Assessment and Classification of Psychological Disorders

4

CHAPTER OUTLINE

LEARNING OBJECTIVES

4.1 Explain what the mental status exam is and how it is used.

4.2 Identify cultural and other considerations used in the assessment of psychological disorders.

4.3 Identify the tests and techniques used in assessing mental illness.

4.4 Discuss diagnostic considerations in approaching psychopathology.

4.5 Explain the significance of the *DSM–5* and RDoC in the classification of mental disorders.

Elyn Saks told of her time as a graduate student at Oxford after graduating from Vanderbilt University. As a student at Oxford, she began to have a hard time concentrating on academic work and lectures. She turned in papers that her tutor did not understand. A friend of hers who was a nurse asked her

fiancé, who was a physician who specialized in neurology, to talk with Elyn. Elyn Saks remembers the conversation as follows:

"Jean and I are very concerned about you," he said quietly. "We think you may be quite sick. Would you mind if I asked you some questions?"

"I'm not sick," I responded. "I'm just not smart enough. But questions, yes. Ask me questions."

"Are you feeling down?"

"Yes."

"Loss of pleasure in daily activities?"

"Yes."

"Difficulty sleeping?"

"Yes."

Elyn Saks

"Loss of appetite?"

"Yes."

"How much weight have you lost in the last month?"

"About fifteen pounds."

"Do you feel like a bad person?"

"Yes."

"Tell me about it."

"Nothing to tell. I'm just a piece of shit."

"Are you thinking of hurting yourself?"

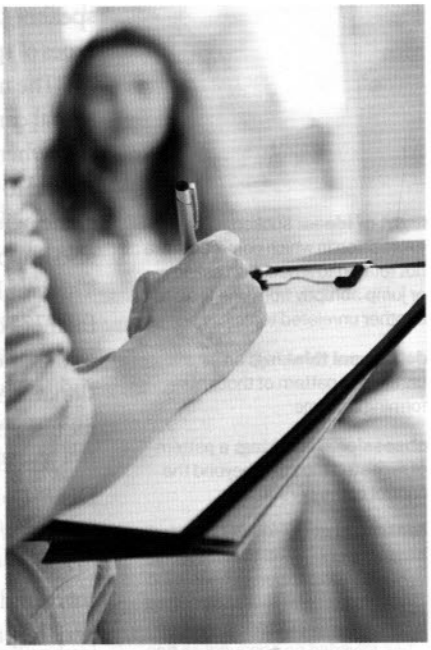
I waited a moment before answering, "Yes."

After a number of other questions, Elyn Saks was referred to a mental health professional to diagnose her distress and formulate a treatment plan. In this chapter, I will introduce you to the ways in which mental health professionals clarify the type of problems a person is describing. This will include methods of assessment that have been developed to maximize reliability and validity. I will then discuss the major classification systems used throughout the world.

Initial Assessment and the Mental Status Exam

As a clinician, people come to see you in a variety of ways. Some people set up an appointment and tell you about how they are feeling distressed. They may tell you about feeling anxious or sad. If you work in a hospital, people may be brought to you by others who are concerned by the behaviors they display or the experiences they describe. As a clinician, it is your job to make sense of the information you are given. The first task is that of *assessment*.

Psychological assessment is simply the process of gathering information about a person so that you can make a clinical decision about that person's symptoms. In the process, you may create a variety of hypotheses about the possible causes of the symptoms. Had the person taken drugs that were causing the behavior? Did the person suffer a negative experience such as being robbed or raped? Is the behavior part of an underlying physical or mental disorder? Part of the task of the clinical assessment is to gather data necessary to rule out or support the possible causes of the symptoms.



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During the clinical interview, mental health professionals gather information about the status of an individual they are working with.

psychological assessment: the process of gathering information about a person so that you can make a clinical decision about that person's symptoms

The Clinical Interview

Most mental health professionals use a clinical interview to initially gather information concerning the status of an individual with whom they are working. Since the interview is also an interaction between two people, it is a chance for the professional to establish rapport, which will lead to more complete information. The information gained from this interview includes not only the individual's present symptoms but also the social and cultural context in which these symptoms appear. This context includes the individual's social support, family relationships, and connections within his or her community. It is also important to assess the individual's attitudes, emotions, and experiences of others in his or her world. The clinical interview further offers the opportunity to assess the current ability of the individual to care for him- or herself.

