notion of affective involvement (Epstein, Ryan, Bishop, Miller, & Keitner, 2003). It emphasizes the degree of interest as well as how family members demonstrate their interest and investment in each other. Family involvement exists on a continuum, ranging from lack of involvement to overinvolvement. Considered to be the optimal level, *empathetic involvement* refers to a genuine interest; family members are invested for the sake of others in the family unit. Empathetic family involvement practices promote healthy functioning within families.

### Family Adaptability/Flexibility

The presence of impairment certainly highlights a family's ability to adapt to new situations. Family adaptability or flexibility represents a family's ability to modify its rules, roles, and leadership based on new situations or experiences. This restores a balance between (a) family members and the family unit and (b) the family unit and the community (Olson & Gorall, 2003; Patterson, 2002b). Families have differing degrees of adaptability that fall along a continuum from rigid/inflexible (extremely low) to somewhat flexible (low to moderate), to flexible (moderate), to very flexible (moderate to high), to chaotic/overly flexible (extremely high) (Olson & Gorall, 2003). Moderate degrees of adaptability (e.g., structured or flexible) may allow for healthier degrees of family functioning than those on the extremes (e.g., rigid or chaotic).

Families need to be both stable and able to adapt to function as a healthy system. Healthy, functional families are able to determine when it is appropriate to maintain stability or address change (Olson & Gorall, 2003). Successfully adaptive families (a) are proactive in the socialization and development of individual family members and (b) understand the importance of maintaining the family unit (Patterson, 2002a).

### Parenting Styles and Problem-Solving Processes

A family's ability to communicate and problem solve effectively is highly related to family functioning. This is particularly true of families who have an individual with impairment. Clear, direct, and honest communication, active listening, and positiveness are all communication styles associated with healthy family functioning. Family functioning also benefits from collaborative problem solving that includes shared decision making among family members, is goal-oriented, follows concrete steps, and builds on successes (Walsh, 2003).

A family's ability and overall style of communication and problem solving is represented by the interactions between parents and children. Three types of parenting styles have been outlined by Baumrind (1968): authoritarian, permissive, and authoritative. Authoritarian parenting styles are marked by high levels of authority and control, with limited negotiation regarding standards of behavior. Permissive parents, in contrast to authoritarian parents, allow children to regulate their own activities, standards, and rules, with few decisions imposed by caregivers. The optimal parenting style for healthy family functioning, *authoritative parenting*, is marked by a balance between freedom and responsibility. Authoritative parents engage family members in problem-solving processes to negotiate compromise and manage conflict.

### Shared Beliefs and Values

Another critical component of healthy family functioning is the presence of a shared belief system. Shared values and beliefs reinforce specific patterns regarding how a family reacts to new situations, life events, and crises and are necessary for strong family resilience. A family's response to impairment is often dependent on the existence of shared family values and expectations. Having a common belief system assists families make meaning of crises, situational events, and impairment and facilitates hope and a positive outlook (Walsh, 2003).

Related to a shared belief system, a strong family schema represents a perspective that the family interacts with the world from a collective "we" versus "I" orientation (McCubbin, McCubbin, & Thompson, 1993). Strong family schemas help families perceive life in a realistic manner and not expect perfect solutions to difficulties that life presents (McCubbin et al., 1993).

### Measuring Family Functioning

When adopting an ecological-systems perspective, there is not one best way of assessing family functioning; rather, it is often necessary to evaluate multiple aspects of how the family operates (Bray, 1995). Methods of evaluating family functioning include family member self-report measures, observation of family interactions, and clinician rating scales.

Commonly used measures of family functioning include the McMaster Family Assessment Device (FAD; Epstein, Baldwin, & Bishop, 1983); Family Adaptability and Cohesion Scales (FACES IV; Olson, Gorall, & Tiesel, 2005); Family Environment Scale (FES; Moos & Moos, 2002); Parenting Stress Index (PSI; Abidin, 1995); Family Functioning Style Scale (Deal, Trivette, & Dunst, 1988); and the Family Functioning Scale (FFS; Bloom, 1985).

## *Utilize a Family-Centered Approach to Assessment*

Families are best included in the assessment process through the use of a family-centered approach.

A family-centered approach for assessment follows four guiding principles (Dunst, Trivette, & Deal, 1994): (a) determining family-identified needs and goals, (b) addressing family strengths and resources, (c) determining the family's social network, and (d) evaluating the family's degree of empowerment.

### Family-Identified Needs

Individual and family interventions related to impairment have the greatest impact when they are developed to address the specific needs of the family (Dunst et al., 1994). As such, the most effective assessments provide information regarding self-determined needs of the family, those identified by the professional. Professionals working with families in the assessment process assist family members to identify, define, and prioritize their specific needs. Needs are often identified within a hierarchy that determines the relative importance and immediacy for the family. A family's ability to address these needs is enhanced through the development of specific objectives. To help families achieve these objectives, professionals should also assist families in developing short- and long-term goals.

### Family Strengths and Resources

All families have varied strengths and resources available to them that they can use to help address any issues related to impairment. It is important during the assessment process not only to identify these strengths and resources but also to determine the accessibility of the resources. Environmental or systemic conditions can sometimes provide families with barriers to attain resources. Thus, it is critical to determine how families may utilize their strengths to mobilize available resources.

### Social Networks

In addressing individual and family needs and strengths related to impairment, connections between other systems and networks also need to be assessed. Collaborations with intra- and intersystemic partners are necessary for addressing the needs of the individual and family (Sheridan, Eagle, & Dowd, 2004). These linkages often exist within Bronfrenbrenner's mesosystem and connect different environments within which an individual exists. During the assessment process, it is beneficial to determine the nature of any partnership between the family and human service, educational, health care, neighborhood, spiritual, and other community organizations. Importantly, not all networks need to be formal; informal and natural social networks are also quite helpful for families and provide extensive support.

### Family Empowerment

A comprehensive assessment based on family-centered services also evaluates the family's degree of self-sufficiency. That is, what competencies does the family possess to achieve the identified goals? This is a picture of where the family is at the moment, or what skill or capacity development might enhance the family's ability to address issues related to impairment. This level of assessment allows for interventions to be developed that build capacities within the family as opposed to simply correct a problem.

### Assess Previous Courses of Action

Families can provide extensive information on previous efforts to address concerns related to impairment. Primarily, they can assist in understanding (a) what supports have been implemented previously and (b) whether they were effective. These two questions provide an opportunity to gain vital information related to the social validity of previous support plans and the fidelity within which plans were implemented. Assessing previous efforts is a critical component to establishing current support plans that are contextually appropriate and have the best chance to be implemented appropriately and consistently. Building from previous efforts can expedite the process and prevent one from "reinventing the wheel."

*Social validity.* A key aspect of assessing past strategies is to ascertain the family's perspective of the effectiveness and acceptability of the intervention. This is referred to as the social importance of an intervention, or social validity. Whether or not a family perceived a previous support plan to be effective or acceptable for their unique context provides fundamental information for the development of a new plan. The key is to incorporate or modify aspects that the family deemed effective or acceptable into current strategies. The best laid plans will not be implemented if they are considered to be unacceptable for a given situation or context.

*Treatment fidelity.* Not surprisingly, a support plan is only as effective as it is implemented appropriately. Support plans that are not implemented as intended or consistently are likely to fail to produce beneficial results. There are many reasons that an intervention may not be implemented effectively, including (a) a lack of knowledge or expertise, (b) limited resources to provide the opportunity, or (c) a lack of contextual fit between the plan and the surrounding environment. Family members can provide information regarding their ability and resources available to carry out a support plan consistently. This assists professionals in determining if modeling, repeated practice, additional resources, or other modifications are necessary to ensure that the support plan developed is implemented with fidelity.

## Conduct a Functional Behavioral Assessment

One of the key purposes of conducting an assessment is to gain information that will assist in developing interventions that have a contextual fit. In many cases, this contextual fit may involve home or school settings, often both. A prominent and evidence-based method to assess how to support an individual with an impairment is through functional behavioral assessment. A functional behavioral assessment is a systematic process designed to evaluate how impairment is associated with behavioral, academic, or social difficulties within specific situations, environments, or contexts. Functional behavioral assessments also provide an opportunity to partner with families to evaluate the effect of situational problems on impairment and should be conducted with input from the family to ensure that they are contextually appropriate.

There are two forms of functional behavioral assessments used when assessing the nature and degree of impairment: (a) contextual, those that evaluate conditions within a single setting (e.g., home or school), and (b) cross-setting, those that look at similarities and differences within conditions across settings (e.g., both at home and school). Although contextual functional behavioral assessments may gather information regarding proximal variables from the immediate setting, cross-setting assessments also provide information on distal variables from outside, additional settings.

Information attained in a functional behavioral assessment comes from multiple informants (e.g., the individual, family members, caregivers, educators, service providers) and multiple sources. Typically, a functional behavioral assessment includes information from record reviews, structured interviews, and direct behavioral observations. Record reviews provide background information from previous assessment reports, educational achievement, social service case history, and documented progress toward behavioral or educational planning goals. Structured interviews allow for a professional to discuss more detailed information in person with the individual and family. However, not all information provided by the family needs to be received through structured interviews as informal conversations can also provide useful, detailed information. Through behavioral observations, direct information regarding how the impairment is manifested in different contexts can be ascertained. Direct observations are used to collect data on the frequency, duration, or intensity of specified difficulties. In addition, direct behavioral observations provide assessment information that includes what happens before and after problem behaviors occur.

Functional behavior assessments consist of four major components that are outlined in Table 3.2. In general, a functional behavioral assessment serves to answer two basic questions: (a) under what conditions a behavior occurs more/less frequently (e.g., setting, surrounding individuals, time of day) and (b) what might be the possible reasons for a behavior to occur.

First, professionals and family members (or teachers) work together to collaboratively define, in operational

**Table 3.2** Guidelines for conducting a functional behavioral assessment

- Identify and operationally define a prioritized concern
- Identify antecedents, consequences, and setting events
- Develop hypotheses regarding the function of the problem
- Build behavioral support plans derived from hypotheses

terms, how the impairment manifests itself into identified difficulties or problems. Through this process, family members (or teachers) identify their concerns related to the impairment and prioritize the most important area, difficulty, or problem behavior to support. Generalized difficulties are redefined and prioritized into one or two specific, primary difficulties for immediate intervening.

Second, through a series of interview questions the family identifies the before and after events related to the identified concern. This process identifies the antecedents, consequences, and setting events that may maintain or govern the specific difficulty or problem behavior. Additional information can also be obtained through behavioral observations of the individual in the home or school setting. To comprehensively assess the context surrounding the impairment, it is advised that professionals also assess family routines and the family environment (Lucshyn, Kayser, Irvin, & Blumberg, 2002). This can also be conducted through interviews with family members, open-ended conversations, rating scales, and observations.

Third, using this information family members (or teachers) and professionals collaboratively develop potential hypotheses regarding the function, or purpose, of how the impairment may be exhibited through problem behavior or identified difficulties. These hypotheses should be testable, meaning that through observations a generated hypothesis can be verified or rejected. Other than determining that a problem behavior related to impairment represents a skill deficit, there are two main functions of behavior (Crone & Horner, 2003). First, a behavior may occur to get something, either a tangible object or attention. Second, the motivation for performing a behavior may result from avoiding or escaping something undesired.

Fourth, information and data collected during the assessment process are connected to intervention development. Behavioral support plans are developed that are linked explicitly to the hypothesized function. Specifically, alternate, more appropriate behaviors are reinforced that serve the same function as the problem behavior. A major principle in developing behavioral support plans through functional behavioral assessment is for the individual to experience the same function for performing the appropriate behavior as the inappropriate behavior.

Family members should be involved throughout the functional behavioral assessment process within the guidelines of the collaborative partnership. Information provided by the family is typically ascertained through the use of structured interview forms, such as the Functional Assessment Interview (FAI) form (O'Neill et al., 1997) and the Functional Behavioral Assessment Interview (Crone & Horner, 2003). There are also several valid observation forms that are used with a functional behavioral assessment, including the functional observation interview (FOI) form (O'Neill et al., 1997) and behavioral observation scatterplot forms.

## *Link Assessment to Intervention*

The final component of a quality, comprehensive assessment is to link the results of the assessment to supports or interventions for the individual or family. It is important to utilize the information ascertained in the assessment process to enhance the effectiveness of supports provided. This link between assessment and intervention ensures that the services delivered are contextually appropriate. Otherwise, interventions that are developed will not be implemented with fidelity.

Information attained from both family-centered service and functional behavioral assessment approaches allow for a systematic way for the assessment process to be connected with intervention development. Both assessments and interventions provided within a family-centered framework follow the same four principles: (a) family-identified needs and goals, (b) family strengths and resources, (c) family's social network, and (d) family's degree of empowerment. This makes it easier to connect the information received from families to the provision of supports. Similarly, functional behavioral assessments systematically generate hypotheses of behavioral function that lead directly to intervention development. The creation of a competing pathways model (Crone & Horner, 2003) during functional behavioral assessment and positive behavioral support development ensures a direct link between assessment and intervention.

However, in all instances it is the development of a collaborative partnership between families and professionals that truly influences the quality of assessment information and adherence to treatment recommendations. Through open communication, supports can be developed that address issues related to impairment and fit within the ecology of the family. But, a true partnership establishes a shared ownership of the (a) problem or area of need, (b) implementation of supports, and (c) evaluation of effectiveness.

## Conjoint Behavioral Consultation

Conjoint behavioral consultation (CBC; Sheridan, Kratochwill, Bergan, 1996; Sheridan, Kratochwill, 2008) is a structured model for addressing impairment through comprehensive assessment, intervention development, and intervention implementation. CBC brings together family members, educators, and other service providers within a partnership framework. Within this framework, members of the consultation team work collaboratively to address the developmental, academic, social, and behavioral needs of an individual with impairment and the needs of the family.

CBC follows a structured but flexible, evidence-based problem-solving model and is based on both an ecological-systems perspective (Bronfenbrenner, 1979) and the principles of positive behavioral support. Through the process of CBC, parents, educators, and other service providers share in the identification of the strengths and needs of families and the development, implementation, and evaluation of interventions to address those needs in home and school environments. The problem-solving model of CBC follows four stages (i.e., needs identification, needs analysis, treatment implementation, treatment evaluation) and allows for each phase to be recycled as needed.

CBC recognizes the importance of bidirectional, reciprocal influences between systems (i.e., children, families, schools, and other systems) and that securing the connections between these systems is critical in establishing positive support and outcomes for children and families. Based on a partnership approach to family-centered services, CBC (a) provides an opportunity for families to be equal partners in the process of addressing the needs of their children, (b) focuses on both family-identified and professional-identified needs, (c) uses identified family and educator strengths and capabilities to access and mobilize services, (d) promotes family and educator empowerment through the acquisition of new skills and competencies, and (e) emphasizes strengthening social supports and networks (Sheridan et al., 2005; Sheridan, Warnes, Cowan, Schemm, & Clarke, 2004). CBC fosters an environment that promotes home-school partnerships by providing a structured environment in which trust, collaboration, effective communication, shared responsibility, and mutual support between families and educators can be developed.

### *Goals in CBC*

Inherent in the implementation of CBC is the understanding that the process is just as important as the outcomes. As such, the overall goals of CBC can be described in terms of both outcomes and process.

#### Outcome Goals

In addressing the identified needs of children, there are several outcome-related goals for CBC. Although the primary outcome goal of CBC is to improve the behavioral, social, or academic functioning of an individual, Sheridan et al. (1996) identified that other outcome goals of CBC are to (a) obtain comprehensive and functional data over extended temporal and contextual bases, (b) identify potential setting events that are temporally or contextually distal to the target, (c) improve skills and knowledge of all parties, (d) establish consistent programming across settings, (e) monitor behavioral contrast and side effects systematically via cross-setting treatment agents, (f) develop skills and competencies for future conjoint problem solving, and (g) enhance generalization and maintenance of treatment effects.

#### Process Goals

In addition to the goals listed that parallel family-centered services (Sheridan et al., 2005), there are several other process goals that have been identified for CBC. These are to (a) increase communication and knowledge about the family, (b) improve the relationship among the child, family, and school personnel, (c) promote shared ownership for the identified need and solution, (d) recognize the need to address problems as occurring across, rather than within, settings, (e) promote greater conceptualization of the problem, (f) increase the diversity of expertise and resources available, and (g) establish and strengthen the home-school relationship and home-school partnership (Sheridan et al., 1996). Several research studies have documented the success of CBC in attaining these process goals (Sheridan, Cowan, & Eagle, 2000; Sheridan et al., 1996, 2004, 2005).

### *CBC Research*

There is extensive body of research demonstrating the effectiveness of CBC in addressing a variety of needs for children. These studies have evaluated CBC on both direct observational outcomes and social validity measures. Case studies have demonstrated that CBC is effective in supporting students with emotional and behavioral difficulties in mainstream classrooms (Wilkinson, 2005), increasing positive social interactions of children with ADHD (Colton & Sheridan, 1998), increasing social initiation behaviors of socially withdrawn children (Sheridan, Kratochwill, & Elliott, 1990), and improving academic performance (Galloway & Sheridan, 1994; Weiner, Sheridan, & Jenson, 1998). A large-scale study also found CBC to be effective in addressing behavioral, social, and academic difficulties in home and school settings, resulting in high levels of reported satisfaction from parents and teachers (Sheridan, Eagle, Cowan, & Mickelson, 2001). CBC has also been demonstrated to produce effective results when utilized with families from diverse backgrounds (Sheridan, Eagle, & Doll, 2006).

Additional social validity research has indicated that parents and teachers (Freer & Watson, 1999; Sheridan et al., 2001) and practitioners (e.g., school psychologists) (Sheridan & Steck, 1995) rate CBC as a highly acceptable model for addressing behavioral, social-emotional, and academic concerns. Process research also suggests that CBC is effective in establishing a collaborative environment characterized by reciprocal and cooperative verbal interchanges between consultation team members (Sheridan, Meegan, & Eagle, 2002).

### *CBC Stages*

CBC incorporates a four-stage problem-solving process (i.e., conjoint needs/problem identification, conjoint needs/problem analysis, plan implementation, conjoint treatment evaluation). Throughout these stages, assessment, intervention development, and intervention implementation information is collected via conjoint interviews with parents, teachers, and other members of the consultation team. The objectives and components of the CBC stages closely mirror those identified by the National Technical Assistance Center on Positive Behavioral Interventions and Supports as optimal components of providing individual support across settings.

### *Conjoint Needs (Problem) Identification*

The needs identification stage of CBC initiates the first formal assessment stage of CBC. The purpose of this stage is to identify a target behavior, gather initial assessment information, and begin to assess the relative frequency of the behavior. Specifically, during this stage consultation team members collaboratively identify specific areas of needs and strengths of the student. Concerns are then prioritized in both home and school settings and analyzed based on contextual variables. A preliminary problem behavior assessment is conducted, evaluating antecedent, consequent, and sequential behaviors both within and across each setting (i.e., home and school). Target behaviors for each setting are identified for assessment and intervention. In a collaborative fashion, consultation team members operationally define target behaviors. These definitions are then reviewed by the team to ensure that the definition appropriately captures the targeted concern. Baseline data collection and recording procedures for the target behaviors are also developed and initiated by parents and teachers.

### *Conjoint Needs (Problem) Analysis*

The goal of the second stage of CBC is to determine the function of the behavior targeted and use the assessment data to develop an appropriate behavior support plan. During the needs analysis stage, baseline data collected at home and school are reviewed and analyzed. Formal functional assessments of the problem behaviors in each setting are conducted in both home and school settings. Based on these functional assessments, members of the consultation team form hypotheses and develop behavioral interventions for the target behaviors.

The interventions developed are based on the principles of positive behavioral supports and typically include a mechanism to increase home-school collaboration (e.g., home-school note). At this time, members of the consultation team also determine objective goals for consultation in each setting.

### *Plan Implementation*

During the plan implementation stage of CBC, parents and teachers implement the support plan developed during the previous phase. The plan is implemented in both settings following the procedures developed in both home and school settings. All members of the consultation team maintain shared ownership of the implementation of the support plan. Plans are evaluated for treatment fidelity and contextual fit, and direct behavioral observation data continue to be collected.

### *Conjoint Treatment Evaluation*

The conjoint treatment evaluation stage serves as the final evaluative step in CBC and typically occurs 2 to 3 weeks after the conjoint needs analysis phase. During this stage, the consultation team reviews data collected in each setting (e.g., home, school) during the plan implementation phase of CBC. Achievement of (or progress toward) consultation goals, established during the needs analysis phase, is also discussed at this time. Dependent on the acquisition of consultation goals in each setting, an additional meeting may be scheduled and modifications made to intervention procedures. If consultation goals are met, consultation services are terminated, and follow-up data collection procedures are developed.

## Conclusion

Families provide an invaluable, and often underutilized, resource in the contextual assessment of impairment and the development and implementation of support plans for individuals with impairment. An ecological-behavioral framework provides the backdrop for partnering with families to assess and address strengths and needs. Conducting contextually appropriate, comprehensive assessments includes establishing a collaborative partnership with family members. Through this partnership, issues related to diversity can be addressed and appropriate, collaborative goals can be developed. Information provided by family members helps assess the level of family functioning, current family needs and resources available, and previous efforts to address those needs. Family members should also be included in the development of cross-setting functional behavioral assessments and the process of using assessment information to drive the development and implementation of contextually appropriate support plans. Undoubtedly, families provide a wealth of knowledge, expertise and resources that are extremely beneficial in understanding and reducing impairment.

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## Chapter 4

# Relationships Between Adaptive Behavior and Impairment

Jeffrey Ditterline and Thomas Oakland

## Relationships Between Adaptive Behavior and Impairment

Adaptive behavior generally refers to one's ability to meet daily living responsibilities and to respond to the needs of others. The American Association on Intellectual and Developmental Disabilities (AAIDD) defines adaptive behavior as "the collection of conceptual, social, and practical skills that have been learned by people in order to function in their everyday lives" (American Association on Mental Retardation [AAMR], 2002, p. 73). The AAIDD's 1992 definition cited the following 10 adaptive skills that constitute adaptive behavior: communication, community use, functional academics, home and school living, health and safety, leisure, self-care, self-direction, social, and work (Table 4.1). These 10 skills have been incorporated into either the conceptual, social, or practical domain. The *Diagnostic and Statistical Manual of Mental Disorders* (*DSM*) emphasizes the importance of these 10 skills in its diagnostic criteria for mental retardation (American Psychiatric Association [APA], 2000).

## Standards Guiding the Development and Use of Measures of Adaptive Behavior

Four sets of standards guide the development and use of measures of adaptive behavior in reference to impairment: (a) those governing test development and use; (b) those informing diagnoses and classifications; (c) those established by laws and related legal policies and practices, including case law; and (d) those guiding ethical behaviors of professionals. Each is reviewed next, with emphasis placed on the second and third.

### *Standards Governing Test Development and Use*

The Standards for Educational and Psychological Testing (American Educational Research Association et al., 1999; hereafter referred to as the standards) provides the most authoritative industry standards governing ways tests should be developed and used. Assessment practices associated with adaptive behavior and other psychological constructs are addressed in the standards, including test construction, evaluation, and documentation; fairness in testing; and test applications. Some key features from these standards that lay a foundation for sections of this and perhaps other chapters in this book are summarized next.

The standards define a *test* as "an evaluation devise or procedure in which a sample of an examinee's behaviors in a specified domain is obtained and subsequently evaluated and scored using standardized procedures" (American Educational Research Association et al., 1999, p. 183). "Assessment is a comprehensive examination undertaken to answer specific questions about a client's functioning during a particular time interval or to predict a client's functioning in the future" (p.119).

Test validity constitutes a test's most important quality (American Educational Research Association et al., 1999). *Validity* refers to the accuracy with which a test measures a construct and how the results may be used appropriately. Validity is judged in light of theory and empirical evidence that support the manner

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**Table 4.1** American Association on Intellectual and Developmental Disabilities adaptive skills and domains

| | |
|---|---|
| Adaptive Skills | |
| Communication | Speech, language, and listening skills needed for communication, including vocabulary, responding to questions, and conversation skills |
| Community use | Skills needed for functioning in the community, including use of community resources, shopping skills, and traveling in the community |
| Functional academics | Basic reading, writing, mathematics, and other academic skills needed for daily, independent functioning, including telling time, measurement, and writing notes or letters |
| Home/School living | Skills needed for basic care of a home, living setting or school, including cleaning, organizing, maintaining and repairing property, preparing food, and performing chores |
| Health and safety | Skills needed for the protection of health and to respond to illness and injury, including following safety rules, using medicines, and showing caution |
| Leisure | Skills needed for engaging in and planning leisure and recreational activities, including playing with others, engaging in recreation at home, and following rules in games |
| Self-care | Skills needed for personal care including eating, dressing, bathing, toileting, grooming, and hygiene |
| Self-direction | Skills needed for independence, responsibility, and self-control, including starting and completing tasks, keeping a schedule, following time limits, following directions, and making choices |
| Social | Skills needed to interact socially and get along with other people, including having friends, showing and recognizing emotions, assisting others, and using manners |
| Work | Skills needed for successfully holding a job and functioning in a part-time or full-time work setting, including completing work tasks, working with supervisors, and following a work schedule |
| Motor skills[a] | Basic fine and gross motor skills needed for locomotion and manipulation of the environment as well as for the development of more complex activities, including sitting, pulling up to a standing position, walking, fine motor control, and kicking |
| Three domains and associated skills | |
| Conceptual | Includes communication, functional academics, self-direction, and health and safety skills |
| Social | Includes social skills and leisure skills |
| Practical | Includes self-care, home/school living, community use, health and safety, and work skills |

[a] Although fine and gross motor development is not included as one of the 10 skills identified by the American Association on Intellectual and Developmental Disabilities, it is included in some scales of adaptive behavior.

in which test data are interpreted and used. Strictly speaking, a test does not have validity. Validity may be attenuated by various conditions. Two that are most prominent include construct underrepresentation (i.e., when a test fails to measure important aspects of the construct) and construct irrelevance (i.e., when qualities extraneous to the construct attenuate its measurement).

Test *reliability* refers to the consistency of scores. The standards define reliability as “the degree to which test scores for a group of test takers are consistent over repeated applications of a measurement procedure and hence are inferred to be dependable, and repeatable for an individual test taker; the degree to which scores are free of errors of measurement for a given group” (American Educational Research Association et al., 1999, p. 180).

## Standards Informing Diagnosis and Classification

Seven international sources are used to define disabilities and disorders. All have implications for the use of scales that assess adaptive behavior and skills. Three sources provide the most authoritative, comprehensive, and widely used systems to classify mental disorders: the text revision of the fourth edition of the *DSM* (*DSM-IV-TR*) (APA, 2000); its international edition (APA, 1995); and the *International Classification of Diseases and Related Health Problems, Tenth Edition* (*ICD-10*; World Health Organization [WHO], 1992a). The disorders identified by the *ICD-10* generally are consistent with those cited in and are cross-referenced to the *DSM*'s international version (APA, 1995). The International Classification of Functioning and

Disability (ICIDH-2, formerly International Classification of Impairments, Disabilities, and Handicaps; WHO, 1992b) and its revision, the *International Classification of Functioning, Disability, and Health* (*ICF*; WHO, 1999) provide a unified and standard language framework for describing human functioning and disability components of health, including physical and mental health. The Organisation for Economic Co-operation and Development (OECD; 2004) proposed the use of three broader criteria to classify children with disabilities: those with organic difficulties (e.g., hearing impairments or severe cognitive disabilities), those for whom social disadvantage is the origin, and those with learning difficulties whose origins may be organic or social disadvantage (e.g., dyslexia). The diagnostic criteria promulgated by the AAIDD, formerly known as the American Association on Mental Retardation, also has an international influence in reference to one disability category: development disabilities, including mental retardation.

Information on methods promulgated by the *DSM* and the AAIDD as well as the *ICF* is summarized next, given the prominence of the first two and emerging importance of the last.

## Diagnostic and Statistical Manual of Mental Disorders

The *DSM-IV-TR* (APA, 2000) outlines a multitier system of assessment. Axis V, Global Assessment of Functioning (GAF), provides a 10-range continuum of mental health. An individual's score on the GAF indicates overall level of functioning and thus directly reflects one's level of impairment. The GAF is based on the Global Assessment Scale, described by Endicott, Spitzer, Fleiss, and Cohen (1976). Ratings include psychological symptoms as well as occupational and social functioning and exclude impairment due to environmental or physical limitations.

Each of the 10 ranges in the GAF has two components: social/occupational impairment and psychological symptoms. The social/occupational component focuses on functional information and relates more directly to adaptive behavior than does the psychological symptoms component (APA, 2000). For example, the social/occupational component of range 61 to 70 includes difficulty in occupational, school, or social functioning—qualities commonly assessed by measures of adaptive behavior. Moreover, direct corollaries can be drawn between behaviors listed in the GAF and domains from measures of adaptive behavior (Table 4.2). Ratings of an individual's adaptive behavior may reveal deficits in work, school, or social functioning. Information from a measure of adaptive behavior combines with an assessment of psychological symptoms to help establish a level of impairment within the specifications of a particular range on the GAF.

The *DSM-IV-TR* also includes the Social and Occupational Functional Assessment Scale (SOFAS). The SOFAS characterizes social and occupational functioning on a continuum from excellent to grossly impaired functioning. Similar to the social/occupational impairment component of ranges on the GAF, behaviors cited in the SOFAS relate directly to qualities addressed by measures of adaptive behavior. For example, the SOFAS includes language such as "occupationally and socially effective," "temporarily falling behind in schoolwork," "no friends," "is unable to work," "inability to maintain personal hygiene," and "unable to function without harming self" (APA, 2000, p. 818). These qualities typically are assessed by measures of adaptive behavior.

The SOFAS differs from the GAF because on the SOFAS practitioners rate social and occupational impairment independently from psychological symptoms (APA, 2000). The use of the SOFAS prevents attaining low GAF scores for high-functioning patients who display

**Table 4.2** Concordance between behaviors in the Global Assessment of Functioning (GAF) and domains in measures of adaptive behavior

| Examples of behaviors in the GAF | Domains in measures of adaptive behavior |
|---|---|
| Inability to maintain personal hygiene | Self-care skills |
| Largely incoherent or mute | Expressive or receptive communication skills |
| Acts grossly inappropriate | Health and safety skills |
| Inability to work | Occupational or work skills |
| Failing at school | Conceptual domain or academic skills (e.g., math, reading, writing) |
| Inability to maintain friends | Social skills |

one or more severe psychological symptoms (Spitzer, Gibbon, Williams, & Endicott, 1996). In addition, whereas the GAF excludes impairment due to physical disabilities, the SOFAS includes impairments that are direct consequences of mental and physical health problems.

The impact of adaptive behavior can be critical when clinicians use the SOFAS or GAF to determine the overall level of a patient's impairment. Measures of adaptive behavior often assess conceptual, social, and work skills as well as behaviors associated with self-care and safety. Thus, data from adaptive behavior measures provide useful functional information that directly relates to behaviors included in the GAF and SOFAS and assists practitioners as they determine the level of a patient's functioning.

## The American Association on Intellectual and Developmental Disabilities

Adaptive behavior has been linked closely with mental retardation. Thus, further knowledge of mental retardation, particularly its diagnosis, informs us of the important role of adaptive behavior for this disorder. The AAIDD and its predecessor, the AAMR, have been the most authoritative voice in reference to issues pertaining to persons with mental retardation. Its current definition of mental retardation is as follows: "Mental retardation is a disability characterized by significant limitations both in intellectual functioning and in adaptive behavior as expressed in conceptual, social, and practical adaptive skills. The disability originates before age 18" (AAMR, 2002, p. 13). Five assumptions important to this definition then are discussed.

> 1. Limitations in present functioning must be considered within the context of community environments typical of the individual's age peers and culture. 2. Valid assessment considers cultural and linguistic diversity as well as differences in communication, sensory, motor, and behavioral factors. 3. Within an individual, limitations often coexist with strengths. 4. An important purpose of describing limitations is to develop a profile of needed supports. 5. Within appropriate personalized supports over a sustained period, the life functioning of the person with mental retardation generally will improve. (AAMR, 2002, p. 13)

Almost all definitions of mental retardation make reference to significant deficits in intellectual functioning as well as adaptive behavior that occur before age 18. Some definitions provide specific scores (e.g., < 71) to demarcate levels that constitute significant deficits.

## International Classification of Functioning, Disability, and Health

The WHO's *ICF* (1999) provides a framework for viewing behaviors from three broad and different perspectives: physiologic, physical, and psychological functions; the extent to which persons engage in functional life activities; and their participation in social settings. The *ICF* does not emphasize pathology or lead to a diagnosis. However, the *ICF* can be used as a companion to WHO's *ICD-10* (1992) when diagnosing disorders. The *ICD-10* provides a system for classifying and diagnosing health conditions, including diseases, disorders, and injuries based on etiology. In contrast, the *ICF* emphasizes a client's full and accurate description, not diagnosis, based on medical and social models of disability through biological, individual, and social perspectives of health. When a diagnosis is needed to obtain benefits, the *ICD-10* may be used to classify a client's disability. The combined use of the *ICF* and *ICD-10* provides for more comprehensive descriptions and is useful for program planning and intervention services.

The *ICF* places considerable emphasis on identifying functional impairments and thus strongly emphasizes the importance of adaptive behavior. Specifically, its activities and participation components address the execution of a task or action by an individual and his or her involvement in life situations (WHO, 1999). The term *activities* refers to tasks or actions a client is able to perform. Examples for older children and adults include writing, talking, and calculating. The term *participation* refers to activities that become integrated into one's life. Examples for children include regularly taking others to nearby places, talking by telephone with family and friends, and refraining from embarrassing others.

Activities and participation include the following nine domains (with examples of corresponding adaptive skills in parentheses): learning and applying knowledge (e.g., functional academics); general tasks and demands (e.g., work); communication (e.g., communication); mobility (e.g., fine and gross motor skills); self-care (e.g., self-care); domestic life (e.g., school and home living); interpersonal interactions and relationships (e.g., social skills); major life areas (e.g., health and safety, leisure skills); and community, social, and civic life (e.g., community use). The skills in parentheses are those identified by the AAMR (2002) and *DSM-IV-TR* (APA, 2000) as important adaptive skills.

A *skill deficit* occurs when a person does not display a needed behavior. A *performance deficit* occurs when a person has displayed a needed skill yet does not use it when needed. For example, a child who does not have the ability to dress oneself displays a skill deficit. In contrast, a child who has displayed the ability to dress oneself and does not do so regularly is described as having a performance deficit. If deficits in adaptive behavior and skills have been identified and an individual is in need of services, then the *ICF* aids in describing the disability in terms of an interaction between impairment, functioning, and the environment. Strengths or weaknesses may be identified, including the adequacy of one's adaptive skills, in light of environmental needs.

An understanding of a client's health requires knowledge of the dynamic nature among body functions, body structures, activities as well as participation, and environmental factors. Each influences the others. The *ICF* emphasizes the importance of identifying possible conditions that have an impact on activities and performance deficits. An understanding of a client's activities and performance requires knowledge of personal, social, and environmental conditions that may be having an impact on them.

For example, a person's adaptive skills may be influenced adversely by his or her body functions (e.g., mental, sensory, and neuromusculoskeletal functions) and structures (e.g., nervous, cardiovascular, and metabolic systems). In addition, his or her environment may not provide needed opportunities to acquire adaptive skills as well as support and reward their use. Thus, knowledge of a client's adaptive skills in conjunction with body functions, structures, and environment is important for diagnosis and is essential to the design, delivery, and monitoring of services intended to have an instrumental and functional impact on a client's life.

An overlap between the *ICF*'s activities and participation framework and adaptive behavior is clear. Thus, there is considerable agreement among the WHO, AAIDD, and the APA regarding the importance of these skills. The assessment of adaptive behavior is directly applicable to the utilization of the *ICF* and can assist in better understanding, describing, and classifying functioning, disability, and health under this model.

## *Legal Standards Governing the Use of Measures of Adaptive Behavior*

Professionals working in public schools typically rely on federal laws and policies that become translated into state board of education agency rules and policies when diagnosing disorders. Although the *DSM* is known and may be considered by school-based professionals, diagnostic criteria approved by their state boards of education constitute the protocol to be used in public schools.

### Individuals with Disabilities Education Act

The federal government partially funds education and support services for approximately 6.5 million individuals with special education needs (U.S. Department of Education, 2006). The Individuals with Disabilities Education Act (IDEA; U.S. Code Service, 2007) governs the provision of early intervention, special education, and related services by state and local educational agencies for children over age 2 to young adults age 21 (U.S. Code Service, 2007).

Part C of IDEA addresses assistance for infants and toddlers beyond age 2 and authorizes states to develop and maintain early intervention programs for infants and toddlers with disabilities (Apling & Jones, 2005). Eligibility is based on a diagnosis of developmental delay that requires early intervention services. The assessment of adaptive behavior provides data that are helpful in establishing impairment and eligibility for services.

Part B of IDEA addresses assistance for students with disabilities ages 3 through 21 (Apling & Jones, 2005). Eligibility is based on 13 categories of disabilities (U.S. Department of Education, 2006). The assessment of adaptive behavior is needed to determine eligibility for students with developmental and intellectual disabilities. In addition, measures of adaptive behavior are helpful for determining the strengths and weaknesses in daily living skills of any student suspected of having a disability.

IDEA requires local educational agencies to use multiple assessment methods and sources of information when compiling developmental and functional information. These data have three purposes: to assist in determining whether a child has a disability, to inform the content of an educational plan, and to provide baseline data useful for determining later changes (Council for Exceptional Children, 2004). Local educational agencies should emphasize the assessment of functional skills, thereby supporting interventions that can have a direct and functional impact on important practical life skills.

Measures of adaptive behavior provide important information about a child's behavior and functional age-related daily living skills. This information is critical when determining whether a child has mental retardation or developmental disabilities and can be useful by indicating the presence of other difficulties or disabilities; informing the contents of educational programming; determining progress and current performance of academic, daily living, and work skills; and providing information for reevaluations.

For example, the results of a measure of adaptive behavior may show a weakness in practical daily life skills such as those associated with community use, health and safety, and self-care. Following intervention with the student, including psychoeducation, consultation, modeling, guided practice, and opportunities for independent monitoring, follow-up assessment of adaptive behavior may show improvement toward meeting goals for the performance of these important life skills.

School districts are obligated to develop and implement a program to help students receiving special education services to transition from school to work and other postsecondary life activities. Given their focus on functional behaviors, measures of adaptive behavior should be used to assist students, their parents, and educators in identifying life skill strengths and deficits, particularly those associated with practical behaviors (e.g., work skills) and their personal behavior (e.g., communication, functional academic, and social skills). No single measure may be used to determine whether a child is served by the appropriate educational or work program. However, a measure of adaptive behavior may provide the most important information when planning a transition program for students served under IDEA. Results inform the proceedings of transition-planning conferences, indicate particular proficiencies and areas of impairment, and thereby facilitate a successful progression to gainful life activities.

## Social Security Disability and Supplemental Security Income

The federal Social Security Administration administers the Social Security and Supplemental Security Income disability programs for individuals with disabilities who meet medical criteria (Social Security Administration 2007). The Social Security Administration's definition of disability is based on an inability to perform one's previous work or to adjust to a new occupation due to a medical condition. A multistep sequential evaluation process determines whether a person who is not working meets criteria to be considered disabled by determining whether the person's condition is severe and if the person can perform either work they previously performed or other work (Social Security Administration, 2006). Results from measures of adaptive behavior help answer these questions.

An applicant for Social Security disability or Supplemental Security Income must have a medical condition sufficiently severe to interfere with basic work-related activities. Eligibility decisions for Social Security can be based partially on information from measures of adaptive behavior that reveal functional limitations in daily life activities, including impairment in work skills.

For example, an individual with a physical or mental disorder must demonstrate severe functional limitations for at least 12 months to qualify for Supplemental Security Income. Functional limitations are determined, in part, by whether a person displays self-care, maintains one's physical well-being, and works. Adaptive behavior measures that evaluate self-care, health and safety, and work skills provide needed information to address these questions. Their use is integral to establishing impairment and functional limitations leading to eligibility for services.

Subsequent reevaluations can help establish the stability of an individual's impairment and disability. Therefore, a comprehensive and valid assessment of adaptive behavior can provide a systematic and scientifically supported method that is respected by the legal system, including courts, to help provide information that has an impact on legal matters in these and other life-altering situations.

### Atkins v. Virginia

The *Atkins v. Virginia* (536 U.S. 304, 2002) U.S. Supreme Court ruling prohibits the execution of individuals with mental retardation. The impact of this ruling applies to prisoners currently being adjudicated as well as those who were adjudicated previously and are on death row. Responsibility for establishing standards and methods for evaluating mental retardation was left to the states. Prominent attorneys and professional organizations have recommended procedures to implement *Atkins* at the state level (American Bar Association, 2006; Bonnie, 2004; Bonnie & Gustafson, 2007; Ellis, 2003). However, many details remain controversial (Duvall & Morris, 2006; Olley, Greenspan, & Switzky, 2006). No nationwide policy exists on these issues. Although all diagnoses can lead to important life-changing events, the decision regarding whether a prisoner is mentally retarded can lead to life-and-death decisions.

The assessment of adaptive behavior figures prominently in the decision regarding whether a prisoner is mentally retarded. As noted elsewhere in this chapter, definitions of mental retardation generally require evidence of adaptive behavior deficits before age 18. If this standard is established by a state, then information on a death row inmate's adaptive behavior is needed before age 18. This poses considerable challenges when assessing a person aged 20 or older—especially those aged 50 and older. The examiner must locate and interview others who knew the person while a teenager and rely on records that provide this information. Locating and gaining access to such records and persons are difficult at best and often not possible. Furthermore, some courts are allowing prison guards to provide information about the prisoner's adaptive behavior and skills displayed in prison. This practice is unsupportable and should not occur. Olley and Cox (2008) discussed more fully the use of adaptive behavior measures in adult forensic cases.

## *Ethical Standards Governing Use of Measures of Adaptive Behavior*

Professions and those societies in which they are practiced are linked through an unwritten social contract whose broad principles are clear. A society agrees to establish and fund institutions that enable professions to select and prepare neophytes, define and license a profession's practice, and fund related research. In turn, professions are expected to serve all members of the society well by addressing critical national issues. The profession's ethics code communicates the ways the profession will serve society.

Ethics codes often are based on fundamental principles that underscore the profession's commitment to provide high-quality services to their clients. The American Psychological Association's 2002 *Ethical Principles of Psychologists and Code of Conduct* emphasizes the following five principles: beneficence, fidelity and responsibility, integrity, justice, and respect for people's rights and dignity.

The principle of beneficence underscores the need to strive to provide services that benefit others. Minimally, professionals strive to do no harm. The principles of fidelity and responsibility underscore the importance of establishing relationships based on trust. Professionals uphold professional standards of conduct, clarify their professional roles and obligations, accept appropriate responsibility for their behavior, and seek to manage conflicts of interest that could lead to exploitation or harm. The principle of integrity underscores the importance of promoting accuracy, honesty, and truthfulness in one's services. Moreover, professionals strive to keep their promises and to avoid unwise or unclear commitments.

The principle of justice underscores the right of all persons to have access to and benefit from professional contributions and to equal quality in the processes, procedures, and services being conducted by them. The principle of respect for people's rights and dignity underscores a person's rights to privacy, confidentiality, and self-determination. Professionals are aware of and respect cultural, individual, and role differences, including those based on age, gender, gender identity, race, ethnicity, culture, national origin, religion, sexual orientation, disability, language, and socioeconomic status and consider these factors when working with members of such groups.

The use of measures of adaptive behavior should be guided by these ethical principles. For example, professionals strive to develop relationships with those who complete these measures (i.e., the respondents) based on honesty, accuracy, and trust, thus encouraging respondents to complete the measures honestly, accurately, and in a timely fashion. Professionals discuss possible uses of information obtained from these measures. Their use should result in some benefits derived by those being assessed, their family, or caregivers. After scoring these measures, professionals communicate the results in ways that accurately describe a person's adaptive skills and behaviors, identify limitations in the data, and discuss implications of this information. Professionals recognize that, although the data may be useful when forming diagnoses, their benefit ultimately lies in informing caregivers and others about practical and functional uses of this information. In addition, professionals are aware of, respect, and do not discriminate on the basis of cultural, individual and role differences, age, gender, gender identity, race, ethnicity, culture, national origin, religion, sexual orientation, disability, language, and socioeconomic status. Moreover, they consider these qualities, if needed, when interpreting data.

## Measures of Adaptive Behavior

Thus, as noted, measures of adaptive behavior can be used in various ways. The assessment of adaptive behavior and skills is useful for diagnosis and classification; the clinical assessment of individuals' strengths and weaknesses; treatment planning, implementation, and evaluation; documenting and monitoring progress; and conducting research (AAMR, 2002; Harrison & Oakland, 2003a). Data from measures of adaptive behavior help determine eligibility for special services (e.g., IDEA or Social Security Disability and Income), differentiate diagnoses and classifications, inform treatment planning, and establish baseline data from which to evaluate change. Although adaptive behavior measures have been used principally with individuals who display mental retardation and developmental delays, they also provide useful information regarding children who display autism, emotional and behavioral disorders, and learning disabilities. Three popular norm-referenced measures of adaptive behavior are reviewed next.

### *Adaptive Behavior Assessment System–Second Edition*

The Adaptive Behavior Assessment System–Second Edition (ABAS-II; Harrison & Oakland, 2003a) provides an assessment of adaptive behavior and skills for individuals from birth through age 89 (Table 4.3). The standardization sample of 7,370 individuals is representative of 1999-2000 U.S. census data for gender, parental education, proportion of individuals with disabilities, and race/ethnicity (Harrison & Oakland, 2003b). Five forms are provided in English and French-Canadian: Parent/Primary Caregiver Form (for ages 0–5), Teacher/Day Care Provider Form (for ages 2–5), Parent Form (for ages 5–21), Teacher Form (for ages 5–21), and an Adult Form (for ages 16–89). Parent forms also are available in Spanish.

Consistent with the adaptive behavior model promulgated by the AAIDD (AAMR, 1992, 2002), the ABAS-II provides a three-tier model: 10 skill areas, three domains, and a general adaptive composite. Ten skill area scores combine to produce standard scores in the following domains: conceptual (communication, functional academics, and self-direction skill areas); social (social and leisure skill areas); and practical (self-care, home or school living, community use, health and safety, and work skill areas) (Table 4.3). A general adaptive composite score is derived from the skill area scores.

The ABAS-II is a psychometrically sound instrument and demonstrates high internal consistency (Harrison & Oakland, 2003a). Reliability coefficients range from .92 to .99 for the general adaptive composite, .80 to .98 for the three domains, and .78 to .98 for the skill areas. Test-retest reliability coefficients range from .86 to .99 for the general adaptive composite, .77 to .99 for the three domains, and .70 to .99 for the skill areas. Interrater reliability coefficients (e.g., between teachers, daycare providers, and parents) range from .82 to .93 for the general adaptive composite, .72 to .92 for the three domains, and .53 to .90 for the skill areas.

Support for the validity of scores on the ABAS-II is based on the test's sound theoretical structure and empirical evidence, which support interpretations of scores for their intended purpose. The theoretical structure of the ABAS-II is derived from the model of adaptive behavior promulgated by the AAIDD (AAMR, 1992, 2002) that defines adaptive skill areas, domains of adaptive functioning, and overall adaptive behavior as important to the assessment of individuals with mental retardation. "The theoretical structure of the ABAS-II outlines ten skill areas, all of which display considerable internal consistency, exhibit differences sensitive to age range, and are independent of one another yet assess common adaptive skills" (Harrison

**Table 4.3** Current assessment measures in adaptive behavior

| Title and Date of Publication | *Adaptive Behavior Assessment System–Second Edition* (2003a) | *Scales of Independent Behavior–Revised (1996)* | *Vineland Adaptive Behavior Scales, 2nd edition (2005)* |
|---|---|---|---|
| Authors | Harrison and Oakland | Bruininks, Woodcock, Weatherman, and Hill | Sparrow, Cicchetti, and Balla |
| Administration time | 15 minutes plus 10 minutes to score | 15–20 minutes for the Short and Early Development Forms | |
| Forms and ages | Parent/Primary Caregiver Form (ages 0–5 years); Teacher/Day Care Provider Form (ages 2–5 years); Parent Form (ages 5–21 years); Teacher Form (ages 5–21 years); and Adult Form (ages 16–89) | Full Scale (ages 3 months–80 years); Short Form (ages 3 months–80 years); and Early Development Form (infancy to 6 years of age or to older individuals with developmental ages ≤ 8 years) | Survey Interview Form (birth–90 years); Expanded Interview Form (birth–90 years, recommended for younger ages or low-functioning individuals); Parent/Caregiver Form; and Teacher Rating Form (3–21 years) |
| Behavior domains and skills measured | **Domains:** General adaptive composite, conceptual, social, practical<br>**Skills:** Communication, community use, functional academics, health and safety, leisure, motor, self-care, self-direction, school/home living, and social | **Domains:** Motor; social interaction and communication; personal living; community living; broad independence; internalized maladaptive behavior; asocial maladaptive behavior; externalized maladaptive behavior; problem behaviors (general)<br>**Skills:** Gross motor and fine motor; social interaction, language comprehension, and language expression; eating and meal preparation, toileting, dressing, personal self-care, and domestic **skills;** time and punctuality, money and value, work skills, and home/community orientation; hurtful to self, unusual or repetitive habits, and withdrawal or inattentive behavior; socially offensive and uncooperative, hurtful to others, destructive to property, and disruptive behavior | **Domains:** Adaptive behavior composite; communication; daily living; socialization; motor; maladaptive behaviorsSkills: Receptive, expressive, and written skills; personal, domestic, and community skills; interpersonal relationships, play and leisure time, and coping **skills;** gross and fine motor; internalizing and externalizing behaviors |

& Oakland, 2003a, p. 115). Intercorrelational data support the theoretical structure of the ABAS-II. Intercorrelations among the skill areas are moderate and lower than those between skill areas and the general adaptive composite; also, intercorrelations between skill areas and their respective adaptive domains are higher than those between skill areas. Evidence of the ABAS-II's construct validity is provided through confirmatory factor analyses using data from the standardization sample, which confirmed that a one-factor model of adaptive behavior provides the most parsimonious fit, although a three-factor model also provides a close fit to the data (Harrison & Oakland, 2003b). The factor structure for the scales has been deemed consistent with the AAIDD model of adaptive behavior (Wei, Oakland, & Algina, 2008).