Overall, the major areas of consideration in a clinical interview are (1) the current areas of distress and their history; (2) any past mental health problems; (3) social history including social support; (4) the manner in which cultural factors may influence the current condition; and (5) any way in which previous family, medical, or psychological factors may influence the current situation.

The Mental Status Exam

Throughout the world, the clinical interview has been organized into major categories and referred to as the **mental status exam.** This exam is often given quickly to gain initial information.

mental status exam: clinical interview organized into major categories designed to determine a person's cognitive processes

The first major category of the exam is the individual's appearance and behavior. In the report, the mental health professional would note such factors as the individual's clothing, grooming, and posture. Motor activity, such as slow movements, may be part of a later diagnosis of depression, whereas quick, abrupt movements may be associated with mania.

The second major category of the exam is mood and *affect*. Affect refers to the emotions that the individual is expressing during the interview. The person might seem happy or sad. The professional might note that the person laughs or cries in describing situations, where other individuals would not laugh or cry. Such affect would be described as inappropriate. It should also be noted if the individual shows no affect when describing situations such as receiving a large raise in pay or losing a friend, where others would be happy or sad. Such affect is said to be flat. Mood, as compared with present affect, is more long term. To assess this, the professional notes how the individual reports he or she has been feeling recently. Has the individual been feeling blue or angry?

The next category is speech quality. Here, the professional notes the manner in which an individual speaks. Is the person speaking quickly or very slowly? Does the person's manner of

speaking feel pressured? Does the person speak very quietly or with great volume? These are the types of speech characteristics the professional can observe and record.

The next major category is thought processes. In describing thought processes, the professional can note if the individual answers the questions that are asked and adds more information when appropriate. On the other hand, some individuals will produce responses that are not related to the question asked or tell a narrative in which each sentence is not related to the one that came before it. This is referred to as a **flight of ideas.** The content of the individual's thought is also important. Is there a theme to the thoughts, such as that the CIA is out to get the individual? This would be referred to as **delusional thinking.** Does the individual keep repeating a certain theme? For example, some individuals express constant concern that they will have a heart attack or that their spouse is cheating on them. This is referred to as **obsessional thinking.** The professional should also take particular note if the person is talking about suicide or homicide. This may require an intervention.

flight of ideas: spoken expression in which comments are not related to a question asked or jump abruptly from one topic to another unrelated topic

delusional thinking: an unrealistic pattern of thoughts forming a theme

obsessional thinking: a pattern of repeated thoughts beyond the control of the person

Another major category is perceptions and a general awareness of the surroundings. Distortions of perceptions can include hallucinations in which the individual perceives experiences without external stimulation. Individuals with a psychotic disorder may hear a radio program talking to them directly or respond to voices in their head. General awareness of the surroundings includes the question of whether the person knows who and where he or she is and the present date and time.

The final categories describe intellectual functioning and insight. Intellectual functioning is generally noted in terms of current vocabulary used in the interview as well as previous academic achievement. The professional can also note if the person has an abstract understanding of the information he or she is reporting. Insight refers to the individual's awareness of his or her own self and the factors related to his or her current situation and distress.

Structured Interviews and Assessment Considerations

A **structured interview** is an evaluation technique that is tightly systematized in terms of the questions asked. The idea is that by asking clients the same set of questions, it is possible to have better consistency across interviewers. Likewise, because every client receives the same questions, it is assumed that there will be more consistency across clients.

structured interview: an evaluation technique that is tightly systematized in terms of the questions asked, allowing for better consistency across interviewers and clients