Items on which clinicians often rely were selected to ensure the measurement of adaptive skills relevant to clinical and applied practice. Each rating form has a sufficient number of items and an acceptable level of internal consistency to ensure a robust measure of each skill area. Items with strong behavior references were selected for use to ensure the measurement of qualities that could be readily observed. Concurrent validity with the Vineland Adaptive Behavior Scales—Classroom Edition Adaptive Behavior Composite is .82 (Harrison & Oakland, 2003b). Investigations using the ABAS-II with clinical samples, described in the adaptive behavior research section of this chapter, provide additional support for the validity of the measure.

Reviewers Rust and Wallace (2004) reported that the items, manual, and record forms are easy to use, and two forms may be used with children who are age 5 as well as individuals ages 16 to 21 (Spies & Plake, 2005). The Buros's evaluation recommends the use of the ABAS-II with few reservations (Spies & Plake, 2005). Reviews of the ABAS-II noted several advantages over other measures, including that the behavior domains align with the model of adaptive behavior promulgated by the AAIDD, respondents can use the scales without a trained interviewer present, an adult self-report form is provided, and multiple respondents from multiple settings can complete the scale (Meikamp & Suppa, 2005). Burns (2005) noted that the ABAS-II is based on sound empirical methodology, and the norm group is sufficient in size and representativeness. Further, the general adaptive composite scores are adequate for eligibility decisions while domain scores are useful for clinical interpretation and intervention development. The ABAS-II is considered to be theoretically sound and among the most clinically valid measures of adaptive behavior (Spies & Plake, 2005).

## *Scales of Independent behavior–Revised Edition*

The Scales of Independent behavior–Revised Edition (SIB-R; Bruininks, Woodcock, Weatherman, & Hill, 1996) provides an assessment of adaptive behavior and skills for individuals from 3 months through 80 years (Table 4.3). The norm group of 2,182 individuals was reflective of data from the 1990 U.S. census for gender, geographic region, occupational status and level, race/ethnicity, and type of community. A portion of the norm group also was administered Woodcock-Johnson Tests of Cognitive Ability to obtain a concurrent estimate of intellectual functioning. The SIB-R provides three forms: a Short Form, an Early Development Form, and a Full Scale Form. The Short Form serves as a screener for all ages and contains items from the 14 subscales that comprise the Full Scale Form. The Early Development Form is used with children from infancy through age 6 or with older individuals with severe disabilities who function at developmental levels below age 8.

The SIB-R provides adaptive behavior scores on the following clusters based on data from 14 skill areas: motor skills (gross motor skills and fine motor skills); social interaction and communication skills (social interaction, language comprehension, and language expression); personal living skills (eating and meal preparation, toileting, dressing, personal self-care, and domestic skills); and community living skills (time and punctuality, money and value, work skills, and home/community orientation) (Table 4.3). A broad independence score is derived from all skill area scores.

The Maladaptive Behavior Scale assesses problem behavior in the following three domains and eight problem areas: internalized maladaptive behavior (hurtful to self, unusual or repetitive habits, and withdrawal or inattentive behavior); asocial maladaptive behavior (socially offensive and uncooperative behaviors); and externalized maladaptive behavior (hurtful to others, destructive to property, and disruptive behavior). A general problem behaviors score is based on scores from the eight problem areas.

The SIB-R displays suitable internal consistency (Bruininks et al., 1996). Median corrected split half reliabilities range from .97 to .98 for the broad score, .84 to .96 for the four clusters, and .70 to .88 for the skill areas. Test-retest reliability coefficients range from .98 to .99 for the broad score, .96 to .99 for the four clusters, and from .83 to .98 for the skill areas. Coefficients for the Short Form, Early Development Form, and Maladaptive Behavior Scale are somewhat lower and generally range from .74 to .92. Interrater reliability coefficients (e.g., between parents or teachers and teacher aides) range from .80 to .96 for the broad score, .74 to .97 for the four clusters, and .58 to .96 for the skill areas.

Support for the content validity of the SIB-R is based on the test's development. The SIB-R subscales assess critical skills identified by various definitions, models, research findings, and theories on adaptive behavior. "The content of the SIB-R includes adaptive behaviors found to predict personal and community independence among elderly people … and among adults with mental retardation" (Bruininks et al., 1996, p. 186). Correlations between the current and prior Scales of Independent Behavior generally are in the .90s.

Several studies with normal and clinical groups were conducted to assess the validity of the SIB-R. High correlations among SIB-R subscales provide support for the construct validity of the measure. Subscale correlations are higher with the clusters in which they are included than with other clusters. Correlations between the subscales and broad independence scores also are high. Criterion-related validity is demonstrated through correlations between SIB-R adaptive behavior scores and Woodcock-Johnson Revised Broad Cognitive Ability scores. Correlations were low, providing evidence that adaptive behavior and cognitive ability, as measured by these two tests, represent different competencies and patterns of development (Bruininks et al., 1996). A concurrent validity study between the SIB-R Early Development Form and the Vineland Adaptive Behavior Scales' Early Screening Profiles reported correlations ranged from .77 to .90 for the four clusters (Bruininks et al., 1996).

A review of the SIB-R noted various positive features, including easy administration and scoring procedures (Maccow & Zlomke, 2001). Training objectives are provided for each subscale to determine which skills are most impaired and thus need the most improvement. Further, the SIB-R provides information about maladaptive behaviors that may impair independent daily living.

### *Vineland Adaptive Behavior Scales-Second Edition*

The Vineland Adaptive Behavior Scales–Second Edition (VABS-II; Sparrow, Cicchetti, & Balla, 2005) provides an assessment of adaptive behavior for individuals from birth through age 90 (Table 4.3). The VABS-II was normed on a sample of 3,695 individuals representative of the 2001 U.S. census for age, geographic region, educational placement, race/ethnicity, sex, and socioeconomic status. The VABS-II has four forms: a Survey Interview Form (birth through age 90); Expanded Interview Form (birth through age 90, recommended for younger or low-functioning individuals); Parent/Caregiver Form (age ranges not provided); and Teacher Rating Form (ages 3 through 21). Professionals use a semistructured interview format to administer the Survey and Expanded Interview forms. The Parent/Caregiver Form can be used when an interview is not possible.

The VABS-II provides scores in various domains. Domains (with subdomains in parentheses) include: communication (receptive, expressive, and written skills); daily living skills (personal, domestic, and community); socialization (interpersonal relationships, play and leisure time, and coping skills); and motor skills (gross and fine motor) (Table 4.3). Scores in the four domains are used to comprise an adaptive behavior composite score. In addition, the VABS-II provides an index of maladaptive behaviors, including internalizing and externalizing behaviors.

The VABS-II generally demonstrates suitable internal consistency. Mean split-half reliability coefficients across ages range from .93 to .97 for the adaptive behavior composite, .77 to .93 for the four domains, and .52 to .93 for the subdomains (Sparrow et al., 2005). Test-retest reliability coefficients range from .83 to .96 for the adaptive behavior composite, .85 to .89 for the four domains, and .79 to .89 for the subdomains. Interinterviewer and interrater reliability coefficients range from .74 to .87 for the adaptive behavior composite, .68 to .83 for the four domains, and .53 to .85 for the subdomains.

Empirical and theoretical evidence for the validity of the VABS-II is based on the test's content, response process, test structure, clinical groups, and relationships with other measures (Sparrow et al., 2005). The theoretical structure, which includes adaptive behaviors and skills in four domains, is based on models promulgated by the AAIDD, American Psychological Association, National Academy of Sciences, and the original Vineland Adaptive Behavior Scales. An investigation of item-scale functioning provides supportive evidence for content validity. "Results confirmed that items belonged to their assigned subdomains and domains, that the range of abilities were well measured, and that the items supported the theoretically expected developmental sequences" (Sparrow et al., 2005, p. 126). The hierarchical structure of adaptive behavior was investigated through intercorrelations between subdomains and hierarchical factor analysis (Sparrow et al., 2005). Subdomain correlations within a domain tend to be larger than those between domains. Confirmatory factor analysis explored the fit of the structure using the standardization data. A three- or four-factor model fit the data significantly better than a one-factor model.

Measurement bias was investigated. Differential item-functioning analysis identified items that performed differently in groups of individuals with the same total test score. Mean scores were similar across genders and for those of different socioeconomic status.

Further evidence of the measure's validity is derived from investigations with clinical groups. The VABS-II showed meaningful patterns of deficits in groups of individuals with diagnoses including mental retardation autism, attention deficit/hyperactivity disorder (ADHD) emotional/behavioral disturbance, learning disability and visual/hearing impairment. Evidence for validity also is provided through correlations between the VABS-II and other measures. High correlation coefficients between the VABS-II and the original Vineland Adaptive Behavior Scales indicate a high degree of consistency between the forms in the measurement of adaptive functioning. The adjusted correlation between the VABS-II adaptive behavior composite and the ABAS-II general adaptive composite was .70, indicating a high degree of consistency for overall adaptive behavior scores.

## Research on Adaptive Behavior

The use of adaptive behavior data traditionally is associated with eligibility decisions for persons with intellectual and developmental disabilities, such as mental retardation and autism. Measures, including the ABAS-II (Harrison & Oakland, 2003a) and the VABS-II (Sparrow et al., 2005), show sensitivity between clinical and nonclinical groups as well as different profiles of strength and weakness displayed by children, adolescents, and adults who have been diagnosed with developmental and intellectual disabilities as well as other disorders, such as emotional and behavioral disorders, ADHD, and learning disabilities.

### *Developmental and Intellectual Disabilities*

On the ABAS-II, individuals with mental retardation displayed below average general adaptive behavior, with their greatest impairment in conceptual behavior, including communication, functional academics, and self-direction skills. They also displayed impaired adaptive social and practical skills (Harrison & Oakland, 2003a). On the VABS-II, individuals with mental retardation displayed below average general adaptive behavior as well as deficits in communication, daily living, socialization, and motor skills (Sparrow et al., 2005). Thus, those with mental retardation have difficulty independently displaying general adaptive behavior, including impairments in various skill areas (Table 4.4).

Given the pervasive influence of adaptive behavior on developmental and intellectual disorders, researchers have investigated the adaptive behavior of persons who display other disabilities and disorders (Harrison, 1990; Reschly, 1990), including autism (Bölte & Poustka, 2002; Fisch, Simensen, & Schroer, 2002; Freeman, Del'Homme, Guthrie, & Zhang, 1999; Gilotty, Kenworthy, Sirian, Black, & Wagner,2002; Harrison & Oakland, 2003a; Liss et al., 2001; Schatz & Hamdan-Allen, 1995; Sparrow et al., 2005); externalizing problems and psychological disturbances (Clark, Prior, & Kinsella, 2002; Harrison & Oakland, 2003a; Sparrow & Cicchetti, 1987); ADHD (Harrison & Oakland, 2003a; Sparrow et al., 2005); and learning disabilities (Harrison & Oakland, 2003a; Leigh, 1987; Strawser & Weller, 1985; Weller & Strawser, 1987).

### *Autism*

On the ABAS-II, children with autism displayed below average general adaptive behavior (Harrison & Oakland, 2003a). Their greatest impairments were displayed in communication, health and safety, and social skills. On the VABS-II, individuals with autism also displayed below average general adaptive behavior. Impairment was most evident in socialization behaviors as well as skills associated with expressiveness and leisure (Sparrow et al., 2005). Findings from these studies are consistent with the dominant definition of autism that emphasizes impairment in communication and socialization skills (APA, 2000).

Research on the adaptive behavior and skills of children with autism generally reveals social skills deficits. The general adaptive behavior as well as adaptive conceptual, social, and practical behaviors were far below average in 24 students with autism (mean age 10.3) (Ditterline, Banner, Oakland, & Becton, 2008). The students displayed significant impairment in community use, health and safety, communication, self-direction, social, leisure, and self-care skills, yet relative strength in functional academics and school living—thus suggesting that the educational programs for these students were responsive to their needs.

Adaptive daily living and socialization skills were studied in 72 children and adolescents with autism

**Table 4.4** Research of adaptive behavior with clinical samples

| Disability | ABAS-II | VABS-II |
|---|---|---|
| Mild MR | GAC, communication, daily living skills, socialization, written, community, play and leisure time | |
| Moderate MR | GAC, communication, daily living skills, socialization, receptive, expressive, written, personal, community, interpersonal relationships, play and leisure time | |
| Severe MR | | ABC, communication, daily living skills, socialization, receptive, expressive, written, personal, domestic, community, interpersonal relationships, play and leisure time, coping skills |
| Autism | GAC; social, practical, and conceptual domains; communication; community use; functional academics; school/home living; health and safety; leisure; self-care; self-direction; social skills (ages 5–18 years) | Verbal: ABC, communication, daily living skills, socialization, expressive, personal, community, interpersonal relationships, play and leisure time, autism Nonverbal: Same as above plus motor skills, receptive, written, domestic, coping skills, fine motor skills |
| ADHD | Communication, community use, functional academics, school/home living, health and safety, leisure, self-care, self-direction, social skills (ages 5–9 years) | |
| Behavior disorders | Communication, community use, functional academics, school/home living, health and safety, leisure, self-care, self-direction, social skills | |
| Emotional disorders | Communication, community use, functional academics, school/home living, health and safety, leisure, self-care, self-direction, social skills | |
| Learning disabilities | Communication, community use, functional academics, and self-direction (ages 10–12 years) | |

Note: Table indicates adaptive behavior composites, domains, and skill areas scores that fall greater than two standard deviations below the mean for each disability on the Adaptive Behavior Assessment System–Second Edition (ABAS-II) and Vineland Adaptive Behavior Scales–Second Edition (VABS-II).

ABC, adaptive behavior composite; ADHD, attention deficit/hyperactivity disorder; GAC, general adaptive composite; MR, mental retardation.

(mean age of 8.2) (Schatz & Hamdan-Allen, 1995). Daily living skills were found to be least impaired and socialization skills to be most impaired. This is consistent with other findings (e.g., Bölte & Poustka, 2002) as well as the accepted definition of autism.

A finding that adaptive communication and socialization skills are correlated with the metacognitive abilities of initiation and working memory in 35 children with autism spectrum disorders (mean age 10.5) suggests that autism is associated with deficits in executive functioning (Gilotty et al., 2002). Correlates of adaptive behavior were compared for 35 nine-year-old children with high-functioning autism and 40 nine-year-old children with low-functioning autism (Liss et al., 2001). Intelligence limited the ability of lower-functioning children to acquire adaptive skills, while specific deficits including autistic symptomology as well as impairments in language and verbal memory limited the ability of higher-functioning children.

When children with autism were compared to those with mental retardation, Schatz and Hamdan-Allen (1995) found those with autism displayed smaller increases in adaptive behavior at progressively higher levels of intellectual functioning. This suggests that the impact of intelligence on adaptive behavior may be less for children with autism than for those with mental retardation.

Partial support for this finding was found in a study of the adaptive social skills of 210 individuals with autism (ages 3 to 19) (Freeman et al., 1999). Improvements in social skills were unrelated to participants' intellectual ability. However, improvements in communication and daily living skills were related to their intellectual ability. Individuals with IQs above 70 made greater gains in communication and daily living skills compared to those with IQs below 70. Further, adaptive behavior improved with age (Freeman et al., 1999). In contrast, a longitudinal 2-year study of 18 children with autism (ages 3 to 12) found they generally acquired general adaptive behavior, communication, daily living, and socialization skills at a slower-than-average rate (Fisch et al., 2002). Further longitudinal research with larger samples is needed to determine the specific relationships among age, IQ, and adaptive changes in children with autism.

## Externalizing Disorders

On the ABAS-II, children with emotional and behavioral disorders generally were most impaired in their adaptive self-direction skills (Harrison & Oakland, 2003a). Impairments in social skills also were evident. Another study found adaptive conceptual and social behaviors to be below average in 28 students receiving special education services for emotional disturbance (mean age 8.3). Impairment was most severe in self-direction, social, and self-care skills (Ditterline et al., 2008). On the VABS-II, individuals with emotional and behavioral disturbance exhibited below average general adaptive behavior. They displayed significant impairment in adaptive socialization, receptive and expressive language, and daily living skills as well as elevated (i.e., abnormal) internalizing and externalizing behaviors (Sparrow et al., 2005). Results confirmed that those with emotional and behavior disorders display general impairment when interacting with others as well as difficulty in various discrete adaptive skill areas (Table 4.4).

For individuals who display externalizing disorders (e.g., ADHD, conduct disorder, and oppositional defiant disorder), the severity of impairment in adaptive behavior tends to increase with the severity of their emotional disturbance (Sparrow & Cicchetti, 1987). Deficits in socialization are displayed most often. Although some children with externalizing disorders display deficits in communication and daily living skills, these patterns are less predictable than patterns indicating deficits in socialization.

The adaptive social and communication skills of 110 adolescents were compared across four groups: an oppositional defiant disorder/conduct disorder-only group, an oppositional defiant disorder/conduct disorder and ADHD group, an ADHD-only group, and a control group (Clark et al., 2002). Compared to the control group, all three clinical groups displayed lower adaptive social skills. Among the clinical groups, participants in the ADHD group displayed the highest social skills and the lowest communication skills. Adolescents in the oppositional defiant disorder/conduct disorder group displayed the lowest social skills and the highest communication skills.

## Attention Deficit/Hyperactivity Disorder

On the ABAS-II, children with ADHD displayed profiles similar to those displayed by children with emotional and behavioral disturbance (Table 4.4). Children with ADHD displayed greatest impairment in self-direction skills, underscoring their general difficulty with self-motivation and self-control, including starting and completing tasks, maintaining a schedule, following directions, and making choices (Harrison & Oakland, 2003a). On the VABS-II, those diagnosed with ADHD showed impairment in adaptive communication and socialization behaviors as well as elevated maladaptive behaviors (Sparrow et al., 2005). These deficits may lead to impairment in educational settings in which students with ADHD must display independent responsibility for the organization and thoroughness of their work.

In contrast to more flexible home settings, structured educational settings are most difficult for children with ADHD, as demonstrated by differences in adaptive behavior ratings made by parents and teachers. Parent ratings generally are higher than matched teacher ratings. Thus, in contrast to their impairments at home, children with ADHD at school may display greater impairments in adaptive communication, self-direction, and socialization skills and display greater difficulty in classrooms in which self-control, rule-governed behavior, and attention to detailed academic tasks are required.

## Learning Disabilities

On the ABAS-II, children with learning disabilities displayed below average general adaptive behavior (Table 4.4). Their communication, functional academics, and self-direction skills were most impaired (Harrison

& Oakland, 2003a). Twenty-six students with learning disabilities (mean age 8.1) displayed below average conceptual adaptive behaviors (Ditterline et al., 2008). Their impairments were most evident in functional academics, communication, and self-direction skills. On the VABS-II, individuals with learning disabilities exhibited deficits in adaptive communication and writing skills (Sparrow et al., 2005). Thus, although academic problems may be most common for individuals with learning disabilities, they also tend to display impairment in important adaptive skills.

Three distinct groups emerged when relationships among adaptive behavior, processing speed, academic achievement, and intellectual ability were examined in 112 students with learning disabilities (ages 8 to 11) (Strawser & Weller, 1985). Group 1 displayed average intellectual ability, mild-to-moderate deficiencies in adaptive behavior, and discrepancies between intellectual ability and academic achievement. Group 2 displayed average levels of intellectual ability, severe deficiencies in adaptive behavior, and significantly greater discrepancies among intellectual ability, academic achievement, and processing speed. Group 3 displayed below average intellectual ability, moderate deficiencies in adaptive behavior, and no discrepancies between intellectual ability and academic achievement or processing speed. Results suggest that students with learning disabilities present with heterogeneous conditions, and their adaptive behavior deficiencies may range from mild to severe. The most severe levels of adaptive behavior deficits were found in those students who displayed the greatest discrepancies among intellectual ability, academic achievement, and processing speed. Thus, prior to placement and programming decisions, consideration of adaptive behavior may aid in determining the severity of a particular learning disability subtype and the impact the learning disability may have on a child's adaptive functioning.

Adaptive self-care, communication, social, academic, and occupation skills of 114 students with learning disabilities (66 elementary-level participants with a mean age of 9.1 and 48 secondary-level participants with a mean age of 13.4) were compared with same-age peers with normal intelligence or with mental retardation who comprised the norm group of the Adaptive Behavior Inventory (Leigh, 1987). The adaptive skills of students with learning disabilities were more impaired than students with normal intelligence and less impaired than students with mental retardation. Students with learning disabilities generally displayed their highest skills in self-care and lowest skills in academic areas. Further, adaptive behavior was considerably lower in adolescents than in children, suggesting that adaptive behavior deficits may be more prevalent in adolescence than in childhood.

Students receiving special education services for multiple or more severe disorders (e.g., emotional disturbance in combination with specific learning disability or autism) display more severe impairment in adaptive behavior than students receiving services for singular disorders (e.g., emotional disturbance) (Ditterline et al., 2008). The general adaptive behavior as well as the adaptive conceptual, social, and practical behaviors were below average for 20 students receiving services for both emotional handicap and specific learning disabilities (mean age 8.5). These students displayed their greatest impairment in social, self-direction, school living, leisure, health, safety, and communication skills (Ditterline et al., 2008). The presence of an emotional and behavioral disturbance together with a specific learning disability may lead to impairment in general adaptive behavior as well as impairment in multiple skill areas.

Thus, research illustrates impairment in the adaptive behavior and skills of individuals with various disabilities. Those with mental retardation display deficits in general adaptive behavior as well as in various skill areas. Individuals diagnosed with autism tend to display deficits in adaptive communication and socialization. Those with emotional and behavioral disturbance tend to display deficits in socialization, while deficits in other skill areas such as communication and daily living are less predictable. Individuals diagnosed with learning disabilities tend to display deficits in conceptual adaptive behaviors (i.e., qualities related to academic skills).

## Conclusion

Adaptive behavior refers to one's ability to meet daily living responsibilities and respond to the needs of others, including the conceptual, practical, and social skills that people need to function in their everyday lives. The assessment of adaptive behavior traditionally has been associated with diagnosing developmental disabilities. Mental retardation generally is characterized by significant impairments in adaptive behavior and intellectual functioning (AAMR, 2002).

The assessment of adaptive behavior increasingly is being used for diagnosis and classification together with treatment planning and evaluation for individuals with various disabilities. Adaptive skills should be assessed routinely for any individual who has difficulties and disorders that may impair their daily functioning. For example, individuals with attention disorders, autism spectrum disorders, developmental disabilities, emotional and behavioral disturbance, and learning disabilities generally exhibit impairments in daily living skills as well as patterns of strength and weakness in discrete adaptive skill areas. The assessment of adaptive behavior provides useful information for diagnosis, functional assessment, and treatment planning and evaluation for these and other individuals.

The WHO, AAIDD, and APA emphasize the importance of adaptive behavior and skills. The assessment of adaptive behavior is necessary for the diagnosis of intellectual disabilities under AAIDD and APA guidelines. Also, the evaluation of adaptive behavior yields information that is useful to professionals using the *DSM*'s GAF and SOFAS (APA, 2000). The WHO's *ICF* provides a framework that professionals may find useful for gathering information about clients' functional status. The Activities and Participation portions of the *ICF* emphasize the acquisition of knowledge about skills used in daily life. Measures of adaptive behavior help provide this information, thus assisting professionals to describe clients more comprehensively.

Further, qualification for services under federal programs often requires information from measures of adaptive behavior. Information from adaptive skills assessments informs eligibility decisions under programs such as the Individuals with Disabilities Education Act, Supplemental Security Income, and Social Security disability. This information may be required to establish stable daily functional limitations—information that often is necessary for the receipt of services. Thus, information from adaptive behavior assessments aids professionals in developing, monitoring, and ameliorating individual and family service, education, and transition services for people with various disabilities. The information also is helpful in the creation of programs for those entering prevocational training or vocational activities and in the evaluation of the needs of the elderly for assisted living and other forms of support.

Professionals can select from several well-developed norm-referenced measures of adaptive behavior. Information on three scales reviewed in this chapter is intended to help professionals in the selection of one or more measures that best meet their needs. The use of these measures provides information that assists professionals in completing more comprehensive assessments for individuals, identifying specific areas of impairment, and developing, implementing, and monitoring intervention services. Professionals often find measures of adaptive behavior to be valuable because results provide data useful for clinical assessment and individual evaluation, assisting in differential diagnosis, establishing eligibility for special services, informing program planning, and identifying changes over time in the skills used by individuals to effectively function in their daily lives.

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# Chapter 5
# Psychometric Issues in the Assessment of Impairment

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## Introduction

One of the greatest contributions psychologists have made to society is the development of methods for quantifying the various constructs used in the field (see Anastasi & Urbina, 1997). In fact, without methods of quantification, little research could be conducted, and practitioners would be limited to subjective interpretations of informal data they obtain. The development of tools used to assess psychological constructs has greatly improved the reliability and validity of the field, perhaps the most obvious ones being personality and intelligence tests. It is important to recognize that the study of *any* psychological construct is very dependent on the quality and content of the tools used. And, the methods included in scientific research directly influence the results of any study and consequently what is learned about the topic. Importantly, we must recognize that what we learn from a test is completely determined by the content of the instruments and the specific information they provide. The quality of these tools, therefore, is directly proportional to the quality of the information obtained and based on the way in which test authors conceptualize and measure their constructs. The better the tool, the more reliable and valid our findings, and as validity increases, so does the quality of the information that is obtained and, ultimately, the better the services provided. In this chapter, the tools used for assessment of impairment are examined.

The first purpose of this chapter is to review the important psychometric qualities of test reliability and validity. Special attention is given to the practical implications of psychometric concepts of reliability and validity and the influences these test attributes have on the decisions made by clinicians and researchers alike. The practical implications these psychometric issues have for the assessment of impairment and the implications they have for interpretation of results within and across instruments are stressed. Given that test quality is so dependent on the processes used to develop a scale and the methods used to develop derived scores, these issues are given close attention. The second section of this chapter focuses on the concept of impairment and how it is measured in research settings and how it should be measured when utilized in clinical practice. The intent of this chapter is to provide a discussion of the relevant psychometric issues and the characteristics researchers and clinicians should demand so that they can have confidence in any tool they use to assess impairment.

## Reliability and Related Issues

### *Reliability*

The reliability of any score has considerable implications for understanding research findings (e.g., reliability of two measures imposes a limit on the extent that they can reliably correlate) and is equally critical in clinical practice (e.g., reliability determines the amount of error of measurement). It is imperative that the reliability of any score be known so that its accuracy can be determined and used to calculate interpretive guides such as confidence intervals around obtained scores. High reliability is always desired because the higher the reliability the smaller the amount of error in the measurement of the construct and the smaller range of scores that represent the confidence interval around the estimated true score. The smaller the range, the more precision, and with precision comes greater confidence in interpretations of the results.

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General guidelines about how much reliability is sufficient were suggested by Bracken (1987). He suggested that a test's total score should have an internal consistency reliability of .90 or greater, and individual scales (e.g., a subtest or subscale) should have a reliability of .80 or greater. These guidelines must, of course, be used in light of the reason for assessment and the importance of the decisions that are being made; the greater the importance, the greater the need for good reliability. For example, if a score is used for screening purposes for which overidentification is preferred to underidentification, a .80 reliability standard for a total score may be acceptable. If decisions are made, for example, about special educational placement, then a higher reliability (e.g., .95) would be more appropriate (Nunnally & Bernstein, 1994).

## *Recognizing Measurement Error*

Every score has two components: the true score and measurement error (Crocker & Algina, 1986). The true score can only be estimated and is therefore best described on the basis of a range of values within which the person's true score falls at a specific level of certainty (e.g., 90% probability). The standard error of measurement (*SEM*), which represents all possible obtained scores within plus or minus 1 standard deviation (*SD*) of the true score, is computed from the reliability coefficient and the *SD* of the scores using the following formula (Crocker & Algina, 1986):

$$\mathrm{SEM} = \mathrm{SD} \times \sqrt{1 - \mathrm{reliability}}$$

The size of the *SEM* is directly related to the reliability in standardized tests that have a set mean. As is evident in Table 5.1, as the reliability of the measure goes down, the *SEM* goes up. This mathematical fact is very important to the researcher and especially the clinician when decisions about score differences are being made. One way to utilize the *SEM* in practice is to convert it to a range of scores that represents the true score, that is, a confidence interval.

**Table 5.1** Various standard errors of measurement (*SEMs*) obtained from different reliability coefficients

| Reliability | *SD* | *SEM* |
|---|---|---|
| .99 | 15 | 1.5 |
| .89 | 15 | 5.0 |
| .79 | 15 | 6.9 |
| .69 | 15 | 8.4 |
| .59 | 15 | 9.6 |
| .49 | 15 | 10.7 |
| .39 | 15 | 11.7 |
| .29 | 15 | 12.6 |
| .19 | 15 | 13.5 |

*SD*, standard deviation.

When the *SEM* is multiplied by a *z* value of, for example, 1.96, we obtain a range of scores, called a *confidence interval*, at the 95% level that includes the true score. Knowing the confidence interval allows us to say that there is a 95% chance that the person's true score falls within a value added to and subtracted from the obtained score. For example, the confidence interval for an obtained score of 100 may be 95 (100 – 5) to 105 (100 + 5). Table 5.2 provides confidence intervals (95% level of confidence) for a standard score of 100 that would be obtained for measures with reliability of .50 through .99. As would be expected, the range within which the true score is expected to fall varies considerably as a function of the reliability coefficient, and the lower the reliability, the wider the range of scores that can be expected to include the true score.

Although many professionals use confidence intervals by adding and subtracting a value from the obtained score, it is more correct that the range of scores should be centered around the estimated true score rather than the obtained score (Nunnally & Bernstein, 1994). These estimated true score-based confidence intervals are included in some test manuals, such as the *Wechsler Intelligence Scale for Children-Fourth Edition* (WISC-IV; Wechsler, 2003) and the Cognitive Assessment System (Naglieri & Das, 1997), for the user's convenience. The differences between these methods and the relationships among the various scores are illustrated in Table 5.3. This table provides several obtained scores and their associated estimated true scores, with the lower and upper ranges for the confidence intervals for standard scores having a normative mean of 100 and *SD* of 15 and a reliability of .90 at the 90% level of confidence.

Table 5.3 values reveal that the confidence interval is equally distributed around a score of 100 (92 and 108 are both 8 points from the obtained score), but the interval becomes more asymmetrical as the obtained scores deviate from the mean. The result is that ranges for standard scores that are below the mean are mostly *higher* than the obtained score. For example, the range for a standard score of 70 is 65 to 81 (5 points below 70 and 11 points above 70). In contrast, scores for

**Table 5.2** 95% Confidence intervals obtained from different reliability coefficients

| Reliability | Confidence interval | Score minus confidence interval | Score plus confidence interval |
|---|---|---|---|
| .99 | 2.9 | 97 | 103 |
| .95 | 6.6 | 93 | 107 |
| .90 | 9.3 | 91 | 109 |
| .85 | 11.4 | 89 | 111 |
| .80 | 13.1 | 87 | 113 |
| .75 | 14.7 | 85 | 115 |
| .70 | 16.1 | 84 | 116 |
| .65 | 17.4 | 83 | 117 |
| .60 | 18.6 | 81 | 119 |
| .55 | 19.7 | 80 | 120 |
| .50 | 20.8 | 79 | 121 |

**Table 5.3** Relationships among obtained standard scores, estimated true scores, and confidence intervals across the 40–160 range

| Obtained standard score | Estimated true score | True score minus obtained score | Lower confidence interval | Upper confidence interval | Upper minus lower confidence interval |
|---|---|---|---|---|---|
| 40 | 46 | 6 | 38 | 54 | 16 |
| 55 | 60 | 5 | 52 | 67 | 16 |
| 70 | 73 | 3 | 65 | 81 | 16 |
| 85 | 87 | 2 | 79 | 94 | 16 |
| 100 | 100 | 0 | 92 | 108 | 16 |
| 115 | 114 | -2 | 106 | 121 | 16 |
| 130 | 127 | -3 | 119 | 135 | 16 |
| 145 | 141 | -5 | 133 | 148 | 16 |
| 160 | 154 | -6 | 146 | 162 | 16 |

*Note:* This assumes a reliability coefficient of .90 and a 90% confidence interval.

standard scores that are above the mean are *lower* than the obtained score. The range for a standard score of 130 is 119 to 135 (11 points below 130 and 5 points above 130). This difference is the result of centering the range of scores on the estimated true score rather than the obtained score even though the size of the confidence interval is constant (±8 points) in all instances.

Practitioners should routinely use confidence intervals when describing results regardless of how the confidence intervals are constructed. In either case, importance of measurement error must be made known and taken into consideration when scores from any measuring system are used. Confidence intervals, especially those that are based on the estimated true score, should be provided for all test scores, including rating scales.

## Comparing Test Scores

Recognition of measurement imprecision is important when describing test scores and particularly important when comparing test scores (Crocker & Algina, 1986). The lower the reliability two scores have, the larger their respective *SEM*s and the more likely two scores will differ on the basis of chance. For example, when a score on an IQ test is compared to an achievement test score, the reliability of these measures will influence the size of the difference needed to reliably compare them. The lower the reliability, the more likely they will be different by chance alone. In fact, the formula for determining how different two scores need to be to have a significant difference includes the standard error of measurement of each score and the $z$ score associated with a specified level of significance. The formula is

$$Difference = Z \times \sqrt{SEM1^2 + SEM2^2}$$

The relationships between *SEM* and the differences needed for significance are apparent in Table 5.4, which provides the values needed for significance when comparing two standard scores on an IQ metric (mean of 100, *SD* of 15). The data show that comparing two scores with reliabilities of .70 requires a difference of 23 points. Differences between such scores that were

**Table 5.4** Differences required for significance when comparing two standardized scores with a mean of 100 and standard deviation of 15 at the $p = .05$ level

| Reliability | .99 | .95 | .90 | .85 | .80 | .75 | .70 | .65 | .60 | .55 | .50 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| .99 | 4 | 7 | 10 | 12 | 13 | 15 | 16 | 18 | 19 | 20 | 21 |
| .95 | 7 | 9 | 11 | 13 | 15 | 16 | 17 | 19 | 20 | 21 | 22 |
| .90 | 10 | 11 | 13 | 15 | 16 | 17 | 19 | 20 | 21 | 22 | 23 |
| .85 | 12 | 13 | 15 | 16 | 17 | 19 | 20 | 21 | 22 | 23 | 24 |
| .80 | 13 | 15 | 16 | 17 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| .75 | 15 | 16 | 17 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 25 |
| .70 | 16 | 17 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 25 | 26 |
| .65 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 25 | 26 | 27 |
| .60 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 25 | 26 | 27 | 28 |
| .55 | 20 | 21 | 22 | 23 | 24 | 25 | 25 | 26 | 27 | 28 | 29 |
| .50 | 21 | 22 | 23 | 24 | 25 | 25 | 26 | 27 | 28 | 29 | 29 |

**Table 5.5** Differences required for significance when comparing two standardized scores with a mean of 50 and standard deviation of 10 at the $p = .05$ level

| Reliability | .99 | .95 | .90 | .85 | .80 | .75 | .70 | .65 | .60 | .55 | .50 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| .99 | 3 | 5 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 13 | 14 |
| .95 | 5 | 6 | 8 | 9 | 10 | 11 | 12 | 12 | 13 | 14 | 15 |
| .90 | 7 | 8 | 9 | 10 | 11 | 12 | 12 | 13 | 14 | 15 | 15 |
| .85 | 8 | 9 | 10 | 11 | 12 | 12 | 13 | 14 | 15 | 15 | 16 |
| .80 | 9 | 10 | 11 | 12 | 12 | 13 | 14 | 15 | 15 | 16 | 16 |
| .75 | 10 | 11 | 12 | 12 | 13 | 14 | 15 | 15 | 16 | 16 | 17 |
| .70 | 11 | 12 | 12 | 13 | 14 | 15 | 15 | 16 | 16 | 17 | 18 |
| .65 | 12 | 12 | 13 | 14 | 15 | 15 | 16 | 16 | 17 | 18 | 18 |
| .60 | 13 | 13 | 14 | 15 | 15 | 16 | 16 | 17 | 18 | 18 | 19 |
| .55 | 13 | 14 | 15 | 15 | 16 | 16 | 17 | 18 | 18 | 19 | 19 |
| .50 | 14 | 15 | 15 | 16 | 16 | 17 | 18 | 18 | 19 | 19 | 20 |

less than 23 points would be attributed to *measurement error alone*. Similarly, Table 5.5 provides the values needed when comparing two *T* scores that have a mean of 50 and *SD* of 10. If two test scores being compared have reliabilities of .90 and .75, the difference required for significance is 12 points. Clearly, in both research and clinical settings, variables with high reliability are particularly needed when scores will be compared.

Comparing pairs of test scores using the values in Table 5.4 or 5.5 provides a way of determining when differences are likely due to measurement error and when the differences are reliable. These tables can be used to compare more than one pair of scores; however, doing so changes the actual level of significance in proportion to the number of comparisons made. For example, using a .05 level of significance six times makes the experimentwise error rate actually .265, not .05, because six pairwise increases error [the chance of a Type I error is obtained using the formula $1 - (1 - .05) \times 6$]. One way to control for inflation in the level of significance is by using the Bonferroni correction method. This procedure controls for the number of comparisons by setting the experimentwise error rate on the basis of making all six comparisons simultaneously (e.g., .05/6 = .008).

An alternative to the pairwise comparison approach that maintains the overall error rate and provides a more efficient way to examine intraindividual differences is termed an *ipsative approach* (Silverstein, 1982). The ipsative method provides the values needed to make comparisons between an individual's scores on separate scales within a test to the average of those scores (Davis, 1959; Silverstein, 1982). See the work of Naglieri and Paolitto (2005) for an example using the WISC-IV, for which this method is most applicable.

## Conclusions Regarding Reliability

Researchers and clinicians who assess any construct should use measures that have a reliability coefficient of .80 for individual variables and .90 for variables that is a composite of several variables. If a rating scale or test does not meet these requirements, then its use in research should be questioned, especially because of the amount of error this will introduce into the results. Of course, this will be particularly important when the research involves many variables with low reliability as well as undocumented reliability. Moreover, clinicians are advised *not* to use measures that do not meet reliability standards because there will be too much error in the obtained scores to allow for reliable interpretation. This is especially important because the decisions clinicians make can have a significant and long-lasting impact on the life of an examinee.

## Validity

Highly reliable psychological measurement is an important goal, but consistently measuring a construct that has insufficient validity accomplishes little for the clinician or researcher. The importance of validity is that it concerns the degree to which empirical evidence supports interpretation of scores that represent a construct of interest. For example, a measure of impairment should contain carefully crafted questions that reliably *and* validly reflect the individual's current state of functioning. Researchers who study impairment and authors who develop tools to assess impairment have the responsibility to carefully and clearly define the condition and ways to detect it. When there has been sufficient operationalization of those observable events that reflect impairment, then further development of the dimensions or factors that may comprise a complete examination of impairment can be obtained and used for research and clinical practice. This is, of course, all dependent on the extent to which the measures of impairment have acceptable levels of reliability.

At this time, there is no nationally standardized measure of impairment, and researchers and clinicians are left using tools that have, at best, varying degrees of documentation of reliability and validity. Given the fact that methods for evaluating impairment as well as our understanding of the underlying aspects of the disorder are evolving, developers of any measure of impairment have a responsibility to provide reliability and validity evidence and normative values based on a nationally representative sample.

Demonstrating reliability is relatively easy, but validity is harder to demonstrate because of the complexity of the concept and the fact that validity is not determined by a single study. A body of literature that supports the interpretation of scores obtained from a measure of impairment must be obtained; this is a considerable undertaking with many challenges. For example, what standard can a measure of impairment be validated against? Any new tools designed to measure impairment will have to first demonstrate validity by showing that individuals who can be objectively agreed are impaired actually earn scores that reflect some level of diminished level of functioning. How such a group is defined and the extent to which that definition will be considered acceptable will be important. Similarly, research methodology is also especially important when comparing impaired individuals to those that are not. Special attention should be made to ensure that the methodology includes a sufficient number of control groups that vary on the basis of diagnosis.

It is important also to consider that our emerging definitions of impairment will influence the questions used in any test of this construct, which in turn will then define the condition. Tests and rating scales not only provide a tool for assessment, but also by the author's inclusion of particular content, they simultaneously define the construct. That is, the very nature of our understanding of impairment is determined by the selection of the variables used to build any scale, which in turn has profound influence on our understanding of the concept. In addition, the psychometric quality of the tests and rating scales used to study impairment will also influence both research and practice decisions. As the research is progressing, clinicians must be aware, however, that until there is sufficient maturity in the scope and quality of the instruments used to assess impairment, use of nonstandardized instruments with undocumented reliability and validity documentation and no nationally representative normative group should be avoided or used with considerable risk.

## Development of Scales to Assess Impairment

There are several nonstandardized impairment methods that have evolved over the past 25 years, such as the Children's Global Assessment Scale (CGAS)

(Shaffer et al., 1983); the Child and Adolescent Functional Assessment Scale (CAFAS) the Columbia Impairment Scale (CIS) (Bird et al., 1993); the Brief Impairment Scale (BIS) (Bird et al., 2005); and the Impairment Rating Scale (Fabiano et al., 2006). Issues concerning the CGAS, CAFAS, and the CIS are that these measures are mostly unidimensional; many include measures of symptomatology into the measurement, some mix severity of psychopathology with functional impairment; others some involve subjective scoring systems and others are excessively lengthy, thus impractical for either clinical or research use (Bird et al., 2005). To address these issues, Bird et al. (2005) created the BIS, which has the advantages of being respondent based, short (23 items), and multidimensional, but it is limited in that it was assessed only within one ethnic group, is not applicable to preschool children, and does not provide an assessment in the direction of superior functioning. Similarly, the Impairment Rating Scale, like the others, is limited to a nonstandardized, nonnormed instrument with limited documentation of psychometric qualities.

Researchers and clinicians alike have a need for a measure of impairment that is appropriately standardized and normed, has sufficient documentation of reliability and validity, and has interpretative guidelines so that researchers and clinicians can assess impairment with confidence. Demonstrated reliability and validity are essential, as is a workable, user-friendly format. Because clinicians are required to demonstrate the impact psychological and psychiatric diagnoses have in daily functioning to make a clinical diagnosis, they have relied on imprecise tools to do so (e.g., the Global Assessment of Functioning included in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision* [*DSM-IV-TR*] of the American Psychiatric Association [APA], 2000). The *DSM* acknowledges that assessing impairment involves "an inherently difficult clinical judgment" (APA, 1994), in which there is no clear-cut standard requirement for specifying how impairment or distress for each specific diagnosis is to be determined. It is therefore clear that the field needs scales that are carefully developed using well-known procedures amply described by Crocker and Algina (1986) as well as Nunnally and Bernstein (1994). The essential ingredients of these methods are summarized next.

## Step 1: Define the Construct

Initial test development should begin with a clear definition of *impairment*. Authors might define impairment as the outcome of any psychological disorder manifested by a constellation of symptoms. This might be defined as clear evidence of clinically significant impairment in social, academic, or occupational functioning, perhaps by restrictiveness of placement (day treatment vs. outpatient care). Functioning could be further categorized into interpersonal and community relations, occupational or school performance, and a range of self-care and other home activity dimensions. Impairment that might be indicated by poor performance in one or more of these dimensions goes beyond any diagnosis that may be causing them. Once the parameters of the definition have been defined, then items can be written.

## Step 2: Operationalize the Definition

These behaviors and other defining characteristics must be written with sufficient clarity that they can be assessed reliably over time and across raters. Behaviors should be included that represent the characteristics that define as completely as possible individuals who have functional impairment. Definitional clarity is *required* for good item writing. The next step is to develop an initial pool of questions followed by a pilot test to evaluate the clarity of the instruction, items, as well as the structure of the form and other logistical issues. For instance, it is important to consider the way items are presented on the page, size of the fonts, clarity of the directions, position of the items on the paper, colors used on the form, and so on. The overall goal of pilot testing is to answer essentials question such as the following: Does the form seem to work? Do the users understand what they need to do? Are the items clear? Can the rater respond to each question? Can the items be answered in a reasonable amount of time?

## Step 3: Assess Psychometric Qualities

Assessing the psychometric characteristics of a test or rating scale prior to collecting standardization data for norming is an important next step. Because of the cost of norming, in the next important step preliminary examinations of the instrument allow for an examination of the psychometric qualities of the items, the relationships between each item and any composite scale scores, and their correspondence to the constructs of interest. This effort is repeated until there is sufficient confidence that the items and the scales have been adequately operationalized. This is also the point at which decisions are made about the experimental evidence as well as the practical demands that application in the real world will involve. For example, research at this stage may yield a psychometrically strong scale that is impractical to give, in which case it might be discarded. What follows is a summary of the essential analyses that are typically conducted.

- Item means, *SDs*, and *p* values should be obtained for each item.
- Item total correlations should be computed to measure the extent to which each item correlates with a total score obtained from the sum of all those items designed to measure that same construct. If the correlations are low, then their inclusion on the scale should be questioned.
- The effect each item has on the reliability of the scales on which it is placed should be evaluated.
- Items designed to measure the same construct should correlate with other items designed to measure that same construct higher than items designed to measure different constructs. If this is not found, then the item may be eliminated.
- The factor structure of the set of items may be examined to test the extent to which items or scales form groups, or factors, whose validity can be examined.
- The internal reliability of those items organized to measure each construct should be computed, as should the reliability of a composite score.

The procedures used at this phase are repeated until the scale is ready for standardization. The number of research studies needed to complete this step will depend on the quality of the original concepts, the pool of items, and the quality of the samples used. The overall aim is to produce an experimental version of an instrument that is ready to be subjected to large-scale and more costly national standardization study. The normative sample should include a sufficient number of cases to obtain stability in the means and *SDs* across ages, gender, and so forth. Standardization requires not only that the scale be administered in a consistent manner, but also that good data are obtained from the sample that represents the population of the country in which the scale will be used. This demands that all the conditions necessary for standardization are followed exactly so that normative values can be computed.

## Step 4: Standardization Data Collection

A normative standardization sample is designed to obtain data that are representative of the normal population so that those who differ from the norm (50th percentile ± 1 *SD*) can be identified, and the extent to which they differ from the norm can be calibrated. Development of norms is an art as much as a science, and there are several ways in which this task can be accomplished (see Crocker & Algina, 1986; Nunnally & Bernstein, 1994; Thorndike, 1982). The second component of this stage is collection and analysis of data for establishing reliability (e.g., internal, test-retest, interrater, intrarater) and validity (e.g., construct, predictive, and content). Of these two, validity is more difficult to establish and should be examined using a number of different methodologies and to assess the extent to which there is empirical evidence for interpretation of the scores the scale yields.

Establishing validity of any psychological test requires an accumulation of evidence that examines the extent to which a test does what the authors intended. Because there are many different types of validity, it is not possible for validity to be determined by a single study. Evidence for validly "integrates various strands of evidence into a coherent account of the degree to which existing evidence and theory support the intended interpretation of test scores for specific uses" (American Educational Research Association et al. [AERA], APA, and National Council on Measurement in Education [NCME], 1999, p. 17). There are nearly 25 standards regarding validity that should be addressed by authors and test development companies. Some of them that demonstrate the amount of evidence available should assess.

- interpretations based on the scores the instrument yields
- the relationships between the new instrument with one or more relevant criterion variables
- the utility of the measure across a wide variety of demographic groups (gender, race, ethnicity, language, culture, and so forth)

- the utility of the test for differentiating groups as intended
- a rationale or empirical support for the alignment of the structure of the items or subtests with the scale configuration provided by the authors

There is wide variety in the way test authors construct a test manual that documents the development, standardization, reliability, and validity of their measure. Some manuals provide sufficient descriptions that bring out the strengths of the scale, others provide limited details. Readers interested in illustrative manuals should examine those developed by the Kaufman Assessment Battery for Children–Second Edition (Kaufman & Kaufman, 2004), Bracken and McCallum for their Universal Nonverbal Intelligence Test (1997), and the Cognitive Assessment System (Naglieri & Das, 1997). These manuals are illustrative of how to provide detailed discussion of the various phases of development, reliability, validity, and especially interpretation of scores the tests yield (AERA et al., 1999). This includes how test scores should be compared with one another and interpretive issues such as the values needed for significance when the various scores are compared. This information is critically important if clinicians are to be expected to interpret the scores from any instrument in a manner that is psychometrically defensible.

## Conclusions

Authors of any published psychological measure have the responsibility to simultaneously publish a test manual that contains accurate information about the reliability, validity, and utility of any instrument they produce and distribute for use in clinical settings. Researchers and practicing clinicians have a responsibility to choose measures that have been developed using the highest standards available when important decisions will be made about individual clients or groups of subjects based on the information a measure may provide. It is best to choose scales for clinical practice that, in addition to being reliable, have a standardized administration and scoring format with norms developed based on a large sample that represents the country in which the scale is used. This should also include ample documentation of methods used to develop the measure, evidence of validity, and explicit instructions for interpretation of the scores that are obtained.

The information provided in this chapter is intended to provide researchers and clinicians with important criteria that could be used to evaluate a measure of impairment. Perhaps the most important characteristic of a measure of impairment is having norms based on a national sample. This provides a critical advantage for several reasons. First, a large representative sample allows for reliable calibration of derived scores. Second, comparison to that sample provides an understanding of how often and to what degree individuals within the normal population have functional impairment. Third, the comparison of an individual to a normative expectation of what is expected in the typically developing population provides for greater understanding of how far an individual may be from the norm. Fourth, having a well-normed score provides a means of calibrating how much response to intervention is needed to bring the person's level of impairment into a range that can be considered typical.

The most glaring shortcoming of all scales of impairment is that they do not provide a way of evaluating individuals in comparison to a representative sample. This poses considerable liability for those who choose to use these measures because it is imperative to know how far a person's level of impairment is from the norm and how much like those with functional impairment the individual may be. The only way to know adequate levels of impairment is to have a national standardization group and to build norms on that sample. Clinicians can then make defensible statements about how far an individual deviates from normality and the extent to which such data provide documentation for making a diagnosis. Those measures that do not have a national standardization sample and documented reliability and validity should be viewed with caution because interpretation of results may or may not be accurate.

The use of well-developed, psychometrically sound assessments will greatly enhance the likelihood that reliable and valid information can be obtained about a person's level of impairment. At the time of this writing, efforts are under way to begin norming a standardized rating scale of impairment (Goldstein & Naglieri, in preparation) as well as obtaining evidence of reliability and validity. Any and all efforts to advance the field in this area should closely follow the guidelines described in this chapter as well as other appropriate resources.