Structured Clinical Interview for *DSM* Disorders

The current classification manual used by most clinicians in North America is the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM–5)* (American Psychiatric Association [APA], 2013).The *DSM* will be discussed in some detail later in this chapter. Based on the *DSM–5,* with its specific criteria for each category of psychological disorder, it is possible to ask questions in an interview that directly probe for the existence of these criteria. The **Structured Clinical Interview for *DSM* Disorders (SCID)** sets forth these questions along with a decision tree for directing follow-up questions. For example, if you want to determine if a person displayed an obsessive–compulsive disorder, you would begin with a general question concerning whether the individual experiences thoughts that kept recurring. If the person said yes, you would then ask what those thoughts were. The decision tree would help you to determine if these thoughts were seen by the individual as something produced in his or her own mind or imposed on the person by an outside agent. Thoughts experienced as not from oneself would be more characteristic of a psychotic disorder, whereas those recognized as coming from one's own mind might indicate a possible obsessive–compulsive disorder. Individuals with anxiety may also experience worries as thoughts coming into their mind, and the SCID would help to determine whether the person experiences obsessive–compulsive disorder or anxiety. The next set of questions would help the professional determine whether compulsions were also present. The SCID would instruct the interviewer to ask if there was anything the

Structured Clinical Interview for *DSM* Disorders (SCID): an interview that directly probes for the existence of the criteria for disorders within the current classification manual, the *DSM–5*

person had to do over and over again such as constant hand washing or checking a door lock several times.

Assessing Cultural Dimensions

Over the past 40 years, there has been an increasing awareness that mental illness takes place within the context of a particular culture (Henderson et al., 2016; Marsella & Yamada, 2007). Initially, there was a realization that specific disorders such as depression, schizophrenia, and stress-related disorders are understood differently in different cultures (Draguns, 1973; Draguns & Tanaka-Matsumi, 2003). That is to say, a fuller understanding of mental illness requires an understanding of context. Although every culture has words for severe mental illness such as psychosis, mood disorders such as depression, and anxiety, there is also variation in what is considered normality and deviance. *Cultural LENS: Empirically Supported Research Approaches and Cultural Competence* notes that culture not only informs one as to how to view one's distress but also influences how that distress is expressed.

With *DSM–5*, a **Cultural Formulation Interview (CFI)** has been developed to help mental health professionals obtain information concerning the person's culture. In general, the CFI focuses on five domains. These are described in *DSM–5* as follows:

Cultural Formulation Interview (CFI): a set of questions developed to help mental health professionals obtain information concerning the person's culture and its influence on behavior and experience

Cultural identity of the individual—This domain in *DSM–5* describes how the individual sees himself or herself in terms of ethnic, racial, or cultural identity. It can also include how connected the person is with the culture of origin.

Cultural conceptualizations of distress—This domain refers to how the person's culture would influence his or her experience of the disorder. For example, different types of symptoms might be more acceptable in one culture than another. Also, some individuals may be unwilling to describe the experience they are having in certain aspects of their lives.

Psychosocial stressors and cultural features of vulnerability—Psychological concerns, as noted in *Cultural LENS: Empirically Supported Research Approaches and Cultural Competence,* vary by culture. Likewise, the amount of support offered by the family and community also vary. In conducting an interview, the mental health professional needs to obtain an overall picture of the individual's social environment with an emphasis on how cultural elements affect the presentation of a particular distress or disorder.

Cultural features of the relationship between the individual and the clinician—This domain emphasizes how the relationship between an individual and a mental health professional can be influenced by cultural factors. If a person has experienced negative situations with those of authority in the world outside of the interview, this could influence how the person relates to the mental health professional. Likewise, if the culture places a high regard on health professionals, then the person may not correct or interrupt with additional information during the interview. This domain would also include how the person expects to be treated by the mental health professional and expectations for future treatment.

Overall cultural assessment—This domain represents an overall assessment and implications of what was identified in the previous domains. Treatment preferences can be described that may be incorporated into the treatment plan.

Understanding the cultural context of a disorder helps increase the validity of the assessment and diagnosis procedure. The CFI asks 16 questions related to culture indirectly. For example, the mental health professional would ask the person how his or her family, friends, or community view what is causing the problems. In this manner, people can describe their understanding of their problems with a direct or indirect reference to their culture.

CULTURAL LENS

Empirically Supported Research Approaches and Cultural Competence

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There is a movement in the training of mental health professionals to emphasize cultural competence.

Beginning in the 1950s and 1960s, there was a movement among researchers and clinicians to evaluate the effectiveness of both medical and psychological assessment and treatment in a scientific manner. In medicine, this came to be known as *evidence-based medicine*. In psychology, the terms *empirically based treatments* and *empirically based principles* refer to assessment and treatments and their aspects for which there is scientific evidence that the procedure is effective.