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## Chapter 6

# The Medical Model of Impairment

Norma Leclair, Steven Leclair, and Christopher R. Brigham

## Introduction

The principal medical model of impairment is the American Medical Association's (AMA's) *Guides to the Evaluation of Permanent Impairment* (2008). The sixth edition, published in December 2008, introduced new approaches to rating impairment, using methodology designed to enhance the relevancy of impairment ratings, improve internal consistency, promote greater precision, and simplify the rating process. The approach is based on a modification of the conceptual framework of the *International Classification of Functioning, Disability, and Health* [*ICF*] (World Health Organization, 2001), although the fundamental principles underlying the guides remain unchanged. In this chapter, we review the medical approach to assessing impairment, with focus on the underlying methodology and the evaluation of pain, nervous system, and mental and behavioral impairment.

## Use of the Guides

The AMA *Guides to the Evaluation of Permanent Impairment* (2008) is used to define *impairment*, which is defined as "a significant deviation, loss, or loss of use of any body structure or function in an individual with a health condition, disorder or disease" (p. 5). The guides provide the basis for defining impairment in the vast majority of workers' compensation jurisdictions, and the use of the most recent edition will be required immediately by certain state jurisdictions and for Federal and Longshore and Harbor Workers Act cases. The guides' impairment ratings are used in different ways, depending on the type of case and the jurisdiction. Although impairment is a different concept from disability, some jurisdictions use impairment as a proxy for the latter, while others use the impairment rating value in a formula that results in a disability rating.

The guides started in 1958 with publication by the AMA of the article, "A Guide to the Evaluation of Permanent Impairment of the Extremities and Back." This was followed by additional guides published in the *Journal of the American Medical Association*. In 1971, a compendium of 13 guides became the first edition (AMA, 1971). Thirteen years later in 1984, the second edition was published (AMA, 1984), and it provided numerical impairments for mental and behavioral impairments. Subsequent editions omitted numerical mental and behavioral ratings until the most current sixth edition.

## Challenges and Criticisms of Prior Editions

There are many challenges associated with the use of the guides, including criticisms of the guides themselves, the use of impairment-rating numbers, and a high error rate (Burd, 1980; Clark et al., 1988; Hinderer, Rondinelli, & Katz, 2000; Pyor, 1990; Rondinelli & Duncan, 2000; Rondinelli et al., 1997; Rondinelli & Katz, 2002; Spieler, Barth, Burton, Himmelstein, & Rudolph, 2000). Previous criticisms include

> Failure to provide a comprehensive, valid, reliable, unbiased, and evidence-based rating system.
> Impairment ratings did not adequately or accurately reflect loss of function.
> Numerical ratings were more the representation of "legal fiction than medical reality."

S. Goldstein and J. Naglieri (eds.), *Assessing Impairment: From Theory to Practice*,
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Therefore, the following changes were recommended:

Standardize assessment of activities of daily living (ADL) limitations associated with physical impairments
Apply functional assessment tools to validate impairment-rating scales
Include measures of functional loss in the impairment rating
Improve overall intrarater and interrater reliability and internal consistency

Studies have demonstrated poor interrater reliability and revealed that most impairment ratings are incorrect, more often rated significantly higher than appropriate (Brigham, Uejo, Dilbeck, & Walker, 2006). While treating physicians, who by definition are advocates for their patients, have been particularly prone to overrate impairment, physicians who have not been adequately trained in the use of the guides also commonly provide similarly erroneous ratings.

## Sixth Edition Approaches and Developmental Process

The guides define the process for evaluating impairment. Clinical discussions among physician colleagues regarding potential severity of an illness or injury typically involve four basic points of consideration:

What is the problem (diagnosis)?
What symptoms and resulting functional difficulty do the patient report?
What are the physical findings pertaining to the problem?
What are the results of clinical studies?

In a similar manner, these same basic considerations are used by the physicians to evaluate and communicate about impairment, although given the use of ratings as the basis for monetary awards, physicians are always cognizant of the need to be certain that subjective and other objectively nonquantifiable aspects of the clinical presentation are consistent with both the diagnosis and the patient's objective findings. The sixth edition (AMA, 2008) expands the spectrum of diagnoses recognized in impairment rating, considers functional consequences of the impairment as a part of each physician's detailed history, refines the physical examination, and clarifies appropriate clinical testing.

## *International Classification of Functioning, Disability, and Health*

The sixth edition of the guides (AMA, 2008) uses the framework based on the *ICF*, a comprehensive model of disablement developed by the World Health Organization. This framework, illustrated in Figure 6.1, is intended for describing and measuring health and disability at the individual and population levels. The *ICF* is a classification of health and health-related domains that describe body functions and structures, activities, and participation. The domains are classified from body, individual, and societal perspectives. The *ICF* systematically groups different domains for a person in a given health condition (e.g., what a person with a disease or disorder does do or can do). *Functioning* is an umbrella term encompassing all body functions, activities, and participation; similarly, *disability* serves as an umbrella term for impairments, activity limitations, or participation restrictions. Since an individual's functioning and disability occur in a context, the *ICF* also includes a list of environmental factors.

The following definitions are presented in the guides (AMA, 2008) and are used in the *ICF* to facilitate communications and standardization:

**Body functions:** Physiological functions of body systems (including psychological functions)
**Body structures:** Anatomic parts of the body such as organs, limbs, and their components
**Activity:** Execution of a task or action by an individual
**Participation:** Involvement in a life situation
**Impairments:** Problems in body function or structure such as a significant deviation or loss
**Activity limitations:** Difficulties an individual may have in executing activities
**Participation restrictions:** Problems an individual may experience in involvement in life situations

The *ICF* model reflects the dynamic interactions between an individual with a given health condition, the environment, and personal factors. Impairment, activity limitations, and limitations in participation are not synonymous; an individual may have impairment and significant limitations in most activities but be able to participate in a specific life situation of relevance, minor impairment and activity limitations with inability to participate in a specific life situation, or any permutation of these three factors.

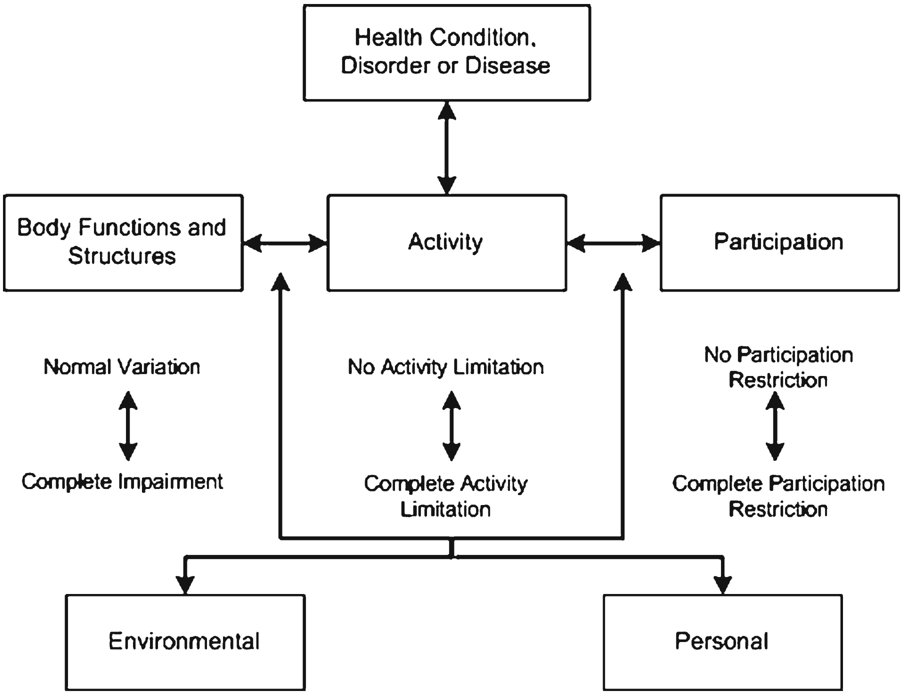

**Fig. 6.1** *International Classification of Functioning, Disability, and Health (ICF) model of disablement*

Use of the *ICF* model does not indicate that the guides (AMA, 2008) will now be assessing disability rather than impairment. Rather, the incorporation of certain aspects of the *ICF* model into the impairment-rating process reflects efforts to place the impairment rating into a structure that promotes integration with the *ICF* constructs for activity limitations and limitations in participation, ultimately enhancing its applicability to situations in which the impairment rating is one component of the "disability evaluation process."

## *Impairment Classes and Diagnosis-Based Grids*

The *ICF* classification uses five impairment classes, which permits rating of patients who range from having no problems to having significant problems. In the sixth edition of the guides (AMA, 2008), "diagnosis-based grids" were developed for each organ system. These grids use commonly accepted consensus-based criteria to classify most diagnoses relevant to a particular organ or body part into five classes of impairment severity ranging from Class 0, normal, to Class 5, very severe. The final impairment is determined by adjusting the initial impairment rating given by factors that may include physical findings, the results of clinical tests, and functional reports by the patient. The basic template of the diagnosis-based grid is common to each organ system and chapter; therefore, although there is variation in the ancillary factors used to develop the impairment rating (depending on the body part), there is greater internal consistency between chapters than was seen formerly.

The preface to the sixth edition (AMA, 2008) states that the features of the new edition include

> A standardized approach across organ systems and chapters.
> The most contemporary evidence-based concepts and terminology of disablement from the ICF.
> The latest scientific research and evolving medical opinions provided by nationally and internationally recognized experts.
> Unified methodology that helps physicians calculate impairment ratings through a grid construct and promotes consistent scoring of impairment ratings.
> A more comprehensive and expanded diagnostic approach.
> Precise documentation of functional outcomes, physical findings, and clinical test results, as modifiers of impairment severity.
> Increased transparency and precision of the impairment ratings.
> Improved physician interrater reliability. (p. iii)

The sixth edition (AMA, 2008) reflects movement toward these features; however, such change is not immediately achieved. Thus, it should be considered a step in the evolution of the guides rather than an end point in and of itself.

### *Development Process*

The sixth edition (AMA, 2008) process involved many participants—including physicians who use the guides and the staff of the AMA, all of whom were tasked to develop the sixth edition in the context of the aforementioned principles. The process was guided by an editorial panel and an advisory committee and involved a tiered peer review process. The editorial process used an evidence-based foundation when possible, primarily as the basis for determining diagnostic criteria, and a Delphi panel approach to consensus building regarding the impairment ratings themselves. When there was not a compelling rationale to alter impairment ratings from what they had been previously, consistency of the ratings with those provided in prior editions was the default. An advisory committee was developed to provide ongoing discussion of items of mutual concern and current issues in impairment and disability.

## Sixth Edition Structure

The sixth edition of the guides (AMA, 2008) is 634 pages long (the fifth edition was 613 pages; AMA, 2001) and is comprised of 17 chapters. Chapter 1, "Conceptual Foundations and Philosophy," and chapter 2, "Practical Applications of the Guides," define the overall approaches to assessing impairment. Chapters 3 to 17 provide approaches for assessment of specific impairments, including chapter 3, "Pain-Related Impairment"; chapter 13, "The Central and Peripheral Nervous System"; and chapter 14, "Mental and Behavioral Disorders."

### *Chapter 1: "Conceptual Foundations and Philosophy"*

The sixth edition of the guides commences with section 1.1, "History of the Guides" (AMA, 2008, pp. 1–2), and describes a history of compensation for personal injury and disability that dates to antiquity. Section 1.2, "New Direction for the Sixth Edition" (p. 3), presents previous criticisms of the guides and five new axioms of the sixth edition, which include

> The Guides adopts the terminology and conceptual framework of disablement as put forward by the International Classification of Functioning, Disability, and Health (ICF).
> The Guides becomes more diagnosis based with these diagnoses being evidence-based when possible.
> Simplicity, ease-of-application, and following precedent, where applicable, are given high priority, with the goal of optimizing interrater and intrarater reliability.
> Rating percentages derived according to the Guides are functionally based, to the fullest practical extent possible.
> The Guides stresses conceptual and methodological congruity within and between organ system ratings.

The contemporary model of disablement adopted by the sixth edition is the *ICF*, as explained in section 1.3 (AMA, 2008, pp. 3–6). The former model of disablement previously relied on the International Classification of Impairments, Disabilities, and Handicaps (ICIDH) presented by the World Health Organization more than a quarter century ago. This approach was a simplistic model providing a unidirectional depiction of the relationship among pathology, impairment, disability, and handicap without recognizing the dynamic relationships among these factors or the role of important personal and environmental modifiers.

The sixth edition defines *impairment* as "a significant deviation, loss, or loss of use of any body structure or body function in an individual with a health condition, disorder, or disease" (AMA, 2008, p. 5). This is more refined than the definition in the fifth edition, which was "a loss, lose of use, or derangement of any body part, organ system, or organ function" (AMA, 2001, p. 601); the sixth edition includes the term *significant* and then adds the phrase "in an individual with a health condition, disorder, or disease." *Disability* is defined as "activity limitations and/or participation restrictions in an individual with a health condition, disorder, or disease" (AMA, 2008, p. 5) reflective of the *ICF* terminology. The fifth edition definition of disability was "alteration of an individual's capacity to meet personal, social or occupational demands, or statutory or regulatory requirements because of an impairment" (AMA, 2001, p. 600)

Impairment rating is a physician-provided process that attempts to link impairment with functional loss and continues to be defined as a "consensus-derived percentage estimate of loss of activity reflecting severity for a given health condition, and the degree of associated limitations in terms of activities of daily living (ADLs)" (AMA, 2008, p. 5). The sixth edition differs in stressing the importance of causation assessment in performing a rating as it is first necessary to determine if the health condition is related to an allegedly causal event or exposure. This represents a concerted attempt to prevent, or at least reduce, the common error of including factors that are not causally related to an injury in the rating (for example, rating spinal degenerative disease not caused by an injury).

Since impairment ratings may be used inappropriately as a direct correlate of disability, the sixth edition addresses this issue by explaining

> The relationship between impairment and disability remains both complex and difficult, if not impossible, to predict. In some conditions there is a strong association between level of injury and the degree of functional loss expected in one's personal sphere of activity (mobility and ADLs). The same level of injury is in no way predictive of an affected individual's ability to participate in major life functions (including work) when appropriate motivation, technology, and sufficient accommodations are available. Disability may be influenced by physical, psychological, and psychosocial factors that can change over time. (AMA, 2008, pp. 5–6)

The sixth edition specifically states, as did prior editions, "the *Guides* is not intended to be used for direct estimates of work participation restrictions. Impairment percentages derived according to the *Guides* criteria do not directly measure work participation restrictions" (AMA, 2008, p. 6). Instead, it stresses that "the intent of the *Guides* is to develop standardized impairment ratings which involves defining the diagnosis and associated loss at maximum medical improvement, enabling a patient with an impairment rating to exit from a system of temporary disablement, and provide diagnosis and taxonomic classification of impairment as a segue into other systems of long-term disability"( p. 6). In other words, the process of assigning an impairment rating requires the evaluator to clearly delineate the diagnostic criteria (based on the history, including prior clinical course), physical examination findings, current and prior diagnostic test results, and functional status that places the patient in a given impairment class and warrants assignment of a specific number within the options for that class, with the understanding that the provision of an impairment rating does not directly equate to a permanent disability rating.

As assessment of the functional ramifications of a given diagnosis is used in assigning (or modifying) impairment ratings, the sixth edition (AMA, 2008) facilitates consideration of relevant factors by defining two domains of human personal function: mobility and self-care (illustrated in Figure 6.2). This definition is new to the guides.

Mobility involves transfer (movement of one's body position while remaining at the same point in space)

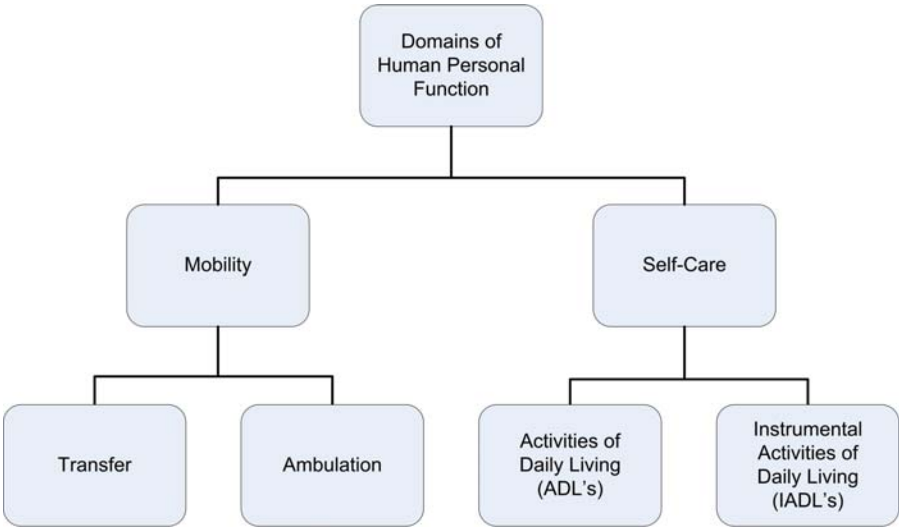

**Fig. 6.2** Domains of personal function

and ambulation (movement of one's body from one point in space to another). The sixth edition (AMA, 2008) differentiates ADLs that relate to self-care performed in one's personal sphere (e.g., bathing and showering, bowel and bladder management, dressing, eating, feeding, functional mobility, personal device care, personal hygiene and grooming, sexual activity, sleep/rest, and toilet hygiene) and "instrumented" ADLs that are complex self-care activities (e.g., financial management, medications, meal preparation), which may be delegated to others. Mobility and self-care activities may be performed independently or may require adaptive aids or helper assistance. The highest level of independence with which a given activity is consistently and safely performed is considered the functional level for that individual. This concept is critically important since function is a modifier of impairment in the sixth edition. It is therefore important that raters be more precise in asking questions (or using questionnaires) to assess the ability to perform activities relevant to an overall assessment of function.

Measurement issues are important factors in defining impairment and are discussed in section 1.4 (AMA, 2008, pp. 6–8). Previous studies examining the validity of musculoskeletal impairment ratings have revealed equivocal results between impairment rating and functional losses. The guides attempt to balance science and clinical judgment, as explained in section 1.5 (pp. 8–9). Impairment ratings continue to be based largely on consensus and expert opinion since there is not yet adequate methodology or data to relate these ratings to functional loss. The validity of impairment percentages defined in the sixth edition must await further empirical testing. As much as possible, the approaches in the sixth edition focus on simplicity and brevity (p. 9), although finding an appropriate balance between these goals and providing the information (often complex) required to increase the accuracy and reliability remains difficult.

The sixth edition provides greater weight to functional assessment than prior editions. The full impact of this approach is yet to be determined. Section 1.7 (AMA, 2008, pp. 9–11) discusses earlier approaches that have worked well (such as the New York Heart Association classification). Guidance is then provided on the use of self-report assessment tools and the need for empirical validation through in-office applications. The rating physician is to consider all available information; however, there is a clear mandate to evaluate the reliability of the information presented. The guides note that patients may underreport or overreport their difficulties. As the guides are often used in workers' compensation cases and other litigation settings as the basis for monetary awards, overreporting severity of problems is a common challenge. Therefore, the sixth edition states that "examiners must exercise their ability to observe the patient perform certain functional tasks to help determine if self-report is accurate" (p. 10). In other words, if the examinee reports loss of certain abilities on a questionnaire or during the clinical interview, the examiner should observe the patient to see if these losses are consistent with the physical examination, diagnostic tests, or functional limitations that are "usually" associated with a given disorder. Inconsistent and invalid data should not be used to define impairment. The use of functional assessment tools varies by chapter.

Section 1.8, "The Need for Internal Consistency and a Uniform Template" (AMA, 2008, p. 11–16), explains the process used to develop a generic template for impairment grids that could be used across various organ systems to enhance uniformity and consistency. The five-scale *ICF* taxonomy used by the guides is provided in Table 6.1.

Impairment percentage ranges are provided for each class; the impairment values are dependent on the organ system and structure. Diagnosis and other historical or clinical information typically serve as the key factor used to place a patient within a specific class, although there are some exceptions. Each class is associated with a corresponding range of available impairment ratings, typically defined into five impairment grades (A to E), with the midrange grade (C) serving as the default value. The grade may be modified by nonkey findings, which may include functional history, physical examination findings, and the results of clinical studies. Whether this modification occurs depends on whether these factors fall into the same class as did the initial key factor.

**Table 6.1** Five-scale *ICF* taxonomy

| Class | Description |
|---|---|
| 1 | No problem |
| 2 | Mild problem |
| 3 | Moderate problem |
| 4 | Severe problem |
| 5 | Complete (very severe) problem |

*ICF, International Classification of Functioning, Disability, and Health.*

**Table 6.2** Diagnosis-based grid template

| Diagnostic Criteria | Class 0 | Class 1 | Class 2 | Class 3 | Class 4 |
|---|---|---|---|---|---|
| RANGES | 0% | Minimal % | Moderate % | Severe % | Very Severe % |
| GRADE | | A B C D E | A B C D E | A B C D E | A B C D E |
| History | No problem | Mild problem | Moderate problem | Severe problem | Very severe problem |
| Physical Findings | No problem | Mild problem | Moderate problem | Severe problem | Very severe problem |
| Test Results | No problem | Mild problem | Moderate problem | Severe problem | Very severe problem |

The structure of a typical diagnosis-based grid is presented in Table 6.2. Not all chapters use the same key factors, and some chapters use information other than the physical examination, test results, and functional limitations in assigning a specific rating (e.g., the endocrine chapter considers burden of treatment compliance) (AMA, 2008). Nonetheless, the system used in the sixth edition represents a dramatic change from prior editions, especially with regard to the nonmusculoskeletal chapters, as the classes previously were listed as ranges of impairment ratings with little or no specific guidance given regarding how to choose a discrete numerical value to reflect a patient's impairment. This significantly contributed to the lack of interrater (and even intrarater) reliability seen with use of prior editions. This new method should improve interrater reliability. The generic system used as the basis for most of the nonmusculoskeletal chapters, which was modified for use in rating the extremities and spine, is presented in Table 6.2, above.

Once the history is used to place a patient into a given impairment class (at the default level of Grade C), the class ratings for other relevant factors (which will differ between body parts or organ systems) will be used to shift the rating to a higher or lower grade. The degree to which this occurs will ordinarily be based on the number of classes by which the additional factor is classified as representing a higher or lower impairment than the key factor. For example, if the history is the key factor and places an individual in Class 2, Class 1 physical findings (one below the originally assigned class) will shift the rating down to Grade B, and then with Class 4 test results (two above the original class), a net change of + 1 (−1 + 2) results in a final rating in Class 2 of Grade D.

## Chapter 2: "Practical Application of the Guides"

Chapter 2 outlines the key concepts, principles, and rationale underlying the application of the guides (AMA, 2008); therefore, it is essential that all participants understand this content. With prior editions, erroneous ratings often occurred as a result of physicians failing to follow rules defined in chapter 2. Fourteen fundamental principles are defined, and many of these principles have a significant impact on the rating process. These principles are summarized in Table 6.3.

The wide use of the guides in workers' compensation and other disability systems is discussed in section 2.1 (AMA, 2008, pp. 20–21), with section 2.2 (pp. 21–23) explaining the concept of the whole-body approach to impairment ratings. Although most ratings are provided as whole-person permanent impairments, some jurisdictions require regional impairment values, and these continue to be supplied to serve the needs of these jurisdictions. The hierarchical relationship of

**Table 6.3** Summary of Fundamental Principles

| |
|---|
| Chapter 2 preempts everything in subsequent chapters that conflicts with or compromises the principles. |
| No impairment may exceed 100% whole person permanent impairment nor may impairment extend the maximum assigned to an organ or extremity, |
| All regional impairments are combined at the same level first and then regional impairments are combined at the whole person level, |
| Impairments must be rated per the chapter relevant to the organ or system where the injury primarily arose or where the greatest dysfunction remains, |
| Only permanent impairment may be rated and only after maximum medical improvement is certified, |
| A licensed physician must perform impairment evaluations, |
| Valid impairment evaluation report must contain the three step approach of clinical evaluation, analysis of findings, and discussion of how the impairment rating was calculated, |
| The evaluating physician must use knowledge, skill, and ability generally accepted by the medical scientific community when evaluating an individual, to arrive at the correct impairment rating, |
| The *Guides* are based on objective criteria and if findings conflict with established medical principles they cannot be used to justify an impairment rating, |
| Motion and strength determinations should be assessed carefully for self-inhibition, |
| Ratings of future impairment are not provided, |
| If there is more than one method to define impairment, the method producing the higher rating must be used, |
| Subjective complaints alone are generally not ratable, |
| Impairment ratings are rounded to the nearest whole number. |

Source: Based on AMA, 2008, Table 2-1.

extremity ratings to whole-person ratings remains with total loss of the upper extremity equaling 60% whole-person permanent impairment and total loss of the lower extremity equaling 40% whole-person permanent impairment. The approach to combining impairment values using the Combined Values Chart remains the same; however, specific guidance is now provided for circumstances when multiple impairments are combined, with it stated that the largest values must be combined first. This is consistent with the approach used in the California Schedule for Rating Permanent Disabilities, January (2005) however, it is a change from directives provided in the fifth edition in chapter 16, “The Upper Extremities, in Section 16.1c Combining Impairment Ratings” (AMA, 2001, p. 438). Duplication or inflation of a rating by combining ratings that rely on a similar underlying factor is not permissible and is avoided by careful consideration of the underlying pathophysiology.

The use of the guides is explained in section 2.3 (AMA, 2008, pp. 23–24). As noted, the most important element is the physician’s accurate diagnosis, particularly since this defines the class of impairment. Diagnosis by analogy is only permitted if there is no other method for rating objectively identifiable impairment. Although impairment ratings are performed by physicians, nonphysician evaluators may analyze an impairment evaluation to determine if it was performed appropriately. The physician’s role is to provide an independent, unbiased assessment; treating physicians are not completely independent. They also may not necessarily have received adequate training in the use of the guides. Therefore, assessments by treating physicians may be subject to greater scrutiny than those provided by independent physicians or those with extensive training in the use of the guides. Impairment ratings are only performed at maximum medical improvement (MMI).

The rules of application for the guides presented in section 2.4 (AMA, 2008, pp. 24–25) are similar to those in prior editions and essentially reiterate the fundamental principles and the need to base ratings on consistent objective criteria. The guides indicate the impairment values may be rounded. It also notes that impairment ratings in the body organ system chapters make allowance for most of the functional losses accompanying the use of prosthetic and similar devices. The sixth edition explicitly advises the physician to assess if an individual must regularly use a prosthesis, orthosis, or other assistive device and then test and evaluate the organ system with that device. If the device is easily removed, the physician does have the option of reporting findings with and without the device.

Section 2.5 (AMA, 2008, pp. 25–27) presents concepts important to the independent medical examiner, including definitions of medical possibility versus probability, causation, exacerbation, aggravation, and apportionment. The process of apportionment is the same as previous editions; the examiner determines the current total impairment rating (all inclusive) and subtracts the baseline rating reflecting preexisting impairment. Apportionment requires careful analysis of the alleged causative factors and may be challenging when ratings have been performed using different editions. This may be particularly challenging with the sixth edition since the approaches used to define impairment may differ from earlier editions. If impairment was defined previously and there has been further injury of the same region, it may be appropriate to subtract that previous impairment number from the current rating by the sixth edition. In most circumstances, the most appropriate method is to rate both the current total impairment and the preexisting impairment (using clinical information about that condition prior to the more recent injury) by the sixth edition.

In this edition, MMI refers to "a status where patients are as good as they are going to be from the medical and surgical treatment available to them. It can also be conceptualized as a date from which further recovery or deterioration is not anticipated, although over time (beyond 12 months) there may be some expected change" (AMA, 2008, p. 26). With prior conditions, typically the factors that result in potentially ratable impairment decrease over time as the patient heals. Therefore, rating prematurely typically inflates ratings. With the sixth edition, diagnoses may be modified by the time the patient is at MMI; therefore, it is again necessary to ensure that the patient is at MMI prior to rating. The guides do not permit the rating of future impairment. This edition presents a brief new discussion of the significance of cultural differences that may have an impact on the evaluation process.

An impairment evaluation is a form of expert testimony, as explained in section 2.6, "Impairment Evaluation and the Law" (AMA, 2008, pp. 27–28). Therefore, ratings must be fully supportable. If findings or impairment estimates based on these findings conflict with established medical principles, they cannot be used to justify an impairment rating.

The standards for reports are provided in section 2.7 (AMA, 2008, pp. 28–29), including clinical evaluation, analysis of findings, and discussion of how the impairment rating was calculated. This continues to serve as an excellent basis to determine the quality of an impairment evaluation report.

## *Chapter 3: "Pain-Related Impairment"*

Chapter 3, "Pain-Related Impairment" (AMA, 2008, pp. 31–46) discusses the challenges and controversies associated with assessing pain. If pain accompanies objective findings of injury or illness that permit rating using another chapter in the guides, than pain-related impairments are not permitted to serve as add-ons. The clear language to this effect should reduce a common problem of double-dipping seen with the fifth edition (i.e., rating for a musculoskeletal condition and then providing further impairment for pain) (AMA, 2001). Therefore, it is probable that impairment ratings for pain will be less frequent with the sixth edition.

Pain not accompanied by objective ratable findings may be ratable (AMA, 2008), resulting in a maximum of 3% whole-person permanent impairment, the same limit assigned in the fifth edition (AMA, 2001). The actual impairment is based on the patient's self-reports on a Pain Disability Questionnaire (PDQ), with lowering of the impairment if the examiner questions the credibility of the patient. Due to the subjective nature of pain and differing theoretical perspectives, this chapter was one of the most controversial. There is limited empiric evidence to support a maximum impairment of only 3%, but the evidence to increase the range of impairment attributable to pain is not widely accepted across the different specialties participating in the development of the guides. Although there was discussion of modifying the magnitude of the impairment due to pain, lacking compelling information to change from the precedence established in the fifth edition, the maximum rating of 3% remains. It is probable that the approach to pain-related impairment will continue to evolve with the seventh edition.

## *Chapter 13: "Central and Peripheral Nervous System"*

Although most chapters in the sixth edition perform impairment ratings by first assigning a class and then assigning a grade within that class, chapter 13, "The Central and Peripheral Nervous System" (AMA, 2008, pp. 321–345) continues to use a methodology similar to that of the fifth edition (AMA, 2001). This is consistent with the stated goal in the introduction of being "evolutionary but not revolutionary," which has led to some important changes and additions to the chapter while leaving the overall format essentially intact. Although the introduction states that one of the goals is "to offer single values rather than range for impairment categories. Ranges implied a level of impairment rating validity that does not exist" (AMA, 2008, p. 321). Most of the tables provide ranges, however, without explanation of how a value is selected within a range.

The primary application of this chapter in previous editions has been for the rating of traumatic brain injuries and spinal cord injuries. This edition comments: "In contrast to previously held belief, the symptoms of mild traumatic brain injury generally resolves in days to weeks, and leave the patient with no impairment" (AMA, 2008, p. 330).

The fifth edition (AMA, 2001) was criticized for having duplication of materials in the central and peripheral nervous system chapter that was presented in other chapters, with some differences between the ratings assigned. Thus, stated goals for the sixth edition (AMA, 2008) included a collaborative decision of the editorial board of the sixth edition to maintain most ratings related to limbs in the upper and lower extremity chapters (chapters 15 and 16, respectively), to refer visual disorder ratings to the visual disorders chapter (chapter 12), and to provide most ratings of nerves of the head and neck in the ear, nose, and throat (ENT) chapter (chapter 11), with complex regional pain syndrome (CRPS) rated only in the upper and lower extremities chapters. Attention was also paid to maintaining consistency between this chapter on neurology and the

Mental and behavioral disorders chapter (chapter 14) in terms of ratings of higher cortical function
Upper and lower extremities chapters in terms of complete loss of limb function
Digestive system chapter (chapter 6) in terms of loss of bowel control
Urinary and reproductive systems chapter (chapter 7) in terms of bladder and sexual function

"Table 13-1 Summary of Chapters Used to Rate Various Neurologic Disorders" (AMA, 2008, p. 323) assists the reader in finding chapters that have been deferred in order to rate neurologic disorders such as radiculopathy and other disorders to the spinal roots, plexus injuries and other plexopathies, focal neuropathy or mononeuropathy relating to the limbs, CRPS, visual disorders, vestibular disorders, disorders of the cranial nerves other than trigeminal and glossopharyngeal neuralgia, dysarthria and dysphonia, and primary mood disorders, anxiety disorders, and psychotic disorders.

Section 13.1 (AMA, 2008, pp. 325–326) provides the principles of assessment. As many of the conditions discussed in this chapter, even if "permanent," can result in significantly less impairment when optimally treated, the clinician is instructed to assess response to treatment before providing an impairment rating. This is to include

> History of the response to treatment, and a determination whether there has been an adequate treatment course;
> Determination of whether the treatment has been sufficiently aggressive and of adequate duration with improvement in patient function;
> Evaluation of whether a suitable number of treatment options have been applied, and both medication compliance and patient cooperation with treatment assessed;
> Documentation of the response to treatment (with it noted that treatment may result only in a partial remission);
> Consideration of whether residual problems represent symptoms or medication side effects;
> Identification of objective evidence to support impairment when the condition is intermittent, including documentation regarding missed work or school days, examination of both medication records from pharmacies and medical records to establish medication use and corroborate symptoms.

The approach in assessing central nervous system (CNS) impairment presented in section 13.2 (AMA, 2008, p. 326) and section 13.3 (pp. 326–333) is similar to the fifth edition (AMA, 2001); however, there are some changes in the values of impairment, in part resulting from the definition of five classes of impairment. With the fifth edition, the most common basis for rating CNS impairment was "Table 13-6 Criteria for Rating Impairment Related to Mental Status" (AMA, 2001, p. 320) or table 13-8 (p. 525), with impairment classes based on interference in ADL. In the sixth edition (AMA, 2008), "Table 13-8 Criteria for Rating Neurologic Impairment Due to Alteration in Mental Status, Cognition, and Highest Integrative Function (MSCHIF)" bases classification of cognitive impairment on findings of an extended mental status exam, neuropsychological assessment and testing, and description of interference in ADL. Maximum impairment is 50% whole-person permanent impairment; previously, it was 70% whole-person permanent impairment. "Table 13-10, the Global Assessment of

Functioning (GAF) Impairment Score" (p. 334) is provided to define emotional or behavioral impairment due to an objective CNS lesion. Conditions that are primarily psychological are rated by chapter 14, "Mental and Behavioral Disorders." Maximum impairment for emotional and behavioral disorders is the same as MSCHIF impairment (i.e., 50% whole-person permanent impairment; previously, it was 90% whole-person permanent impairment). With the exception of consciousness and awareness (now 100%, previously 90%), maximum whole-person permanent impairment for other ratable CNS impairments is less: episodic loss of consciousness or awareness 50% (previously 70%) and sleep and arousal 50% (previously 90%).

Central nervous and spinal cord injuries that result in upper extremity impairment are rated per Section 13.5 "Criteria for Rating Impairments of Upper Extremities due to CNS Dysfunction" (AMA, 2008, p. 335); Section 13.6, "Criteria for Rating Impairments of Station, Gait and Motion Disorders" (p. 336); section 13.7, "Criteria for Rating Neurogenic Bowel, Bladder, and Sexual Dysfunction" (p. 336); and section 13.8, "Criteria for Rating Respiratory Dysfunction" (pp. 336–337). The number of classes of impairments range from four (sexual dysfunction) to six (respiratory dysfunction), rather than the five-class approach. Some maximum values have changed (i.e., bladder maximum of 30% whole-person permanent impairment [previously 60%], sexual 15% [previously 20%], and respiratory 65% [previously 90%+]).

Section 13.9 (AMA, 2008, pp. 339–341) provides criteria for rating peripheral neuropathy, neuromuscular junction disorders, and myopathies; however ratings of peripheral nerve lesions are performed using chapter 15, "The Upper Extremities," or chapter 16, "The Lower Extremities."

Criteria for rating impairments related to chronic pain (fifth edition, section 13.8; AMA, 2001, pp. 343–344) have been replaced by "Table 13-17 Dysesthetic Pain Secondary to Peripheral Neuropathy or Spinal Cord Injury" (AMA, 2008, p. 339). The maximum impairment for dysesthetic pain is 10% whole-person permanent impairment (Class 3, "severe dysesthetic pain"); the maximum impairment from the fifth edition for "Table 13–22 Criteria for Rating Impairment Related to Chronic Pain in One Upper Extremity" (AMA, 2001, p. 343) was 60% whole-person permanent impairment (Class 4, dominant extremity, "individual cannot use the involved extremity for self-care or daily activities"). A brief description of complex regional pain syndrome is provided in section 13.10 (AMA, 2008, p. 341); however, these ratings are performed using chapters 15 and 16.

Instruction for rating impairments due to migraines are provided in section 13.11, "Criteria for Rating Impairments Related to Craniocephalic Pain" (AMA, 2008, p. 341) and table 13–18 (AMA, 2008, p. 342), with scores obtained from the MIDAS (Migraine Disability Assessment) Questionnaire. The maximum impairment for migraine headaches is 5% whole-person permanent impairment; however, the maximum assigned for pain in chapter 3, "Pain," is 3% whole-person permanent impairment.

Miscellaneous peripheral nerves not ratable in the previous edition are discussed in section 13.12 (AMA, 2008, p. 343) and listed in table 13–20 (p. 344).

## *Chapter 14: "Mental and Behavioral Disorders"*

Chapter 14, "Mental and Behavioral Disorders" (AMA, 2008, pp. 347–382), discusses impairments due to mental disorders and considers mental and behavioral impairments that may result from these disorders. The authors stated that focus is on evaluating brain function and its effect on behavior in the absence of evident traumatic or disease-related objective CNS damage. The most significant change from the most recent editions of the guides is the provision of numeric ratings. Earlier editions of the guides cited the lack of empiric evidence to support any method for assigning a percentage of impairment of the whole person for a mental and behavioral disorder. These editions classified impairment across four domains: ADL, social functioning, concentration, and adaptation. There were five classes of impairment ratings applied to each of the four domains, ranging from no impairment (Class 1) to extreme impairment (Class 5). The sixth edition of the guides is the first since the publication of the second edition in 1984 to provide numeric ratings for mental and behavioral disorders. It is important to note that this is a controversial decision because of the continued lack of clear, consistent empiric evidence to support the use of numeric ratings. It is the intention of the sixth edition, however, to increase the internal consistency of impairment evaluation and rating, and to accomplish this it was judged as important to provide numeric ratings for mental and behavioral impairments. In addition, since the guides are established to provide a uniform template to translate human trauma or disease into a percentage of the whole person, the delineation of numeric ratings in this chapter will minimize the highly inconsistent and idiosyncratic methodologies used by clinicians, adjudicators, and others in their attempt to apply numeric ratings without a standard template to guide them. While greater interrater reliability and internal consistency may be achieved by the methodology described as of this writing, the validity and usefulness of the impairment ratings will certainly be in question.

The guides sixth edition continues to emphasize the importance of following the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (*DSM-IV*; American Psychiatric Association [APA], 1994). For the purpose of this discussion, we make the assumption that the authors of the guides were referring to the most recent text revised version of the *DSM*, the *DSM-IV-TR* (APA, 2000). Section 14.1b (AMA, 2008, p. 348) stresses strict adherence to the *DSM-IV-TR* criteria to determine an accurate diagnosis and notes the importance of using the multiaxial system referenced in table 14-1 (p. 348). Axis I includes the major psychiatric syndromes and conditions, such as mood disorders or anxiety disorders. Axis II is reserved for personality and developmental disorders, while physical disorders and conditions relevant to the health and treatment of the patient are listed on Axis III. Axis IV conveys information about any psychosocial stressors experienced by the patient. The Global Assessment of Functioning (GAF) score is reported on Axis V and should reflect the effects of the psychiatric impairment. Identifying the GAF score is essential because this score is used as part of the procedure to determine the percentage of whole-person psychiatric impairment.

The guides (AMA, 2008) indicate that clinicians conducting an independent mental and behavioral evaluation using this procedure should be trained in psychiatry or psychology or have expertise in the use of the *DSM-IV-TR* (APA, 2000), be experienced in the psychiatric or psychological evaluation of patients, and have expertise in the diagnosis and treatment of mental and behavioral disorders.

The introduction to the “Mental and Behavioral Disorders” chapter states that only impairments for selected well-validated major mental illnesses are considered for an impairment rating. Section 14.1c (AMA, 2008, pp. 348–349) elaborates, stating that the purpose of the chapter is not to rate impairment in all persons who may fit a *DSM-IV-TR* (APA, 2000) diagnosis since many conditions are common in the general population and do not require an impairment rating. Given the use of the guides in medicolegal settings, impairment rating in the sixth edition is specifically limited to mood disorders (including major depressive disorder and bipolar disorder), anxiety disorders, and psychotic disorders (including schizophrenia). Section 14.1c further provides a list of disorders that are *not* ratable in this chapter, including psychiatric reaction to pain, somatoform disorders, dissociative disorders, personality disorders, psychosexual disorders, factitious disorders, substance use disorders, sleep disorders, dementia and delirium, mental retardation, and psychiatric manifestations of traumatic brain injury. While the inclusion and exclusion of diagnostic categories is stated clearly in the chapter, the explanation and rationale are stated with less clarity. It is probable that the inclusion and exclusion criteria for medicolegal purposes will be determined by regulatory bodies, contractual wording, or the court systems in specific jurisdictions.

Specific rules for the use of this chapter are delineated in section 14.1, “Principles of Assessment” (AMA, 2008, p. 349). This methodology is used when

> There is a mental and behavioral disorder without a physical impairment or pain impairment.
> A mental and behavioral disorder exists that is judged independently compensable by the jurisdiction involved. In such an instance, the mental and behavioral disorder impairment is combined with the physical impairment.
> There is a specific requirement of the compensation system.

The sixth edition of the guides also states, “In most cases of a mental and behavioral disorder accompanying a physical impairment, the psychological issues are encompassed within the rating for the physical impairment, and the mental and behavioral disorder chapter should not be used” (AMA, 2008, p. 349). This statement is somewhat confusing and may be an overstatement. The focus of the consensus building among participating clinicians to establish numeric impairment ratings for physical disorders described in the other chapters typically did not include a discussion of or any emphasis on related or cooccurring mental and behavioral disorders. It is also important to note that if at least one of the first three statements is true, then the impairment may be ratable under this chapter. If none are true, then the impairment is not ratable. Therefore, the fourth statement may not be relevant and can probably be disregarded.

Section 14.2, "Psychiatric/Psychological Evaluation" (AMA, 2008, pp. 349–351) provides only minimal detail about what constitutes an appropriate mental and behavioral disorders independent medical examination (IME). The guides state, "The general psychiatric or psychological evaluation involves soliciting a history, review of appropriate records, and a mental status examination" (p. 349). Key areas addressed in a mental status examination include the patients' appearance, activity level, mood and affect, speech and language, thought content and organization, perceptual disturbances, insight and judgment, and neuropsychiatric functions such as sensorium, cognitive functions, memory, attention and concentration, and level of intelligence. Another area typically included in a mental status examination involves somatic functions and concerns such as a change in appetite and weight, alterations in energy level and libido, and alterations in sleep patterns. The evaluator usually describes the person's attitude toward the examiner, quality of cooperation during the examination, and the reliability of information provided.

An effective independent psychiatric evaluation typically begins with a thorough psychiatric and medical history that elicits information about the onset of clinical signs and symptoms of the psychological disturbance as well as any relevant medical information that may contribute to the development of the mental and behavioral disorder. The evaluator notes the various health care and mental health care providers the person has consulted to address the reported symptoms. The treatment history is a critical element of this evaluation as it documents interventions used to alleviate the symptoms of the psychological disorder and whether these interventions have been effective. The evaluator should also solicit information about the person's level of stress or dissatisfaction with the work environment, work relationships, or personal relationships.

Other relevant historical data include the identification of previous episodes of mental or behavioral disorders and the response to any treatment the person might have received to address these disorders. The evaluator should note whether there is a positive family history for any psychiatric disorder. The evaluator should also solicit information about the person's childhood and adolescent development and whether there was a history for abuse or trauma. School functioning, level of education, and work history provide context for understanding the person's ability to function in the community. Personal habits like the use of caffeine, nicotine, alcohol, or illicit drugs are included in the history section of the report.

Section 14-2 includes a brief and inadequate discussion of the utility of psychological testing as part of the assessment process. The guides sixth edition states: "The use of well-standardized psychological tests, such as the Wechsler Adult Intelligence Scale [we assume the authors are actually referring to the 3rd edition, the WAIS-III] and the Minnesota Multiphasic Personality Inventory-2 (MMPI-2), may improve diagnostic accuracy and support the existence of a mental disorder" (AMA, 2008, p. 351). The guides provide a list of selected psychological assessment tools in adults in table 14-3 (AMA, 2008, p. 350). This list is broken down into four categories: personality and symptoms assessment, intellectual assessment, academic assessment, and neuropsychological evaluation. Self-report inventories such as the Beck Depression Inventory are described by the guides as "purely subjective" and viewed as having limited value in the independent medical evaluation setting. The guides reiterate: "Despite the wide range of available psychological tests, the patient interview, review of records, and the mental status exam remain the foundation for the evaluation of the patient and determination of the impairment rating" (p. 351). This appears to minimize the use of psychological assessment as one essential component of the evaluation process. This perspective is also inconsistent with the guides' stated intention of relying on objective clinical data as a basis for establishing a diagnosis as well as the type and degree of impairment experienced by a patient.

Section 14-3, "Special Features of the Mental and Behavioral Disorders Independent Medical Examination" (AMA, 2008, pp. 351–353), addresses the physician alliance and source materials. This section points out how a mental and behavioral disorders IME conducted in a medicolegal setting differs from a standard psychiatric or psychological evaluation. The guides primary purpose is "to rate impairment to assist adjudicators and others in determining the financial compensation to be awarded to individuals who, as a result of injury or illness, have suffered measurable physical and/or psychological loss" (p. 20). Table 14-4 (p. 352) lists a number of specific suggestions to address when conducting a mental and behavioral disorders IME. Examples of these recommendations include the following:

> Screen individuals for past and current substance abuse to determine whether symptoms of substance abuse better account for psychiatric symptoms manifested by the person;
> Evaluate the legal history, especially concerning prior lawsuits, work-related injuries, bankruptcies, incarcerations, driving while intoxicated, restraining orders and courts ordered child support;
> Obtain military history, overseas service, adjustment to service, discharge history, pay grade, military arrests, disability pension;
> Note whether there is a pattern of over endorsing symptoms during the psychiatric interview;
> Assess the patient's motivation vis-a-vis returning to work;
> Determine if symptom exaggeration or malingering is present;
> Ask about the patient's attitude to the third-party payer (employer, insurance company, etc.);
> Assess the influence of the litigation process on return to work;
> Determine whether adequate pharmacologic and biologic treatment has been provided, including whether the patient has accepted and complied with reasonable treatment.

The guides (AMA, 2008) stress that mental health professionals conducting an independent psychiatric or psychological evaluation are expected to maintain a neutral, unbiased position regarding the patient. This perspective differs from the role of a treating mental health professional, in which patient advocacy may play an important role in treatment intervention. Treating mental health professionals are cautioned that the therapeutic relationship can be compromised when the mental health provider serves as an expert witness.

While the guides sixth edition (AMA, 2008) places emphasis on the use of objective data in determining the presence of a psychiatric impairment, it is still important to assess how the person describes his or her psychological symptoms and the impact these symptoms have on functioning. Six areas of functional impairment are particularly relevant in this evaluation process: self-care and personal hygiene; social and recreational activities; the capacity for travel, including driving and using public transportation; interpersonal relationships; the capacity for concentration, persistence, and pace; and employability. The evaluator should review information from other reliable sources, such as records from inpatient hospitalization, outpatient treatment, day treatment programs, occupational therapy, work evaluations, and disability assessments. Information gathered from these sources, the patient's self-report of symptoms, and impact on the six functional areas as well as the findings from the objective clinical assessment are analyzed by the evaluator to determine how consistent this information is. Any widely inconsistent findings between the patient's self-reports and the other sources of information, including the clinical evaluation, should be examined in detail to determine the reasons for this discrepancy.

Section 14.4 of the guides sixth edition discusses the importance of determining whether the person has reached MMI (AMA, 2008). This edition continues to instruct the evaluator to follow the general principle that a condition is ratable when the person has reached MMI. This level of improvement implies the condition is not expected to change significantly over the next 12 months. This principle poses somewhat of a challenge when assessing impairment for mental disorders because a degree of variability exists for many mental disorders, like recurrent major depression or schizophrenia. Persons with these chronic conditions are likely to experience a series of relapses and remissions. Personal life stressors, new or chronic health conditions, and workplace stressors can exacerbate stress and lead to a resurgence of psychological symptoms.

The establishment of MMI is a highly controversial area in the mental health field. True MMI implies a relatively rare state for someone with a psychiatric disorder, yet many people are judged to have reached that point in the medicolegal environment. This is not consistent with the literature and may be more of a function of the system within which the disorder is being evaluated (medicolegal system) than a general psychiatric population. Individuals with psychiatric diagnoses may experience a complete resolution of their disorder even after an extended period of time. They may also experience a relapse/remission pattern. For example, many individuals have a single episode of major depression that resolves over time, while others experience recurrent episodes of depression.

Investigating the treatment history is essential in determining whether the person has reached MMI and is likely to remain so over the next 12 months. The guides direct the evaluator to determine how the person has responded to the prescribed treatment (both medication and psychotherapy) and whether the treatment has been adequate and appropriate according to best practice standards (AMA, 2008). Patient compliance to treatment may be an issue requiring further investigation. Barriers to treatment compliance include poor insight about the importance of treatment compliance, timely and consistent access to mental health services, and the experience of significant side effects of medications. Partial response to treatment can indicate the need to reassess medication intervention or adjust the psychotherapeutic approach. Other comorbid factors such as substance abuse, a personality disorder, or perceptions of involvement in the medicolegal system may affect treatment response.

Since the evaluation of permanent impairment is the basis for defining impairment in the vast majority of workers' compensation jurisdictions, vocational issues are relevant to the evaluation process. Many people diagnosed with psychiatric disorders continue to work successfully by meeting the essential requirements and demands of the job. Others are unable to meet these demands because their psychiatric symptoms significantly affect their work capacity. All editions of the guides have consistently stated that the purpose of the impairment rating is not to provide direct estimates of work participation restrictions. The guides are intended to identify impairments such as limitations in concentration, persistence, and pace; disturbances in memory and recall; difficulty with emotional stability; challenges in interpersonal relationships at the work site; or diminished capacity to adapt to worklike settings. Permanent impairment in any of these areas may ultimately affect the person's ability to perform his or her specific job, but an employer's capacity to modify the particular requirements of a job on a temporary or permanent basis can also influence whether a person with a psychiatric condition can return to work.

## The Impairment Rating Process

In determining impairment rating, the guides rely on measurements of the severity of psychiatric symptoms, global functioning, and more specific areas of functional impairment. Specific considerations are offered to provide guidance in the overall impairment rating process (AMA, 2008, pp. 355–356):

> Psychiatric impairment is based on Axis I pathology only and in cases where multiple diagnoses exist, only one impairment rating is derived;
> Underlying aspects of the personality, borderline intellectual functioning and personality disorders are not rated;
> Compromise of ADL's that is caused by financial constraints, the lack of transportation or the lack of opportunity (e.g., employment) is not rated;
> The assessment is not limited to the number of activities that are restricted but the overall degree of restriction or combination of restrictions;
> The assessment is not limited to a one-time interview. The evaluation of a patient's abilities and functional limitations may also rely on documented collateral sources of information that reflect the patient's behavior in other settings;
> Functional limitations across the following areas: Self-care and personal hygiene; social and recreational activity; travel; interpersonal relationships; concentration, persistence and pace; and employability that are related to physical impairment should not be included in the impairment rating in this chapter;
> The percentage of impairment associated with the current accident or event (final impairment rating) is what remains when the level impairment associated with a pre-existing condition is subtracted from the current total impairment; The impairment rating score is not necessarily indicative of whether or not a person can work.

The mental and behavioral disorders impairment rating is based on consideration of three specific scales—the Brief Psychiatric Rating Scale (BPRS), the GAF, and the Psychiatric Impairment Rating Scale (PIRS)—as explained in section 14.5, "Concepts for Impairment Ratings" (AMA, 2008, pp. 355–356), and section 14.6, "Methods of Impairment Rating" (pp. 356–360). These scales are provided either in the chapter or in its appendix.

The guides identify the BPRS as a measure of "major psychotic and nonpsychotic symptoms in patients with major psychiatric illnesses" (AMA, 2008, p. 352). The authors also indicate it has shown excellent reliability in clinical trails, and "it is probably the most researched instrument in psychiatry (p. 352)." However, there are selected examples and some are abbreviated. A 7-point scale is used, ranging from 1 (not present) to 7 (extremely severe). The BPRS summed score is grouped in ranges reflecting various percentages of impairment from 0% to a maximum of 50%.

Unfortunately, the BPRS was not designed for a general outpatient psychiatric population, and it was not developed for the purpose of impairment rating (and has not undergone any validation studies to support its use for this purpose with this type of population). The reader should note that the Corrections and Clarifications for the Guides 6th edition, published in August, 2008, corrects the scoring process described in the first printing. Because a score of "1" is used for "not present", a rating of "2" (very mild) on a single item results in a summed score of 25. The range of summed scores resulting in an impairment score of 5% was 25 to 30 in the original printing. The entire rating scale was shifted up 5 raw score points, so a score of 24 to 30 now represents an impairment score of 0%, a score of 31 to 35 represents an impairment score of 5%, and so on. There have been very few studies exploring the clinical implications of specific scores on the BPRS. One such study (Leucht et al., 2005) identified "mildly ill" as the descriptor for a range of scores beginning at 31. In the future, it may be prudent and very worthwhile for the guides to review and revise the scoring methodology it has used to attribute impairment ratings for BPRS score ranges. It may also be very desirable to explore the use of alternative scales for the purpose of establishing the severity of psychiatric symptoms. An example of one alternative could be the DPRS (Derogatis Psychiatric Rating Scale), which is coupled with either the Brief Symptoms Inventory or the Symptom Checklist 90-Revised (SCL-90-R). This alternative has the advantage of combining professional rating (DPRS) with the results of a structured self-report instrument rather than relying on professional rating alone (as is the case for the BPRS). From a measurement point of view alone, the use of the BPRS and the methodology used to derive impairment ratings from BPRS scores is questionable and ambiguous. While reliability may be adequate, the validity of this instrument as a measure of impairment in a population of people with psychiatric disorders in the medicolegal system is very weak.

The second scale used is the GAF, Axis V of the *DSM-IV-TR* (APA, 2000). This is a well-known scale that rates a combination of overall psychological symptoms, occupational functioning, and social functioning. Like the BPRS, the guides (AMA, 2008) established a series of score ranges that translate to percentage of impairment from 0% to a maximum of 50%. The GAF is routinely used as part of the multiaxial assessment and has both undergone significant psychometric assessment and been demonstrated to have satisfactory interrater reliability. Its use in formulating an impairment rating appeared obvious to the guides authors, although the assignment of impairment ratings to GAF score ranges is not based on empiric evidence. Section 14.5 also notes some of the limitations of the GAF, which is one of the reasons for combining its use with that of the BPRS and PIRS.

The PIRS is the final scale used as a measure of impairment. It evaluates the behavioral consequences of psychiatric disorders and, while expanded to rate impairment, is similar in construction to the GAF. This scale was developed for the New South Wales Motor Accidents Authority in Australia and is in use in a variety of other Australian states. It is a relatively new scale, and its validity and coverage as a measure of impairment associated with psychiatric disorders have been questioned by Australian mental health professionals (Australian Psychological Association, 2003). The PIRS is made up of six scales, each designed to evaluate a specific area of functional impairment. The six functional impairment scales are scored using a 5-point, anchored scale. The two *middle* scores (of the six) are summed and translated to percentage of impairment from 0% to a maximum of 50%. While this scale has high "content" validity, it lacks empiric evidence to support its use as a measure of impairment.

The *total impairment* rating from the sixth edition of the AMA guides (2008) is the middle score of the three impairment ratings derived from the BPRS, GAF, and PIRS. The authors chose to use the "median" as a measure of central tendency to avoid the influence of outliers. While this may be true, it is generally accepted that the mean is a more effective reflection of central tendency for very small distributions of scores and is much more appropriate when the scores are not necessarily drawn from a single distribution. While these scores were designed to reflect a similar scoring approach for level of impairment, they clearly are not from the same distribution. While it may be more appropriate to use the mean as the measure of central tendency, this is not the method that will be used in the guides at this point in time.

When there is documented evidence of a preexisting condition, the base rate (impairment rating prior to the current accident or event that has triggered the impairment rating) is subtracted from the total impairment rating documented in the process outlined. The result is a *final* impairment rating for the mental and behavioral impairment.

## Challenges Existing in the Use of Chapter 14

The stated purpose of including all three of these scales is "to provide a broad assessment of the patient with M&BD" (AMA, 2008, p. 355). The goal is to "arrive at a strongly supportable impairment rating" (p. 355). As the approach used in the Mental and Behavioral

Disorders chapter is a dramatic departure from what was used previously (especially since numerical psychiatric ratings have not been used since the second edition), its impact and reliability are yet to be determined. Several critical challenges exist that greatly complicate the use of this particular chapter in the guides. Many of these challenges have been discussed in this section. Briefly, there are problems with the conceptualization and definition of impairment associated with mental and behavioral disorders, with the process used to identify certain diagnoses as "ratable" and others as "nonratable", with the establishment of the very difficult concept of MMI, and with the identification of what information will be used as the foundation for impairment assessment and how that information should be gained. Most important, there are significant problems and flaws associated with instrumentation, measurement, statistical analysis, and validity of the tools and methods chosen to derive the actual impairment ratings. It is clear that this chapter, while it provides a methodology that will increase the reliability of impairment ratings, faces major challenges *as it currently exists* in terms of its validity and usefulness in medicolegal settings.

## Conclusion

The AMA *Guides to the Evaluation of Permanent Impairment* serves as the standard for assessing medical impairment. The new sixth edition (AMA, 2008) reflects a change in the process of assessing impairment by defining most impairments on the basis of a methodology derived from the *ICF*. The process of defining impairment or the complexities of human function is not perfect; however, the vast majority of the sixth edition should simplify the rating process, increase intra- and interrater reliability, improve accuracy, and provide a solid basis for future editions of the guides.

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# Chapter 7
# The *DSM* Model of Impairment

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The primary purpose of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM*) is to provide a consistent and evidence-based diagnostic system to guide clinicians in practice. An additional goal of the DSM is to facilitate research through delineation of objectively defined and measurable variables within mental health syndromes. This research has both national and international implications for identifying early risk factors, understanding prognosis, and validating the efficacy of treatments. The organizers of the *DSM* sought to achieve these purposes by providing clear and explicit criteria for diagnosis (American Psychiatric Association [APA], 2000). The arduous process of developing this classification system required consensus among a wide range of professional orientations within psychology, ranging from biological to psychodynamic perspectives. The manual has provided a nomenclature that is shared within the fields of psychology and medicine as well as across settings (e.g., hospitals, private practice, social service agencies). The utilization of a common taxonomy ensures more accurate identification of patient needs and can assist in documenting justification for prompt access to services. Finally, the manual is utilized to shape national policy issues through documentation of mental health statistics and as an educational tool to educate readers about psychopathology.

## History of the Development of the *DSM*

### *DSM-I and DSM-II*

An early impetus for the establishment of the *DSM* as a classification system was the need to collect statistical data on mental illness in America (APA, 2000). This need dates back to as early as 1840, when the U.S. government first included the category of insanity/idiocy on the national census. Over the following decades, a more detailed categorization system was established. In 1917, the forerunner of the APA collaborated with the New York Academy of Medicine to develop a nomenclature system. The system would be used not only for statistical collection but also for diagnosing severe psychiatric and neurological disorders in inpatient populations. However, after World Wars I and II, there was a clear need for a broader classification system that could be used to diagnose less-debilitating psychiatric illnesses in outpatient populations. This need was precipitated by veterans and other service members who demonstrated manifestations of exposure to trauma, such as acute stress, and psychosomatic and personality disorders.

In 1952, the APA addressed this need by establishing the first version of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-I*; APA, 1952), a variation of a similar system that had been established internationally (the *International Statistical Classification of Diseases and Related Health Problems, Sixth Edition* [*ICD-6*]; World Health Organization [WHO], 1948). The *DSM-I* was unique in that it was the first official manual developed with the primary purpose of clinical diagnostics as opposed to a sole focus on statistical utility, hence leading to the terms *diagnostic* and *statistical* in the name of the manual. The original version of the *DSM* largely reflected a psychobiological view of mental disorders in which mental illnesses were perceived as *reactions* to internal and external factors. The manual contained descriptions of various psychiatric categories of illness for adults but described few categories of illness specific to children. The *DSM* was organized into three categories (i.e., organic brain syndromes, functional disorders, and mental deficiency)

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with 106 subcategories (Kessler, 1971). Furthermore, the manual was criticized for providing vague criteria for disorders, leading to only moderate agreement rates among diagnosticians (Ward, Beck, Mendelson, Mock, & Erbaugh, 1962).

The *DSM-II* was published by the APA in 1968 and corresponded with the publication of the eighth version of the *ICD* (WHO, 1968). The major deviation in the second manual from the first was the elimination of the term *reaction* throughout the manual, thus demonstrating a theoretical change in the basis of the classification system. Unfortunately, the manual did not improve on the vague diagnostic definitions and failed to lead to increased consistency in diagnoses among clinicians (Spitzer & Fleiss, 1974). Symptoms were presented in a narrative form, and clinicians had the option of diagnosing based the client's current symptoms or the client's perceived unconscious processes. The emphasis on unconscious processes was a result of influences from psychoanalytic theory (Mash & Barkley, 2003).

## DSM-III and DSM-III-R

In 1974, APA began to develop a major revision of the second manual. The *DSM-I* (1952) and *DSM-II* (1968) were short and more closely resembled pamphlets than manuals; the third edition of the *DSM* was increasingly complex and more closely resembled a text. The third edition of the manual, published by the APA in 1980, also improved on the earlier editions by providing explicit diagnostic criteria for the diagnosis of mental illness. A more neutral approach to describing the development and manifestations of mental illnesses was adopted. The multiaxial diagnostic system was introduced and remains in place in the current edition of the manual. The multiaxial approach is described in greater detail elsewhere in this chapter. These changes led to a significant overall increase in interrater diagnostic agreement for disorders (Spitzer, Forman, & Nee, 1979). The *DSM-III* contained more childhood and adolescent diagnostic categories than the *DSM-II*. However, unlike the adult categories, they were not as well established and thus did not lead to a significant improvement in diagnostic agreement between clinicians (Mattison, Cantwell, Russell, & Will, 1979).

Descriptions of each diagnostic disorder in the *DSM-III* (APA, 1980) included age of symptom onset, etiology, course, sex differences, associated features, and differential diagnoses. Most notably, symptoms lists were included in which the behavioral and cognitive manifestations of each illness were described. This allowed clinicians to make yes or no decisions regarding patient diagnoses. The third edition was revised (*DSM-III-R*) in 1987 by the APA to clarify inconsistencies and errors in *DSM-III* (APA, 2000).

## DSM-IV and DSM-IV-TR

It has been widely argued that the publication of the *DSM-III* in 1980 by the APA revolutionized clinical diagnosis of mental illnesses (McBurnett, 1996). However, the manual still had criticisms regarding the vague criteria of some categories of psychopathology; thus, a fourth edition of the manual was necessary and preparation began in 1987. The resulting manual was formed utilizing the input of over 1,000 professionals in various professions and 13 distinct work groups (APA, 2000). The work groups consisted of international practitioners and scholars from varied disciplines, work settings, and orientations to ensure that no orientation dominated the selection of the diagnostic criteria. Each group conducted comprehensive literature reviews of the published research regarding their assigned topics to gather unbiased information from a range of theoretical perspectives. When the literature was lacking in evidence for resolution of issues, reanalyzes of large, aggregated data sets and field trials from multiple sites and subjects were conducted to better inform diagnostic decisions. The *DSM-IV* was published by the APA in 1994.

The most current edition of the manual is the text revision of *DSM-IV* (*DSM-IV-TR*; APA, 2000). The *DSM-IV-TR* was designed to provide a bridge between the *DSM-IV* (APA, 1994) and the *DSM-V*, which has an anticipated publication date of 2011 (APA, 2007). The *DSM-IV-TR* contains the same disorders and symptoms lists as the *DSM-IV*. However, updates in the *DSM-IV-TR* include text revisions for factual errors in the *DSM-IV* and additions of the most current research available at the time of publication for the listed conditions.

The *DSM-IV-TR* (APA, 2000) appendix also includes the October 2000 updated *International Statistical Classification of Diseases and Related Health Problems, Ninth Edition, Clinical Modification* (*ICD-9-CM*) codes (National Center for Health Statistics, 1989).

The *ICD-9-CM* is a clinical modification of the *International Classification of Diseases: Ninth Revision* (*ICD-9*). It was adapted by the National Center for Health Statistics (1989) to record additional morbidity data for U.S. hospitals that were not represented in the *ICD-9* system (APA, 2000; WHO, 1977). These codes are important as they can be utilized on Axis III of the *DSM-IV-TR* to note medical disorders that affect mental health issues. The codes may be required in some settings by agencies and insurance companies to acquire financial reimbursement for some services. The codes for the 10th edition of the *ICD* (*ICD-10*) are also included in the *DSM-IV-TR*, although they are not yet implemented in the United States (WHO, 1992). Finally, listed in the appendix of the *DSM-IV-TR* are several mental conditions that are gathering increasing attention and research support and thus may be considered for formal classification in the *DSM-V*.

## *DSM-IV-TR* Multiaxial Assessment System

The third edition of the *DSM* introduced a multiaxial assessment system that continues to be used in the current edition. This diagnostic system contains five axes (listed in Table 7.1) that are each associated with an independent domain of information about the individual. The overall goal of the multiaxial system is to provide a useful format for organizing multiple components of the patient's current condition. This allows for the inclusion of psychosocial, environmental, and daily functioning domains that may be overlooked or minimized if the diagnostician is only concerned with just determining a diagnosis. The multiaxial system prompts clinicians to consider the individual differences between persons within the same diagnostic categories (APA, 2000). The domains also are useful for planning treatment and providing information about projected course and exacerbating factors of the diagnosed mental disorders.

**Table 7.1** Multiaxial assessment system

| Axis | Information reported |
|---|---|
| Axis I | Clinical disorders<br>Other conditons that may be a focus of clinical attention |
| Axis II | Personality disorders<br>Mental retardation |
| Axis III | General medical conditions |
| Axis IV | Psychosocial and environmental problems |
| Axis V | Global assessment of functioning |

*Source:* American Psychiatric Association (2000).

## Five-Axis System

In the five-axis system, Axis I is utilized to report any clinical disorders or other conditions requiring clinical intervention in the *DSM-IV* (APA, 1994) classification system (except for mental retardation and personality disorders). When providing diagnostic codes for this axis, the clinician provides both the name of the condition and the corresponding numerical code. The numerical codes are derived from the Mental Disorders chapter of the *ICD-9-CM* (WHO, 2007) and fall between numbers 290 and 319. More than one diagnostic category can be listed under Axis I; when a person meets criteria for more than one diagnosis, the primary (or principal) diagnosis is listed first. A code indicating no diagnosis should be provided if there is no current diagnosis or if a diagnostic decision is deferred until more information is gathered. Box 7.1 contains a list of disorders to be reported in Axis I.

**Box 7.1** Reported conditions in Axis I

Disorders usually first diagnosed in infancy, childhood, or adolescence
Delirium, dementia, and amnestic and other cognitive disorders
Mental disorders due to a general medical condition
Anxiety disorders
Somatoform disorders
Factitious disorders
Dissociative disorders
Sexual and gender identity disorders
Eating disorders
Sleep disorders
Impulse control disorders not elsewhere classified
Adjustment disorders
Other conditions that may be a focus of clinical attention

*Source*: American Psychiatric Association (2000).

**Box 7.2** Reported conditions in Axis II

Paranoid personality disorder
Schizoid personality disorder
Schizotypal personality disorder
Antisocial personality disorder
Borderline personality disorder
Narcissistic personality disorder
Avoidant personality disorder
Dependent personality disorder
Obsessive-compulsive personality disorder
Personality disorder not otherwise specified
Mental retardation

*Source:* American Psychiatric Association (2000).

Personality disorders and mental retardation are reported (see Box 7.2) under Axis II. As with Axis I, it is acceptable to list more than one disorder when appropriate. If an Axis II disorder is the primary diagnosis for the person, then this is indicated after the listing for the diagnosis by denoting "principal diagnosis" in parenthesis. If there is no Axis II diagnosis, the clinician lists the appropriate code to indicate no diagnosis or deferment of diagnostic decision. Numerical diagnostic codes are also noted in the *DSM-IV-TR* (APA, 2000) and correspond with the *ICD-9-CM* codes (WHO, 2007).

The patient's general medical status is reported along Axis III. Only medical conditions that are relevant to the person's current functioning in relation to the mental illness are listed in Axis III. The 16 broad categories of medical conditions and their corresponding ranges of *ICD-9-CM* (WHO, 2000) codes are listed in Box 7.3. A comprehensive list of medical conditions is provided in appendix G. The purpose of inclusion of medical factors is to promote communication among health care providers and to encourage clinicians to conduct a thorough evaluation of the patient (APA, 2000). The inclusion of these factors along a separate axis than mental disorders does not imply that there is not a relationship between mental illness and medical condition. Indeed, it is widely recognized that there is a bidirectional relationship between psychological and physiological functioning (APA, 2000).

In many patients, the presence of a medical illness can disrupt psychological functioning (for a review, see Boekaerts & Röder, 1999); conversely, a mental illness can contribute to complications with medical conditions (for a review, see Balon, 2006). The documentation of dual medical/mental health diagnoses is particularly important for prognosis and treatment

**Box 7.3** Reported conditions in Axis III with corresponding *ICD-9-CM* codes

Infectious and parasitic diseases (001-139)
Neoplasms (140-239)
Endocrine, nutritional, and metabolic diseases and immunity disorders (240-289)
Diseases of the blood and flood-forming organs (280-289)
Diseases of the nervous system and sense organs (290-389)
Diseases of the circulatory system (390-459)
Diseases of the respiratory system (460-519)
Diseases of the digestive system (520-579)
Diseases of the genitourinary system (580-629)
Complications of pregnancy, childbirth, and the puerperium (630-676)
Diseases of the skin and subcutaneous tissue (680-709)
Diseases of the musculoskeletal system and connective tissue (710-739)
Congenital anomalies (740-759)
Certain conditions originating in the perinatal period (760-779)
Symptoms, signs, and ill-defined conditions (780-799)
Injury and poisoning (800-999)

*Source:* American Psychiatric Association (2000).*ICD-9-CM*, *International Classification of Diseases, Version 9, Clinical Modifications*.

decisions in neuropathological disorders that may include degeneration characteristics (e.g., Alzheimer's disease, Parkinson's disease). This is also true for neurodevelopmental disorders of children (Goldstein & Reynolds, 1999; Lezak, 1995). When a patient's medical condition or injury is the underlying mechanism for the development of a mental illness (e.g., traumatic brain injury or when a seizure disorder causes neurological damage that results in amnesia), the primary diagnosis is listed in Axis I (mental disorder due to a general medical condition), and the medical condition is specified in both Axis I and Axis III.

Axis IV is for recording environmental and psychosocial events that may have a negative impact on a person's functioning, treatment, or prognosis. A list of the various domains that may be listed in Axis IV is included in Box 7.4. Multiple events may be listed in this domain, but usually only those that have relevance within the past year are included. For example, a patient may be distressed about the loss of a parent, although this should only be listed if it occurred within the past year, not if the client is still struggling with the loss after 5 years. Usually, the events included in this domain are secondary to the patient's diagnosis; however, in some cases they may be the primary reason for treatment (e.g., helping a client process the loss of a friend). In such cases, the event should be recorded in Axis I as "other conditions that may be a focus of clinical attention."

Finally, the patient's overall level of functioning during a given time period is recorded in Axis V. In this axis, the clinician uses clinical judgment to provide an indication of the patient's symptom severity and impairment of functioning using the Global Assessment of Functioning (GAF) scale (which ranges from 0 to 100). The GAF rating indicates the degree to which the patient's diagnoses along the previous four axes limit the ability to engage in skills and behaviors necessary for daily living across multiple domains (psychological, social, and occupational/educational); limitations due to physical and environmental conditions are not considered. When providing a numerical rating from the GAF scale, the clinician considers both symptom severity and ability to function and provides the number that corresponds to the lower of these two domains. A list of functioning descriptions and examples is included in the *DSM-IV-TR* (APA, 2000) to guide practitioner judgment on assigning a GAF score. The GAF is frequently used for tracking overall change in patient severity of impairment in treatment settings (e.g., Glenn, Dana, Der-Karabetian, & Kramer, 2004).

**Box 7.4** Reported in Axis IV

Problems with primary support group
Problems related to the social environment
Educational problems
Occupational problems
Housing problems
Economic problems
Problems with access to health care services
Problems related to interaction with the legal system/crime
Other psychosocial and environmental problems

*Source:* American Psychiatric Association (2000).

## *Coding and Reporting Patient DSM Diagnoses Along the Five Axes*

When reporting on the mental health status of an individual, information along all five axes is provided, and the diagnostician indicates *none* if there are no concerns along a particular axis. Furthermore, the clinician designates the primary reason for the admission or visit by listing the disorder first in the Axis I category or using the qualifying phrase "principal diagnosis" or "reason for visit" if the reason is due to an Axis II condition. Inclusion of the corresponding *ICD-9* codes to facilitate communication with government agencies and private insurance companies are essential when providing diagnoses along Axis I, Axis II, and Axis III conditions (APA, 2000). All disorders listed in the *DSM-IV* (APA, 1994) classification system have corresponding *ICD-9* codes between 290 and 319. The first three numbers indicate the general diagnostic disorder, and the fourth and fifth digits indicate subtypes or specifiers. For example, a diagnosis of conduct disorder with adolescent onset would receive a code of 312.82; the first three digits (312) correspond with the general diagnosis of conduct disorder and the fourth and fifth digits (82) specify that symptoms had an adolescent onset. Alternatively, a diagnosis of conduct disorder with childhood onset corresponds with a code of

312.81. Again, the 312 indicates conduct disorder, and in this case, 81 indicates childhood onset.

Diagnoses included in the diagnostic report describe a patient's current functioning, and the clinician is allowed to provide further information about the severity and course of a given diagnosis after listing the name and code of the diagnosis for specific diagnoses. To communicate severity of a disorder for which the patient is *currently* exhibiting/experiencing symptoms, the clinician can indicate whether the symptoms are mild, moderate, or severe. These specifiers can be applied to diagnoses of conduct disorder, major depressive episode, manic episode, and mental retardation. In addition, if the patient met criteria for a diagnosis of major depressive episode, manic episode, or substance dependence in the past but does not currently report or display symptoms that meet diagnostic criteria, the clinician can report if symptoms are in partial remission (some symptoms are present, but some have disappeared) or full remission (symptoms are no longer present, but condition is still clinically relevant). The clinician also has the option of indicating that the patient has a prior history of that condition. For example, it may be important for a clinician to indicate that a patient has a history of substance dependence, even if the patient no longer uses substances, because it communicates that the patient is at risk for relapse. If the diagnosis is contingent on a specific time period criterion (e.g., symptoms must be present for 3 months), which the clinician expects the patient to eventually meet, the clinician can assign the diagnosis and then indicate "provisional" after listing the name and code of the disorder.

Occasionally, a clinician may encounter a situation that is not directly covered under the symptom lists of a specific diagnostic category, although a diagnosis should still be made. Due to these situations, most diagnostic groupings have a not otherwise specified (NOS) category that can be indicated. There are several situations in which assignment of NOS may be appropriate. First, a patient's symptoms may be consistent with the general guidelines of a diagnostic category but do not meet criteria for a specific diagnosis. For example, a young child may demonstrate symptoms consistent with a pervasive developmental disorder, such as difficulties engaging in social interactions and deficits in communication, but not meet specific criteria for Asperger's disorder, autistic disorder, childhood disintegrative disorder, or Rett's disorder. In such a case, the clinician could provide a diagnosis of pervasive developmental disorder NOS. Another example of when an assignment of NOS may be necessary is when the clinician is unsure of the etiology of a disorder (e.g., if it results from a general medical condition) or when the clinician has limited time to collect symptom data but is confident that the symptoms are consistent with a broad diagnostic grouping. Finally, NOS may be assigned if the patient exhibits a symptom pattern that is not officially delineated in the *DSM-IV-TR* classification system (APA, 2000) but is consistent with a pattern of symptoms that has been identified in appendix B of the manual for further study. Finally, it is appropriate for a clinician to put a missing code on Axis I or Axis II when the clinician wishes to communicate diagnostic uncertainty or absence of symptoms along a particular axis.

An example of a patient diagnosis along the multiaxial format is provided in Box 7.5. The patient was a 34-year-old female who visited the clinician with concerns regarding depressed mood that affected her motivation to complete work at her job and caused fights among her family members. It was determined that she met criteria for major depressive disorder, with symptoms in the moderate range. This was the patient's first time experiencing a depressive episode. The first listing under Axis I corresponds to this diagnosis because it was the primary reason for the clinic visit. The patient also had a history of alcohol dependence, although she did not use any drugs or alcohol at the current time. Due to the clinical relevance of prior alcohol dependence, this was listed under Axis I, and it was specified that this was a *prior* history. The patient did not exhibit symptoms consistent with a personality disorder,

**Box 7.5** Diagnosis using multiaxial system

| | |
|---|---|
| Axis I | 296.22 Major depressive disorder, single episode, moderate<br>303.90 Alcohol dependence, prior history |
| Axis II | V71.09 No diagnosis on Axis II |
| Axis III | None |
| Axis IV | Financial strain due to husband's loss of employment |
| Axis V | GAF = 55 (current) |

GAF, Global Assessment of Functioning.

and her cognitive functioning was average; she did not report any significant medical conditions relevant to her current psychological functioning. Due to this, a no diagnosis code was listed under Axis II, and the absence of any relevant general medical conditions was indicated under Axis III. The patient also indicated that she was experiencing increased stress because her husband had recently lost his job, so the family was experiencing significant financial strain. This environmental problem was thus listed in Axis IV. Finally, a GAF code was assigned in Axis V that indicated that the patient exhibited moderate symptoms that resulted in moderate difficulty in her occupational and social functioning. Clearly, the reporting of all the information included on this multiaxial format provided a more comprehensive indication of the patient's current functioning than would be provided if all that were reported were a diagnosis of major depressive disorder, which is the only diagnosis in the classification system for which she currently meets diagnostic criteria.

## *DSM-IV-TR Diagnostic Information*

Each diagnostic category in the *DSM-IV-TR* (APA, 2000) contains detailed and specific information to guide the diagnosis and educate the reader about the etiology and course of the diagnosis. Several broad categories of information are systematically included for each diagnostic category. All diagnostic categories include sections communicating information about diagnostic features, associated features and disorders, specific age, gender, and culture features, prevalence, course, familial patterns, and differential diagnoses. In addition, some categories also include information about subtypes and specifiers and the procedures for recording this information.

### "Diagnostic Features"

The "Diagnostic Features" is the first section listed under each diagnostic category. This section provides information about the defining characteristics of a disorder and describes the features that are usually consistent with the disorder. Symptoms described in this section are essential for making the diagnosis. In addition, illustrative examples are often provided.

### Subtypes or Specifiers

As discussed, some of the diagnostic categories in the classification system can have subtypes or specifiers. Subtypes provide specific information regarding the categorical features of the diagnosis. For example, under the diagnostic category of specific phobia, the clinician can indicate the category of the phobia under subtype (animal, natural environment, blood-injection-injury, situational, or other). In contrast, specifiers provide information about the features of the symptoms, such as age of onset or severity of symptoms. The specific subtypes or specifiers that can be indicated are described under each diagnostic category, if applicable.

### Recording Procedures

Some diagnostic categories also include information about the procedures used to record information related to the diagnosis. Included in this section may be instructions for recording the *ICD-9-CM* codes (WHO, 2007) and selecting and communicating the appropriate subtypes and specifiers.

### "Associated Features and Disorders"

The "Associated Features and Disorders" section is included for each diagnostic category. This section might include information related to the descriptive clinical features of a disorder that are nonessential for diagnosis. For example, the "Associated Features and Disorders" section under the depersonalization disorder diagnostic category lists susceptibility to hypnotizability as a clinical feature that may be observed in some patients, although it is not a symptom that must be present for diagnosis. Also reported in this section are any associated physiological or anatomical laboratory findings that can be (a) used for diagnosis; (b) associated with the disorder but not necessary for diagnosis; or (c) are related to complications with the disorder. An example of this, under the diagnostic category of cannabis-related disorders, the presence of cannabinoid metabolites in the patient's urine is listed as an associated laboratory finding. Finally, this section is used to describe any associated medical or physical examination findings related to the disorder but not necessary for diagnosis. For example, under the diagnostic category of intermittent explosive disorder, the occasional presence of "soft" neurological findings (e.g., problems with specific movements) is noted as an associated physical examination finding.

### "Specific Age, Gender, and Culture Features"

Information included in this section communicates the variability of the diagnostic features and prevalence of the disorder that may be due to demographic and cultural differences among patients. When describing variability by age, differences in symptom manifestations between children and adults are frequently described. The manual also frequently indicates any gender or ethnic differences in prevalence or diagnostic features (or the lack of gender or ethnic differences), if relevant. For example, under the bipolar disorders diagnostic category, this section describes the increased likelihood for patients to demonstrate depressive symptoms during the course of a manic episode.

### "Prevalence"

As noted, one of the purposes of the manual is to provide a forum by which to communicate statistical information regarding the prevalence of mental disorders. This section meets this goal by presenting statistical information related to the prevalence of the specific diagnostic disorder and is included for all diagnostic categories.

### "Course"

The information included in the "Course" section under each diagnostic category describes the lifetime patterns and prognosis related to the mental disorder. The typical age and nature of onset is depicted, as is the recurring nature of the disorder. For example, this section will describe whether a specific diagnosis is episodic (it occurs occasionally and is marked by periodic absence of symptoms) or continuous (untreated symptoms remain present). The length of each duration of episodes and likelihood for recurrence are also recorded. Finally, the prognosis of symptom severity (e.g., worsening, alleviating) over time is also indicated. This knowledge is valuable in treatment planning as well as educating the patient or guardians on the long-range implications for managing symptoms.

### "Familial Pattern"

The "Familial Pattern" section provides information about the heritability of a diagnostic category. These data depict the frequency of diagnosis among first-degree relatives of a patient meeting criteria for diagnosis in comparison to the frequency of the disorder in the general public. Statistics derived from twin studies in which rates of frequency between identical twins with 100% genetic similarity in comparison to fraternal twins with approximately 50% genetic similarity are also compared in some sections.

### "Differential Diagnosis"

Some disorders have overlapping symptoms or yield similar symptoms to one another. In addition, some symptoms are a result of physical health conditions rather than mental health diagnoses. Therefore, the "Differential Diagnosis" section is included to provide the clinician with information regarding how to make decisions about diagnosis that rule out disorders with shared symptomology. Typically contained in this section are specific criteria for differentiating the specific diagnosis from others with similar symptoms or symptom patterns. The process of differentiating disorders is essential to avoiding misdiagnosis as well as increasing treatment efficacy.

### Diagnostic Criteria

The final section for each diagnostic category is a symptom list of the diagnostic criteria essential for making a diagnostic decision. The diagnostic criteria are concise and included in boxes for quick reference. The criteria boxes summarize the symptoms that must be present, the associated features that are sometimes observed, and the need to include information regarding subtypes or specifiers. As symptom manifestations, even within a disorder, are not homogeneous, appropriate use of diagnostic criteria lists is more complex than simply a symptom checklist. The criteria often include establishing a number of symptoms both across and within subcategories. Criteria may also include documenting symptom onset, duration, or occurrences across context. For example, a diagnosis of attention deficit/hyperactivity disorder, combined type, requires that symptoms be present for the past 6 months and have had onset prior to age 7 years. Symptoms must also be evident in two or more settings (e.g., work and home).

### Other *DSM-IV-TR* Resources

The *DSM-IV-TR* (APA, 2000) contains several additional resources within the appendices that enhance diagnostic capabilities. There is an appendix with decision trees that provide a visual reference and series of easy yes-no questions to guide differential diagnosis. Other appendices include criteria sets for syndromes that were proposed but not yet included in the *DSM-IV* (APA, 2000), a glossary of terms, highlights of changes in the *DSM-IV-TR*, and *ICD-10* (WHO, 1992) codes.

## Diversity and Cultural Issues in Diagnosis

Mental health professionals provide clinical services to persons from a wide range of racial, ethnic, socioeconomic, sexual orientation, faith perspective, and linguistic backgrounds. When reviewing statistics for just race/ethnicity alone as a diversity factor, there are numerous groups to consider. The U.S. census (2000) data indicate the following distribution: white 75.1%, black 12.3%, American Indian/Alaska Native 0.9%, Asian 3.6%, Native Hawaiian/other Pacific Islander 0.1%, and two or more races 2.4%. Hispanic or Latino (or any race) represents 12.5% of the population. Even within these eight groups, it is important to note these categories are not homogeneous, and in fact many subgroups are represented. For example, the census also provides data for subcategories within some of those noted, such as Asian, which may include Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, other Asian category, and two or more Asian categories (U.S. Census Bureau, 2000).

The Office of Management and Budget (OMB) currently defines ethnicity (termed as Hispanic and non-Hispanic) and race categories that will be included on the census; however, these terms change over time and cannot be assumed to represent all possible groups. It is the responsibility of mental health professionals to remain aware and sensitive to the different needs of individuals based on their group affiliations.

Although consensus of definitions does not exist at this time, the American Psychological Association has provided an explanation of diversity terms that can guide individual considerations during diagnosis (American Psychological Association, 2000). *Culture* is defined to include a client's belief systems, values, customs, norms, practices, and social institutions that inform his or her worldview. This may include the individual's language and racial heritage as well as religious and spiritual traditions. *Race* is defined as a socially constructed concept as there is more within-group than between-group variation for perceived biological or phenotype characteristics. Some policy makers argue that race categories are subjective terms without anthropological or scientific support (Hodgkinson, 1995). *Ethnicity* is defined as a sense of belonging that includes embracing the mores of the culture of origin. Based on the APA definitions, the terms *multicultural* and *diverse* have been used synonymously. These aspects of individual difference are broader than race and ethnicity in that they also include sexual orientation, gender, age, disability, and education. In addition, practitioners are reminded that persons may identify with several different groups based on differing roles or aspects of their persona. It should be noted that, although the APA definition does not include ableism in their definitions, other researchers note the importance of this concept to culture as well.

Mental health professionals also are expected to aptly differentiate appropriate and adaptive beliefs and behaviors from those that are maladaptive based on developmental stages across the life span. In addition, there are variations in life experience and roles based on gender and sexual orientation. These differing perspectives require practitioners to be diligent in evaluating clients within the appropriate context to avoid misinterpreting cultural variations as deviant or pathological and thus misdiagnosing.

The *DSM-IV-TR* (APA, 2000) provides guidance on these important issues in several ways. First, within the discussion of disorders on Axes I and II, the "Specific Culture, Age, and Gender Features" section discusses a variety of relevant considerations. For example, when considering a diagnosis of mental retardation, clinicians are reminded of the importance of considering linguistic background as well as representative standardization norms in assessment measurements. Sensitivity to the issues of lower-income families and the higher premature birth rate and teratogen exposure incidence is encouraged as well.

Secondarily, an appendix is included (APA, 2000) to address cultural formation and provide descriptions of culturally bound syndromes. Aspects of cultural formation include noting the client's current identification with the culture of origin as compared to the host culture; language preference/dominance, differing verbal expressions for symptoms, cultural opinions of professional intervention; perceived causes for distress, social support networks, and culturally mediated levels of disclosure. Culturally bound syndromes acknowledge region-specific diagnoses or explanations for behavioral clusters. Culturally bound syndromes also may be limited to industrialized or nonindustrialized countries. For example, anorexia is not prevalent in some nations (American Psychological Association, 2000).

In addition to the *DSM*, there is an ethics code provided by the American Psychological Association that addresses the need for all psychologists to respect the rights and dignity of clients, including awareness of their cultural, individual, role, age, gender, race, ethnicity, and national origin differences. Competence in cultural diversity, assessment, and research are emphasized as well (American Psychological Association, 2002a). There are several documents available from the American Psychological Association that provide practice guidelines for diversity issues including: *Guidelines on Multicultural Education, Training, Research, Practice, and Organizational Change for Psychologists* (American Psychological Association, 2002b) and "Professional Practice Guidelines for Psychotherapy with Lesbian, Gay and Bisexual Clients" (American Psychological Association, 2000). These guidelines have many implications for the process of establishing appropriate *DSM* diagnoses and treatment based on those decisions.

## *DSM* Limitations

The *DSM* provides mental health professionals an important comprehensive guide to diagnoses. It has made significant changes with each edition and will continue to evolve as practice demands change and research informs treatment. In looking forward to better serving the mental health needs for future patients, a number of limitations in the current *DSM* structure have been proposed (Bornstein, 1998; Watson, 2005; Widiger & Samuel, 2005).

### Categorical Approach

At this time, the *DSM* is primarily a categorical approach to diagnosis and assumes a disorder is either present or not rather than perceiving symptoms on a continuum (e.g., low, at risk, clinically significant). Disorders are presumed to be distinct from each other and from normal functioning. The *DSM* also is based on a medical model of identifying pathology and assumes maladaptive functioning within the patient. In addition, many diagnoses are made based on traits treated as static and stable when in fact personality traits change over time even among persons without mental disorders (Widiger & Trull, 2007). The categorical approach has little emphasis on an ecological perspective that would include documenting the environmental context or examination of support networks for patients and promote understanding disabilities within a psychosocial context (Kerig, 2006; Mash & Barkley, 2003; Routh, 1990).

Comorbidities are common and can further complicate the distinctions between diagnoses, especially when there are overlapping symptoms. In addition, there is variability of the clustering of symptoms within a diagnostic category. Thus, two patients with the same diagnosis may exhibit markedly different behavioral patterns. Oppositional defiant disorder lists eight symptoms, four of which are required for a diagnosis. In this particular case, it is possible for two clients to have the disorder and not share even one of the eight symptoms. This heterogeneity among many disorders, as defined by the *DSM*, does not provide strong discriminate validity for differential diagnosis or presumed divergent etiologies.

Some authors have suggested viewing mental health issues in alternative paradigms that acknowledge there is not always a clear boundary between normal and pathological and describe mental health functioning on a multidimensional spectrum (Ball, 2001; First, 2005; Krueger, Markon, Patrick, & Iacono, 2005). Considerations have included a continuum from healthy to maladaptive functioning, distinguishing internalizing from externalizing symptoms, as well as defining diagnosis in terms of protective and vulnerability factors (Achenbach, 1985; Mash & Barkley, 2003; Widiger & Trull, 2007). It is suggested these changes would also enhance the *DSM* by creating a more direct link from diagnosis to treatment. Currently, the *DSM* model does not offer guidance on treatment.

## Specificity of Terms

Although the *DSM* has greatly improved the behavioral descriptors of symptoms, it still lacks specificity in some terms. Diagnosis is often dependent on establishing the severity of symptoms with descriptors such as "markedly increased or markedly decreased," a criterion that is not explicit (Mash & Barkley, 2003). Practitioners also are required to make decisions on the frequency of symptoms over time based on indistinct terms (e.g., persistent or recurrent) and decide whether the patient has functioning impairment. For example, the diagnosis of post-traumatic stress disorder requires evidence of clinically significant impairment in the patient's social, work, or other areas of functioning (APA, 2000). The *DSM* does not provide guiding principles for measuring symptoms or impairment and does not make recommendations for types of measures used in gathering information to make these judgments. The lack of common parameters in selecting qualitative or quantitative data that will determine a diagnosis presents a significant limitation (Regier et al., 1998).

## Variability in Diagnostic Assessment Data Utilized with the DSM

Another issue inherent in *DSM* diagnosis is the variation among professionals in how they gather information to establish diagnostic criteria. In the absence of clear *DSM* guidance for types of data to collect, the type of assessment will depend on the orientation of the diagnostician. This results in considerable variation of testing measures or observation skills and the dependence on clinical judgment by the examiner. Not all patients within a diagnostic category will receive the same type of evaluation. The assessment/diagnosis style of physicians, social workers, counselors, psychologists, and psychiatrics as well as other mental health professionals may depend heavily on their particular training orientation.

Assessment perspectives may include a medical model, a psychodynamic approach, a psychometric model, or a behavioral paradigm (Achenbach, 1985). For clinicians who espouse a medical or neurological model, assessment is conceptualized in lieu of cerebral trauma, malformation, or deterioration. Therefore, organic causes or injury are investigated. Neurological and neuropsychological evaluations may be conducted in tandem. The neurological evaluation will focus on biological components (e.g., sensory, motor, reflexes) and sometimes neuroimaging (Lezak, 1995; Lyon & Rumsey, 1996). The neuropsychological assessment will address cognitive processes (e.g., intelligence, memory, attention). Goals include documentation of adaptive functioning or deterioration and differentiating behavioral problems that are a result of brain damage from those that are more psychological in nature (Sattler & Hoge, 2006).

From a psychodynamic position, internal drives, motivations, early unresolved conflicts, and interpersonal relationships may be explored through interviews and the use of more projective measures. A psychometric approach will include utilizing norm-referenced tests and objective measures of behavior. The behavioral paradigm seeks to identify antecedents, reinforcers, consequences, and chronic maladaptive patterns. This approach relies heavily on interview and naturalistic observations. Professionals may also combine perspectives and select components from differing approaches.

Assessments to establish *DSM* criteria typically include a review of records (e.g., health, psychiatric, forensic), social-developmental history, clinical interviews, and observations. Additional formal test instruments may also be included such as omnibus behavior-rating scales, personality measures, projective tests, sensory/motor screenings, language, adaptive behavior, and intelligence or educational testing. The choice of testing approach is the purview of the clinician and can result in significant differences in data (Lezak, 1995). In addition to variation in what measures are chosen, there are variations in how those measures are administered and what types of information are sought. Deficits may be conceptualized in lieu of normative comparisons to others (e.g., age norm-referenced intelligence score) or individual comparison based on past history (e.g., sudden deterioration in personal grooming standards). Depending on the hypothesis, testing may also be administered in lieu of typical performance or optimal performance. Optimal performance administrations do not necessarily follow standardization and may include a number of accommodations as well as testing-the-limits strategies. In addition, the rigor of assessment methods vary considerably. For example, behavioral observations are a common clinical assessment tool, yet often interobserver agreement is not conducted to establish reliability. Behavioral ratings scales may also present different conclusions depending on the perspective of the informant. Another example is the use of rating scale normative data with minority clients who are not well represented in the norming sample.

Best practices in psychological assessment require selection of instruments and methods that meet standards for reliability, validity, and fairness (American Educational Research Association [AERA], 1999). The *DSM* does not provide guidance on assessment batteries or diagnosis techniques within its criteria for disorders. These choices are made by individual practitioners and therefore may vary across patients, settings, and disciplines. Training and credentialing standards address broad competencies in psychological services. In addition, there are a number of ethical and professional guidelines practitioners can reference for these decisions. They include "Ethical Principles of Psychologists and Code of Conduct" (American Psychological Association, 2002a), *Code of Fair Testing Practices in Education* (American Psychological Association, 2003), "Record Keeping Guidelines" (American Psychological Association, 1993), *Responsibilities of Users of Standardized Tests* (Association for Assessment in Counseling, 2003), and the *Standards for Educational and Psychological Testing* (AERA, 1999).

## *DSM* Diagnosis with Children and Adolescents

### *Neglecting Child and Adolescent Diagnosis*

Another limitation of the *DSM* is the focus on criteria in adult terms. There is a lack of discussion of developmental norms, trajectories, and early emerging risk factors that make the use of the *DSM* especially problematic in the diagnosis of children and adolescents. In an effort to address this need, the *Diagnostic and Statistical Manual for Primary Care* (*DSM-PC*) was created, although it has not enjoyed wide usage (Wolraich, Felice, & Drotar, 1997). A second system, the Diagnostic Classification for Zero to Three (DC:0–3) written by the Diagnostic Classification Task Force for the Zero to Three/National Center for Clinical Infant Programs provides diagnostic guidelines for infants through toddlers age 3. A multiaxial model was designed to include primary diagnosis, relationship disorder classifications, medical and developmental disorders and conditions, psychosocial stressors, and functional emotional development (Zero to Three/National Center for Clinical Infant Programs, 1994).

## The *International Classification of Diseases* and *International Classification of Functioning, Disability, and Health* Model

The *DSM* is a well-respected and important diagnostic instrument within the U.S. mental health care system; however, it is not utilized in many other countries. With the fourth edition of the *DSM* (APA, 1994), a shift was made to include reference codes from the *ICD* and to align the *DSM-IV-TR* (APA, 2000) categories with the "Mental and Behavioral Disorders" chapter of the 10th edition of the *ICD* (WHO, 1992). The *ICD-10* provides a universal framework for the diagnostic classification of disorders, diseases, and health conditions. This section briefly reviews the development of the *ICD*, merging trends between the *DSM* and *ICD*, as well as implications for a common classification and statistical data system.

### *History of the ICD*

Systematic attempts to classify diseases and causes of death may have begun as early as the 1500s. Recovered portions of the London Bills of Mortality indicate records by parishes of births, christenings, and burials from 1592. These documents were utilized to make primitive mortality estimates and determine longevity as well as prevalent types of death. Causes of death included accidents (e.g., bit by mad dog) and illness (e.g., scurvy, swinepox). In addition, a number of deaths were contributed to what may now be considered mental health issues (e.g., grief, lunatique). Rudimentary efforts were made to understand data patterns across groups and health issues for society as a whole. For example, a large number of abortive, stillborn, and childbed deaths noted the blight of young children. One particular record indicates only 64 of 100 children remained alive at age 6, and only 25 still remained alive at age 26. Early pioneers in collecting and reviewing these data included John Graunt and Franciois Bossier de Lacroix (Stephan, 2007; WHO, 2007).

In 1853, the first International Statistical Congress initiated the preparation of a formal international classification system that could track morbidity data across countries. The work of William Farr and Marc d'Espine resulted in a rubric classification approach that was revised several times between 1864 and 1886. In 1893, the International Statistical Institute furthered this work by adopting Bertillon's Classification of Causes of Death, which included nomenclature from the English, German and Swiss systems (see Table 7.2). The American Public Health Association later adopted Bertillon's classification in 1898 (WHO, 2007).

The first international conference for the revision of Bertillon's classification, renamed the *International List of Causes of Death* (*ICD-1*), was held in 1900 with 26 countries participating (WHO, 2007). To acknowledge the importance of collecting data on not only death but also illnesses and public health, a second classification system for diseases also was adopted. Subsequent conferences resulted in the second and third revisions (*ICD-2* in 1909, *ICD-3* in 1920). Fourth and fifth versions (*ICD-4* in 1929, *ICD-5* in 1938) created more sophisticated statistical utility of the classifications and morbidity data system. In addition, the revisions included broader collaboration across experts, and the International Statistical Institute shared responsibility for development with the Health Organization of the League of Nations.

Subsequent revisions have been completed under the oversight of WHO (*ICD-6* in 1948; *ICD-7*, 1955; *ICD-8*, 1968; *ICD-9*, 1968; *ICD-10*, 2003), and the 11th edition is pending, with expected completion in 2011. Following publication of the *ICD-9*, the United States created a clinical modification (*ICD-9-CM*) of the codes (WHO, 1977) that was adapted by the U.S. National Center for Health Statistics to record additional morbidity data for U.S. hospitals. The U.S. Department of Health and Human Services directs all changes to the clinical modifications, and updates are available annually (APA, 2000).

The *DSM-IV-TR* (APA, 2000) appendices contain listings of both the *ICD-9-CM* (National Center for Health Statistics 1989) and *ICD-10* (WHO, 1992) codes to facilitate hospital and agency data collection as well as some financial reimbursements. The *DSM-IV-TR*

**Table 7.2** Development of the *DSM, ICD,* and *ICF*Bertillon Classification of Causes of Death adopted, International Statistical Institute, 1898; *ICD-1 International List of Causes of Death* (also parallel classification of diseases), International Statistical Institute, 1900; *ICD-2 International List of Causes of Sickness and Death* (also parallel classification of diseases), International Statistical Institute, 1910; *ICD-3 International List of Causes of Death*, International Statistical Institute1920; *ICD-4 International List of Causes of Death,* International Statistical Institute and the Health Organization of the League of Nations, 1929; *ICD-5 International List of Causes of Death*, International Statistical Institute and the Health Organization of the League of Nations, 1938; *ICD-6 International List of Diseases and Causes of Death*, World Health Organization, 1948; *ICD-7 International Classification of Diseases*, World Health Organization, 1955.

| *DSM* | | *ICD* and *ICF* | |
|---|---|---|---|
| *DSM-I*: Vague criteria focused on psychological "reactions" | 1952 | *ICD-8*: *International Classification of Diseases*, World Health Organization | 1968 |
| *DSM-II*: Dropped term *reactions*, added symptoms | 1968 | *ICD-9: International Classification of Diseases*, World Health Organization | 1975 |
| *DSM-III*: Explicit diagnostic criteria; multiaxial system | 1980 | *ICD-9-CM*: *International Classification of Diseases, Version 9, Clinical Modifications* | 1977 |
| *DSM-III-R*: Clarified inconsistencies in *DSM-III* | 1987 | *ICD-10: International Classification of Diseases, Version 10*, World Health Organization | 1992 |
| *DSM-IV*: Empirical support, data analysis, and field trials | 1994 | ICF: International Classification of Functioning, Disability, and Health | 2001 |
| *DSM-IV-TR*: Updated errors, *ICD-9-CM/ICD-10* codes | 2000 | *ICD-10-CM: International Classification of Diseases, Version 10, Clinical Modifications*ICF, World Health Assembly | 2003 2001 |
| *DSM-V* (anticipated 2011) | 2011 | ICD-11 (Anticipated 2011) | 2011 |

*DSM, Diagnostic and Statistical Manual of Mental Disorders.*

listing of codes from the *ICD-9-CM* are outside the "Mental Disorders" chapter of *ICD-9-CM* and are provided to be utilized with Axis III diagnoses. The inclusion of these general medical disorders permits *DSM-IV-TR* diagnoses that acknowledge the interaction between some medical and mental health disabilities. The current *DSM-IV* (APA, 1994) codes and terminology were organized to correspond with Chapter 5 of the *ICD-10*, "Mental and Behavioral Disorders," codes that are now utilized by many countries and will eventually be implemented in the United States (APA, 2000).

## Implications for the International Classification of Functioning, Disability, and Health Framework in Assessing Function

Another important diagnostic tool, the *International Classification of Functioning, Disability, and Health* (*ICF*) is used in conjunction with the *ICD-10* (WHO, 2001) for identifying health and health-related functioning levels. The *ICF* classifies functioning in the context of interactions between health characteristics or limitations and individual or environmental factors. This model suggests that a diagnosis or disability classification alone should not dictate the services provided, and evaluation should directly inform treatment or intervention (Reed et al., 2005). In some ways, the *ICF* addresses limitation issues that have been presented regarding the *DSM*'s lack of emphasis on specific functioning measurement and consideration for environmental context.

The *ICF* approach to determining treatment needs emphasizes a comprehensive analysis of the individual and the individual's resources (WHO, 2001). The *ICF* coding provides a two-part evaluation documentation system that (a) considers components of body functions and structures with impact on activities and participation as well as (b) contextual factors. The emphasis on body functions delineates several aspects directly related to the work of psychologists. These include global mental functions, temperament, personality, attention, memory, and emotional functioning. In addition, body functions address sensory and neuromusculoskeletal functions related to physical impairments (e.g., vision). Atypical bodily functions may be considered impaired yet not problematic if they do not diminish activities and participation in life functions. Analysis of activities and participation include review of the individual's learning, knowledge application, communication, mobility, self-care, and interpersonal relationships. The *ICF* also requires practitioners to assess environmental factors that may impede or facilitate the individual's progress. This includes assistive products and technology, support relationships, attitudes, agency services, and public policies (Bruyere, Van Looy, & Peterson, 2005; Reed et al., 2005; WHO, 2001).

With the emphasis on simultaneous consideration for body function, activity level, and participation factors, the *ICF* model provides a synopsis of individual strengths and needs. The model acknowledges that a physical impairment may exist with or without a negative impact on performance depending on other facilitating factors. The model emphasizes that impairment's effect on performance is also subject to change over time. An understanding of this approach may enhance collaboration on treatment regimens for persons comorbid for both mental health and general medical disorders as it is used by many health professionals.

## Integration of the DSM, ICD, and ICF

As the *DSM* and *ICD* codes become closer aligned and cross-data systems are created, the utilization of a common international taxonomy has immense implications for understanding mental health issues across cultures and environments and within differing medical systems. Analysis of these data has the potential to inform social policy, treatment, and research. Clinical implications include creating a common language for diagnosis and treatment that facilitates multidisciplinary collaboration. This is particularly important for persons with neurological impairments or comorbid disabilities as those cases require working in tandem with other service providers. Comparisons across differing health care systems in countries can serve to inform best practices in managed care. With the inclusion of the *ICF* emphasis on functional impact, issues such as the level of care, disability benefits, and work performance are also directly addressed in the diagnostic process. Research implications include creating a unified framework that permits an international database of mental health symptoms, treatment, and outcomes. Analyses of these data across nations can expand scientific knowledge to better inform etiology across the life span and across cultures.

## Summary

The *DSM* provides a sophisticated and encompassing guide for the multifarious task of diagnosing mental disorders. It represents the combined expertise of a broad range of nationally and internationally recognized scholars and agencies. The metamorphosis from the original *DSM-I* (APA, 1952) with three major categories to the current *DSM-IV-TR* (APA, 2000) with over 400 possible diagnoses is indeed commendable (Kessler, 1971; Mash & Barkley, 2003). However, as in the past, the *DSM* remains a work in progress and will no doubt continue to change. Discussions are already in progress to revise the *DSM* for the fifth edition in lieu of recent research findings, new advances in diagnostic techniques, improved treatment protocols, and important public policy endeavors to ensure equity for patients from diverse backgrounds.

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## Chapter 8

# Measuring Impairment in a Legal Context: Practical Considerations in the Evaluation of Psychiatric and Learning Disabilities

Benjamin J. Lovett, Michael Gordon, and Lawrence J. Lewandowski

The measurement of functional impairment has become far more than an academic enterprise given the current demand for clinical evaluations of disability status. Individuals seeking access to legal accommodations in school or at work are pursuing assessments that establish their qualification as having a disability. To satisfy those requests, clinicians have to understand how the law defines disability and the level of documentation required to establish that an individual has a disability. These legal definitions of disability push clinicians to shift focus from the familiar terrain of symptom counts and psychological test scores to the less-well-tread path of assessing impairment in actual functioning.

The confluence of psychiatric criteria and legal formulations poses challenges for the mental health practitioner. Because the law draws brighter lines than prevail in the clinical arena, clinicians have to contend with a different world of concepts and criteria. While that transition can be jarring, it can also be productive, provoking us to reconsider ideas that are central to the diagnostic enterprise: What constitutes a disorder? What standard should we use to consider someone as having a disability? Should we compare the examinee to the average person, to people of similar educational attainment or aspirations, or to an individual's own array of strengths and weaknesses? How valid is psychological testing as a source of information about impairment? Should a person be considered to have a disability if the deficit is not so great as to lead to limitations in activities central to daily living? Might the legal method of establishing disability represent a fairer and more practical strategy than what prevails in psychiatry? Does the forensic construal of impairment have something to teach us about how we might reformulate diagnostic protocols?

This chapter reviews the essential elements of establishing impairment within a legal context. Although the fundamental concepts are universal to disability determinations across environments, we illustrate them primarily through consideration of accommodations in higher education. It is in this domain that clinicians are finding themselves having to wrestle most with the constraints and nuances of disability law.

## The Americans with Disabilities Act: Origins and Aims

The legislation that currently establishes the bounds of disability is the Americans with Disabilities Act (ADA, 1990). This law, designed to combat discrimination against individuals with disabilities, contains five sections, three of which have an impact on daily life. Title I requires employers to treat qualified individuals with and without disabilities equally with regard to hiring, salary, promotion, and training opportunities. It also requires that "reasonable accommodations" be made to allow individuals with disabilities to perform their jobs. Title II deals with public transportation services, requiring public transportation authorities to ensure that individuals with disabilities have comparable access to the transit system. Finally, Title III requires that any facility open to the public (designated under the law as a "public accommodation") be accessible to individuals with disabilities. As proclaimed by the general rule for this section: "No individual shall be discriminated against on the basis of disability in the full and equal enjoyment of the goods, services, facilities, privileges, advantages, or accommodations of any place of public accommodation by any person who owns, leases (or leases to), or operates a place of public accommodation" §12182.

Antidiscrimination laws do not guarantee success in life for individuals of groups that the laws combat

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discrimination against. In the same way that a law prohibiting racial discrimination in employment would not guarantee that any African American applicant applying for a particular job would be hired, the ADA does not guarantee that an individual with a disability will be hired for a job or admitted to a particular educational program.

By definition, an antidiscrimination law such as the ADA is "outcome neutral." While it establishes procedures for making certain decisions around hiring and test accommodations, it does not impose constraints on the decision itself. For instance, the ADA does not dictate that a student qualified as having a disability must succeed in every course or examination. It only guarantees that the student not be discriminated against because of limitations that are irrelevant to the essential functions inherent in being a student. The ADA would protect someone who was visually impaired from failing an examination because he could not see the text. It would not ensure that that student received a high score on a version of the test he or she could see. Therefore, a clinician who writes, in a report supporting accommodations, that the student "must be allowed extra time so that he can have the best chance of passing the examination and showing his real abilities" misreads the intent of the law and ensuing regulations. The ADA ensures that individuals who are otherwise qualified for jobs or educational programs are not denied participation simply because they have a disability. The law therefore guarantees *access*, not *success*.

Case law generally supports the stance adopted by many testing organizations and educational institutions that the ADA is not intended to maximize performance or fulfill potential. For example, in *Gonzales vs. NBME* (2000), a medical student sued the National Board of Medical Examiners when it denied his request for testing accommodations on the medical licensure examination. The courts found that he was not qualified as having a disability even though he had a high IQ and a record of improved performance with extended time accommodations. According to that decision, Gonzales did not have a disability as defined by the ADA because his academic performance was in the average range when compared to the population at large. This court, like almost all others, indicated that the ADA defined disability as an inability to function as most others, not as underachievement relative to measured IQ or to some other metric of potential.

In educational settings, advocates for students with disabilities may be surprised to learn about ADA's outcome-neutral nature, especially if they are using special education laws (e.g., the Individuals with Disabilities Education Act and its revisions) as a model. Typically, these special education laws have aimed at improving performance of students with disabilities rather than merely protecting students from discrimination (Yell, 2006). Even though these laws do not guarantee high achievement (or any *particular* outcome; Latham, Latham, & Mandlawitz, 2008), they are designed to promote it. The more recent No Child Left Behind Act of 2001 reinforces this goal by setting clear academic expectations for students and insisting that all students (including almost all students with disabilities) meet those expectations (Hess & Petrilli, 2006). These laws consider outcomes, while the ADA, again, only examines the *procedures* followed by institutions. This distinction may cause confusion when students transition from high school to college since special education laws do not apply in the latter setting.

Evaluators charged with making objective decisions about disability status may also misconstrue the intent of the law. In a survey of 147 clinicians who prepared disability documentation to support testing accommodations on the Law School Admissions Test (LSAT), Gordon, Lewandowski, Murphy, and Dempsey (2002) found marked disagreement over the purpose of the ADA. Over 30% of the clinicians (incorrectly) endorsed the statement that the ADA was intended to increase test scores and the academic performance of individuals with disabilities, and over 35% of the clinicians (again incorrectly) endorsed the statement that the ADA is violated if a testing organization or academic institution "fails to provide accommodations guaranteeing that the individual with a disability will perform at his or her best."

## ADA and the Average Person Standard

At the heart of the ADA is a fundamental question: What defines a disability? The law defines *disability* as follows: "The term disability means, with respect to an individual, a physical or mental impairment that substantially limits one or more of the major life activities of such individual, a record of such an impairment; or being regarded as having such an impairment" (Americans with Disabilities Act, 1990).

Like most laws passed by Congress, the actual meaning of key phrases is left open to interpretation. An especially controversial point is that of the proper comparison group when describing someone's activities as "substantially limited." If a medical student cannot read as quickly as classmates at Harvard Medical School but the student's reading skills are in the top 25% of the American adult population more generally, do we compare the student to classmates or to all American adults?

The governmental entity responsible for setting forth clarifying regulations regarding the ADA, the Equal Employment Opportunity Commission, (EEOC) published this clarification: "An individual is not substantially limited in a major life activity if the limitation does not amount to a significant restriction when *compared with the abilities of the average person*" [Equal employment opportunity commission (2002)]. The regulations illustrate this principle by stating that "an individual who had once been able to walk at an extraordinary speed would not be substantially limited in the major life activity of walking if, as a result of a physical impairment, he or she were only able to walk at an average speed, or even at moderately below average speed" [Equal employment opportunity commission (2002)]. This statutory language was intended to ensure that the ADA covered serious disabilities but not those that were minor or trivial.

Establishing the general population as the norm against which to judge impairment has profound implications for determinations of disabilities in both postsecondary education and the workplace. By setting "average abilities of most persons" as the standard, Congress adopted a benchmark that departs from the educational tradition embodied by special education laws. For determining learning disabilities (LDs) in elementary and secondary school students, most states have used a discrepancy between aptitude and achievement to serve as the basis for establishing abnormality (Reschly & Hosp, 2004). However, for ADA-type determinations, the government and courts have indicated that a discrepancy alone is not sufficient to warrant test accommodations, and that impairment also must be considered. The obvious significance for clinicians is that one cannot justify someone as having a *legal* disability based on relative discrepancies or presumptions of "potential" based on scores from psychological testing. Furthermore, the law discourages the practice of using norms based on other than the general population (for example, college graduates or students in professional programs). According to the ADA, a student cannot be considered to have a disability simply because he or she is not quite as talented as other very talented individuals.

Parenthetically, the ADA-style definition of a disability is generally in keeping with standard definitions of what it means to have a disorder. One popular construal (Wakefield, 1997) defines a disorder as a "harmful dysfunction" in a set of mental mechanisms required for successful adaptation to the environment. Deficits in these mental mechanisms lead to increased mortality, morbidity, or impairments in major life activities. To take one example, attention deficit/hyperactivity disorder (ADHD) generally meets these criteria, given the ample evidence that individuals with this disorder are at significant risk for mortality, morbidity, and impairments in major life activities (e.g., Barkley, Murphy, & Fischer, 2008; Frazier, Youngstrom, Glutting, & Watkins, 2007). By implication, though, individuals can only be qualified as having a disorder if they show this same level of "harmful dysfunction."

The ADA standard is also consistent with the diagnostic language found in the *Diagnostic and Statistical Manual of Mental Disorders* (currently, the fourth edition, text revision [*DSM-IV-TR*]; American Psychiatric Association [APA], 2000). The *DSM* imposes an impairment criterion on many of its psychiatric diagnoses, including the categories of ADHD and LDs (Lehman, Alexopoulos, Goldman, Jeste, & Ustun, 2002). Therefore, clinicians performing assessments for purposes of accommodations must provide convincing evidence of significant impairment in daily functioning relative to the average person. A diagnosis then becomes a necessary condition for accommodations but not a sufficient condition unless significant impairment is also demonstrated.

Several concrete implications for the assessment of impairment follow from these points. First, assessment measures with population norms should be strongly preferred to criterion-referenced test scores. Norm-referenced scores are calculated by comparing each examinee's performance to that of other examinees. IQ scores, *T* scores from rating scales, and percentile scores are common examples of scores that show a relative comparison to the average person. Criterion-referenced scores are calculated by comparing the examinee's performance to an absolute standard rather than to other examinees' performance. For instance, many state exams in K-12 education classify students using terms such as "proficient" and "advanced" depending on what percentage of items they answer correctly. These scores do not gauge an individual's scores to the performance of most people (Sax, 1997).

Second, these norms should be based on the general population (occasionally, age- or gender-specific norms may be appropriate) rather than being norms for "clinical groups" (e.g., samples of students with ADHD) or high-functioning groups (e.g., college graduates, law students, etc.). As Hopkins (1998) pointed out, the key to making confident norm-referenced score interpretations is a representative norm group, and individually administered tests of ability and achievement are known for their careful selection of participants for standardization samples, stratified by relevant demographic variables, and consequently representative of the population at large. A new trend has been the creation of norms for certain population subgroups (e.g., performance of college graduates on the Nelson Denny Reading Test), but even though these norms may serve certain clinical goals well, they cannot be used for disability determinations since they directly violate the average person standard.

Finally, the assessment of impairment should not be based on self-reported comparisons to one's peers since the peers are unlikely to be a representative sample of the general population and may be too high functioning to provide an appropriate baseline standard. A professor at Harvard Law School who describes a student as having academic trouble should be received the same way by evaluators as an Olympics coach who describes one of his or her athletes as being "the worst on the team." It is difficult to imagine that a Harvard law student is significantly impaired in learning, or that an unsuccessful Olympian is impaired because he or she failed to live up to his or her athletic potential. Yet, high-functioning individuals frequently report that they perform less well than peers. In a recent survey study, Lewandowski, Lovett, Codding, and Gordon (2008) found that a sizable proportion of typical college students perceived themselves as slower readers and poorer test takers than other students. Thus, there is something inherently natural, albeit inaccurate, about reporting relativistic deficiencies even when someone performs better than most people.

Many clinicians are unaware of some of the ADA's basic tenets on these points. For example, the survey by Gordon and colleagues (2002) documented that 43% of clinicians wrongly endorsed the practice of determining impairment by comparing a student to others at "similar educational levels," and 36% wrongly endorsed examining "students in a similar college or professional program" to establish a standard. Even more surprisingly, over 50% of clinicians wrongly endorsed making a diagnosis of "reading disability" for a hypothetical student with an IQ of 135 and a reading score of 100 (perfectly average) under ADA. Clearly, to the extent that clinicians examine impairment, many compare examinees with standards other than the average person standard of ADA.

## Significant Impairment and Major Life Activities

To be qualified as disabled under the ADA, an individual must be substantially limited in one or more "major life activities." In other realms, this language is construed as requiring that the person be unable to perform tasks central to daily living. To justify accommodations for individuals in higher education, clinicians often claim that the substantial limitations are present, but latent (see Lovett & Lewandowski, 2006, for a critique of this reasoning). Typically, the evaluator accounts for high academic or occupational functioning by claiming that the individual was only successful because of hard work or high intelligence. For example, a clinician might write, "Susan was able to adjust because she was so motivated to achieve and worked much harder than her classmates. Now that she is in graduate school, she requires accommodations because the work is becoming so demanding, and her LD/ADHD is causing her to perform below average in the class."

Claiming that a person can become disabled because of heightened academic demands is problematic in the context of diagnostic criteria, clinical research, and the ADA. First, it overlooks that both LD and ADHD are developmental problems that, by definition, should surface and cause impairment during childhood or, at the latest, in adolescence. Generally, if an individual is able to cope with the academic and social demands of a secondary education without substantial assistance, he or she is neuropsychologically intact and therefore unimpaired relative to most people. While the person may encounter future academic difficulties, those shortcomings are often better understood as the consequences of a mismatch between individual aptitude and the requirements of a challenging educational program or career choice. A reading disability, then, should not be first identified when a law student begins to struggle with comprehension of a law textbook. By stretching the age of onset for symptom presentation until young adulthood or later, clinicians risk distorting the concept of disability to include anyone who reaches an academic level that outstrips his or her particular array of talents. Conceivably, people can "develop" a disability simply by matriculating in educational programs for which they are poorly suited. Thus, clinical impairment resulting from a developmental disorder should be documented early and throughout one's educational life.

A second problem with the clinician's report on Susan is that "being a graduate student" is not to be considered a major life activity. "School" may be a major life activity in elementary and even high school, but in postsecondary settings, the classification is less obvious, and in graduate or professional school, the major life activity designation is incorrect, considering how many individuals discontinue formal education by this point. Similarly, an assistant district attorney who develops problems concentrating and other symptoms of inattention after taking a job directing the homicide division of a large city's district attorney's office is unlikely to be considered to have a disability under ADA since success in that position is not a major life activity. Indeed, "working" has only been considered a major life activity when an individual cannot find work in a *range* of jobs *despite* having training and skills similar to individuals in those jobs (Colker & Milani, 2005). The Supreme Court ruling in *Toyota vs. Williams* (2002) is perhaps the best example of this point. In its opinion, the court ruled that a woman with carpal tunnel syndrome was not substantially limited in a major life activity because performing a particular job is not a major life activity. Similarly, the ruling in *Singh vs. George Washington University School of Medicine* (2006) made clear that taking tests is not a major life activity. Cases such as these should spark the attention of clinicians to what the law considers as a major life activity (e.g., breathing, walking, speaking, seeing, hearing, learning, and caring for oneself).

A third problem often seen in evaluation reports involves the clinician's use of "hard work" as an explanation for successful function in spite of a disability. In truth, most of us have to work hard to succeed, especially as we grow older and expectations and demands mount. In fact, Lewandowski et al. (2008) found that over 40% of a large sample of nondisabled students at a private university felt they worked harder than peers to get good grades, and over half of the students reported having to read material over and over to understand it. The idea, then, that finding life's challenges to be challenging (i.e., requiring of effort) suggests impairment would lead to classifying most individuals as having a disability in some area of life. Since a sizable minority of high school graduates do not attend postsecondary education, and an even smaller percentage of college graduates pursue postgraduate work, we should be hesitant to say that students who have academic troubles in these arenas meet the legal standard for having a disability—to do otherwise is to presume that going to college (or graduate/professional school) is a natural, expected part of life for everyone.

Yet another problem with the report on Susan involves her high intelligence; clinicians often make the argument that a particular student warrants a disability classification because he or she does not perform as one would expect given his or her IQ score. The logic behind this assertion seems to require that IQ is a perfect predictor of academic outcome. Actually, research indicates that IQ is not an especially strong predictor of academic or occupational achievement (for a review, see Sternberg, Grigorenko, & Bundy, 2001) in that the majority of the variability in these outcomes is unexplained. A high IQ is simply not a not a trusty indicator of how well someone should perform on the job or in higher education. A bright person can underperform for a universe of reasons unrelated to disability, from poor educational experiences to uneven motivation. The evidence is clear that a diagnosis of a learning problem based on a discrepancy between IQ and achievement is not sufficient to document an LD.

One final point about how the courts have viewed "substantial limitations" in a major life activity: In 1999, in *Sutton vs. United Airlines, Inc.*, the U.S. Supreme Court clarified this ADA clause by making clear that limitations should be evaluated in the presence of "mitigating factors" such as corrective measures and interventions for the person's problems. The

Suttons were twin sisters, both afflicted with severe nearsightedness that, with the aid of eyeglasses, kept them from experiencing significant limitations. Alleging discrimination after being rejected as applicants for airplane pilot positions, the court found that even though it was their poor vision (when uncorrected) that kept them from getting hired, their adequate vision (when corrected) kept them from being able to use ADA to seek remedies. To apply this important decision to psychiatric disorders, an individual with recurrent clinical depression who, after finding an appropriate medication and entering into a period of psychotherapy, is no longer limited substantially, would not meet ADA criteria; the same is true for an individual with ADHD whose severe symptoms are much improved by medication.

In assessing impairment, then, clinicians should expect agencies that grant accommodation requests to ask for documentation of a history of measures that have been taken to remediate or lessen the impact of any symptoms. In addition, clinicians should assess functional impairment with the mitigating measures in place since this allows for the assessment of how the individual *typically* functions in the real world. For example, *Sutton* requires that vision be assessed while someone is wearing eyeglasses that they typically use. While courts have not weighed in especially on whether individuals who have been prescribed medication for the treatment of ADHD should be evaluated while medicated, prior precedents would support that assessment strategy.

## The Nature of Reasonable Accommodations

If it is determined that an individual is indeed qualified as having a disability under the ADA, the next step is to identify reasonable accommodations. Those accommodations must be justified based on two considerations: the specific nature of the person's functional impairment and the educational, occupational, or testing environment in which that individual will be functioning. The evaluator must provide a rationale for any recommended accommodations and must explain how those adjustments or technical aids would cancel or ease the impact of the impairment on the task in question.

Accommodations are task specific and are meant to eliminate or reduce the impact of the impairment on a particular activity. Thus, an individual who must dictate test answers to a scribe because of a limitation in his or her ability to write would not require that accommodation on an oral examination. Likewise, an individual who requires a ramp to access a building because of limited ability to walk would not need additional time to complete cognitive tasks, such as assignments or examinations (unless there were additional disabilities present as well). In essence, there must be a demonstrated match between the disability and the task requirements.

Assignment of a diagnostic label does not mean that the individual is automatically entitled to accommodations, even though students (and their advocates) sometimes request accommodations that are not directly related to the impairment. To give an example: Roger submits documentation to a testing agency (e.g., Educational Testing Service (ETS)) certifying that he suffers from ulcerative colitis. First, he wants to be seated near the restroom because he may need to use it often during the course of the day. The test organization has no problem granting this request. But, Roger also wants double the allotted time to take the examination. Here, the ADA administrator balks. What are the functional impairments associated with ulcerative colitis that would require extra time to work on the test? While off-the-clock breaks may be justified, it is hard to provide a rationale for extended time working on this test itself.

Another key concept in justifying accommodations relates back to the outcome-neutral nature of these antidiscrimination laws. Under ADA, the explanation that someone "would benefit from" a particular accommodation is not sufficient. As we have repeatedly indicated, the intent of the law is not to help people succeed. This stance is eloquently described in an opinion by the Office of Civil Rights (OCR) in the Golden Gate University (CA) case in 1996. In this instance, a student claimed to have the right to accommodations so that he could achieve a certain grade. OCR responded:

> [The student] appears to be of the misapprehension that the duty to provide academic adjustments includes a responsibility to provide such adjustments until a certain outcome is achieved, e.g., a grade of A. This is not what was contemplated by the OCR regulations. The objective is to create equal opportunity, not equal outcomes. Tests are modified to achieve greater validity, not higher grades. Indeed, the regulation implementing Section 504 explicitly states that services provided by recipients, "to be equally effective, are not required to produce the identi-

> cal result or level of achievement for disabled and nondisabled persons, but must afford disabled persons equal opportunity to obtain the same result, to gain the same benefit, or to reach the same level of achievement.' ("Golden Gate University," 1996, §12)

The focus of an accommodations request should therefore not be on what would help the individual to do better or to pass the exam or course requirements. Instead, the focus should be on which accommodations would correct or circumvent functional impairments that might otherwise preclude a fair opportunity to access a course or a test.

By implication, an ADA-based accommodation, because it is designed to correct a deficit, should not represent a general benefit to anyone in the same situation. Such an accommodation would constitute an unfair advantage rather than an accommodation specifically aimed at reducing the impact of a disability. For example, a handicapped-accessible door allows someone in a wheelchair to gain access to that building. The accommodation would neither help nor hinder individuals who did not use wheelchairs, and even if individuals who fell outside ADA's protection benefited from it, they are, importantly, not excluded from using it. Similarly, while large print on a paper exam would be an appropriate accommodation for an individual with poor eyesight, it would be of no benefit to nondisabled individuals, and it might actually slow them down because it would require extra page turning. These accommodations entail what has been described as a "differential boost" (Fuchs & Fuchs, 2001) for the individual with a disability since it provides more of a boost to the test scores of individuals with the disability than to nondisabled examinees.

Strictly speaking, accommodations for ADHD must also meet the differential boost criterion. Most examinees who apply for accommodations based on this disorder request extra time. However, because most high-stakes examinations are at least in part speeded, additional time would likely help anyone (see Sireci, Scarpati, & Li, 2005, for a review of evidence on this point). Indeed, in a recent study in which middle school students with and without ADHD took a mathematics test under standard and extended time conditions, the students without ADHD benefited *more* from the extra time, not less (Lewandowski, Lovett, Parolin, Gordon, & Codding, 2007). There are a variety of reasons why extra time may not be particularly helpful for ADHD, some of which follow from the impulsiveness that is the hallmark of this disorder (Barkley, 1997). For instance, many individuals with ADHD report that extra time would be of little use because they tend to complete tests too quickly and fail to make wise use of the allotted time for checking answers and ensuring accuracy (Murphy & Gordon, 1997).

That reasonable accommodations are designed to correct for impairment rather than to increase performance is often a difficult distinction to make in practice, but many clinicians may not be aware of the principle, as evidenced by the survey by Gordon and colleagues (2002). In this survey, 29% of clinicians agreed with the statement that the "purpose of accommodations is to allow an individual with a disability to perform at his or her best," which presumes that all performance (and testing) environments should be *optimal* environments.

## A Special Legal Issue in Assessment: Malingered Impairment

One additional issue in the assessment of impairment concerns malingering, defined in the *DSM-IV* as "the intentional production of false or grossly exaggerated physical or psychological symptoms, motivated by external incentives such as avoiding military duty, avoiding work, obtaining financial compensation, evading criminal prosecution, or obtaining drugs" (APA, 1994, p. 683). Malingering has long been recognized as a problem in medical assessment (e.g., Jones & Llewellyn, 1918). Its import in psychological assessment is seen in the "validity scales" of personality tests and the "effort tests" developed by neuropsychologists. In assessing impairment, clinicians must be alert to the possibility of malingering whenever an external incentive is present (for "best practices" guidelines, see Bush et al., 2005), and when assessing individuals for the presence of high-incidence disorders (such as LD and ADHD) in an effort to determine whether accommodations are appropriate, the external incentives should be obvious: extra time on tests, the availability of academic support services, accommodations on the job, and the like.

In the case of ADHD, only very recently has research established that many individuals being assessed for possible ADHD may be exaggerating their symptoms to some degree (Harrison, 2006), and that most ADHD rating scales make malingering remarkably easy for anyone who has even a passing acquaintance with the symptoms of the disorder (Jachimowicz & Geiselman, 2004). In one recent study, Harrison, Edwards, and Parker (2007) compared university students who were asked to put forth full effort on a battery of tests with students who were asked to try to simulate symptoms of ADHD in an attempt to obtain a variety of accommodations. Both groups were then compared with a sample of students from the same university who had validated diagnoses of ADHD. The simulators exhibited performances closer to the legitimate ADHD group than to the other nondisabled students, and a discriminant function analysis incorrectly classified over one third of the simulators as being in the ADHD group.

Most of the malingering literature has focused on more severe neuropsychological problems, especially traumatic brain injury (TBI; see e.g., Green, Rohling, Lees-Haley, & Allen, 2001), but the concept clearly applies in any test or evaluative situation in which less-than-optimal effort can produce a desirable outcome. Recent research on LD assessments suggests that they exhibit a vulnerability to malingering similar to that of ADHD assessments, although fewer examinees may attempt to malinger. Sullivan, May, and Galbally (2007) used the Word Memory Test (WMT) to examine possible malingering in a sample of college students being assessed for LD/ADHD conditions. The WMT is a measure designed to detect malingering and uses recognition measures of memory for paired-associate stimuli (e.g., dog/cat) for which almost all cognitively intact, literate adults have little trouble obtaining high scores. Based on the number of students who "failed" the WMT, Sullivan and colleagues estimated that 25% of students being assessed for comorbid LD/ADHD were exaggerating symptoms, and 48% of students being assessed solely for ADHD were exaggerating symptoms.

To assess for possible malingering when examining impairment, clinicians should consider administering tests that have been shown to be easier for individuals with actual impairment than for those feigning impairment. The WMT meets this criterion for neuropsychological problems, and for dyslexia, there is an even more specific test, the Word Reading Test, which has been shown to effectively detect malingering (Osmon, Plambeck, Klein, & Mano, 2006). For schizophrenia and other psychiatric problems, there are a variety of personality test indices that have been shown to be sensitive to malingering (Berry, Baer, Rinaldo, & Wetter, 2002), and there are even effort tests to detect low effort in chronic pain disorders (Suhr & Spickard, 2007).

## Taking Impairment Seriously: Response-to-Intervention Diagnoses

Sweeping school districts nationwide is an initiative known as the response-to-intervention (RTI) movement. Under RTI, students are not referred directly for testing due to apparent learning or behavior problems. Rather, students are tracked through a series of tiered intervention efforts that have been empirically validated (Gresham, 2002, 2005). A student who has shown reading difficulties might be given increasingly intensive small-group or individual instruction in reading, whereas a student who has shown maladaptive impulsive behavior may be placed in increasingly intensive consequence-based behavior modification programs. This intervention-based approach will ensure that any struggling student will receive appropriate intervention and then be monitored in response to that intervention. Nonresponders would move to another tier of more intense intervention and continue being monitored. This recursive series of treatments and checks on efficacy continues until a variety of evidence-based treatments have been tried (Brown-Chidsey & Steege, 2005). Only after these efforts have been exhausted would a student be considered not responsive to treatment and likely to have a disability. The student would then be referred for more extensive assessment, possible diagnosis, and even more intensive special education services. No longer should we have the scenario described of an adult claiming to be a slow reader who after 25 years of regular education has a perceived need for extended time on tests. Such a student would surely have been offered appropriate services under RTI to mitigate the reading weakness.

The RTI model has significant implications for diagnoses such as LD and ADHD. As this model takes root in elementary schools, it is likely that far fewer students will graduate with LD and ADHD diagnoses. It also means that many more will move to postsecondary educational settings without psychoeducational testing, individualized educational plans, and other forms of documentation. In 10 years or so, students coming to college or graduate school without a formal diagnosis will be hard-pressed to document a disability and significant impairment. Adults who, for instance, claim to be slow readers due to LD or ADHD will have had to encounter all sorts of interventions that were unsuccessful in improving their skills, thus resulting in a continuing substantial limitation.

The philosophy underlying RTI is a welcome one since a focus on intervention is long overdue in diagnostic assessment (Deno, 1985; Elliott & Fuchs, 1997). However, some scholars are already beginning to critique the RTI model based on its lack of emphasis on categorical disability status. For instance, Townsend (2007) admitted that the RTI movement is "well intentioned" but argued that it "obscures the political justifications behind the protections" given to individuals with disabilities (p. 260). On close inspection of Townsend's arguments, it becomes clear that he is most concerned about how RTI only helps individuals who are impaired in an absolute sense. He charges that, under RTI, "no learning disabled child has a right to anything more than learning to achieve these basics [basic academic skills] at an average level" (p. 264), and he is, of course, correct—students whose academic skills are within (or above) the average range are not impaired and therefore not in need of special services. In a critique similar to that of Townsend, Dunham (2007) expressed worries that students whose academic difficulties are addressed in an RTI approach will not be as able to access resources such as testing accommodations on college/graduate entrance exams and school-to-work transition services. Curiously, Dunham never addressed the question of impairment: If, after progressing through an RTI system, a student no longer has significant impairment, why should he or she be accessing these resources?

Our own concerns with the RTI model result not from its intervention-focused philosophy, but from the way that it characterizes impairment. Although more traditional models of diagnosis have their own limitations, they are typically executed with standardized measures that have been normed on large samples representative of populations of interest. The most popular RTI models instead rely on curriculum-based measurement (CBM) strategies, and practitioners are encouraged to rely on local (i.e., classroom-based) norms for comparison (Shinn, 1989). Given the substantial variability in academic skills across different classrooms, schools, and school districts, disability diagnoses in an RTI model hinge on impairment, but impairment relative to one's immediate peers, rather than a true average person standard. As Hale, Kaufman, Naglieri, and Kavale (2006) have pointed out, RTI procedures can be of great benefit when school staff are selecting instructional programs and interventions, but the diagnosis of a disability requires a comprehensive assessment involving standardized measures of high technical quality. The RTI model, then, is right to focus on impairment but lacks the measurement tools to identify a disability in the legal (ADA) sense.

RTI is needed educational reform but clearly not a panacea. There will always be students with certain disabilities that do not respond well to treatment, are life long, and cause impairment. These cases will be documented and will likely receive test accommodations. What could change as a result of RTI is a decrease in the mild or borderline cases of LD and ADHD that cause so much turmoil in accommodation determinations. Such students will likely respond to interventions and never receive a school diagnosis, never be considered impaired in an absolute sense, and probably do fine without accommodations. In a sense, RTI might help clarify some of the issues that currently plague accommodation determination. A student who moves through all tiers of the model, does not respond, and receives a diagnosis is a student who is significantly impaired. Finally, we may have a diagnostic process that is consistent with the ADA.

## Conclusions

In this chapter, we reviewed issues pertinent to the evaluation of disability status within a legal context. We emphasized how laws such as the ADA set standards that can be at odds with practices common to clinical and educational settings. At the heart of that tension are contrasting conceptions for what constitutes a disability or disorder. The legal standard hinges on the notion that an individual is disabled only if he or she is substantially impaired in a major life activity relative to the average person. Also, the ADA and its predecessors were designed to combat discrimination, not ensure a successful outcome. Clinicians, on the other hand, operate in a world where the lines are drawn less boldly. It is more common in such circumstances to identify a disorder even in the absence of absolute abnormality relative to most people.

The courts have been consistent in upholding principles that some have seen as overly conservative and, indeed, as discriminating against individuals who, while not grossly impaired, are still underfunctioning relative to their presumed potential. These rulings have sent reverberations throughout psychiatric and educational diagnostic circles because they place the burden of proof of impairment on ADA applicants and their evaluators. They also reduce the likelihood that a high-functioning individual will be considered disabled. However, regardless of how one views the current state of ADA implementation, the fact remains that testing organizations and educational institutions have the option of adhering to a narrow construal of what it means to be disabled. Clinical evaluators therefore have the responsibility of providing documentation that is developed within the constraints of the ADA. They may also need to refrain from advocating for accommodations in those cases for which the data paint a picture of relative normality.

While legal and clinical approaches to the identification of disability/disorder can collide, those conflicts may stem more from practice than from stark differences in published criteria. The legal emphasis on impairment is consistent with the criteria found for most disorders listed in the *DSM-IV-TR* (APA, 2000). Nearly all require "clear evidence of clinically significant impairment" in major realms of functioning. The educational reform movement known as RTI also implicitly defines abnormality as an inability to respond to concerted efforts at treatment, even though the comparison for this failure is the immediate peer group rather than population norms. One cannot help but wonder whether the clear lines established in a legal context are truly antithetical to those appropriate for clinical settings. In refusing to lower thresholds for what constitutes a disability, courts aim to limit special protections to those who are truly impaired. That stance, while disheartening to some, has a basis in much clinical literature and represents a reasonable effort at defining disability in ways that are fair to all and most protective of those who are most in need.

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# Chapter 9
# Impairment in Children

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For children with mental health problems, impairment results in a diminished ability to perform at developmentally expected levels. Impairment in daily life activities can include dysfunction or an absence of adaptation in social, emotional, psychological, or occupational/academic domains, and it is a core component of nearly all childhood and adolescent mental health disorders. Currently, the American Psychiatric Association's (APA's) *Diagnostic and Statistical Manual of Mental Health Disorders, Fourth Edition, Text Revision* (*DSM-IV-TR*, 2000) requires impairment in daily life functioning for the diagnosis of the externalizing (e.g., attention deficit/hyperactivity disorder [ADHD], oppositional defiant disorder [ODD], and conduct disorder [CD]) and internalizing (e.g., anxiety and mood-related) disorders, and impairment in social or academic functioning is a cardinal feature of other disorders of childhood and adolescence (e.g., autism, learning disabilities, substance abuse).

## Importance of Impairment for Child and Adolescent Disorders

With the advent of the *DSM*, substantial research and professional attention has been devoted toward developing and implementing *DSM* symptom-related assessments (e.g., Pelham, Fabiano, & Massetti, 2005), and *DSM* symptoms have been used as primary outcome measures in large treatment outcome studies (e.g., MTA Cooperative Group, 1999; Treatment for Adolescents with Depression Study [TADS] Team, 2004). Relative to symptoms, however, attention devoted toward impairment in daily life functioning has lagged. As described in this chapter, there is considerable justification for emphasizing impairment in evaluations and interventions; as it is a key contributor to referral for intervention, it should be the major outcome evaluated during and after intervention, and it is the best predictor of long-term outcomes for children and adolescents.

Importantly, it is impairment in daily life functioning, not putative *DSM* symptoms, that typically results in referral for treatment or services (e.g., Angold, Costello, Farmer, Burns, & Erkanli, 1999; Lavigne et al., 1998). For example, (Angold et al. 1999) reported that children who had evidence of psychosocial impairment, whether or not they met criteria for a *DSM* disorder, were typically involved in clinical treatment setting efforts. Further, children who met symptom criteria for a *DSM* disorder but did not have impaired functioning were generally not receiving clinical services. Costello and Shugart 1992 investigated rates of *DSM* symptoms in pediatric and psychiatric settings and reported that there were a considerable number of children who did not meet symptom count criteria for *DSM* externalizing disorders but were nonetheless experiencing significant psychosocial impairment. Intensity of service use is also related to severity of impairment, with more restrictive and costly treatments generally implemented for more impaired children and adolescents (McDermott, McKelvey, Roberts, & Davies, 2002).

Second, impaired domains of functioning, and not *DSM* symptoms, are one aspect of the social validity of a treatment. Social validity relates to the "meaningfulness" of the goals of treatment, intervention procedures, and the way outcomes of the treatment are defined and evaluated (Foster & Mash, 1999; Kazdin, 1977; Wolf, 1978). For instance, referring problems as reported by parents and teachers rarely include *DSM* symptoms such as "fidgeting" or "psychomotor agitation or retardation nearly every day." Rather, parents

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and teachers report that the child is actively rejected by peers, is failing academic classes in school, disrupts family and classroom routines, and does not get along with adults. These latter areas are those that are the socially valid targets of intervention; it is these areas of impairment that should receive the attention of intervention efforts, and whether treatment improves functioning in these domains is the primary means for assessing treatment outcome (Foster & Mash, 1999).

Third, with an eye toward treatment planning, the identification and evaluation of impaired functional domains is a critical task because the putative *DSM* symptoms do not provide information on the function of problematic behavior (Scotti, Morris, McNeil, & Hawkins, 1996). Take, for example, the symptom of "distractibility." A child who has this item endorsed on a structured interview or rating scale as occurring at least "pretty much" would have the item count toward a *DSM* diagnosis. However, the item in and of itself provides no information on the extent to which this behavior is a problem for the child and what causes, maintains, or exacerbates the behavior. Even worse, a perusal of the *DSM* illustrates that this symptom could be part of inattention related to ADHD, a mood disorder (either depressed or elevated mood), a generalized anxiety disorder, or a post-traumatic stress disorder. For one child, the function of the behavior could be to avoid tasks he or she dislikes, and the behavior is limited to situations in which a demand is placed on the child. For another child, he or she may appear distractible because of an attempt to avoid intrusive thoughts. A third child may not have psychological problems at all and instead have auditory problems that impair his or her ability to follow a conversation effectively. Obviously, effective interventions for this behavior will require different approaches depending on the function of the behavior and the nature of the impairment; in this example, the intervention for the first child may focus on increasing motivation, for the second child, a cognitive-behavioral approach that includes exposure to the feared thought, and for the third child accommodations for hearing impairment. The negative *impact* of the symptom on the child's functioning is what is conceptualized as impairment—in all three cases, we suspect the child would experience negative outcomes related to the symptom of distractibility. However, rather than spending valuable clinician and patient time establishing whether the child is distractible "just a little" or "pretty much," assessment efforts should be devoted toward determining the function, extent, and impact of the behavior on functioning and how to reduce the negative impact of the behavior in functional life domains.

Fourth, and perhaps most important, impairment in functional domains during childhood are the best predictors of negative short-term and long-term outcomes, and improvement in impaired domains must be achieved to avoid continued problems throughout development. Longitudinal studies have demonstrated functional impairment in childhood is predictive of future adolescent problems (Costello, Angold, & Keeler, 1999). For example, poor peer relationships in childhood, inconsistent and ineffective parenting, and academic underachievement all predict a host of negative outcomes in adolescence and adulthood (Chamberlain & Patterson, 1995; Christle, Jolivette, & Nelson, 2005; Coie & Dodge, 1998; Dishion, Nelson, & Yasui, 2005; LaGreca & Harrison, 2005), whereas to our knowledge, the symptoms of *DSM* disorders are *not* strong predictors of adolescent or adult outcomes (e.g., Mannuzza & Klein, 1999). Thus, improvement in functioning in the areas of impairment is necessary to divert the child's developmental trajectory from these negative outcomes.

It is also worth noting that symptoms of a *DSM* disorder typically do not provide any information on the child's current levels of adaptive functioning or strengths, which may also predict long-term outcomes. In addition to reducing impaired areas of functioning, treatment efforts also focus on promoting the development of positive behaviors and competencies. A comprehensive assessment of impairment will include a consideration of adaptive abilities and behavioral competencies, and these behaviors will also be monitored and targeted in treatment.

## Domains of Child and Adolescent Impairment

A prototypical child from a family who seeks services will present with problems across functional domains, including in his or her relationships with peers and siblings; relationships with parents, teachers, and other adults; academic progress in school; and disruption in family and classroom functioning or routines. For many children, these difficulties will be apparent across domains of functioning, meaning treatments will need to address impairment in the home, school, and peer group settings.

Peer relationship problems are often impaired in children and adolescents referred for psychological services (Bukowski & Adams, 2005). For example, researchers have long known that children with ADHD (e.g., Pelham & Bender, 1982) or conduct problems (Coie & Dodge, 1998) have problems in peer relationships. Problems may range from simply being ignored by other children (e.g., not being picked to play in recess activities, being the only child not invited to a classmate's birthday party) to being actively rejected by other children (e.g., being bullied during recess). A child with ADHD or CD may also tease and be teased by peers, get into fights with other children, and exhibit inappropriate social skills (e.g., is a poor sport during games).

Adult relationships may also be an area of impaired functioning. Problems include noncompliance to adult commands and instructions and argumentative behavior. Furthermore, the negative behavior exhibited by children with disruptive behavior disorders seriously affects family and classroom functioning (e.g., Fischer, 1990). It is not uncommon for parents to report that they no longer go out to dinner at a restaurant, attend Sunday worship services, or attend family parties and social gatherings as a direct result of their child's behavior. Similarly, teachers may observe impaired children in their classrooms require constant one-to-one attention to complete even the simplest of tasks, require extra attention during field trips or other activities outside the classroom (e.g., music class), or fail to complete academic assignments accurately and in a timely manner. Children with internalizing disorders might have comparable impacts on family or classroom functioning. For example, a child with depression may spend large portions of the school day in the nurse's office with somatic complaints.

An additional area of impairment is in the domain of academic achievement. The primary feature of the specific learning disabilities is impairment in academic functioning. Other disorders may also result in impaired academics. For example, a child with school phobia may fail to attend classes and therefore may experience a lag in academic achievement or with social development. Children with ADHD may perform poorly due to failing to hand in completed homework or long-term projects. Furthermore, behaviors that may be relatively easy for most students, such as completing independent seatwork assignments, remembering to bring home all needed materials for homework, and note taking, may be extremely difficult for children with ADHD.

Notably, these problems in important domains of daily life functioning are rarely included in the behavioral symptoms in the *DSM*. In addition, any evaluation of impairment typically measures a child's strengths, skills, and abilities. Eventual treatment efforts will work not only to reduce the occurrence of problematic behaviors but also to increase competencies in these areas of adaptive functioning.

## Impairment Measures

We briefly review the current armamentarium of impairment measures for children and adolescents. Perhaps because impairment has been *implicit* but not *explicit* in previous versions of the *DSM*, few practical means of measuring impairment across functional domains have been developed. Some impairment-rating procedures have been developed to quantify a child's overall level of functional impairment. In clinical and research settings, commonly used global impairment scales include Axis V of the *DSM* (APA, 2000), which is a modified version of the Global Assessment Scale (Endicott, Spitzer, Fleiss, & Cohen, 1976). The version most commonly used with children and adolescents is the Children's Global Assessment Scale (CGAS; Setterberg, Bird, & Gould, 1992).

Respondents on the CGAS rate the child's current level of functioning on a scale from 1 to 100, with scores of 1 relating to the most serious impairment in functioning and 100 relating to the best level of functioning. Raters refer to a behavioral descriptor for every 10 points on the scale and can make a rating anywhere in the range from 1 to 100. The CGAS has been used in epidemiological, research, and clinical settings, and it evinces good reliability and validity. Advantages of the CGAS include its good psychometric properties and its ability to be completed quickly and over repeated administrations.

However, global measures of impairment have limitations. They provide no information on specific impaired areas of functioning, which is critical for treatment planning, monitoring, and evaluation. Therefore, many other scales have been developed to assess functional impairment in specific domains. For example, a portion of the widely used Child Behavior Checklist (CBCL) and Teacher Report Form (TRF; Achenbach & Rescorla, 2001) asks parents about adaptive functioning, such as the child's participation and proficiency in social activities, academic achievement, and receipt of special services in school. Measures such as the Teacher Assessment of Social Behavior (TASB; Cassidy & Asher, 1992), the Social Skills Rating Scale (SSRS; Gresham & Elliott, 1990), and peer sociometric ratings may be used to evaluate impairment in children's peer interactions. The effects of a child's behavior problems on the family may be measured by the Impact on Family Scale (IFS; Sheeber & Johnson, 1992) or the Daily Hassles Scale (Crnic & Greenberg, 1990). In addition, a child's impairment in academic functioning may be determined through standardized intelligence and academic achievement tests or school report cards.

Although these measures, and others, may be used to measure specific domains of impairment, they have limitations. For example, some require the rater to answer a large number of questions (e.g., the SSRS), some require multiple raters (e.g., sociometrics, which requires a group of children to make negative or positive nominations of peers), and others require the use of lengthy and therefore expensive psychological tests (e.g., intelligence and academic achievement testing) or observation for a lengthy time period (e.g., academic grades). Finally, most focus on a single domain of impairment, which means that a battery of measures such as these must be administered to obtain a comprehensive assessment of impairment (see Lahey et al., 1998, for an example of such an approach). This means that raters and clinicians must invest significant time to evaluate impairment, which is impractical for large-scale screenings or repeated assessments in clinical or applied research settings.

Due to these limitations, other researchers have worked to develop multidimensional measures of impaired functioning. Table 9.1 lists commonly used multidimensional measures of impairment, a brief description of each, and a general review of the psychometric properties of each measure. We briefly review each of these measures next.

### Columbia Impairment Scale

The Columbia Impairment Scale (CIS; Bird et al., 1993, 1996) is a 13-item measure that assesses multiple areas of psychosocial functioning, including interpersonal relationships, occupational or academic functioning, and use of leisure time, in addition to some questions on broad areas of psychopathology (e.g., feeling sad or unhappy). Respondents are instructed to rate each item on a scale from zero (no problem) to four (very big problem), and the measure can be completed by a parent or other adult informant as well as a child/adolescent. The parent CIS evinces good indices of reliability (Bird et al., 1993) and validity (e.g., correlates with measures of functioning such as whether the youth was in treatment or had been expelled/suspended from school; Bird et al., 1996).

### Child and Adolescent Functional Assessment Scale

The Child and Adolescent Functional Assessment Scale (CAFAS; Hodges, Doucette-Gates, & Liao, 1999; Hodges & Kim, 2000; Hodges & Wong, 1996) is a multidimensional measure of impairment. Following a clinical interaction that includes an interview, record review, or consultation with treatment providers or other professionals, the CAFAS asks an interviewer to rate the child across eight domains (e.g., behavior toward self and others) and to rate the caregiver (i.e., the environment) on two domains. Psychometric studies of the CAFAS indicate that the measure demonstrates good internal consistency and the measure is consistent across raters (Hodges & Wong, 1996). Furthermore, the CAFAS is sensitive to changes in functioning due to treatment efforts (Hodges et al., 1999).

### Child and Adolescent Psychiatric Assessment

The Child and Adolescent Psychiatric Assessment (CAPA) integrates the assessment of impairment with a structured diagnostic interview, asking the informant to rate impairment specific to each symptom group (e.g., ADHD, depression, etc.; Angold et al., 1995). The CAPA is a structured psychiatric interview administered by an interviewer to both children and parents. Interviewers are trained to ask about the presence, frequency, and intensity of diagnostic symptoms. Then, interviewers rate the degree to which the symptoms have incapacitated the individual across a number of important functional domains (e.g., family life and relationships). The CAPA has demonstrated acceptable indices of reliability and good indicators of validity, and it has been used in epidemiological as well as clinical settings.

## Impairment Rating Scale

The Impairment Rating Scale (IRS; Evans, Allen, Moore, & Strauss, 2005; Fabiano et al., 2006) is a multidimensional measure that assesses functioning across domains developed for children with ADHD. The IRS asks the rater to place an "X" on a continuum from "no problem; definitely does not need treatment or special services" to "extreme problem; definitely needs treatment or special services." There is also space for the rater to describe in a narrative fashion his or her reasoning for the rating or to provide additional information or examples regarding the extent of the impairment. Because the IRS can be completed by a parent or teacher without clinician involvement, the only clinical cost is the time spent to review and score it. It is unique in that it is a rating scale completed by the child's parent and teacher, making it a quick and low-cost alternative to assessments that require an interviewer. The IRS exhibits concurrent, discriminant, and convergent validity and acceptable levels of temporal stability. The IRS is also sensitive to changes in behavior modification or pharmacological interventions (e.g., Fabiano et al., 2007). Research indicates a score of three or greater on the measure reliably identifies children with ADHD and does not identify those without the disorder.

As Table 9.1 indicates, there are a number of well-studied, psychometrically sound instruments for assessment of impairment. Depending on the explicit goal of a particular assessment, one measure may be preferred over another. Clinicians/researchers must decide on the best approach to assessing impairment given their needs.

## Illustrative Case

In an effort to describe a practical approach to measuring impairment in a child client, we describe a prototypical case in our clinic for children with ADHD and then walk through the steps included in the assessment, beginning with the initial referral, meetings with the parents, the approach to treatment, and the strategies for assessing treatment outcomes. Following this, we present general guidelines for the assessment of impairment in children and adolescents.

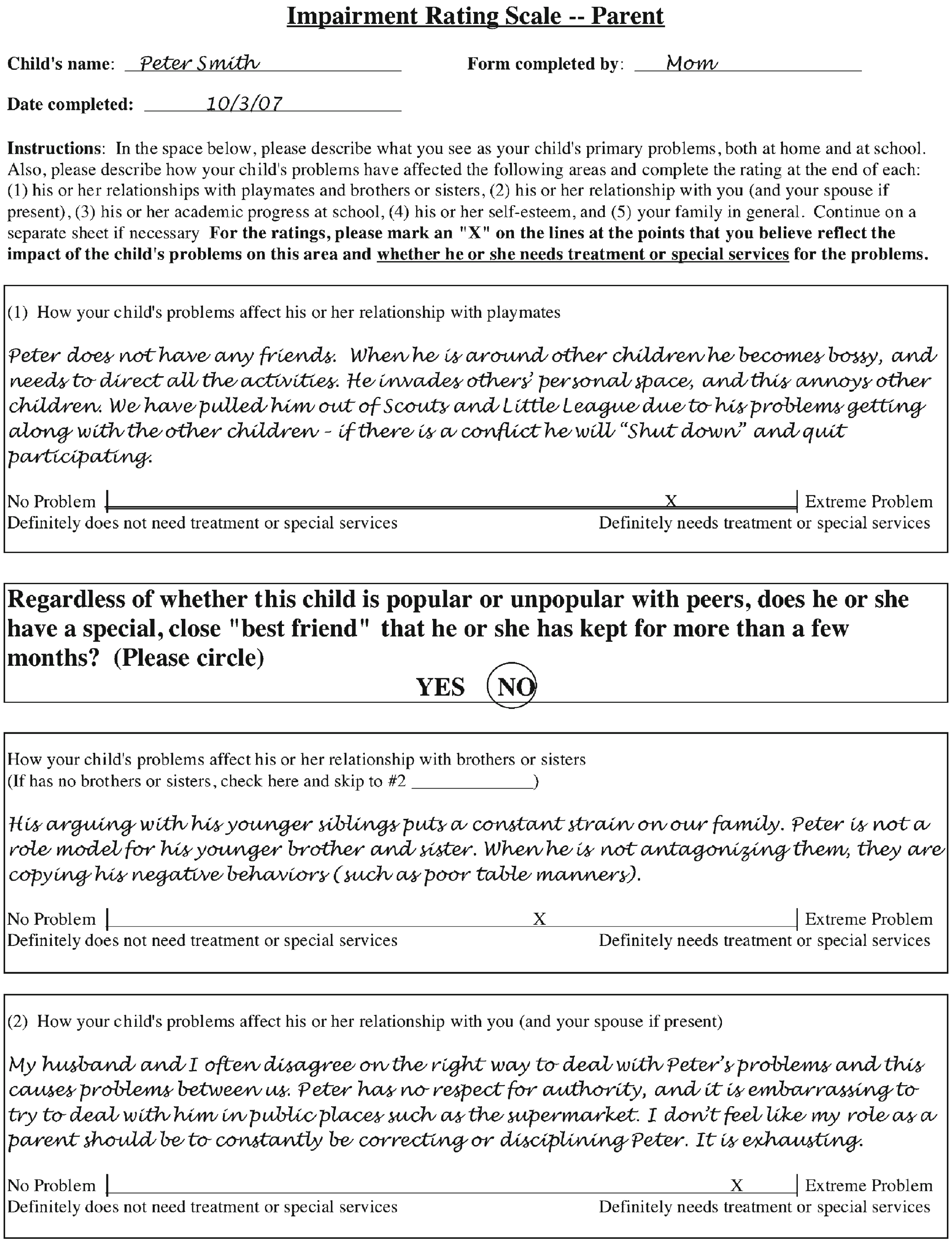
Peter Smith is a 9-year old boy who lives with his parents, John and Jane Smith, and his younger brother and sister. He attends third grade at the local public elementary school. He has had long-standing behavior problems dating back to preschool, and he was referred to the clinic in October of the current school year due to parent and teacher concerns about behavior. Before the initial clinic intake, his parent and teacher were mailed the IRS to complete. Figure 9.1 displays the responses on the parent IRS, and Figure 9.2 displays the teacher IRS responses.

Before the initial meeting with the parents, the clinician should review and score the IRS. The IRS is scored by placing a transparency over the line where the rater placed an "X". The line is divided into seven equal segments labeled 0 (no problem) to 6 (extreme problem). The segment within which the "X" is placed constitutes the score. Research indicates any score greater than or equal to three is within the clinically impaired range for a child Peter's age (Fabiano et al., 2006). Thus, with the exception of self-esteem (not surprising given the literature on positive illusory bias in children with ADHD; Hoza, Pelham, Dobbs, Owens, & Pillow, 2002), Peter's parent and teacher agree that he is impaired across all major functional domains in both the home and school setting. The narrative information provided on the parent and teacher IRS provides additional explanatory and contextual information on impairment, and this information naturally leads to follow-up questions that may be asked during the clinical interview.

Figure 9.3 illustrates a portion of an initial intake interview. In clinical practice, the majority of intake time should be devoted to identifying, operationalizing, and understanding the child's areas of impairment. This portion of the assessment is where the clinician collects more detailed information on the nature and extent of impairment, and this information should be collected in a manner that is integrated with treatment planning. As Figure 9.3 illustrates, the clinician reviews intake ratings and the parent report of presenting problems and then works with the parent to operationalize and review the antecedents, consequences, and setting events of the targeted behavior. For example, for the targeted behavior of completing homework in the specified time, the parents described antecedents that encompassed

**Table 9.1** Multidimensional measures of impairment

| Impairment measure | Description | Reliability | Validity |
|---|---|---|---|
| Columbia Impairment Scale (CIS; Bird et al., 1993, 1996) | • Completed by lay interviewer or parent<br>• 13-item scale that asks about functioning across functional domains<br>• Respondents rate each domain on a scale from 0 to 4 | • Evidence of internal consistency ($r = .82$ to .89) and test-retest reliability for the parent version ($r = .89$)<br>• Less internal consistency ($r = .70$ to .78) and test-retest reliability for child raters ($r = .69$) | • Evidence of concurrent validity when compared to parent CGAS<br>• Mean scores higher in clinical participants compared to community respondents<br>• Correlates with other psychosocial measures of dysfunction; parent version exhibited more evidence of validity than child-rated version |
| Children's Global Assessment of Functioning (CGAS; Bird et al., 1987, 1990; Shaffer et al., 1983) | • Adapted from adult Global Assessment Scale<br>• Scores range from 0 to 100 with descriptions of behavior and functioning for every 10 points<br>• Typically completed by a clinician after interview/records review<br>• Nonclinician version may be completed by parents | • Evidence of test-retest reliability when completed by a clinician ($r = .74$ to .84)<br>• Evidence of interrater reliability for clinicians ($r = .69$ to .87) | • Correlates highly with other global measures of impairment ($r = .80$ to .92)<br>• Scores related to service use and severity of behavior problem ratings |
| Impairment Rating Scale (IRS; Evans et al., 2005; Fabiano et al., 2006) | • Completed by a parent and teacher<br>• Items ask raters to report on functioning across important domains<br>• Includes space for a rater to provide a narrative of problematic behaviors | • Evidence of temporal stability over 4 months and 1 year for parent and teacher version<br>• Moderate to high interrater reliability between parents and teachers | • Correlates moderately with parent and teacher CGAS<br>• Correlates moderately with objective measures of problematic behavior<br>• Predicts use of mental health and school services |
| Child and Adolescent Psychiatric Assessment (CAPA; Angold & Costello, 1995; Angold et al., 1995, 1999) | • Built into a psychiatric diagnostic interview<br>• Symptoms counted only if impairing<br>• After disorder-specific symptom questions are completed, interviewer also rates incapacities across important life domains | • Evidence of temporal stability on the child version;<br>• Kappa coefficients rage from .55 (conduct disorder) to 1.0 (substance abuse/dependence) | • Children with impaired functioning rated on the CAPA more likely to be receiving services |
| Child and Adolescent Functional Assessment Scale (CAFAS; Hodges et al., 1999; Hodges & Kim, 2000; Hodges & Wong, 1996) | • Includes eight scales to assess child behavior and two scales for the child's environment<br>• Completed by a rater after a review of records, interviews with relevant respondents, and discussions with others involved in the case<br>• Yields a score for each subscale and a total score<br>• Training manual available for completing the measure | • Internal consistency ($r = .73$ to .78)<br>• Interrater reliability for total score ($r = .92$ to .96) | • Higher ratings of impairment obtained for children with more "severe" disorders and behavioral indices of impairment such as academic grades, school attendance, contact with the police<br>• Sensitive to treatment effects |



## Impairment Rating Scale -- Parent

**Child's name:** Peter Smith **Form completed by:** Mom

**Date completed:** 10/3/07

**Instructions:** In the space below, please describe what you see as your child's primary problems, both at home and at school. Also, please describe how your child's problems have affected the following areas and complete the rating at the end of each: (1) his or her relationships with playmates and brothers or sisters, (2) his or her relationship with you (and your spouse if present), (3) his or her academic progress at school, (4) his or her self-esteem, and (5) your family in general. Continue on a separate sheet if necessary **For the ratings, please mark an "X" on the lines at the points that you believe reflect the impact of the child's problems on this area and whether he or she needs treatment or special services for the problems.**

(1) How your child's problems affect his or her relationship with playmates

Peter does not have any friends. When he is around other children he becomes bossy, and needs to direct all the activities. He invades others' personal space, and this annoys other children. We have pulled him out of Scouts and Little League due to his problems getting along with the other children - if there is a conflict he will "Shut down" and quit participating.

No Problem |_______________________________X_______| Extreme Problem
Definitely does not need treatment or special services Definitely needs treatment or special services

**Regardless of whether this child is popular or unpopular with peers, does he or she have a special, close "best friend" that he or she has kept for more than a few months? (Please circle)**

**YES [✓ NO]**

How your child's problems affect his or her relationship with brothers or sisters
(If has no brothers or sisters, check here and skip to #2 ______________)

His arguing with his younger siblings puts a constant strain on our family. Peter is not a role model for his younger brother and sister. When he is not antagonizing them, they are copying his negative behaviors (such as poor table manners).

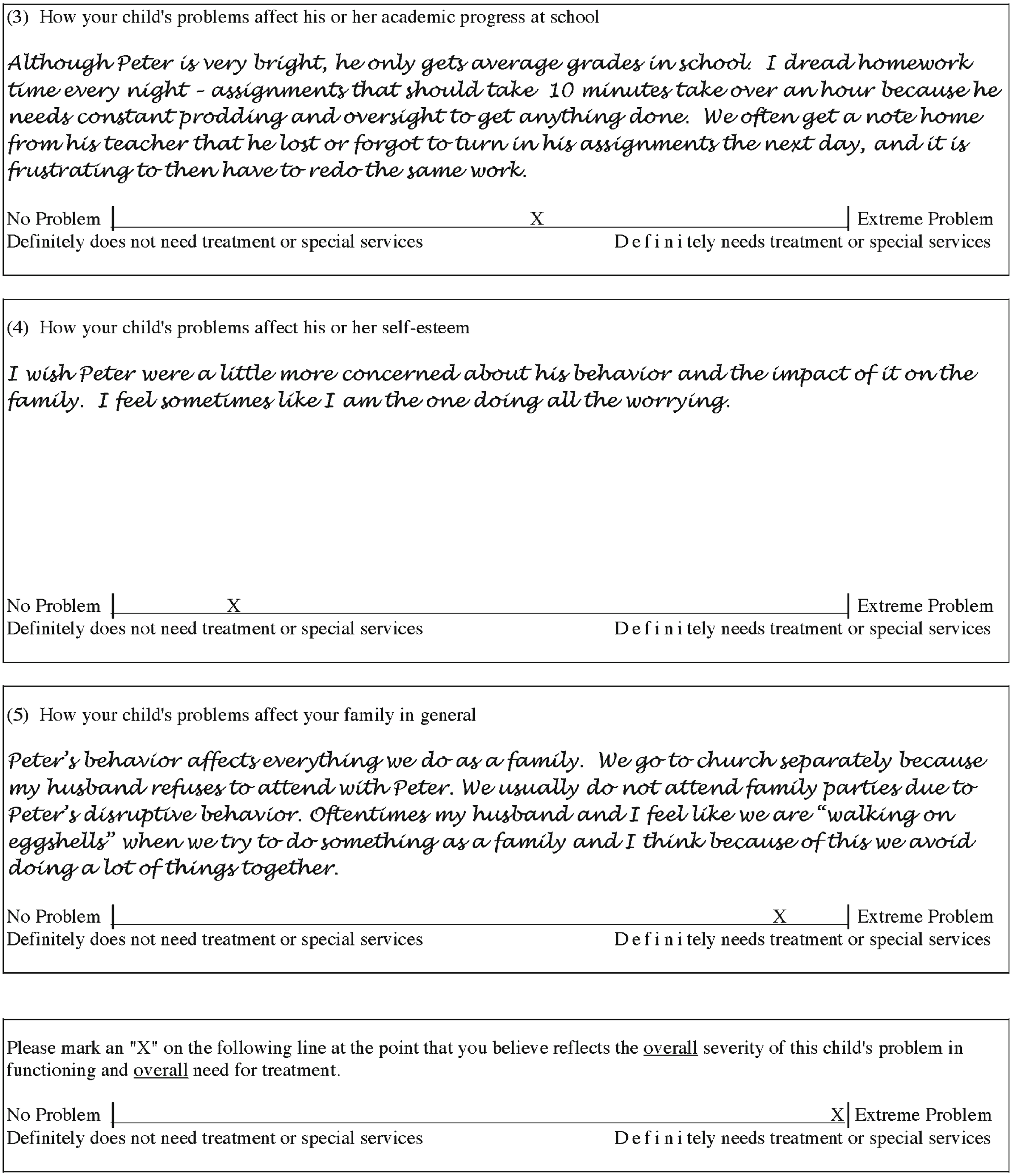
No Problem |____________________X____________________| Extreme Problem
Definitely does not need treatment or special services Definitely needs treatment or special services

(2) How your child's problems affect his or her relationship with you (and your spouse if present)

My husband and I often disagree on the right way to deal with Peter's problems and this causes problems between us. Peter has no respect for authority, and it is embarrassing to try to deal with him in public places such as the supermarket. I don't feel like my role as a parent should be to constantly be correcting or disciplining Peter. It is exhausting.

No Problem |__________________________________X____| Extreme Problem
Definitely does not need treatment or special services Definitely needs treatment or special services

**Fig. 9.1** Sample parent Impairment Rating Scale.



(3) How your child's problems affect his or her academic progress at school

*Although Peter is very bright, he only gets average grades in school. I dread homework time every night - assignments that should take 10 minutes take over an hour because he needs constant prodding and oversight to get anything done. We often get a note home from his teacher that he lost or forgot to turn in his assignments the next day, and it is frustrating to then have to redo the same work.*

No Problem |__________X__________| Extreme Problem
Definitely does not need treatment or special services Definitely needs treatment or special services

(4) How your child's problems affect his or her self-esteem

*I wish Peter were a little more concerned about his behavior and the impact of it on the family. I feel sometimes like I am the one doing all the worrying.*

No Problem |___X_________________| Extreme Problem
Definitely does not need treatment or special services Definitely needs treatment or special services

(5) How your child's problems affect your family in general

*Peter's behavior affects everything we do as a family. We go to church separately because my husband refuses to attend with Peter. We usually do not attend family parties due to Peter's disruptive behavior. Oftentimes my husband and I feel like we are "walking on eggshells" when we try to do something as a family and I think because of this we avoid doing a lot of things together.*

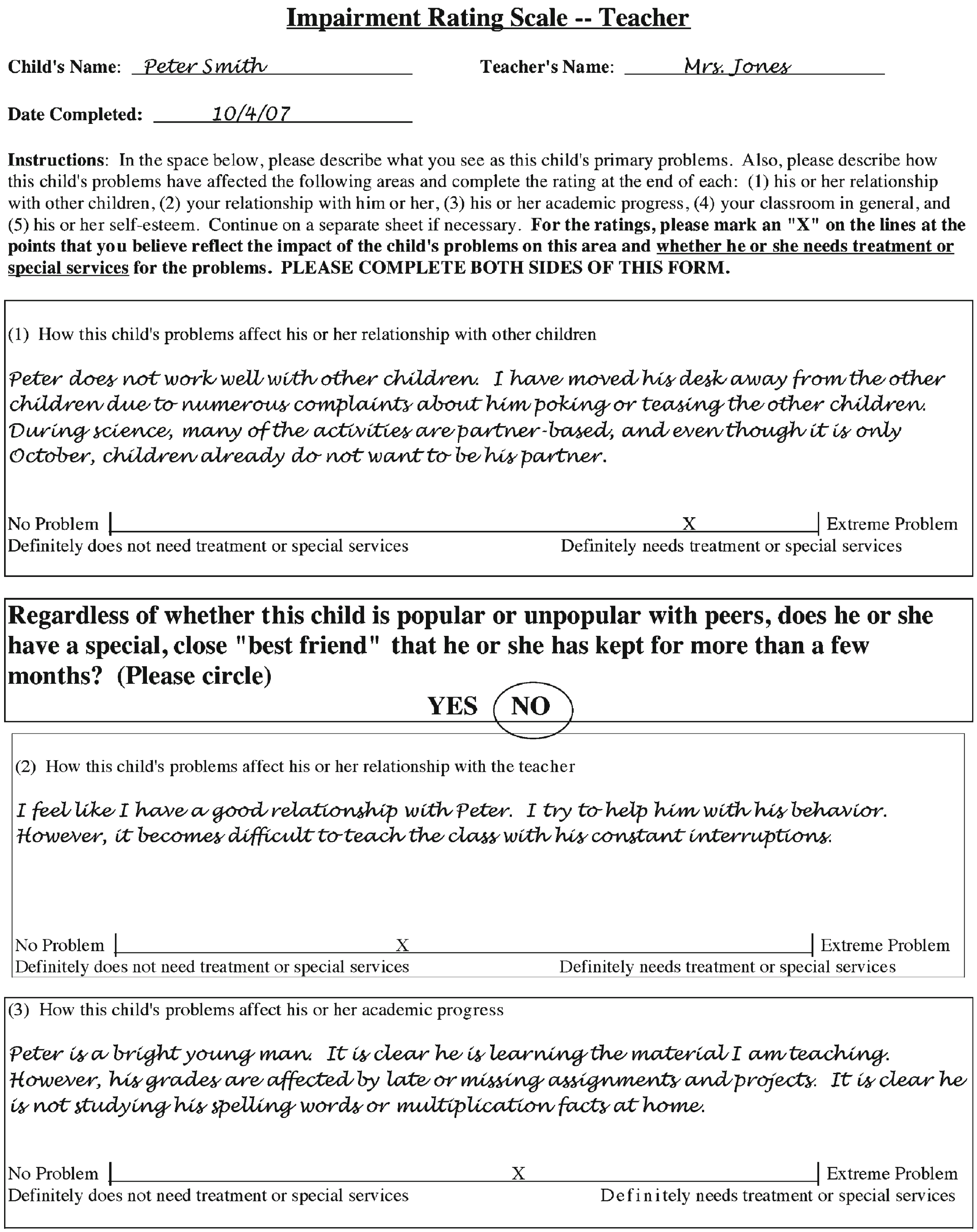
No Problem |_________________X___| Extreme Problem
Definitely does not need treatment or special services Definitely needs treatment or special services

Please mark an "X" on the following line at the point that you believe reflects the overall severity of this child's problem in functioning and overall need for treatment.

No Problem |____________________X| Extreme Problem
Definitely does not need treatment or special services Definitely needs treatment or special services

**Fig. 9.1** (continued)

tasks that included writing and situations for which they were feeling time pressure. The clinician also obtains information on consequences; for the child, these include escape/avoidance of an aversive task, and for the parents these consequences include their own feelings of frustration. Behavior modification strategies such as time-out have not been effective consequences according to the parent. Clinicians also obtain informa-



## Impairment Rating Scale -- Teacher

**Child's Name:** *Peter Smith* **Teacher's Name:** *Mrs. Jones*

**Date Completed:** *10/4/07*

**Instructions**: In the space below, please describe what you see as this child's primary problems. Also, please describe how this child's problems have affected the following areas and complete the rating at the end of each: (1) his or her relationship with other children, (2) your relationship with him or her, (3) his or her academic progress, (4) your classroom in general, and (5) his or her self-esteem. Continue on a separate sheet if necessary. **For the ratings, please mark an "X" on the lines at the points that you believe reflect the impact of the child's problems on this area and whether he or she needs treatment or special services for the problems. PLEASE COMPLETE BOTH SIDES OF THIS FORM.**

(1) How this child's problems affect his or her relationship with other children

*Peter does not work well with other children. I have moved his desk away from the other children due to numerous complaints about him poking or teasing the other children. During science, many of the activities are partner-based, and even though it is only October, children already do not want to be his partner.*

No Problem |______________________________________X______| Extreme Problem
Definitely does not need treatment or special services Definitely needs treatment or special services

**Regardless of whether this child is popular or unpopular with peers, does he or she have a special, close "best friend" that he or she has kept for more than a few months? (Please circle)**

**YES [✓ NO]**

(2) How this child's problems affect his or her relationship with the teacher

*I feel like I have a good relationship with Peter. I try to help him with his behavior. However, it becomes difficult to teach the class with his constant interruptions.*

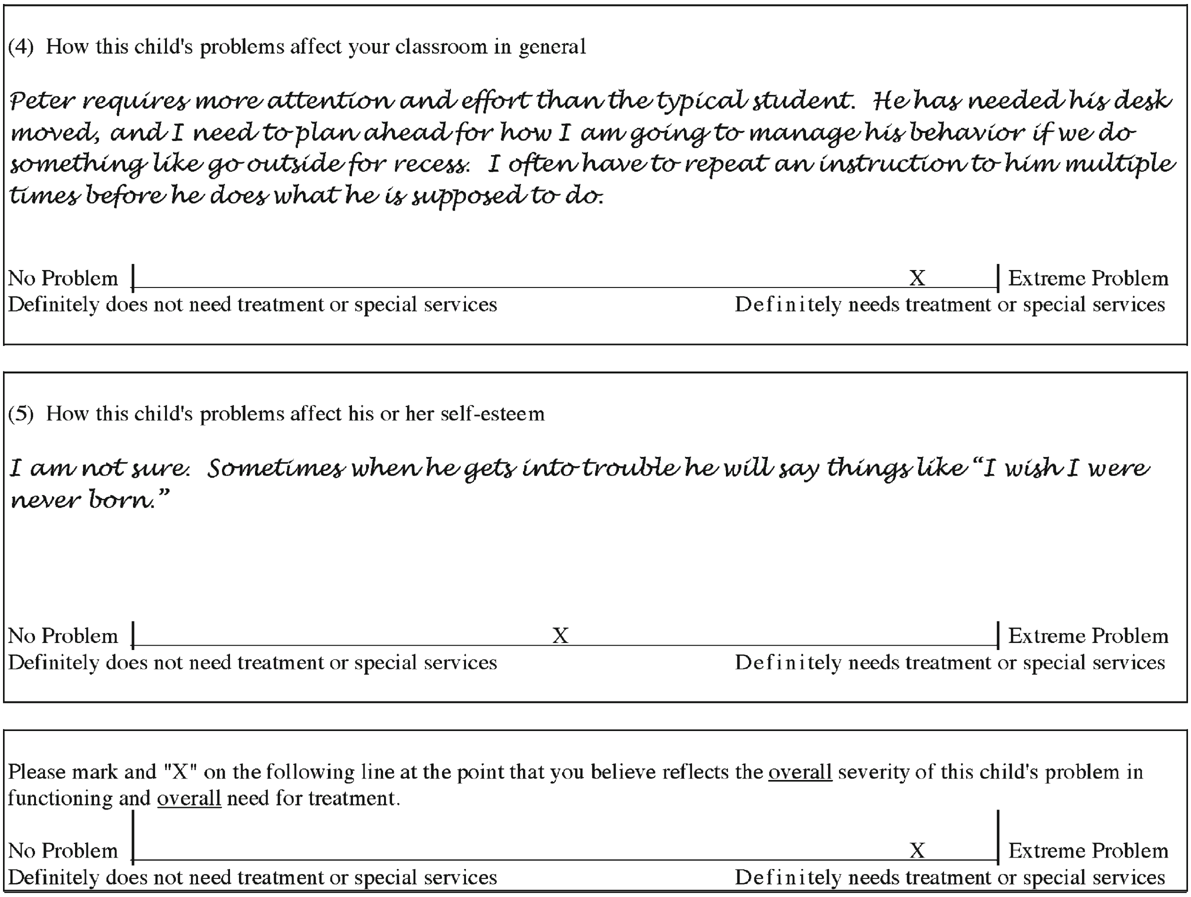
No Problem |______________X_________________________________| Extreme Problem
Definitely does not need treatment or special services Definitely needs treatment or special services

(3) How this child's problems affect his or her academic progress

*Peter is a bright young man. It is clear he is learning the material I am teaching. However, his grades are affected by late or missing assignments and projects. It is clear he is not studying his spelling words or multiplication facts at home.*

No Problem |_______________________X________________________| Extreme Problem
Definitely does not need treatment or special services Definitely needs treatment or special services

**Fig. 9.2** Sample teacher Impairment Rating Scale



(4) How this child's problems affect your classroom in general

*Peter requires more attention and effort than the typical student. He has needed his desk moved, and I need to plan ahead for how I am going to manage his behavior if we do something like go outside for recess. I often have to repeat an instruction to him multiple times before he does what he is supposed to do.*

No Problem |________________________________________X____| Extreme Problem
Definitely does not need treatment or special services Definitely needs treatment or special services

(5) How this child's problems affect his or her self-esteem

*I am not sure. Sometimes when he gets into trouble he will say things like "I wish I were never born."*

No Problem |______________________X______________________| Extreme Problem
Definitely does not need treatment or special services Definitely needs treatment or special services

Please mark and "X" on the following line at the point that you believe reflects the <u>overall</u> severity of this child's problem in functioning and <u>overall</u> need for treatment.

No Problem |________________________________________X____| Extreme Problem
Definitely does not need treatment or special services Definitely needs treatment or special services

**Fig. 9.2** (contined)

tion during this interview on the child's strengths and competencies and ask the parent about the impact of the targeted behavior for the child in the short and long term. Similar to other global ratings of impairment (e.g., Shaffer et al., 1983), the clinician also provides an overall global rating of the impact of the behavior using IRS methodology (Fabiano et al., 2006). If this procedure is repeated for the child's main presenting problems, the result of the initial assessment should be a list of target behaviors and parent-generated information on the nature, severity, and function of each.

Using the information gathered on impaired areas of functioning as part of the assessment, the clinician is now armed with sufficient information to begin treatment planning, with a focus on the child's main areas of functional impairment. For a child such as Peter, intervention should focus on reducing problematic behaviors and increasing adaptive ones. An efficient and effective means of meeting this goal is to establish a daily report card (DRC; http://ccf.buffalo.edu/pdf/school_daily_report_card.pdf). The DRC has long been used effectively to treat ADHD, monitor outcomes, and open a daily line of communication between teachers and the child's parent (DuPaul & Eckert, 1997; DuPaul & Stoner, 2004; Kelley, 1990; O'Leary & Pelham, 1978; O'Leary, Pelham, Rosenbaum, & Price, 1976; Pelham et al., 2001, 2002, 2005; Pelham, Wheeler, & Chronis, 1998), and it is a procedure aligned with a long tradition of using contingency management with children with disruptive behavior in clinical and educational settings (e.g., Hops & Walker, 1988).

In addition to being an effective treatment for ADHD, the DRC is also an efficient and effective procedure for monitoring outcomes in the child's important areas of psychosocial functioning (Pelham et al., 2005). It is sen-

**Presenting Problems (complete one page for each problem; continue on back if necessary). Begin by giving a brief explanation of how antecedents and consequences affect behavior, and explain that you will be asking about antecedents, behaviors and consequences, all defined very specifically and objectively.**

**Problem (define specific behavioral target from the Impairment Rating Scale):**

Homework not completed within expected time.

**When was the problem first noted, and by whom? (Include age/grade, sudden or gradual, noticed personally or brought to attention by someone else)**
First noticed in second grade. The teacher sent home notes stating seatwork was incomplete and needed to be completed at home.

**How often does the problem occur, and in what settings? What is the intensity/severity of the behavior?**

**-Home** This problem occurs on an almost daily basis at home. Generally, it takes 4-5 times as long to complete the work as it should. We are often surprised by unfinished long-term projects, which send us scrambling to the store at 8:00 at night (i.e.,to buy posterboard or markers for his projects).
**-School** Some of the same problems occur at school because the unfinished work gets sent home to be completed.
**-With peers** N/A
**-Other (describe)** N/A

**What are the typical antecedents to the behavior? Is the behavior usually in response to some event or provocation (e.g., person, setting, situation, time of day, event), or does it appear to happen for no reason? What is the variability in the behavior across time, settings, people, etc. (e.g., preset, cyclic)?**
Command to get started on homework; Peter is more resistant if the homework includes writing; He appears to get the work done faster if it is done right after school rather than later in the evening; problem is worse is parents are rushed.

**What typically happens after the behavior occurs? What are the typical consequences? What have the parents tried to do to modify consequences and what have been the results? How consistent have the parents' reactions been?**
Peter avoids having to concentrate on and complete his work; parents get very frustrated and upset; homework time often includes multiple arguments/shouting matches between the parent and Peter; schoolwork incomplete; have tried time outs and grounding and it does not work.

**Current level of competency/strengths related to target behavior:**
Peter is good at math – these assignments tend to get done quicker; Can persist in a homework activity if it is really engaging (e.g., searching for different types of leaves for a science project).

**What effect does the problem have on the child and those around him/her; what is the level and type of impairment associated with the problem? What are short-term and long-term consequences?**
Severely impacts family functioning – parents dread having to deal with homework each afternoon. Homework takes so long to complete that most days this is the only parent-child interaction after school and it is extremely unpleasant. In the short-term missed homework is affecting Peter's grades and he is not getting good practice of academic tasks. In the long-term his parents worry if he does not develop good skills now things will only become worse as he moves to middle/high school.

Please mark an "X" on the following line at the point that you believe reflects the overall severity of this child's problem in functioning and overall need for treatment.

No Problem |____________________________________________X__________| Extreme Problem
Definitely does not need treatment or special services — Definitely needs treatment or special services

Fig. 9.3 Sample clinician-completed target behavior evaluation sitive to environmental modifications, and it is also a useful device for communicating with parents regarding the child's behavior in school. The DRC is sensitive to pharmacological (e.g., Pelham et al., 2001) and behavioral treatment effects (e.g., Pelham et al., 2005). Teacher feedback to the child regarding progress toward DRC goals and explicit feedback regarding whether goals are met may also serve as an antecedent to future appropriate behavior as well as be used as a data-driven monitoring device for schools to use to evaluate the progress of children in general and special education programs. Importantly, the targets on the DRC are the impaired areas of functioning that constitute the socially valid targets of treatment.

For Peter, impaired areas of functioning are clearly present in the home and school settings. A clinician should synthesize the information gathered through the IRS and clinical interview and use it to establish target behaviors. These targeted behaviors then become the means of monitoring progress and measuring the outcome of treatment efforts. Based on the information presented in Figures 9.1–9.3, a clinician may choose to focus on academic-related targets such as seatwork and homework completion. Further, Peter appears to have difficulty negotiating peer interactions at home and at school. Figure 9.4 illustrates a sample DRC that might be constructed initially to target Peter's impaired areas of functioning at home and at school. Importantly, many of the goals are phrased in a positive way to promote Peter's development of adaptive behavioral skills. Because the targets selected are clinically meaningful, the DRC can also double as an individualized target behavior evaluation (ITBE; Pelham et al., 2005). As such, the percentage of targets that earn a "yes" before consequences are introduced, as consequences are added, and as additional treatment modifications occur (e.g., Peter is made to complete homework immediately after school before he can engage in other activities) will yield information on the effectiveness of treatment in an ongoing fashion. Clinicians can also be confident this progress monitoring is socially valid and clinically meaningful because the targets are directly linked from concerns at referral. The ITBE/DRC may also be modified as needed. For example, should Peter's parents decide to reintroduce him to a Little League activity, a goal that targets his active participation throughout the activity might be supportive of this transition.

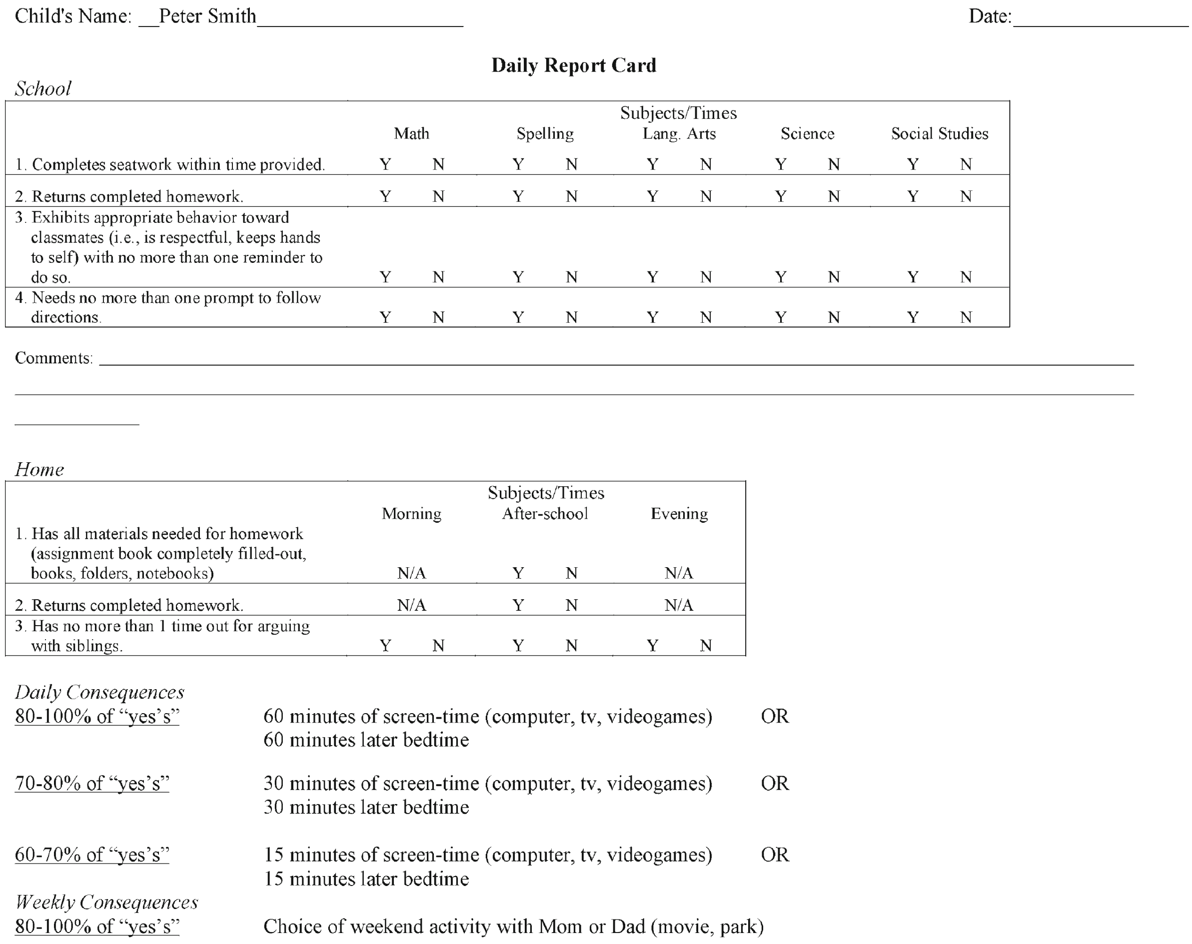
## Guidelines for Assessment

Based on this review of impairment rating scales, a few guidelines for assessment may be generated. First, assessment of impairment in daily life functioning should be a cornerstone of any psychological assessment. Second, these assessments should utilize multidimensional measures to adequately capture the topography of impaired functioning. Third, the measures utilized should lend themselves to efficient, reliable repeated assessments to permit the monitoring of treatment outcomes. Fourth, measures should provide useful information for treatment planning as clinically meaningful targets of treatment are those that are related to impaired functioning. We discuss each of these guidelines in turn.

As mentioned, the research literature on measures for assessing *DSM* symptoms dwarfs that of impairment measures. However, recent prominent publications have emphasized the importance of measuring functional outcomes. For example, the American Academy of Pediatrics (2000) clinical assessment guidelines for ADHD emphasize the assessment of impaired functioning by parents and teachers. The treatment guidelines for ADHD state "the primary goal of treatment should be to maximize function" (American Academy of Pediatrics, 2001, p. 1036). If these guidelines are followed, the assessment of impairment should be heavily emphasized in psychological assessments from the initial meeting through treatment.

Multidimensional measures of impairment have advantages over global measures in clinical settings. Global measures are useful for epidemiologic or research activities, but in clinical settings, specific information on impaired areas of functioning is needed. For instance, a clinician using a global rating that indicated impaired functioning would then have to proceed with an assessment to determine the specific behaviors that contributed to the negative rating. Collecting a multidimensional measure across domains (e.g., academic, family, peer relationships) has more practical clinical utility as it permits the clinician to obtain a comprehensive picture of the child's current levels of functioning.

Once an initial diagnosis and functional assessment are obtained, clinician efforts should be dedicated to treatment planning, monitoring, and evaluation. For



Child's Name: __Peter Smith___________________ Date:________________

**Daily Report Card**

*School*

| | Subjects/Times | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Math | | Spelling | | Lang. Arts | | Science | | Social Studies | |
| 1. Completes seatwork within time provided. | Y | N | Y | N | Y | N | Y | N | Y | N |
| 2. Returns completed homework. | Y | N | Y | N | Y | N | Y | N | Y | N |
| 3. Exhibits appropriate behavior toward classmates (i.e., is respectful, keeps hands to self) with no more than one reminder to do so. | Y | N | Y | N | Y | N | Y | N | Y | N |
| 4. Needs no more than one prompt to follow directions. | Y | N | Y | N | Y | N | Y | N | Y | N |

Comments: ____________________________________________

*Home*

| | Subjects/Times | | | |
|---|---|---|---|---|
| | Morning | After-school | | Evening |
| 1. Has all materials needed for homework (assignment book completely filled-out, books, folders, notebooks) | N/A | Y | N | N/A |
| 2. Returns completed homework. | N/A | Y | N | N/A |
| 3. Has no more than 1 time out for arguing with siblings. | Y N | Y | N | Y N |

*Daily Consequences*

| | | |
|---|---|---|
| 80-100% of "yes's" | 60 minutes of screen-time (computer, tv, videogames)<br>60 minutes later bedtime | OR |
| 70-80% of "yes's" | 30 minutes of screen-time (computer, tv, videogames)<br>30 minutes later bedtime | OR |
| 60-70% of "yes's" | 15 minutes of screen-time (computer, tv, videogames)<br>15 minutes later bedtime | OR |

*Weekly Consequences*

80-100% of "yes's" Choice of weekend activity with Mom or Dad (movie, park)

**Fig. 9.4** Sample daily report card (DRC) for the school and home setting

this reason, measures of functional impairment should be brief and efficient and lend themselves to repeated assessments (Pelham et al., 2005). Longer, expensive measures of functional impairment, such as those embedded in interviews administered by a clinician, are undesirable for these assessment goals. It is recommended that clinicians use assessment measures that are brief and easy to score. This permits repeated assessments that will promote an ongoing measure of the child's functioning and feedback directly into treatment planning and modification.

Finally, clinicians should use measures of impairment that are directly related to intervention. Assessments of impairment should lead directly to the establishment of target outcomes that can be operationalized in intervention plans. For this reason, measures must go beyond classifying a child as impaired, or not, and instead document the specific problems the child is experiencing (e.g., failing academic classes; being rejected by peers). These target outcomes then become the yardstick that clinicians, parents, teachers, and the child use to measure progress related to treatment.

## Conclusion

Many measures of impairment have been developed and validated of late. It is hoped that researchers and clinicians continue to emphasize the measurement of impairment in their work. Policy makers and decision makers should also begin to emphasize the importance of impairment, both as a means of identifying children in need of intervention and as the main means of evaluating treatment outcomes.

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## Chapter 10
# Impairment in the Geriatric Population

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## Introduction

The aim of this chapter is examine how the concept of impairment has been applied in geriatric populations. In so doing, we focus on impairments in cognition and in the performance of everyday behaviors as they are known to be age-associated and interrelated. Moreover, impairments in cognition and everyday behavior are some of the greatest challenges faced by this population. As people live longer, more are likely to be affected by age-associated neurodegenerative diseases (e.g., Alzheimer's disease [AD]), resulting in a substantial number of cognitively impaired people requiring support and assistance in performing everyday behaviors (Gruenberg, 1977; Kramer, 1980). For these reasons, it is important to consider how cognitive impairment has been conceptualized as well as factors that influence its expression.

We have chosen to examine the cognitive and functional impairments associated with later life within the disablement process, a broad conceptual framework emerging from discussions and research on disability (Verbrugge & Jette, 1994). We have chosen to do this, rather than limiting ourselves to the concept of impairment alone, because research with geriatric populations has revealed that the conceptualization and identification of impairment are heavily influenced by myriad factors. These factors include characteristics of the individual (e.g., biological, psychosocial, sociodemographic) and actions that may be taken to reduce or accentuate impairment. These concepts are central to the disablement process and to understanding how behavioral interventions can be used to optimize functioning and well-being, minimize the risk of disability, and prevent the development of dysfunctional family or social functioning. We address the concept of impairment, the many influences (e.g., lifestyle, psychosocial, compensatory) that may affect the consequences of impairment for an individual and whether benefits from interventions are likely to be derived within the context of the conceptual framework of the disablement process.

The disablement process, a "sociopsychobiological" model of disability (Barberger-Gateau, Fabrigoule, Amieva, Helmer, & Dartigues, 2002), describes a pathway from pathology to various kinds of functional outcomes and incorporates psychological, social, and environmental factors that modify or alter the proposed pathway. According to Verbrugge and Jette (1994), "disablement" refers to impacts that chronic and acute conditions have on the functioning of specific body systems and on people's abilities to act in necessary, usual, expected and personally desired ways in their society" (p. 3). The term *process* is used to acknowledge the dynamic interplay of factors that affect the direction, pace, and patterns of change over time.

The main pathway of the disablement model consists of four interrelated components: pathology, functional impairments, functional limitations, and disability (see Fig. 10.1). In this context, *pathology* refers to the biological and physiological abnormalities medically labeled as disease or injury. Pathology leads to functional *impairments*, defined as dysfunctions and significant structural abnormalities in specific body systems (e.g., neurological, cardiovascular, musculoskeletal) that have consequences for mental, physical, or social functioning. These consequences are referred to as functional *limitations* and are defined as restrictions in physical actions, such as mobility, discrete motions, and strength, and mental actions, such as cognitive and emotional functions (Verbrugge & Jette, 1994). The final consequence of the pathway

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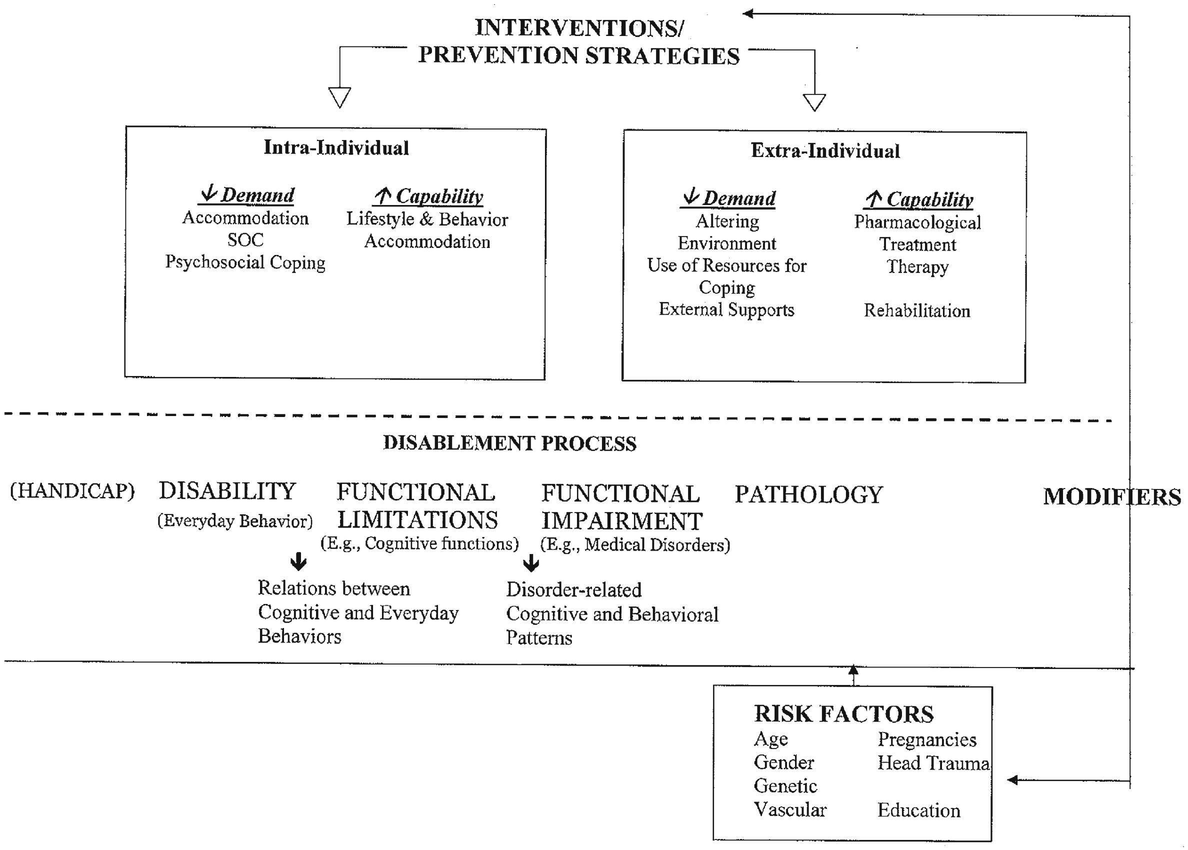

**Fig. 10.1** Extended disablement process model. SOC, selective optimization with compensation

is *disability*, or difficulty performing everyday activities of daily living (ADLs; i.e., basic and instrumental) and work-related activities.

This main pathway, then, posits the sequence of events that lead from pathology to disability when medical factors are considered and aids in distinguishing between constructs. For example, in the context of this model, *functional impairment* refers to dysfunctions or structural abnormalities in specific body systems (e.g., metabolic, cardiovascular, neurological, renal) that are identified through clinical examinations, laboratory tests, imaging procedures and symptom reports. The term *functional limitation* is used to refer to restrictions in physical and mental activities (e.g., trouble seeing, short-term memory problems) that are frequently identified as "impairments" outside the context of this model. For example, the International Classification of Impairments, Disabilities, and Handicaps (ICIDH; World Health Organization [WHO], 1980) defined impairment more broadly as any loss or abnormality of psychological, physiological, or anatomical structure or function. Similarly, that described as disability in the disablement process model is often described as functional impairment in other contexts. To further extend the model, the social disadvantage resulting from an impairment or a disability has been referred to as handicap within the ICIDH (WHO, 1980). These distinctions begin to allow us to differentiate one set of consequences, resulting from an underlying pathology, from another.

However, it is well known that relations among pathology, impairments, limitations, and disability are not straightforward and are influenced by myriad other factors, many of which are psychosocial in nature. These include characteristics of the individual that affect the presence and severity of impairment, functional limitations, and disability (i.e., risk factors). In addition, actions or interventions may be taken in response to age-associated changes that mitigate or accentuate their impact. These may be internally generated (operate within a person) or may be dependent on others (external to the individual).

In practice, it is often disability or functional limitations that bring older adults to the attention of clinicians. The clinician's role often is to determine the underlying impairments, abnormalities in specific body systems that give rise to these limitations or disabilities. For example, it may be determined that an older adult who presents with mild memory impairment (functional limitation) and difficulty handling finances (disability) is in the early stages of dementia (impairment). Medical investigations and a detailed clinical history (risk factors) would ensure examining for reversible forms of dementia and clarify the differential diagnosis. If no identifiable medical foundation for the dementia was evident, a presumptive diagnosis of AD (pathology) may be given.

At this point, the clinical focus may shift from diagnosis to interventions aimed at minimizing functional limitations and, consequently, disability. An important consideration in many chronic disease conditions, such as AD, is that these interventions are taking place within the context of progressive underlying pathology that is associated with progressive functional decline. This should not deter intervention efforts, but emphasizes the need to be mindful of expected patterns of progressive decline associated with various disorders and the factors that may reduce or accentuate the speed of decline or the manifestation of functional limitations or disability. Disability greater than that warranted by existing impairment and functional limitations has been referred to as "excess disability" (Brody, Kleban, Lawton, & Silverman, 1971; Rogers et al., 2000) and carries with it the implication that vigilance is required to ensure all efforts are undertaken to maximize functional capabilities.

We have chosen to structure the remainder of this chapter in accordance with this clinical process (functional limitations/disability, then impairment/pathology), in contrast to the sequence typically described in association with the disablement process model (pathology through to disability). As the focus of this chapter is on the functional limitations (i.e., cognitive impairments) and disability associated with later life, we begin by examining key issues relevant to understanding the links between functional limitations and disability arising from the literature. We focus on selected functional impairments (i.e., medical disorders) commonly seen in geriatric populations that differ with respect to expected patterns of progressive decline, risk factors that may influence the course of the disablement process or predispose an individual to cognitive impairment, and underlying pathology. We then discuss intraindividual and extraindividual interventions that can be used to optimize functioning and well-being, minimize disability, or prevent the development of dysfunctional family or social functioning.

## The Process

### *Functional Limitations/Disability*

A number of different approaches may be taken to the identification of impairments in cognition (functional limitations) and everyday behaviors (disability) for older adults. In general, these are the same approaches to deficit measurement identified by Lezak, Howieson, and Loring (2004) that pertain to all age groups. However, some specific caveats need to be considered that are particular to this age group and the types of disorders commonly encountered.

#### Identification of Cognitive Impairment

As is typical of clinical measurement across a number of fields and age groups, measures designed to assess relevant cognitive functions are administered, and often the person's performance during the test administration is observed to provide information about the individual's approach to the task, tolerance levels, personal style, and coping skills. In addition, characteristics of speech and language and abnormalities in movement that may be clinically significant can be observed. Information is gathered through interviews with the older adult or a person familiar with this person's daily activities (e.g., family member or close friend). Standardized tests (i.e., tests administered and scored in a set and consistent manner) are used to gather objective data about a person's performance that permits meaningful comparisons with others (i.e., standardization samples), to assess change over time within an individual, or in relation to a "gold standard" or specific criterion of achievement (Lezak et al., 2004).

Measures of cognitive and everyday behaviors are most commonly interpreted in relation to the performance of a standardization sample, a representative group of people administered the measure in the standardized fashion. Where the scores on the measure are normally distributed in the adult population, an individual's performance can be evaluated in relation to norms based on the performance of the standardization sample. Many measures of cognitive functions are affected by age and education (or vocational achievement), and the effects of these variables need to be considered when generating norms and in the interpretation of an individual's performance in relation to the norms. Although it has often been common practice to use norms adjusted for age and education, Sliwinski, Buschke, Stewart, Masur, and Lipton (1997) and Sliwinski, Hofer, Hall, Buschke, and Lipton (2003) questioned this approach in the context of dementia diagnosis. Because it has been repeatedly observed that age and education are risk factors for dementia (see section on impairment; Bachman et al., 1993; Braak et al., 1999; Canadian Study of Health and Aging [CSHA] Working Group, 1994, 2000; Shaji, Promodu, Abraham, Roy, & Verchese, 1996), Sliwinski et al. (2003) argued that using norms corrected for these factors would compromise diagnostic accuracy by removing predictive variance. They proposed, instead, the use of uncorrected raw scores from the adult population as a whole taken in conjunction with demographically based dementia base rates when seeking information relevant to the diagnosis of dementia (diagnostic norms). On the other hand, when the purpose of the assessment is to describe the cognitive strengths and weaknesses of the older individual, Sliwinski et al. (1997, 2003) supported the use of demographically corrected scores (comparative norms).

Even taking these issues into account, the use of norms to identify impairment requires the selection of a cutoff point, such as defining scores of 1.5 or 2.0 or more *SD* below the mean of a cognitively normal sample as being impaired. This approach assumes that impaired people show quantitative differences rather than differences of kind. An advantage to this approach is that no matter how difficult a cognitive measure is, roughly the same number of people will be identified, and this will largely determine the prevalence of impairment in the population. The disadvantage is that there will almost always be an overlap in scores between the normal population and the group with cognitive impairment, with a percentage of the normal population falsely classified as impaired (e.g., approximately 7% of the normal sample will fall below −1.5 *SD*). A related issue is how many measures in a particular cognitive domain must be impaired before impairment is determined. Petersen (2004a), in discussing criterion for identifying mild cognitive impairment (MCI), a classification thought by some to capture those individuals likely to develop AD, noted that "multiple more challenging memory instruments are required to detect the subtle memory deficits seen in early MCI." Similarly, Blackford and La Rue's (1989) definition of late life forgetfulness requires a performance of 1–2 *SD*s below the mean established for age on 50% of memory measures administered. However, in practice, few cognitive assessment batteries have been co-normed (i.e., simultaneous attainment of data on multiple tests for the same cohort; Smith & Ivnik, 2003), and when such norms have been developed, it is common for "normal" participants to show impaired performance on one or more measures within a battery (Tuokko & Woodward, 1996).

Another approach to the interpretation of scores on measures that are normally distributed in the adult population is to examine differences between scores obtained for an individual on the same standardized measure at different points in time. This information may be particularly relevant for older adults as (a) more normative change in cognitive functions is expected in older age groups than in younger samples, (b) inherent in the diagnosis of dementia is recognition that the individual's cognition and behavior have changed over time, and (c) being able to demonstrate that interventions may alter the rate at which cognitive functions change in specific forms of dementia (e.g., AD) is an important goal. However, as yet, there is a lack of information about the appropriateness of different change measurement methods, the validity of neuropsychological measures for studying change in older adults, and information about the amount of test score change that can be considered normal (or abnormal) among older adults over clinically relevant intervals (Frerichs & Tuokko, 2005). Methods for measuring change have been discussed for over 50 years (e.g., Harris, 1963; Lord, 1957, 1958; McNemar, 1958; Payne & Jones, 1957) and continue to be topics of debate (e.g., Crawford & Howell, 1998; Hageman & Arrindell, 1999; Hsu, 1989; Jacobson & Truax, 1991). Our research suggests that normal change in older adults' memory test performance can be accurately classified using change score methods (Frerichs & Tuokko, 2005). Moreover, diagnostic change was significantly associated with a number of different change score methods but differed in strength of association depending on the memory measure under investigation. These findings stand in contrast to those of Ivnik et al. (2000), who concluded that reliable change in test scores did not contribute to dementia diagnosis in older adults beyond chance levels. Given that these studies differed markedly in the samples that were examined, the design of the study, and the measures used, additional research is needed to examine and validate change score methods in other samples of older adults to determine whether these methods can assist in the detection of particular neurodegenerative disorders.

Although many measures of cognitive functioning provide scores that are normally distributed in the adult population, this is not true for some domains of cognitive functioning. In some instances, an underlying assumption of the measure is that all persons of a certain age (e.g., adults) will manifest these capabilities as they are considered rudimentary components of behavior (e.g., following simple instructions). If the task cannot be performed, impairment is assumed. This is a form of criterion-referenced testing (Anastasi, 1988) in which performance is evaluated in terms of achievement on the measure, not in relation other people. In criterion-referenced testing, a particular score on a reference test may be selected and designated as an indication of "significant" impairment. This is a more common approach used in the field of occupational therapy, in which performance of everyday behavior is of particular concern (see next section below).

By definition, the identification of functional limitations (e.g., poor performance on measures of cognitive functions) and disabilities is central to criteria for cognitive disorders. For example, in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV; American Psychiatric Association [APA], 1994), a diagnosis of dementia required the presence of memory impairment, as well as impairment of at least one other cognitive domain, of sufficient severity to interfere with everyday functioning. Dementia is then further subclassified according to underlying pathology (e.g., AD, vascular). When memory impairment is not central to a clinical presentation or only a single area of cognitive impairment (memory or otherwise) is evident, a variety of other sets of criteria may be employed. For example, the *DSM-IV* provides categories such as "cognitive disorders not otherwise specified" and "amnestic disorders." The *International Classification of Diseases and Related Health Problems, Tenth Edition* (*ICD-10*; WHO, 1993) provides a classification for mild cognitive disorder to capture objective evidence of decline in cognitive performance not attributable to other mental or behavioral disorders identified in *ICD-10*.

Most recently, Petersen (2004b) has proposed an algorithm for identifying MCI, a hypothesized interim state between normal and abnormal cognitive functioning indicative of incipient dementia. According to Petersen (2004b), MCI is identified when (a) an individual presents with a cognitive complaint (either subjective or by proxy), (b) a determination of abnormal cognitive function in relation to age and education is established after clinical examination, (c) the individual's cognitive functioning represents a decline from previous function, and (d) the individual exhibits intact activities of daily living (ADLs). Once the presence of MCI has been established, the type of MCI can be further subdivided based on the presence or absence of memory impairment into amnestic MCI (aMCI) or nonamnestic MCI (naMCI). These types can be further subdivided into aMCI single domain (aMCIsd; memory impairment only); aMCI multiple domain (aMCImd, memory impairment plus other cognitive impairment); naMCI single domain (naMCIsd, impairment in a single nonmemory domain); and naMCI multiple domain (naMCImd, impairments in multiple domains other than memory). MCI, then, is cognitively heterogeneous with subgroups that differ with respect to cognitive profiles. In addition, MCI appears to be etiologically heterogeneous, and some promising work has been performed linking etiologic subtypes to cognitive subgroups using neuroimaging techniques and genetic markers (Smith, Machulda, & Kantarci, 2006; Wilson, Aggarwal, & Bennett, 2006, Wolf & Gertz, 2006).

Although the presence of these sets of criteria for cognitive disorders is useful, at least conceptually, few specify procedures for identifying cognitive impairment but instead involve the application of clinical judgment based on the overall impression (Petersen, 2004a). Dementia criteria, as outlined in the *DSM-IV* (APA, 1994), give no direction regarding the meaning of impairment. The National Institute of Neurological and Communicative Disorders and Stroke and the Alzheimer's Disease and Related Disorders Association (NINCDS-ADRDA) criteria for AD (McKhann et al., 1984) specify the presence of dementia (i.e., deficits in two or more areas of cognition) as established by a clinical examination and confirmed by neuropsychological testing with impairment operationalized as a score falling below the fifth percentile in comparison to appropriate normative data controlling for age, gender, and education. The disadvantage of the last approach is, as noted, that there will always be substantial overlap between those truly impaired and those from the normal population falling at the lower end of the distribution. The major disadvantage of relying on clinical judgment is that a broad understanding of brain-behavior relations is required, and a number of factors (e.g., risk and protective factors) need to be taken into consideration. This will affect the reliability with which cognitive impairment is identified (Tuokko, Gabriel, and the CSH immediately before section head Identification of Impairment in Everyday Behavior A Neuropsychology Working Group, 2006).

## Identification of Impairment in Everyday behavior

Measures of everyday behavior vary in terms of content and method. *Content* refers to whether a measure is more global (i.e., fewer questions per domain, spanning a number of domains) or specific (i.e., many questions per domain, usually focusing on only one domain). *Method* refers to the manner in which information is collected from participants (i.e., whether data are collected in a subjective or objective manner). Most commonly employed measures of everyday behavior are subjective, relying on self-report or report of a knowledgeable informant, when there is reason to believe participants may not be able to accurately self-report (Diehl, 1998; Fillenbaum, 1985, 1987a, 1987b; Lawton & Brody, 1969). Moreover, most of these measures are global in nature, spanning a number of domains with few questions per domain. Typically, questions relevant to each domain are evaluated on a 3- or 4-point scale. For example, a question relevant to the ability to transport oneself outside of walking distance might read, "Can you use public transportation: (a) without help, (b) with some help, (c) not at all?" (Willis, 1996). Self-report measures of everyday behavior tend to focus on *what* is happening rather than *why*. They provide minimal information on concomitants and causes of incapacities in particular domains. Asking an older adult whether he or she can transport themselves does not provide information regarding why that may be the case. For example, the self-reported inability to transport oneself may be due to immobility or a lack of knowledge of the local bus schedule.

Moreover, a distinction can be made between a person's intrinsic ability (doing an activity without personal or equipment assistance) and functional ability (doing activity with personal or equipment assistance). Many people with cognitive impairment can continue to perform many ADLs if provided with minimal support and assistance. For example, making use of direct deposit and automatic withdrawal banking functions can alleviate concerns about paying bills on time for people who may have memory difficulties. A final distinction can be made between a person's ability to perform everyday tasks and his or her understanding of personal limitations and the consequences of these limitations. This distinction is central to compensatory and adaptive processes (see intraindividual interventions discussion).

## Relations Among Impairments in Cognitive and Everyday Functions

As noted, impairments in both cognitive and everyday functions are central to the definition of dementia, and their co-occurrence is expected in this context. However, a number of studies have shown a clear co-occurrence of cognitive impairments and disabilities in samples of older adults without dementia (Barberger-Gateau, Fabrigoule, Rouch, Letenneur, & Dartigues, 1999; Black & Rush, 2002; Njegovan, Man-Son-Hing, Mitchell, & Molnar, 2001; Steen, Sonn, Hanson, & Steen, 2001). It appears that progressive cognitive decline is associated with a natural hierarchy of loss with instrumental activities of daily living (IADLs; e.g., shopping, banking, and cooking) being lost at higher levels of cognitive functioning than basic ADLs (e.g., eating, dressing, and walking) (Njegovan et al., 2001). In addition, strong associations have been found between measures assessing a broad range of cognitive domains and dependency in four IADLs (i.e., telephone use, use of transportation, medication intake, and handling finances) (Barberger-Gateau et al.,1999). Processing speed was associated with performance on each IADL, whereas specific independent associations between cognitive domains and individual IADLs were noted. For example, transportation was also related to visuospatial perception and attention; medication intake was also associated with memory; and handling of finances was the most heavily cognitively mediated, being associated with conceptual abilities, orientation, and memory as well as processing speed.

In studies of people identified with MCI, it is clear that they experience difficulty with a number of household and other everyday activities (Albert et al., 1999; Bassett & Folstein, 1991). Artero, Touchon, and Ritchie (2001) found the overall prevalence of impairment in everyday activities for people with MCI to be 30.8%. The domains with which those with MCI experienced the most difficulty were walking (18%), bladder control (16.1%), bathing (7.7%), and use of telephone (7.5%).

There remains controversy in the literature concerning the temporal relations between cognitive impairment and everyday functions. Some longitudinal studies suggest that cognitive impairment occurs first (Greiner, Snowdon, & Schmitt, 1996; Moritz, Kasl, & Berkman, 1995; Steen et al., 2001), while others suggest that both cognitive impairment and disability may show roughly parallel progression (Barberger-Gateau, Dartigues, & Letenneur, 1993). For example, Artero et al. (2001) noted that, over a 3-year follow-up interval, decline in language and visuospatial skills corresponded to an overall drop in activity performance, with visuospatial deficits being most strongly related to decline in a number of specific areas of decline on everyday tasks (i.e., dressing; going to bed; use of telephone; mobility; toileting, involving bladder and bowel, bathing, dental hygiene). Our own work in this area (Tuokko et al., 2005) suggests that cognitive impairment and disability may be seen independently, but the likelihood of developing disability after cognitive impairment is high.

## *Functional Impairment and Pathology*

In the original model of the disablement process put forward by Verbrugge and Jette (1994), the development of disability is initiated by pathology. Diseases and disorders affecting many different body systems (e.g., pulmonary, renal, hepatic) can adversely influence cognitive functioning (e.g., Tarter, Butters, & Beers, 2001). However, we have chosen to limit our discussion here to the pathological processes of diseases affecting the brain (e.g., abnormal biological or biochemical changes), many of which are often immeasurable until death. For instance, despite technological advances in the study of medicine, extracellular β-amyloid senile plaques (SPs), and intracellular accumulations of neurofibrillary tangles (NFTs), the neuropathological markers of AD are only identified postmortem. As such, only presumptive diagnoses of possible and probable AD (based on NINCDS-ADRDA criteria) may be assigned premortem (McKhann et al., 1984). Given this substantial limitation, we have elected to focus on the disease processes that affect brain function and result in measurable cognitive changes in the geriatric population. We have chosen to classify disorders leading to cognitive impairment in old age according to their progression (e.g., rapid deterioration, maximal neurologic deficit at onset, progressive decline, variable, reversible with intervention, Tuokko & Hadjistavropoulos, 1998).

### Rapid Deterioration

#### Acute Confusional State

Acute confusional state (ACS) or delirium is an acute condition resulting from a general medical condition, substance intoxication or withdrawal, exposure to toxins, or medication use, alone or in combination. To receive a diagnosis of ACS, a person must not meet the criteria for dementia. ACS is especially prevalent among elderly persons: hospitalized (10–30% point prevalence), individuals 75 or older living in nursing homes (60%), and terminally ill (80%). In general, 20–25% of elderly persons admitted to hospital are delirious on arrival or develop ACS while hospitalized (Lipowski, 1994). ACS serves as a marker for serious illness in the elderly and necessitates emergent care. Although a full recovery is possible following treatment of the underlying condition, elderly persons typically continue to exhibit residual deficits. In the elderly, ACS due to a general medical condition is also associated with a high risk of mortality (15–30% die within 30 days of hospitalization; Lipowski, 1994).

### Maximal Neurologic Deficit at Onset

#### Cerebrovascular Disease and Vascular Dementia

Cerebrovascular disease (CVD) is associated with significant cognitive and physical deficits. The cognitive deficits are often the result of an acquired dementia (i.e., vascular dementia, VaD) resulting from varied cerebrovascular incidents (e.g., stroke, cerebral hypoperfusion causing anoxia; Onyike, 2006). VaD accounts for approximately 13% of the dementias in the Canadian population (Ebly, Parhad, Hogan, & Fung, 1994). The occurrence and development of VaD is dependent on the type, severity, and location of the cerebral infarct. Moreover, VaD and AD pathology often coexist, resulting in a diagnosis of mixed dementia. The severity of dementia is often higher in persons with mixed dementia. For example, data from the Nun Study reveal significantly poorer cognitive performance among nuns whose brains at autopsy met the neuropathological criteria for AD and contained infarcts (Snowdon et al., 1997). In his review of CVD and dementia, Onyike (2006) suggested that AD may be a symptom of VaD, given arguments that sporadic AD is due to cerebral hypoperfusion (de la Torre, 2004). De la Torre argued that, despite its popularity, research does not support the amyloid hypothesis (i.e., deposits of amyloid-b-peptide and NFTs are the cause of progressive neurodegeneration in AD). Rather, he argued that evidence supports a vascular hypothesis (i.e., the risk factors for AD are primarily vascular in nautre and can cause cerebral hypoperfusion) in which age and vascular risk factors create a condition of cerebral hypoperfusion, thereby affecting cellular energy and resulting in cognitive impairment, neurodegeneration, and ultimately AD (de la Torre, 2004).

## Progressive Decline

### Dementias

The etiology of dementia may be due to several neurologic diseases, including AD, Parkinson's disease (PD), Lewy bodies, or frontotemporal dementia (FTD). The prevalence of dementia varies from 1.4% to 1.6% in persons aged 65–69 and increases to 16–25% in persons 85 years and older (APA, 2000). In the CSHA (CSHA Working Group, 2000), the prevalence of dementia was shown to increase from 2.4% to 11.1% then to 34.5% in persons aged 65–74, 75–84, and 85+ years, respectively. *Dementia* is defined as a progressive, stable, or remitting cognitive disorder that is not better accounted for by delirium. It is characterized by cognitive deficits, including memory impairment and at least one of executive dysfunction, aphasia, apraxia, or agnosia. The symptoms must represent a decline from premorbid functioning and cause clinically significant impairment in social or occupational functioning.

### Alzheimer's Disease

Alzheimer's disease is the most prevalent of the dementias, accounting for approximately 60% of all dementias (Terry, 2006). The prevalence of AD is positively correlated with increased age (i.e., 0.6% in males aged 65 compared to 36% in males aged 95 years). AD is a progressive dementia with an average survival time of 8–10 years (APA, 2000). The neuropathological markers of AD, as seen at autopsy, include cerebral atrophy (especially in the temporal and parietal lobes), loss of cholinergic neurons in the nucleus basalis of Meynert, abnormal intracellular accumulations of tau protein in the form of NFTs, abnormal accumulations of cellular debris and b-amyloid protein in the form of extracellular SPs, and amyloid deposits in the arteries and arterioles. NFTs are typically found in the hippocampus, entorhinal cortex, and neocortex of persons with AD. SPs are found in the neocortex and mesial temporal cortex. The severity of dementia is reported to increase with the distribution of NFTs and SPs (Terry, 2006).

### Parkinson's Disease

Parkinson's disease is a movement disorder characterized by bradykinesia (slowed movement), rigidity, resting tremor, and postural instability. The neuropathological underpinning of PD is the degeneration of dopamine neurons in the pars compacta region of substantia nigra. The disease is also marked by neuronal Lewy body inclusions and adrenergic and cholinergic neuronal atrophy. Over 8 years, 78.2% of persons with PD developed dementia (Aarsland et al., 2001). PD is estimated to affect 2% of persons over 65 years of age, 20–40% of whom have comorbid depression (Lieberman, 2006).

### Lewy Body Dementia

Lewy bodies, eosin inclusions in neuronal cytoplasm, were first identified in the brains of patients with PD. Compared to Parkinson's dementia, for which patients are diagnosed with PD more than 1 year before the onset of dementia symptoms, Lewy body dementia

(LBD) is characterized by dementia early in the course with some features of PD (McKeith et al., 2005).

The distribution of a-synuclein Lewy bodies determines the type of pathology: brain stem predominant, limbic, or diffuse neocortical (McKeith et al., 2005). LBD shares several neuropathological markers with other forms of dementia. Specifically, Lewy bodies are present in the cortex and basal ganglia of both PD and LBD; cortical and subcortical dopaminergic deficits due to atrophy of substantia nigra neurons are observed in both PD and LBD; and cholinergic deficits are observed in both LBD and AD (Selwa & Gelb, 2005).

## Variable

### Frontotemporal Dementia

Frontotemporal dementia is due to the degeneration of the frontal and temporal lobes of the brain. FTD accounts for approximately 5–15% of all dementias (Selwa & Gelb, 2005) and is more rapidly progressing than AD (i.e., mean survivals time after symptom onset of 8.7 ± 1.2 years and 11.8 ± 0.6 years, respectively; Robertson et al., 2005). The average age of onset for FTD is 40–60 years (Tuokko & Hadjistavropoulos, 1998). Although FTD is a progressive dementia, it is also described as having a variable course due to the fluctuating cognitive symptoms of the disorder (Tuokko & Hadjistavropoulos, 1998). FTD may present with personality, behavior, executive, or language (i.e., primary progressive aphasia) deficits. Three variants of FTD have been isolated: behavioral/dysexecutive FTD (a frontal lobe variant), semantic FTD (temporal lobe variant), and progressive nonfluent aphasia (PNFA) (Boxer & Miller, 2005).

## Reversible with Intervention

### Depression

Depression, identified as a mood disturbance (APA, 2000), is common in the geriatric population. Several depressive syndromes are described in the text revision of *DSM-IV* (*DSM-IV-TR*; APA, 2000), including major depressive disorder, dysthymic disorder, bereavement, and adjustment disorders. A common clinical referral question addresses whether an older adult's cognitive deficits are related to depression (i.e., pseudodementia) or dementia. Depression in the elderly is often accompanied by cognitive impairments (Lockwood, Alexopoulos, & van Gorp, 2002). Dementia and depression, however, do not necessarily occur in isolation. Rather, increasing depression is associated with the development of dementia. It is not clear whether dementia precedes depression or vice versa (Barberger-Gateau et al., 2002).

## Relations Between Disease/Disorder and Functional Limitations

The disorders described differ with respect to underlying pathology and in how they manifest in terms of functional limitations (i.e., cognitive impairments) and associated disability (i.e., impairment in everyday behaviors). These disorders are perhaps best conceptualized as syndromes that may or may not be linked to specific etiologies. It has been proposed that these syndromes can often be distinguished based on key features of the presenting functional limitations (i.e., patterns of cognitive deficits) and associated disability (Tuokko & Hadjistavropoulos, 1998). Table 10.1 links the disease/disorder in question to the typical presenting functional limitations.

It is important to note that some of these disorders and their associated underlying pathology are degenerative, and the cognitive or behavioral presentations may change or evolve over time. For example, in the AD literature, Reisberg and colleagues (1984) have proposed seven identifiable stages based on cognitive or behavioral presentation presumed reflective of the severity of the underlying pathological brain damage (see Table 10.2). In fact, despite differences in the initial symptoms of different forms of dementia (e.g., primary memory deficit in AD; behavioral and executive dysfunction in the frontal variant of FTD), because of the progressive nature of most dementias, they are all characterized by severe functional limitations and disability at the end of the disease process.

## Modifying Factors

The disablement process is described as the natural process of disease. However, it is not a fixed process. Rather, several innate and developed personal characteristics, as well as intra- and extraindividual processes, occur along the continuum of the disablement process

**Table 10.1** Cognitive and behavioral symptoms of common disorders affecting older adults

| Domain | ACS | CVD & VaD | AD | PD | LBD | FTD | Depression |
|---|---|---|---|---|---|---|---|
| Awareness | Disorientation to time and place | | Progressive loss of awareness of deficit | | Confusion | Lack of awareness, no insight | |
| Memory | Impaired recent memory | Often preserved | Impaired recent and remote memory | Impaired recall | Impaired recall | Impaired memory for words | Memory deficits due to lack of attention |
| Attention and executive function | Impaired ability to focus, shift, or sustain attention | | Difficulty sustaining attention | Executive dysfunction | Obvious deficits in attention and executive function | Disinhibition, socially inappropriate, perseveration, attention deficits, impulsive | Impaired selective and sustained attention, slow processing speed, indecisive |
| Language | Dysarthria, dysnomia, dysgraphia, aphasia | | Difficulty sustaining attention | Executive dysfunction | Obvious deficits in attention and executive function | Disinhibition, socially inappropriate, perseveration, attention deficits, impulsive | Impaired selective and sustained attention, slow processing speed, indecisive |
| Perception | Delusions, hallucinations, misinterpretations | | Progressive paranoia, visuospatial dysfunction | | Visuospatial dysfunction, visual hallucinations, delusions | | |
| Emotional | Fear, anxiety, depression, anger, euphoria, apathy | Pseudobulbar affect | Apathy, disinterest, personality change | Depression, apathy | Depression | Flat affect, apathy, personality change, irritability | Disinterest, apathy, loss of pleasure, lack of motivation |
| Physical | Hypoactivity | Physical deficits dependent on location of cerebral infarct | Apraxia, difficulty dressing | Bradykinesia Rigidity Resting tremor Postural instability | Spontaneous parkinsonism (bradykinesia, rigidity, hypomimia, postural, gait abnormalities) | Increase in eating or drinking | Slowed movement |
| Other | Altered sleep-wake cycle | Focal neurological signs or symptoms | No loss of consciousness | Dementia symptoms at least 1 year after motor symptoms | Early-onset dementia Extreme sensitivity to neuroleptics, rapid eye movement sleep disturbance, loss of consciousness | Early-onset, fluctuating cognitive symptoms, lack of personal hygiene, changes in appetite | Poor performance on measures reliant on frontal lobe function |
| Course | Fluctuating | Stable or stepwise | Insidious onset Progressive course | Insidious onset Slowly progressive | Fluctuating | Insidious onset Rapidly progressing and variable | Abrupt onset Variable course |

ACS, acute confusional state; AD, Alzheimer's disease; CVD, cerebrovascular disease; FTD, frontotemporal dementia; LBD, Lewy body dementia; PD, Parkinson's disease; VaD, vascular dementia.

**Table 10.2** Reisberg's Functional Assessment Stages (FAST) in Normal Aging and AD

| Global Deterioration Scale | Clinical Phase | FAST Characteristics |
|---|---|---|
| 1. No cognitive decline | Normal | No functional decrement manifest, either subjectively or objectively |
| 2. Very mild cognitive decline | Forgetfulness | Complains of forgetting location of objects; subjective work difficulties |
| 3. Mild cognitive decline | Early confusional | Decreased functioning in demanding employment settings evident to co-workers; difficulty in traveling to new locations |
| 4. Moderate cognitive decline | Late confusional | Decreased ability to perform complex tasks such as planning dinner for guests, handling finances, and marketing. |
| 5. Moderately severe cognitive decline | Early dementia | Requires assistance in choosing proper clothing; may require coaxing to bathe properly |
| 6. Severe cognitive decline | Middle dementia | (a) Difficulty putting on clothing properly (b) Requires assistance bathing; may develop fear of bathing (c) Inability to handle mechanics of toileting (d) Urinary incontinence (e) Fecal incontinence |
| 7. Very severe cognitive decline | Late dementia | (a) Ability to speak limited to one to five words (b) All intelligible vocabulary lost (c) All motoric abilities lost (d) Stupor (e) Coma |

and have an impact on the rate of progression and transition from one stage to the next. These modifiers include disease/impairment-specific risk factors, protective factors, and interventions to delay the progression of the disease.

## Risk Factors

According to the original model proposed by Verbrugge and Jette (1994), *risk factors* are those characteristics of a person that exist prior to the beginning of the disablement process. They include demographic, social, genetic/biological, environmental, educational, and recreational factors. In this chapter, we discuss risk factors that are preexisting personal characteristics associated with an increased incidence of cognitive decline. They predispose an individual to cognitive impairment or dementia and may also influence the course of the disablement process (Barberger-Gateau et al., 2004). A sample of risk factors for select diagnoses of cognitive impairment and associated supportive research follows.

### *Age*

With the lengthening of the human life span, there has been increased interest in the study of aging and dementia. The most prominent risk factor associated with cognitive decline is age. As noted, the prevalence of dementia was shown to increase from 2.4% to 11.1% and then to 34.5% in persons aged 65–74, 75–84, and 85+ years, respectively, in the Canadian population (CSHA Working Group, 2000). Increasing age is also a risk factor for cognitive impairment not meeting the criteria for dementia. For example, age was found to be a risk factor for cognitive impairment no dementia (CIND) in the older Italian population (Di Carlo et al., 2000) and the Australian population (Low et al., 2004) and for cognitive decline in the Canadian older population (Graham et al., 1997). Positive correlations between incidence rates of dementia (i.e., the number of new dementia cases each year) and advancing age are also reported. For example, in persons up to 90 years of age, the incidence of dementia continues to increase with advancing age without reaching a plateau (Ravaglia et al., 2005). Similar findings were reported in the European Studies of Dementia (EURODEM), a pooled examination of dementia in the Netherlands, the United Kingdom, France, and Denmark. The incidence rate for dementia in persons aged 65 years was 2.5, compared to 85.6 in persons aged 90 years or older (Launer et al., 1999).

### *Gender*

The role of gender as a risk factor for cognitive decline differs according to diagnosis. Specifically, the female gender is associated with a greater risk for AD. In contrast, men have a higher risk of developing VaD. For example, Yamada et al. (1999) reported AD prevalence rates of 3.8% and 2.0% for women and men, respectively. In contrast, women had VaD prevalence rates of 1.8% compared to 2.0% for men.

### *Genetic Risk*

Having first-degree relatives with a history of dementia may be a risk for dementia. Launer et al. (1999) reported a positive but insignificant risk for dementia in persons with two or more family members with a history of dementia. Family history of dementia occurs almost twice as frequently in persons with VaD and AD compared to nondemented persons (Boston, Dennis, & Jagger, 1999).

Genetic risk factors associated with AD involve four genes: amyloid precursor protein (APP), presynilin genes 1 and 2, and the apolipoprotein E (ApoE) gene. Unlike the first three genes, risk associated with the ApoE gene is not due to mutation of the gene. Rather, its presence is speculated to predispose individuals to AD (Hsiung, Sadonick, & Felman, 2004). ApoE is located on chromosome 19 and consists of three alleles: ε2, ε3, and ε4. The ε4 allele is associated with an increased risk of dementia.

Results from the CSHA (Hsiung et al., 2004) revealed the prevalence of the ApoE ε4 genotype to be significantly higher in those with AD and VaD. Similar findings were observed in persons who progressed from CIND to AD. New and nonprogressing CIND cases and CIND cases who subsequently reverted to a diagnosis of no cognitive impairment (NCI) had distributions of ApoE ε4 similar to control subjects. In addition, an interaction between age and ApoE ε4 genotype was noted in persons with AD. Specifically, age of onset of AD and age of progression from CIND to AD were significantly associated with the ApoE ε4 genotype. The authors suggested that these interactions may account for the earlier onset of AD and earlier conversion to AD in persons with the ApoE ε4 genotype.

Similar increase in risk was noted by Frikke-Schmidt, Nordestgaard, Thudium, Moes Grøholdt, and Tybjærg-Hansen (2001) in their sample of Danish participants. The ε44 and the ε43 genotypes were associated with 10- and 3-fold increases in the risk of AD compared to persons with the ε34 genotype. The increased risk associated with the ApoE ε4 allele was not limited to diagnoses of AD. Rather, a 2.5-fold increase in risk of "other dementia" was also noted in persons with the ε43 genotype. The authors reported that, overall, the ε44 and the ε43 genotypes, respectively, accounted for 37% and 20% of AD, and the ε43 genotype accounted for 26% of other dementias in the general population.

The risk of dementia associated with ApoE ε4 genotype has also been linked to vascular risk factors. Baum et al. (2006) found a significantly greater percentage of persons with VaD (23.6%) compared to controls (15.1%) who had the ApoE ε3/ε4 or ε4/ε4 genotype. The relationship between VaD and ApoE ε4 was significant only in patients with comorbid hypertension or diabetes.

### *Vascular Risk Factors*

Risk of cognitive decline associated with various cerebrovascular factors differs according to type of dementia (i.e., VaD vs. AD). Hayden et al. (2006) examined the differential risk of AD and VaD associated with cerebrovascular factors using data from the Cache County Study of Memory Health and Aging. Overall, increased risk of dementia was associated with older age, female gender, ApoE genotype, history of stroke, and history of obesity. The following disease- and gender-specific risk factors were identified: (a) history of diabetes in men with AD; (b) history of diabetes in women with VaD; (c) obesity in women with AD; (d) hypertension in women with VaD.

While hypertension has been associated with VaD, hypotension has been identified as a risk factor for AD. Verghese, Lipton, Hall, Kullansky, and Katz (2003) reported that in persons over 75 years of age, ongoing low diastolic blood pressure increases the risk of developing AD. The authors hypothesized that hypotension may predispose a person to dementia and may also be an outcome of dementia.

Xu, Qiu, Wahlin, Winblad, and Fratiglioni (2004) investigated the role of diabetes as a risk factor for dementia using data from the Kungsholmen Project. Diabetes was identified as a significant risk factor for dementia, especially VaD. The risk of dementia associated with diabetes was further magnified with comorbid severe systolic hypertension and heart disease. The authors speculated that diabetes may increase the risk of dementia through both vascular and nonvascular effects. On its own, diabetes was not identified as a risk factor for AD. Hassing et al. (2002) reported similar findings of significantly increased risk of VaD, but not AD, in persons with Type 2 diabetes.

### *Pregnancy*

Women with a higher number of pregnancies have a higher risk of dementia than women with fewer pregnancies. In a study of 204 AD and 201 control Italian older women, Colucci et al. (2006) found that women with three or more pregnancies had an earlier age of onset of AD (71.7 ± 7 years), compared to women with less than three pregnancies (75.6 ± 6.7 years).

Moreover, the risk of dementia was three times greater in women with three or more pregnancies. The authors hypothesized that the greater prevalence and earlier onset of AD in women with three or more pregnancies may be due to increased exposure to estrogen and progesterone.

### *Head Trauma*

There are mixed results in the literature regarding the role of head trauma as a risk factor for the development of dementia. For example, in the Rotterdam Study, none of head trauma with loss of consciousness (LOC), multiple head traumas, time since head trauma, or length of LOC was significant risk factors for dementia (Mehta et al., 1999). Similar results were observed in the European population-based study of dementia (EURODEM; Launer et al., 1999). In contrast, in a study examining the risk of dementia among war veterans with and without early closed head injury, Plassman and colleagues (2000) found moderate and severe early head trauma to be significant risk factors for the development of AD. In a recent review of 15 case-controlled studies, Fleminger, Oliver, Lovestone, Rabe-Hesketh, and Giora (2003) confirmed that head injury is a significant risk factor for AD in males. These studies highlight the disparity of results of the risk of dementia among persons with head injury.

## Protective Factors

Theoretically, protective factors modify the disablement process by delaying or preventing the onset or progression of cognitive decline. It can be difficult to identify the specific variables that serve to protect against cognitive decline. As discussed next, easily researched variables, such as education, may serve as a proxy for more remote variables, such as lifestyle, quality of education, access to health care, or socioeconomic status (McDowell, Xi, Lindsay, & Tuokko, 2004).

### *Education*

Head circumference and education have been identified as protective factors against the development of dementia. For example, in the Nun Study (Mortimer, Snowdon, & Markesbery, 2003) smaller head circumference and low education were associated with a four-fold increase in the development of dementia. These results are in concert with earlier findings that the clinical manifestation of dementia is delayed in persons with larger brains (Katzman et al., 1988). The “brain reserve capacity” (BRC) is a passive threshold model of cognitive impairment following damage to the brain (Stern, 2002). The BRC model hypothesizes that different clinical manifestations of similar brain damage are due to differences in the brain itself (e.g., number of synapses or neurons). In theory, persons with greater BRC can tolerate more damage to the brain before crossing the “threshold” for clinical expression of cognitive impairment (Satz, 1993). Thus, according to the BRC model, sisters in the Nun Study with smaller head circumferences may be described as having lower BRC; therefore, they surpassed the threshold for clinical impairment earlier than those with larger head circumferences.

Some suggest that higher levels of education serve to protect against cognitive impairment by enhancing one’s cognitive reserve, thereby delaying the onset of cognitive decline (Cummings, Vinters, Cole, & Khachaturian, 1998). Cognitive reserve is based on the theory that differences in the clinical outcome of brain damage are due to individual differences in intellectual, educational, and occupational achievements. Persons with higher cognitive reserve can theoretically withstand greater damage to the brain before exhibiting clinical symptoms of cognitive impairment because of proficient use of intact cognitive abilities. Unlike the BRC model, the cognitive reserve model is not a threshold model. It is not assumed that there is a predetermined threshold that, once surpassed, is associated with cognitive or functional impairment (Stern, 2002). Rather, the cognitive reserve model holds that individuals with the same BRC but differing levels of cognitive reserve will exhibit diverse clinical presentations following similar injury to the brain (Fig 10.2; derived from Stern, 2002). When applied to dementia, Fig 10.2 suggests that Person A, who has more cognitive reserve, can withstand greater synaptic degeneration before exhibiting symptoms of cognitive decline compared to Person B, who has less cognitive reserve.

Cognitive reserve is described as an “active model” in which there is an active attempt by the brain to compensate for damage (Stern, 2002). Le Carret et al. (2003) suggested that level of education supports and increases cognitive reserve by developing and maintaining two multifaceted cognitive functions: controlled processes and conceptual skills. In a population

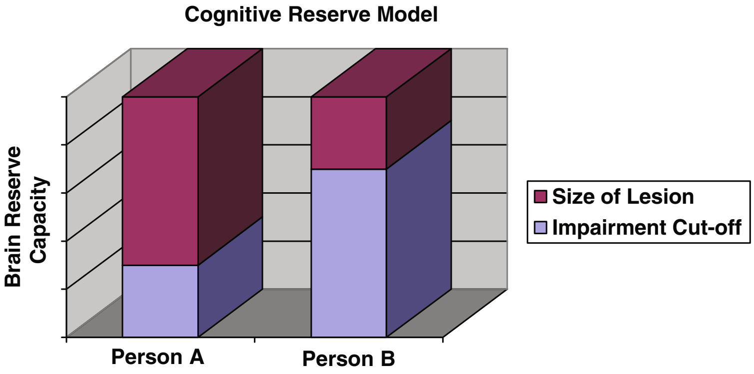

**Fig. 10.2** Cognitive reserve model.

sample of normal, healthy French elderly persons, higher education was associated with higher neuropsychological performance, especially on attention-focused tasks. Together, controlled processes and conceptual skills are hypothesized to delay the clinical expression of cognitive decline through proficient cognitive functioning.

Classifying education as a protective factor that potentially delays the onset of cognitive decline or dementia is not without controversy. Several studies suggested that the protective effects of education are limited with respect to age. For example, data from the Canadian Study on Aging suggest that education protects against cognitive decline in persons younger than age 80 years (McDowell et al., 2004). Similar findings were reported in the Framingham Study, a community-based study examining the role of education in the incidence of dementia (Cobb, Wolf, Au, & D'Agostino., 1995). The authors reported an absence of education as a risk factor for dementia when controlling for age. It has been proposed that the protective effects of education in delaying the onset of dementia may reflect an "ascertainment bias." For example, McDowell et al. (2004) suggested that highly educated individuals may be more adept at and familiar with testing practices similar to those utilized in neuropsychological assessments. Alternatively, given findings that higher-functioning (HF) persons with incident dementia exhibit more rapid cognitive decline than lower-functioning (LF) persons with incident dementia, Tuokko, Garrett, McDowell, Silverberg, and Kristjansson (2003) proposed that the ascertainment bias reflects the use of inappropriate normative data for the detection of dementia in HF individuals. As such, cognitive decline is not identified in these individuals until the later stages of impairment. Moreover, education may serve as a proxy for other potentially protective factors such as socioeconomic status (i.e., better lifestyle, access to better health care) and occupation (i.e., mental stimulation, exposure to toxins). These possibilities, however, do not invalidate the role of education in the dementia process. Rather, the protective effect of education on the dementia process may be indirect instead of linear (McDowell, Xi, Lindsay, & Tierney, 2007).

Also reducing the risk of cognitive decline with aging is regular physical activity. For example, in a longitudinal study of the relation between cognitive function and regular physical activity in women aged 71 to 80 years, Weuve et al. (2004) identified a 20% reduction in the risk of cognitive decline in the most physically active women. The authors described the observed decline in risk as equivalent to being 3 years younger than their less-active counterparts. The cognitive benefits of physical activity were not limited to extremely active women. Better cognitive functioning was observed in women who walked more than 90 minutes per week compared to those walking for less than 40 minutes per week.

An active lifestyle among aged persons serves to promote cardiovascular and nervous system health, thereby delaying the onset of cognitive decline. In particular, cardiovascular exercise promotes cognitive functions associated with the frontal and parietal regions of the brain, which are instrumental in promoting such functions as working memory and attention (Colcombe & Kramer, 2003; Colcombe et al., 2003).

Research using magnetic resonance imaging (MRI) of the brain revealed significant increases in both gray and white matter volume in elderly (aged 60–79 years) persons following a 6-month aerobic exercise routine. The largest increase in gray matter was located in the frontal lobes, while white matter volume increases were largest in the anterior third of the corpus callosum (Colcombe et al., 2006). The benefits of short-term cardiovascular training appear to be restricted to specific brain regions and cognitive functions that are vulnerable to age-associated declines, and as with education, it is possible that some of the protective effects of education are due to factors associated with it, such as nutrition and lifestyle (Churchill et al., 2002).

Although beneficial to promoting both physical and cognitive health, the resulting neural effects of exercise may be enhanced by cognitively stimulating experiences. Human and animal studies have each contributed to the understanding of the complimentary roles of exercise and experience in preserving neural and cognitive function in late life. Overall, aerobic exercise promotes neurogenesis into late life, while exposure to cognitively stimulating environments (i.e., learning) promotes the growth of synapses within the brain (Churchill et al., 2002). These results suggest that, in persons "destined" to develop dementia, physically active, well-educated, cognitively stimulated older persons should exhibit slower rates of cognitive decline compared to sedentary, less-educated persons with repetitive nonstimulating occupations or activities.

## Interventions

In contrast to risk and protective factors, intervention practices are typically introduced following the discovery or identification of specific impairments to slow or prevent the progression of decline (Verbrugge & Jette, 1994). For example, following a left temporal lobe stroke, a patient may be enrolled in rehabilitative speech pathology to address issues of aphasia. Interventions can take place at any level of the disablement process and are classified as either intraindividual or extraindividual. Intraindividual interventions are those processes that originate within the patient (e.g., self-efficacy), while extraindividual interventions are processes that are initiated or provided by sources outside of the patient (e.g., cognitive rehabilitation) (Verbrugge & Jette, 1994).

Interventions have been researched to both prevent and slow the progression of dementia. Using Caplan's (1964) classifications of prevention, interventions designed to prevent the development of dementia in at-risk, but asymptomatic, persons are means of primary prevention. In the context of the current discussion of interventions implemented in response to the disablement process, the interventions of interest are secondary prevention mechanisms—interventions put into action by or for persons exhibiting symptoms of cognitive decline to prevent or slow further decline.

### *Intraindividual Interventions*

There are a number of actions a person may take to reduce the demands placed on them, thereby allowing them to maximize their functional capabilities. In describing the disablement process, Verbrugge and Jette (1994) make reference to activity accommodations (i.e., what people do or the activities they engage in, how they do it, for how long, and how often) and psychosocial coping strategies (i.e., adjustment of the definition of self in the face of chronic conditions and dysfunctions). In describing behavior change associated with the aging process, Baltes and colleagues (Baltes & Lang, 1997; Baltes & Baltes, 1990) referred to selective optimization with compensation (SOC), by which an older adult *selects* (actively or passively reduces the overall number of goals and pursuits to conserve energy for goals determined to be most important), *optimizes (*refines the means and resources necessary to reach a goal or to excel in a chosen domain), and *compensates* (searches for and makes use of alternate means to reach goals once old means are no longer available). Although neither Verbrugge and Jette (1994) or the SOC model examined what motivates an older adult to compensate or select to maintain their level of everyday functioning, awareness has been identified as playing a key role in compensatory behavior, with those who are more aware of their own deficits more likely to compensate for them and find alternative methods of completing desired tasks (e.g., Diehl, 1998). It is this understanding or awareness that promotes the use of compensatory or adaptive behavior that allows people to continue to function well despite difficulties performing specific activities.

Although many people with cognitive impairments are painfully aware of their deficits early in the course of the disorder, others are not and may not engage in compensatory behaviors, thereby placing themselves and others at risk of harm. For example, there is substantial literature to suggest that some older adults with dementia continue to drive even in the face of significant impairment (e.g., Wild & Cotrell, 2003). Similarly, there is some evidence to suggest that dementia patients with insight make significantly greater gains in intervention programs addressing cognitive and affective functioning (Koltai, Welsh-Bohmer, & Schmechel, 2001) than those without insight.

### *Extraindividual Interventions*

The functional transitions model (FTM) was designed to improve clinical practice with AD patients by predicting and preparing for progressive functional decline associated with the disorder (Slaughter & Bankes, 2007). Recall that the progression of AD is reported to occur in seven stages. The goal of this staging was to allow clinicians to identify both disease-related progression and disability due to comorbid factors (Reisberg et al., 1984). Understanding the predicted transitions and identifying impairments due to comorbid conditions allow families and caregivers the opportunity to plan for probable declines in the patient's function (e.g., consider possible intervention strategies; establish the patient's care wishes [e.g., living will], power of attorney). Anticipating functional declines provides the opportunity to be better able to cope with progressive declines (Slaughter & Bankes, 2007).

Several interventions have been proposed as effective treatments (not cures) for dementia. From a medical perspective, pharmacological treatments, such as cholinesterase inhibitors (ChEIs), are the most researched extraindividual interventions for slowing the progression of dementia. Despite recent findings that persons in the early stages of AD do not exhibit diminished levels of the neurotransmitter acetylcholine, cholinesterase inhibitors are the most effective treatments for symptoms of AD (Chertkow, 2006). Meta-analysis of three approved ChEIs (donepezil, rivastigmine, and galantamine) revealed significant but modest increases on a global assessment score compared to placebo (Lanctôt et al., 2003). Long-term treatment with donepezil (i.e., at least 2 years) has been found to reduce levels of annual cognitive decline in persons with AD compared to non-donepezil-treated patients (annual declines of 1.2 and 2.8 points on the Mini-Mental State Examination, respectively; Tomita et al., 2007).

Positive results for the treatment of AD have been found with memantine, an N-methyl d-asparate (NMDA) receptor antagonist. This drug is approved for the treatment of severe AD in Europe and the United States. It has also proven to be effective in the treatment of mild-moderate AD. In a 6-month, randomized, placebo-controlled study, mild AD patients receiving memantine treatment exhibited statistically significant better cognitive functioning than placebo-receiving mild AD participants. Statistically superior language and memory abilities were found in the memantine-treated group (Pomara, Ott, Peskind, & Resnick, 2007).

Other pharmaceutical interventions (both prescribed and over-the-counter products) have been utilized for the treatment of memory disorders in old age. Such products include ginko biloba, nootropics ("dietary supplements"), antioxidants, vitamin E, estrogen, anti-inflammatory agents, to name a few. For a good review of existing and emerging pharmacological treatments for memory impairment, see the work of Chertkow (2006). For a review of the pharmacological treatments available for non-Alzheimer's dementia, see the 2006 work of Arlt and Jahn. From a clinical psychology perspective, cognitive rehabilitation has been identified as an intervention for persons with AD and VaD. Clare and Woods (2004) have identified three cognitive interventions with different foci for use with people with dementia. Cognitive stimulation is typically conducted in a group format and, while encompassing a cognitive element, generally has an equal emphasis on social interaction. Cognitive training, designed to maintain current cognitive abilities and slow the progression of cognitive decline, is undertaken in group or individual format and consists of ongoing practice of exercises targeting specific cognitive domains (e.g., memory, attention, language, praxis). Improvement on cognitive tasks is believed to generalize to activities outside the training regime. Cognitive rehabilitation programs are tailored to the individual patient and involve working with the patient and their caregiver to design specific strategies (e.g., use of memory aids) to compensate for cognitive deficits. Examples of cognitive rehabilitation techniques include spaced retrieval, errorless learning, and mnemonics. Cognitive stimulation and rehabilitation are reported to be effective treatments for persons diagnosed with early AD. There is limited research to support the utility of cognitive training for the treatment of dementia (Woods & Clare, 2006). Similar cognitive rehabilitation approaches are used to address cognitive deficits resulting from a cerebrovascular event (e.g., stroke, anoxia due to hypoperfusion, etc.), traumatic brain injury (e.g., from a fall), or illness/disease (e.g., diabetes).

The aim of pharmaceutical treatments, cognitive stimulation, and cognitive training is to increase the patient's cognitive capacity and in turn maintain or improve his or her current level of independence. Other interventions aim to decrease the environmental demands with which the patient is struggling. The implementation of memory aids in cognitive rehabilitation essentially modifies the memory demand of the task to meet the abilities of the person. Relocation to a care facility reduces the environmental demands for intact IADLs (e.g., grocery shopping, cooking) or ADLs (e.g., personal hygiene) by providing the necessary supports for the patient. Different levels of care are available and are dependent on the patient's level of independence. Interventions that decrease environmental demand and those that increase personal capacity aim to create a better fit between the patient's environment and their abilities (Verbrugge & Jette, 1994).

Overall, the goal of implementing intervention programs is to slow the progression of the disablement process. However, interventions can have negative outcomes for the individual and serve to "exacerbate" the existing deficits (Verbrugge & Jette, 1994). For example, relocation to an institution is associated with increased levels of disability (Barberger-Gateau et al., 2004). Woods (1999) suggests that, in many care settings, dependence is encouraged over autonomy. This finding is consistent with Baltes's (1982, 1988) theory of learned dependency, in which dependent behavior among elderly persons is rewarded socially, while independent behavior is frequently ignored (Horgas, Wahl, & Baltes, 1996). Coping with feelings of loss (e.g., freedom, possessions, independence) is perhaps the biggest obstacle for persons entering a nursing home. Inability to do so can result in withdrawal (e.g., activities, meals, socializing) and depression (Harker, 1997). Depression in older adults is associated with impairment in executive functioning (Lockwood et al., 2002). Thus, although the goal of institutionalization is to improve the fit between the personal capacity and environmental demand, it is important to address and plan for the potential negative consequences associated with the transition.

## Conclusion

The use of the disablement process clearly illustrates the complexities of identifying impairment in geriatric populations. Within the disablement process framework, functional impairments refer to abnormalities within specific body systems (here, we have focused on disorders affecting brain function), whereas functional limitations refer to restrictions in physical and mental activities, often referred to as impairments outside the context of this model (e.g., cognitive impairments). In practice, it is often these functional limitations or the resulting disability (i.e., impairments in everyday functioning) that bring older adults to clinical attention. We discussed a number of different approaches to the identification of cognitive impairment (e.g., comparison to normative samples, to assess change over time, in relation to specific criterion for achievement) and sets of criteria for disorders of cognitive functions. In addition, we described common approaches to assessing impairments in everyday functions (i.e., disability) and how these impairments relate to cognitive impairment. We described common underlying pathologies related to disorders of cognition in older adults, noting how differences in patterns and presentation of cognitive and behavioral impairments are often the basis from which inferences are drawn concerning the presence of these pathologies. We identified modifying factors that have an impact on emergence, rates of progression, and functional outcomes associated with the expression of these pathologies: risk factors, protective factors, and interventions. The inferences drawn about the nature of the underlying pathology are of primary importance for determining prognosis and selecting medical intervention options (e.g., pharmacologic agents to slow, arrest, or reverse the pathological process). On the other hand, it is the clarity with which functional limitations (i.e., cognitive and behavioral) are understood that lays the foundation for behavioral and psychosocial interventions intended to optimize functioning, minimize the risk of disability, and prevent dysfunctional social or family functioning (Woods & Clare, 2006). Particularly within the context of geriatric populations, in which biological, psychological, and social changes are expected and highly interdependent, the disablement process framework offers a comprehensive view of the myriad factors that need to be considered when assessing and interpreting the meaning of impairment.

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# Chapter 11

# Assessing Occupational Disability Following Trauma and Impairment

Jasen M. Walker and Stacey A. Petersen

Rehabilitation professionals have come to recognize the importance of comprehensive assessment in evaluating the employability of individuals who may have acquired occupational disability secondary to trauma. Disability evaluation and rehabilitation professionals do not always agree on nomenclature and specific methodologies, and as a result, both the meaning and practice of assessing occupational disability vary. For many years, however, occupational disability assessment and vocational rehabilitation following trauma have been considered comprehensive, intradisciplinary processes of evaluating an individual's physical, mental, and emotional abilities; limitations from identifiable medical impairment; and residual functional capacities to help the injured person experience optimal restoration (Power, 1991).

The National Institute on Disability and Research (1992) summarized the role of assessment and measurement in rehabilitation as follows: "Consumers are measured to establish their eligibility for benefits or services, to determine which services are appropriate, to assess their needs, to ascertain their current level of functioning, and to estimate their potential" (p. 1). Cushman and Scherer (1995) noted that Anne Anastasi presented three definitions of assessment during her 1993 Master Lecture at the 100th American Psychological Association annual meeting: (a) testing as a whole; (b) any information-gathering technique regarding individual behavior; and (c) the clinical and intensive study of an individual in which test scores are considered together with all of the relevant data and information. Cushman and Scherer declared that they preferred the third definition, and we concur.

Disability assessment integrates medical, psychological, social, educational, vocational, cultural, and psychometric data into a process that explains the effects of medical impairment on an individual's occupational capabilities. Despite the recognition that comprehensive assessment is fundamental to disability evaluation and occupational rehabilitation, the practice of disability evaluation following the onset of impairment remains highly eclectic. Moreover, notwithstanding the growing appreciation for the difference between medical impairment and occupational disability (Holmes, 2007), many physicians are asked to determine vocational capacity.

In this chapter, we define the lexicon of vocational/disability evaluation and occupational rehabilitation, trace its origin, briefly review relevant literature related to assessment of impairment and evaluation of disability following trauma, and describe a model of vocational disability assessment. We make our bias known. Physicians diagnose disease and attempt to ameliorate the effects of impairment. Vocational evaluators trained in a variety of disciplines, generally allied with but outside medicine, assess disability.

Accurate assessment of vocational disability following injury or trauma should be a concern for health care professionals, employers, public policy makers, and society in general. If for no other reason, human injury is expensive. Direct medical costs and indirect costs, such as lost productivity due to traumatic brain injury (TBI) alone, totaled an estimated $60 billion in the United States in 2000 (Finkelstein, Corso, & Miller, 2006). The U.S. Bureau of the Census (2006) estimated that in 2003 medical costs for injured workers were $25.6 billion, and compensation payments were in excess of $26.9 billion. The National Safety Council (2007) reported the economic impact of fatal and nonfatal unintentional injuries amounted to $625.5 billon in 2005.

A multiphase economic study has replicated findings that workplace disability costs the average American employer just over 8% of payroll (Berkowitz, Chelius, & Dean, 1992; Berkowitz, Chelius & O'Leary,

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1994; Berkowitz & O'Leary, 1997). If one were to imagine a company with a modest $6 million payroll (100 employees averaging $60,000 in annual wages and benefits each), annual disability costs at that company would average $480,000.

Traumatic injury and resultant disability are expensive. Precision and accuracy in disability assessments can only benefit the individual being evaluated, employers, and society in general as inaccurate assessments are likely to be the subject of scrutiny, further inquiry, misguided treatment, and additional expense. Precise assessment begins with differentiating among the phenomena of trauma, impairment, and disability.

## Trauma

People arrive at the disability evaluation process most often following trauma. The term *trauma* originates from the Greek word meaning "wound." Bodily trauma can take place in many ways. Slip and fall incidents, motor vehicle collisions, work accidents, physical assaults, shootings, and surgeries can cause trauma. Mild physical trauma does not always cause damage. For example, striking one's elbow on the arm of a chair (hitting the "funny bone") is a mild form of trauma that seldom causes damage to the organism, and if it does, the damage is not necessarily permanent. However, ulnar nerve injuries can cause permanent damage, and when irreversible damage occurs, the trauma has caused anatomic or physiologic change, which is described in this chapter as impairment.

Definitions of trauma are myriad and too diverse to adequately summarize here. Classen and Koopman (1993) described trauma as "an abrupt physical disruption in ordinary daily experience, often with loss of control over the body" (p. 178). Courtois (2004) spoke to complex trauma as "a type of trauma that occurs repeatedly and cumulatively, usually over a period of time and within specific relationships and contexts" (p. 412).

Trauma can be the result of a single event or repetitive exposures to environmental forces. Industrial explosions can cause trauma. Repetitive assembly operations can cause trauma and injury. Repetitive trauma often occurs because muscles are repeatedly stressed, tendons become inflamed, nerves get pinched, or blood flow becomes restricted (Van Fleet & Bates, 1995).

The American Psychological Association's *Dictionary of Psychology* (VandenBos, 2007) defines trauma as a physical injury or event in which a person witnesses or experiences a threat to his or her own life or physical safety or that of others and, as a consequence, also experiences fear, terror, or helplessness. Likewise, the effects of trauma can be numerous. Psychological responses during and related to trauma include temporary psychophysiological reactions and development of permanent mental disorder. Dissociative symptoms concomitant to traumatic experiences include stupor, derealization, depersonalization, numbing, and amnesia for the event (Classen & Koopman, 1993). Survivors of automobile accidents often report a dulling of senses during the accident (Noyes, Hoenk, Kuperman, & Slymen, 1977, as cited in Classen & Koopman, 1993). Traumas that are seen as being caused by others (e.g., rape, assault, toxic accidents) generally have more psychological effect on victims and their significant others than those caused by natural disasters (e.g., earthquakes) (VandenBos, 2007).

Acute stress disorder (ASD) is a diagnosis in the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision* (*DSM-IV-TR*) (2000), and by definition, ASD should resolve within 4 weeks after the conclusion of the traumatic event. However, psychological responses to trauma can be more enduring and pervasive. Post-traumatic stress disorder (PTSD) is a diagnosis that grew from the observations and formulations of researchers concerned with the devastating effects of war trauma on individual soldiers, but according to the *DSM-IV-TR*, PTSD can occur at any age, including childhood. Survivors of rape, child abuse, domestic violence, and other traumatic experiences can also develop PTSD. Moreover, chronic PTSD has been linked with diminished health and longevity of Vietnam War veterans (Boscarino, 2005). As the result of severe, cumulative, or complex trauma, maladaptive psychological responses can be chronic and debilitating.

According to Herman (Herman, 1992a, 1992b, as cited in Courtois, 2004), symptoms associated with complex PTSD include alterations in the regulation of affective impulses; attention and consciousness; self-perceptions; perception of the perpetrators;

relationships with others; position or medical problems; and alterations in systems of meaning.

Not all traumatic injuries produce enduring psychological sequelae. When it does occur as a result of trauma, dissociation, for example, does not necessarily persist (Esposito & Mellman, 2005). Likewise, other psychological symptoms to trauma have been found to abate with time. Grunert et al. (1992) discovered that the majority of workers with injured hands assessed 5 days postinjury reported flashbacks and nightmares. At 3-, 6-, 12-, and 18-month follow-ups, however, many of these nonexertional symptoms had diminished, although some, including flashbacks and avoidance behaviors, persisted.

Trauma may be described as mild, moderate, or severe, but these vague scales in the evaluation process are qualitative at best and may provide little meaning in the assessment of impairment and disability. What is clear is that trauma can produce physical or mental damage to the individual. With time, the effects of trauma can abate, but the residuum from trauma may be permanent and can be measured in terms of impairment, physical or mental.

## Impairment

Impairment is defined by the American Medical Association (AMA) (Cocchiarella & Andersson, 2001) as the loss, loss of use, or derangement of any body part, system, or function. Impairments may be exertional or nonexertional in nature. The Social Security Administration (SSA) offers a program policy statement (SSA, 1978) that clarifies the distinction between exertional and nonexertional impairments. Exertional impairment affects the performance of work activities involving strength and endurance, such as standing, walking, lifting, and otherwise performing the essential requirements of sedentary, light, medium, heavy, or very heavy work. A nonexertional impairment is one that is medically determinable and causes functional limitation generally unrelated to strength or environmental restriction. For example, a speech impairment or a hearing disorder may be considered a nonexertional impairment. Most mental disorders can be classified as nonexertional impairments. One would expect licensed clinical social workers, psychologists, and psychiatrists to diagnose a mental impairment and hopefully assess its effects on mental and emotional functioning. Impairment is evaluated in a variety of ways and is customarily the purview of health care providers with a particular expertise related to the type of injury, illness, or impairment. Therefore, orthopedic surgeons are concerned with trauma to the musculoskeletal system, including bones, joints, and muscles. Neurologists assess what is thought to be impairment of the central and peripheral nervous systems, and neuropsychologists generally assess cognitive deficits and other changes in brain behavior. Psychiatrists and psychologists diagnose and assess mental and emotional disorders. The American Psychiatric Association relies on the *DSM-IV-TR* (2000) to categorize mental disorders and provide criteria for diagnosis. In its introduction, the *DSM-IV-TR* reminds its readers that the term *mental disorder* implies an unfortunate distinction between "mental" and "physical," as the compelling literature documents that the mind/body dualism is misleading: "There is much 'physical' in 'mental' disorders and much 'mental' in 'physical' disorders" (p. xxx).

Each health care specialist possesses more or less reliable methodologies to assess the nature and degree of impairment. When necessary, there may be attempts to determine the permanency of impairment. Diagnoses and impairments, however, are insufficient to provide a basis for disability. The critical link between impairment and disability is functional capacity.

## Functional Capacity: The Critical Link

The critical link or keystone between impairment and disability is functional capacity, and in disability evaluation, accurately assessing functional capacity is of significant importance in evaluating disability and predicting employability. Nonetheless, the evaluation of an individual's residual functional capacities following trauma remains a challenge for rehabilitation professionals. Among the primary issues are the validity and reliability of functional capacity assessments (King, 2004). Although thought to be a substantial improvement over the practice of a physician simply filling out a physical capacity checklist, solid empirical data with respect to the validity and reliability of the functional capacity evaluation (FCE) is still lacking. Randolph, Nguyen, and Osborne (as cited in Talmage & Melhorn,

2005) recommended that the FCE be used in conjunction with the practitioner's thorough understanding of the examinee's health problem and medical history. Still, the FCE appears to be an improvement over the so-called educated guess offered by most physicians in response to questions regarding the injured person's postinjury physical capacities.

Similarly, psychiatric or psychological statements regarding residual functional capacity are dubiously reliable in terms of predicting an individual's disability and employability. Knowing the diagnosis and Global Assessment of Functioning (GAF) of the individual with mental impairment is likely to be insufficient in accurately assessing the degree of motivation, self-control, functional skills, and tolerance for stress that individuals bring to prospective employment. The GAF forms the fifth axis of the standardized diagnostic procedure followed in the *DSM-IV-TR* (American Psychiatric Association, 2000) and seeks to quantify psychological, social, and occupational functioning on a continuum of mental illness.

Because trauma can result in permanent physical or mental impairment, and functional capacity assessments are currently designed only to investigate the impaired person's physical capacities, rehabilitation professionals must turn to other assessment tools and procedures to appreciate the examinee's residual employability following trauma that may have resulted in mental impairment and associated dysfunction. The SSA (2005) cited limitations in concentration, persistence, or pace as representative of disabling mental impairment. Fortunately, significant attention has been paid to the validity and reliability of mental measurements, including standardized psychological and vocational tests that can measure an individual's concentration, persistence, and pace. Unfortunately, psychological and vocational testing in disability assessments is not always employed, and when utilized, psychometrics in vocational disability evaluation are not always administered with issues of ecological validity in mind.

*Ecological validity* refers to the real-world meaningfulness of data-gathering activities. The term was coined by Egon Brunswik (Hammond, 1998), who was concerned with ergonomics, the application of human factors in the design of objects and systems in the environment. How a person behaves at the time of an FCE or disability assessment may not necessarily predict how the person will function in a work setting, and essentially that is the challenge to rehabilitation professionals.

## Disability

In describing the relationship of trauma and impairment to occupational disability, one must reiterate the important distinction between impairment and disability (Walker, 1993). The AMA *Guides* (Cocchiarella & Andersson, 2001) references the difference between impairment and disability. As noted, *impairment* is defined as "a loss, loss of use, or derangement of any body part, organ system, or organ function" (p. 3) and is evaluated best by medical means. On the other hand, *disability* is "an alteration of an individual's capacity to meet personal, social, or occupational demands" (p. 3). The World Health Organization (WHO, 2007) defined disability as an activity limitation that creates a difficulty in the performance, accomplishment, or completion of an activity in a manner that is within the range considered normal for a human being. The Americans with Disabilities Act of 1990 (U.S. Department of Justice, 2007) speaks to disability as having a physical or mental impairment that substantially limits one or more of an individual's major life activities; having a record of impairment; or being regarded as having an impairment. In this chapter, we are concerned with the occupational consequences of medical impairment.

*Occupational disability* may be defined as an individual's loss or limitations in employment capabilities secondary to physical or mental impairment. Vocational disability can have a strong social component. Observations and research have shown that vocational disability can be induced by social dynamics, and disability can be ameliorated or managed through psychological and social interventions, transition to work, ergonomic assistance, or career change, to name a few (Walker & Heffner, 2006). Vocational or occupational disability is best assessed by qualified evaluators who possess an understanding of medical impairments and their effects on functionality. Through comprehensive assessment, vocational disability evaluators can develop an accurate prediction of how the individual's history of impairment will have an impact on the essential functions of employment for which he or she is best qualified given the person's residual physical capabilities, age, education, work skills, potentials to benefit from retraining, and return-to-work possibilities through job reengineering.

Scheer (1991) pointed out that society is accustomed to putting physicians in decision-making roles for assessing work capacity or vocational disability and expecting physicians to make disability determinations, often without collaborating with other assessment professionals. By training, however, physicians are ill prepared to assess work disability, capability, and employability. Nonetheless, the family physician in particular is commonly called on to serve as an occupational health physician and to assess vocational capacity. Walker (2007) and others (Growick, 2004) have described, in detail, the problems facing physicians and other health care professionals (i.e., physical and occupational therapists) in assessing an individual's functional capacity following physical injury or illness, and yet, assessing functional capacity is only part of the tripartite analysis (i.e., impairment, functionality, and residual employability) of disability. Following the occurrence of trauma, impairment and then functionality must be carefully investigated prior to determining the examinee's occupational disability and assessing his or her employability.

Rehabilitation professionals trained in vocational disability evaluation realize that assessment of occupational disability following trauma is a comprehensive, intradisciplinary process of evaluating an injured individual's physical, mental, and emotional capacities in an effort to identify an optimal vocational fit and, in most cases, a return to work (Power, 1991). In forensic vocational disability assessments, those carried out for court purposes, rehabilitation is probably not the goal. Nonetheless, assessment is the same and involves the gathering and integration of data for purposes of making evaluations, decisions, or recommendations (VandenBos, 2007, p.751). Assessing vocational disability following trauma for any purpose is logically multidisciplinary, integrating information from a variety of sources, as accurate assessment requires reliable data from more than one specialty.

Assessment of disability and employability following trauma begins with appreciating the functional effects of impairment, and the various assessment methodologies employed to determine functional capacity are dictated to some extent by the nature of the impairment. Assessment of occupational disability following brain injury resulting in both exertional or strength deficits (e.g., hemiplegia) and nonexertional impairments (i.e., cognitive and emotional deficits) will likely require physical capacity testing, neuropsychological investigation, and ultimately, vocational evaluation, the last to determine if the individual with multiple impairments can still carry out work-related activities on a competitive level.

Assessment strategies for determining disability are therefore dictated to a large extent by the nature of the permanent impairments presented at the time of evaluation. An individual with a permanent impairment of the lumbar spine following a work-related trauma involving lifting may not demonstrate postaccident psychological problems and may require no more than physical capacity testing after reaching maximum medical improvement through physiotherapy.

Thorough assessment of disability following trauma, however, requires a comprehensive and detailed investigation of an individual's medical history and residual functional capacities. The examinee's social and family background, educational history, acquisition of vocational skills through experience, and potentials to acquire additional skills through postinjury training or job experience are critical areas of inquiry.

The more thorough the assessment, the more likely it is to carry ecological validity. The prediction of vocational functioning from laboratory or clinical diagnoses alone remains a concern. The rehabilitation professional wants to know how an examinee's performance on an FCE and scores on various tests compare to what is expected in a job description or in relation to those performances of unimpaired cohorts with whom the examinee will compete in the labor market.

In terms of assessing the occupational disability and residual employability of individuals experiencing psychiatric or psychological symptoms following trauma, the input from treating mental health professionals regarding the examinee's diagnosis and capacities for nonexertional work demands can be helpful. For example, whether the psychologically impaired person can communicate and cooperate with others in a workplace is essential in determining if a person is disabled from the essential function of teamwork. Moos, Nichol, and Moos (2002) conducted research that led them to conclude that GAF ratings were only minimally associated with treatment outcomes and were of questionable value in a program for predicting the allocation and outcomes of mental health care. No consistent relationship has been identified between psychiatric symptoms and vocational performance, making diagnostic categories poor predictors of future work performance (Anthony & Jansen, 1984). On the other hand, a person's functional capabilities and occupational adjustment exhibited in a clinical setting and in response to work-like tasks, such as problems on psychological tests and work samples, may still be important observational data in assessing disability and residual employability. For example, whether the psychologically impaired person can communicate and cooperate effectively with others in an evaluation would seem to have merit in terms of predicting work behaviors. Likewise, because standardized tests are designed to measure behaviors, a person's performances on appropriately selected psychological and vocational measures would seem to have value in predicting work performance following the onset of impairment.

It is in light of the experience and research of others that we advocate multidisciplinary, comprehensive assessment to include documentation regarding the examinee's medical history and disabling impairment; careful observation during a detailed structured clinical interview; and analysis of relevant data from both functional capacity assessments and psychological/vocational testing. Assessing occupational disability is greatly enhanced through "clinical and intensive study of an individual in which test scores are considered together with all other relevant data and information" (Cushman & Scherer, 1995, p. 3). As stated, we concur with Anastasi (as cited in Cushman & Scherer, 1995) and propose a three-part model to disability assessment: (a) review of detailed documentation; (b) structured clinical interview data; and (c) results of ecologically valid psychovocational testing.

## Assessing Disability: Practical Applications

Although there are many elements of investigation that have the potential to contribute to disability assessment, beginning with determination of physical or mental impairment, the findings of impairment alone should not be considered equivalent to disability. As stated, there is a, sometimes considerable, difference between impairment and disability. Walker and Heffner (2006) noted that the presence of impairment alone does not determine an individual's capacity to meet social or occupational demands. Disability is more complex than a change in mental or physical functioning secondary to impairment; it is a multifaceted combination of physical, social, and psychological factors. Breeding (2005) recognized that the impact of a medical impairment largely depends on the perception of the person affected, and he added that the psychosocial impact on two people with identical impairments can be quite different.

A major objective of disability assessment is to determine an individual's capacity to meet social and occupational demands. The goal of the disability assessment process is to develop a detailed picture of the individual being evaluated, including, among other factors, medical impairments, residual functional capacities, postinjury aptitudes and skills, personality characteristics, the environments in which the individual might again live and work, and levels of functioning prior to impairment. The individual's entire medical history is often important in disability assessment. Disease entities and resultant limitations can be antecedent to and a consequence of trauma, and these comorbidities, regardless of onset, may be occupationally significant. Due to the encompassing nature of disability, the information needed to adequately assess disability is necessarily comprehensive.

Although the methods for assessing disability in a forensic setting remain the same as for rehabilitation purposes, the goal of the former is often to answer a legal question. Typically, it is a question of whether an individual has incurred reduced employment capacity or lost potential to earn wages occupationally. Assessment for rehabilitation purposes generally produces recommendations, and forensic vocational disability evaluation aims to answer legal questions. Ideally, the initial assessment processes and methodologies remain the same.

It is important to consider the question of who is qualified to conduct disability assessments. Walker and Heffner (2006) indicated that it is a common misconception that members of the medical field are qualified to make determinations about disability. There are several concerns associated with this misconception, particularly as the determination of disability is reliant on many factors apart from medical expertise alone and are therefore beyond the purview of physicians (Cocchiarella & Andersson, 2001; Scheer, 1991; Talmage & Melhorn, 2005). The assessment of disability also requires training in the nature and demands of multiple forms of work and what is required of individuals to successfully participate socially in a work setting. Sleister (2000) correctly noted that the reliance on physicians and economists to provide assessment of an individual's capacity to work following impairment is ineffective as they do not have the expertise to speak to qualifications, physical requirements, or earnings for the more than 20,000 jobs in the U.S. labor market.

Often, in cases of personal injury for which disability assessment is required, vocational experts are the most qualified. Sleister (2000) provided a comprehensive discussion on the qualifications and abilities of vocational experts, which include knowledge of the psychosocial aspects of disability and a variety of occupational skills and characteristics. Weed and Field (2001) discussed the role of vocational or rehabilitation experts as professionals who are knowledgeable in vocational, educational, and psychological assessment practices. Weed and Field provided an overview of the forensic disability evaluation process. Ultimately, the disability assessor needs to be able to synthesize information from a variety of sources while maintaining a focus on ecological validity.

## The Elements of a Disability Assessment

Although Thomas (1999) noted that some feel the present state of vocational evaluation has lost its utility and that the formal process associated with disability assessment should be altered to reflect more of a screening process driven by self-report, we argue that thorough and accurate assessment should consist of three main parts: a review of pertinent documentation, a clinical interview, and the administration of standardized testing. Berven (as cited in Bolton, 2001) similarly described assessment for rehabilitative purposes as constructed of a review of client records, clinical interviews, observations, examinations by other professionals, and formal testing.

Before presenting each of these data-gathering areas in some detail, it is noteworthy to mention that reliance on a clinical interview solely is fraught with potential for error. Meyer et al. (2001) highlighted several possible errors, such as gathering data from poor or unreliable historians, using overly narrow interview formats, and having an inability to objectively determine exaggerated or biased self-reporting. It is also worth noting that through the use of testing in conjunction with interviews, the evaluator is able to measure a variety of features at the same time, compare individual performances to relevant norm groups, and follow standardized scoring and administration procedures, which lessen possible legal and ethical conflicts and likely increase the validity of the findings.

Sleister (2000) noted that throughout a disability assessment a skilled evaluator must be able to observe and assess personal characteristics, educational potential, and related work histories, which would be difficult to complete accurately through reliance on self-report alone. In addition, Breeding (2005) pointed out that in the research on disability, no link exists between the physical severity of an injury or illness and the psychosocial effects it has on a given individual; therefore, disability cannot adequately be assessed through medical examination alone.

Many disability evaluators have traditionally relied on transferability of skills analysis (TSA), a process of investigating the skills and traits a person has demonstrated during his or her working life, in order to recommend alternative job placement or retraining options after the onset of impairment. Despite its broad acceptance in the field of disability evaluation, we suggest that a TSA is not comprehensive enough to adequately assess disability and has several inherent flaws that lend against its use. In fact, some commentary suggests that little research, particularly empirical research, has been conducted to speak to the validity and usefulness of the practice (Dunn & Growick, 2000).

A major criticism of TSA is its rigidity, which often leads evaluators to overlook a range of alternate occupations available to a person simply because it falls outside of the description of his or her customary employment. TSAs actually evaluate the essential functions of job descriptions that the person reportedly carried out and intend to predict which skills the individual should be capable of doing with functional limitations. However, an individual's self-report of work history, job titles held, and specific work responsibilities is not a reliable method of ensuring the individual had actually acquired skills delineated by government job descriptions, such as those promulgated by the U.S. Department of Labor (1991). Job titles alone vary from workplace to workplace. Even with a very careful inquiry regarding the individual's training, tools, materials, and methodologies used, considerable variation can exist from one worker's job responsibilities and experience to another's.

The TSA method of disability assessment also assumes that an individual was well suited to prior employment, which may be untrue, and therefore not only presumes acquisition of work adjustment skills but also ignores potential vocational interests outside previous modes of work (Dunn & Growick, 2000). Dunn and Cain (2001) noted that often a return to employment following the onset of impairment is dependent on extravocational circumstances and activities, and a disability assessment is likely to be ineffective if these variables are not considered. Dunn and Cain also concluded that many elements of TSA are not relevant to determining vocational outcome, and furthermore, TSA does not appear to be as sensitive in identifying alternate vocations when the individual in question has greater physical effects of impairment.

Power (1991) concluded that when assessing an impaired individual's current level of functioning, the use of standardized tests, such as aptitude and achievement tests, is warranted because specific knowledge of how an impaired individual's abilities or competencies compare with those of nonimpaired individuals may be necessary for rehabilitation planning to be relevant.

### *Review of Pertinent Documentation*

The process of assessing disability is greatly enhanced by the review of critical documents, which can provide a wealth of information not typically available to an evaluator. It is not possible to gather all of the needed information for a disability assessment through a clinical interview and testing alone, particularly given the limited time allotted for those tasks. Through the review of additional records, the evaluator often has better access to the social environment in which the individual lives and works. For example, by reviewing employment records, it is possible to obtain information about how an individual typically performs at work through performance reviews, disciplinary actions, workplace injury reports, and attendance logs. Review of these records may also provide valuable insight into the employee-employer relationship, which may influence an individual's motivation to return to work following impairment. It can also serve to highlight supportive social environments that can be utilized to support a return to employment or avocational activities.

Medical documentation can be vital in a disability assessment and stands as a historical reflection of the individual's health. As mentioned, some individuals can be unreliable historians or may intentionally distort or omit aspects of their health history that they feel will influence the outcome of a disability assessment. Reviewing documentation of medical treatment, both prior to and after an injury or illness, has the potential to provide a more complete body of information than some individuals may provide in an interview. Reviewing medical records is especially important if the individual in question had been diagnosed with particular conditions, such as advanced heart disease or diabetes, that could have interfered with his or her ability to participate in work prior to the issue in question.

Apart from employment and medical records, in some cases academic records can provide excellent information about an individual's baseline or premorbid performance for formal testing and his or her specific skill sets. At times, academic records identify a starting point in a long history of absenteeism or disciplinary issues. These types of records also have the potential to illustrate postinjury avenues for someone who must consider alternate work following the onset of impairment.

Ultimately, the review of records provides the evaluator with information about an individual as that person may be living from day to day as opposed to how that person presented in the assessment interview and performed during testing. Records provide a historical context to the disability assessment, a context that is hoped to include both pretrauma and postinjury data.

## Clinical Interview

The clinical interview is an essential element of a comprehensive disability assessment for several reasons. For one, it gives the individual evaluated the opportunity to express his or her personal experience prior to and after sustaining an impairment. Breeding (2005) highlighted the subjective nature of the impact of impairment and noted that information about an individual's lived experience is typically not available in documentation, testing, or general intake interviews. The clinical interview provides the examiner with the opportunity to ask an individual about a variety of areas in his or her life that may have been affected by impairment and to gather information about the person's lifestyle.

Perhaps the most important reason to conduct a clinical interview, as opposed to simply reviewing records, is that more often than not, people are much different in person than they appear to be on paper. This point comes into sharp relief when one considers the many different professional perspectives that build a body of records regarding an individual's care. The type of qualitative information generated in a clinical interview helps to construct a context for the assessment and resultant findings by exploring and incorporating the unique features of the individual.

There are numerous texts devoted to specific techniques, styles, and goals of interviewing, so only select points are briefly discussed here. Before conducting a clinical interview, the examiner should invest considerable time in practicing the required skills. Namely, data gathered from clinical interviews are greatly enhanced when the interviewer is a trained listener who recognizes and follows important leads instead of relying solely on the rather clerical nature of filling in a structured interview format. That is, although semistructured, the interviewer should respond and adjust to the unique features each individual brings to an evaluation. This is also essential to building rapport with the person interviewed and demonstrates that the examiner is listening. Berven (as cited by Bolton, 2001) suggested that during an interview the communication of empathy, respect, and genuineness has the power to augment the relationship and encourage disclosure.

During the interview, the evaluator's main tool is that of questioning, so it is essential to practice phrasing questions tactfully although directly. At times, individuals are resistant to being interviewed, and the evaluator must effectively confront the person to generate quality information. One method is simply to point out the individual's behavior, such as appearing uncomfortable, and then engage the person in a dialogue directed to resolve the resistance and resume the interview. For example, it may be that the individual feels uncomfortable meeting new people and simply needs a few additional minutes to adjust to the task. In forensic settings, some individuals come to evaluations with the knowledge that the opposing legal party sent them and therefore have preexisting notions of what the experience will entail. In any case, investing a few minutes to develop rapport with the individual and reduce resistance is worthwhile.

Another essential task of the clinical interviewer is to closely observe the person being interviewed. As mentioned, interviewing should not be considered a static clerical task but rather an opportunity to gather important qualitative data about a person. Observations might include noting the way an individual is dressed, monitoring body language or complaints of physical discomfort, surveying the person's emotional responses to different questions, and observing any obvious abnormalities in thinking or information processing. The evaluator may also want to observe the individual's level of social appropriateness and sophistication as the ability to be socially aware and accurately interpret social cues is essential to successful functioning in all but a select few vocational settings. Goleman (2006) explored the topic of social intelligence in detail.

The examiner should begin an interview by clearly stating the purpose of the evaluation. This includes stating any limitations to confidentiality, the source of the referral, and who will have access to the findings of the evaluation. The assessor should be prepared to answer any questions that the individual may have before beginning and should take care to ensure that the person has understood the purposes of the evaluation as stated.

When conducting a clinical interview as part of a disability assessment, it is important to structure the interview around the areas of the individual's life that generally have an effect on his or her productivity. This would include exploring the person's perceptions of his or her own abilities or disabilities, the role of work in the person's life as part of a detailed job history, and premorbid and unrelated postmorbid health issues. Berven (as cited by Bolton, 2001) suggested conducting an interview with at least a semistructured format so that other professionals assessing the individual are likely to reach similar conclusions or at least to understand how the conclusions of an interview are determined. During the clinical interview, the evaluator should take into account how the person spends a typical day, which in some cases has the potential to highlight new roles the individual has taken on that may reduce the likelihood of a return to full productivity. An example of this is when a person becomes the primary caretaker of the family almost by default while the spouse works.

There are certain concrete areas of an individual's experience that should be taken into account during a clinical interview as well, such as recording a list of any medications taken, including the dosage and frequency of use. Some medications can affect the speed or clarity of cognitive processing, thus affecting performance both on standardized testing and on general measures of productivity. It is also helpful to ask individuals to describe educational attainment, hobbies, and his or her family. This information further builds the context for a disability assessment.

If possible, it is helpful to interview other people who are significant in the life of the individual who is the focus of the evaluation. Often, significant others can offer valuable perspectives on the individual both prior to and after injury and can also speak to the person's residual abilities, activities, and interests. The need to interview significant others becomes evident when a child is the subject of evaluation, as it is essential to interview parents. This can also be the case if the subject of the evaluation is unable to participate in interviewing due to his or her physical or mental limitations.

## Standardized Testing

The final area of the three-part model proposed for conducting a disability assessment is the administration of standardized testing. This area is frequently overlooked or is undertaken incompletely by examiners. As mentioned, Meyer et al. (2001) pointed out the many benefits of using standardized testing as a valuable part of an assessment and even demonstrated that many published assessment measures are as reliable as medical tests like x-rays and computed tomographic scans. The use of standardized testing also provides unique information in that it can measure a person's aptitudes for retraining in a new vocation, for example. It is difficult to determine with any certainty a person's learning potentials based on self-report or historical documentation alone (Walker, 2004).

When designing a test battery to employ during a disability assessment, it is important to keep the concept of ecological validity in mind. That is, it is most logical to select measures that can provide information useful in the real world in which the person will be functioning. There is not much value in administering a test of manual speed and dexterity to a person who has suffered a major injury to his or her dominant hand unless attempting to demonstrate that, in fact, the hand is impaired. It would be more informative, not to mention a better use of time, to select measures for that person that speak to the basic skill sets required in areas in which he or she may be able to resume work or social activities. The availability of various workplace accommodations, such as voice-activated dictation, highlight the need to measure the basic, underlying skills a person has even if the person is impaired in using those skills via traditional methods. An individual who possesses skills associated with office work should not be considered excluded from that category of work simply because he or she lacks the capacity to type on a keyboard in a way that others do.

Typically, a test battery used for the purpose of disability assessment includes measures of achievement, intelligence, aptitudes, interests, personality dynamics, and at times, measures of effort (Walker, 2004). Standardized testing should always include objective measures of personality or temperament as opposed to only including subjective self-report measures. The use of self-report measures raises the potential for biased responding and offers no means of objectively determining when biased responses are given. Although not directly related to vocational skill, personality measures offer valuable information about an individual's suitability for a certain vocation. Even if an individual had the requisite skills for a career in sales, the person would likely not be successful if extremely introverted or socially timid. Personality measures not only provide objective information on how suitable a person is for a specific job, but also how likely the individual is to be satisfied with that particular work. In addition to administering an objective measure of personality, a test battery for disability assessment should also include measures of achievement to include basic academic skills, such as reading comprehension and mathematics. It is advisable to administer achievement testing early in a battery to ensure that later measures are appropriate for the individual's mathematic and reading abilities. There are also a variety of standardized measures that assess a range of work aptitudes, such as the Career Ability Placement Survey and the Differential Aptitude Test, that may be helpful.

When conducting disability assessment, it is important to incorporate the individual's personal and vocational interests as an individual should not be expected to undertake an activity that he or she finds repellent; in fact, it is likely that the individual would not sustain unappealing activity even if able. Evaluators should devote special attention to the interest inventory they employ to ensure that it adequately covers a large range of occupational interests, including more modern vocations, such as computer-related activities, if possible.

Another aspect of the test battery for disability assessment is testing designed to measure effort. There are several available measures for assessing the validity of an individual's effort and response style during testing that are informative to the process as sometimes individuals purposefully distort performance, particularly when secondary gain dynamics are present. Lynch (2004) offered some suggestions for identifying behaviors that indicate when validity testing is warranted, such as large discrepancies between subjective complaints and objective findings or a lack of cooperation during assessment efforts.

As with interviewing, test administration is a clinical process rather than a clerical task. The test administrator should make careful observations throughout the administration of standardized testing to gather qualitative data about how the person approached and organized each task. These observations should also include the individual's emotional response to particular activities, willingness to follow instructions, affect, and any signs of thought disorder. The examiner must be prepared to answer questions about not only the purpose of testing, but also specific questions about each test and therefore must be quite familiar with the measures. Frequently, it will fall to the examiner to help reduce anxiety associated with taking tests.

It is of great importance that the test battery and the examiner are responsive to the strengths, weaknesses, and needs of the individual assessed. As data are gathered during the interview and test administration, it is the examiner's responsibility to integrate the information and adjust the assessment so that the most useful information is collected.

The goal of medical and vocational rehabilitation is to maximize an individual's functioning following trauma and the onset of impairment and, if possible, restore that person's productivity. The comprehensive assessment initiates the disability evaluation and vocational rehabilitation processes, both of which are enhanced when practitioners fully appreciate the difference between impairment and disability.

## Conclusion

The vocational disability assessment process is of substantial concern to rehabilitation professionals, employers, and society in general. In this chapter, we provided specific definitions of vocational disability assessment and its key concepts, looked at relevant economic impact data, and continued by discussing the explicit methods used in disability assessment to evaluate the work potentials of individuals who are impaired physically or mentally. After defining trauma, we made the crucial distinction between impairment and disability. We described the vital role of the FCE in the assessment process.

Vocational disability assessment was discussed in depth in terms of practical applications, the elements of an assessment, and the "three-part model" of assessment. The three-part model, the heart of the assessment process, identifies the essential steps as (a) a document review, (b) the clinical interview, and (c) standardized testing.

The essence of this chapter is that the goal of vocational assessment is to develop a precise picture of the individual's capacity to function occupationally so that additional decisions regarding the examinee's potentials and productivity can be made.

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# Chapter 12
# Conclusion

Sam Goldstein and Jack A. Naglieri

In 2006, the National Institute of Disability and Rehabilitation reported the prevalence of disability in the United States for persons 5 years and older as 15% (Disability Status Report, 2006). Further, disability was reported to be greater among females, lower in Asians, and higher in African Americans and Native Americans than Caucasians. Disability in this survey was based on the following definition.

> **Disability and Disability Types:** The ACS definition of disability is based on three questions. (1) Does this person have any of the following long-lasting conditions: (a) blindness, deafness, or a severe vision or hearing impairment? [Sensory Disability]; (b) a condition that substantially limits one or more basic physical activities such as walking, climbing stairs, reaching, lifting, or carrying? [Physical Disability] (2) Because of a physical, mental, or emotional condition lasting six months or more, does this person have difficulty in doing any of the following activities: (a) learning, remembering, or concentrating? [Mental Disability]; (b) dressing, bathing, or getting around inside the home? [Self-Care Disability] (3) Because of a physical, mental, or emotional condition lasting six months or more, does this person have any difficulty in doing any of the following activities: (a) going outside the home alone to shop or visit a doctor's office? [Go Outside-Home Disability]; (b) working at a job or business? [Employment Disability]. A person is coded as having a disability if he or she or a proxy respondent answers affirmatively for one or more of these six categories. Disability Status Report 2006, p. 42

It still remains the case that the primary survey of disability in the United States not only fails to make a clear distinction between disability and impairment but also implies that disability is determined on the one hand by impairment (e.g., employment disability) and on the other by physical conditions (e.g. sensory disability). This large survey failed to take into account the emerging body of research that has been well documented in this volume demonstrating that equal disabilities do not lead to equal impairments in all individuals. In doing so, the broader fields of medical, mental health, and education remain shackled by antiquated ideas unsupported by a current literature.

As the authors of this volume have amply demonstrated, impairment and ultimately quality of life are predicted by a set of biopsychosocial variables that likely have an impact on each individual uniquely. The central scientific challenge facing researchers in this field today is not only to develop an understanding and appreciation of impairment but also to create a workable system to assess risk in the face of disability, evaluate impairment, and most importantly, intervene successfully to reduce impairment and in doing so improve quality of life. As such, this issue fits well with the emerging research on resilience. Resilience research is rooted in developing an understanding not just on what factors insulate and protect but how these factors go about exerting their influence. The study of resilience traces its roots back a scant 50 years. Early on, the field of study was not extensive, and the number of researchers devoting their careers to the examination of this phenomenon was fairly small. The study of resilience, however, has expanded significantly over the past 25 years. It is with a greater sense of urgency that resilience research has accelerated. The technological and cultural complexity of our society has increased at an exponential rate, appearing to go hand in hand with the number of individuals facing adversity and the number of adversities they face. More of our population across the life span appears at risk. As authors in this volume have demonstrated, even some individuals falling in a gray area, subthreshold for full disability consideration, can and do suffer significant impairments. Resilience researchers have accelerated their interest in not only understanding risk and protective factors in the face of adversity but also determining whether this knowledge can be distilled into a

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clinically relevant set of interventions that will increase positive outcome for those facing risk and can be applied to the population in general.

A number of longitudinal studies over the past few decades with youth have set out to develop an understanding of these processes, in particular the complex interaction of protective and risk factors, with the goal of developing a model to apply this knowledge in clinical practice (Garmezy, Masten, & Tellegen, 1984, Luthar, 1991; Werner & Smith, 1982,1992,2001). These studies have made major contributions by identifying resources across children's lives that predict successful adjustment despite adversity or disability as well as clarifying models of how these protective factors promoted adaptation (Wyman, Sandler, Wolchik, & Nelson, 2000). Whether these processes can be applied to the general population in anticipation of adversity remains to be demonstrated. Yet, a promising and emerging body of research suggests that even severely disabled individuals can be guided to live lives relatively free of significant impairment (Masten, 2001).

The process of creating an applied psychology of resilience in the face of impairment must begin with an understanding of the relevant variables and an appreciation and acknowledgment of certain key phenomena. Such a process must take into account a range of biological, psychological, and social factors, each with multidirectional influences contributing to adequate functioning over time (Sroufe, 1997). Such a model must also begin with the basic foundation examining and appreciating the concept of wellness. Wellness, as Cowen noted in 1991, must include competence, resilience, modification of the social system, and empowerment. In 1994, elaborating further on this concept, Cowen emphasized the importance of resilience within the broader concept of wellness. For Cowen, a wellness framework assumed the development of healthy personal environmental systems leading to the promotion of positive well-being and the reduction of dysfunction. A wellness framework emphasizes the interaction of the individual with family and environment. Thus, the quality of personal environment interaction may ultimately predict the strength and power of an individual's resilience in the face of adversity and in doing so may best predict ultimate level of impairment.

As multiple authors in this volume have demonstrated, the absence of pathology or diagnosis does not necessarily equate with psychological and physical wellness or the absence of impairment. This concept continues to represent a challenge that will have to be addressed in the coming years (Lorion, 2000). Medical and mental health professionals have been trained to collect data through a variety of means to measure symptoms. Such symptoms have been equated with poor adaptation, inadequate adjustment, distress, and life problems. Emphasis on the negative equates with the perception that symptom relief will ultimately lead to positive long-term outcome. In fact, as Russell Barkley noted in his foreword, the accepted nosology of all of these systems is a model that reflects assessment of symptoms and severity packaged into what at this point are weakly factor-analyzed frameworks. Still unavailable, however, are a nosology and system to measure adaptation, stress hardiness, and the qualities necessary to deal successfully with and overcome adversity—the very qualities needed to live life free of impairment. Yet, in clinical practice it is increasingly recognized that these phenomena rather than relief of symptoms or the absence of certain risk factors best predict adaptation, stress hardiness, positive adjustment, and freedom from impairment.

To move forward, we must expand beyond symptom-driven treatment interventions toward the development of a consensus set of definitions, model, and applied theories. There must be an increased focus on the ways of developing an understanding of those resilience factors within individuals as well as within the immediate and extended environment capable of insulating and preventing not only clinical and medical disorders but also reducing impairment in the face of such conditions. Understanding resilience is as important as developing "an understanding of the mechanisms and processes defining the etiological path by which disorders evolve and a theory of the solution conceptual and empirically supported or supportable intervention that alters these mechanisms and processes in ways that normalize the underlying developmental trajectory" (Cowen, 1994, p. 172). As Werner and Smith (1992) pointed out, "beating the odds" is an attainable goal. Such a goal must comprise a "science of prevention" (Coie et al., 1993) as well as scientifically demonstrated interventions to reduce impairment in those with such conditions and disorders.

The concept of resilience as a process to reduce impairment in the face of adversity is fairly straightforward if one accepts the possibility of developing an understanding of the means by which members of our species thrive emotionally, behaviorally, academically, vocationally, and interpersonally either in the face of risk and adversity or not. Such a model offers valuable insight into those qualities that likely insulate and protect in the face of wide and varied types of adversities. Although, as noted, a focus on symptoms and symptom relief (assessing risk alone) may be satisfactory for identification of immediate needs and diagnoses within a pathology model, such data are necessary but not sufficient to improve future functioning and reduce impairment. It has been well documented that not all individuals facing significant risk and adversity develop serious life problems. Risk factors also do not appear to be specific to particular outcomes but related more to broad, developmental phenomena. It is likely that there is a complex, multidimensional interaction among risk factors, biological functioning, environmental issues, and protective factors that ultimately combine to predict an individual's level of impairment in the face of adversity. Within this framework, resilience can be defined as an individual's achievement of positive outcomes and avoidance of maladaptive outcomes under adverse conditions.

In 1983, over 25 years ago, Bronfenbrenner and Crouter described a functional model that could very well lend itself today to building a foundation for a clinical psychology of resilience. This model contained four domains of influence: the acute stressor or challenge, the environmental context, the individual's characteristics, and the outcomes required. Although these authors were unable to address the exact mechanisms by which stressors or challenges interacted, such a model provides an interesting and workable foundation to begin addressing and applying resilience theory to the concept of impairment.

Finally, Werner and Johnson (1999) have well demonstrated that protective factors include dispositional attributes of the individual, the individual's daily interactions with family and friends, and finally the broader support offered by an individual's community. Such protective factors "moderate against the effects of a stressful or stress situation so that the individuals able to adapt more successfully than they would have had the protective factors not been present" (Conrad & Hammen, 1993 p. 594). The concept of resilience has not traditionally encompassed the potential of individuals to survive risks should they arise. Defining risks and protective factors relative to impairment is, as the authors of this volume have demonstrated, not going to be a simple process. They are likely variable in their presentation and impact on specific individuals. Application of a clinical psychology of resilience to impairment must be capable of defining and understanding the multiple pathways by which outcome, good or bad, is achieved.

In this volume, we have attempted with our coauthors to begin addressing many critical questions relative to impairment. As this text goes to press, it still remains the case that impairment secondary to medical, educational, and mental health disabilities and adversities represents a diverse and important set of myriad challenges facing our society. An increasing number of our citizens across the life span face lives influenced by medical, educational, and mental health disabilities leading to lives of pain, suffering, and adversity. In this volume, we have taken the first steps necessary to appreciate that within the broader context of prevention we can and must develop a system to address impairment in the face of adversity. Such a process will lead to a proactive, primary prevention model. Such a process, as Weisberg et al. (2003) noted, "is a sound investment in society's future" (p. 425).

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