Recently, a movement in the training of mental health professionals has begun to emphasize *cultural competence* (Delvecchio Good & Hannah, 2015). In this approach, the focus of interventions begins with the person who is being served. That is, a clinician should consider and understand the worldview of the individual she is treating. This includes the client's willingness to describe internal thoughts and feelings, how he understands how a particular disorder affects him, what he expects from his treatment, as well as his relationships with significant others. For example, in one study, Latinos with depression were less likely to take antidepressants since they had cultural concerns about addiction or dependence (Vargas et al., 2015).

The existence of these two movements has led to a debate concerning the degree to which a particular psychological disorder should be considered from a more universal standpoint (represented by empirically based principles) as opposed to a manifestation of cultural processes (represented by cultural competence). This debate is of particular concern in countries such as the United States where there has been a lot of immigration from different cultures leading to an increasingly diverse population. At the same time, increases in the numbers of women as well as individuals from different cultures becoming mental health professionals have led to significant changes in the diversity of those offering health and mental health services.

For some researchers, there is a dynamic tension between cultural considerations with an emphasis on the individual client and his or her way of expressing and experiencing mental illness, and empirically based principles that emphasize treating all clients in a consistent manner (Delvecchio Good & Hannah, 2015). That is, there is a tension between flexibility and consistency. Other researchers suggest this dynamic tension can be overcome by beginning with particular cultural groups and developing an intervention based on the cultural factors found in that particular group (Weisner & Hay, 2015).

One alternative is to classify treatments in terms of culture (Evans, 2009). *Transcultural* concepts and treatments would be appropriate to individuals in all cultures. *Multicultural* concepts and treatments would be appropriate for individuals from groups that have similar worldviews, practices, and traditions. *Culturally adapted* and *culture-specific* concepts and treatments would be designed for individuals from a specific group. At this point, however, there has been limited research that fully integrates cultural factors with empirically supported approaches to treatment (Helms, 2015; V. H. Jackson, 2015).

Thought Question: What are some particular benefits that each of these two approaches—empirically based principles and cultural competence—bring to psychological treatment? If you were a mental health professional, how would you bring the benefits of the two approaches to your clients?

Reliability and Validity in Relation to Psychopathology

Concerns about the accuracy of assessment and classification of psychopathology require us to consider two very different questions. The first has to do with the person who is being interviewed. We need to know if the person is giving us information that is accurate or not. Sometimes, individuals will "fake bad" if there is some advantage such as receiving a larger disability payout. Other times, individuals will "fake good" and deny there are any problems.

The second question is which assessment instruments to use. An assessment instrument can be an interview, an inventory, a mood scale, and so forth. In considering instruments, we think about measurement. Measurement considerations help to define the variety of instruments that we use and the theoretical variables that these reflect.

Traditionally, the two key measurement issues are *reliability* and *validity*. That is, does an instrument measure the construct consistently (reliability) and accurately (validity)? The measurement of temperature, for example, is based on the kinetic theory of heat, which helped define the type of devices used. With psychopathology, however, we lack exact formal definitions that tell us exactly how to make measurements. In fact, we are both trying to learn about disorders and creating techniques for making diagnoses. This makes reliability and validity considerations both more difficult and more important.

Reliability

Reliability asks the question of whether the instrument is consistent. We would expect, for example, that the odometer in our car would reflect that we drove a mile each time we drove 5,280 feet. We would also expect our bathroom scale to show the same reading if our weight had not changed. Researchers interested in questions of measurement discuss a number of types of reliability:

reliability: consistency of the measurement by an assessment instrument

Internal reliability—Internal reliability assesses whether different questions on an instrument relate to one another. If we were seeking a general measure of depression, for example, we would want to use questions that relate to one another. Questions related to feeling sad, not having energy, and wanting to stay in bed would be expected to show internal reliability.

Test–retest reliability—Test–retest reliability determines whether two measurement opportunities result in similar scores. A key consideration with test–retest reliability is the nature of the underlying construct. Constructs seen as stable, such as intelligence or hypnotizability, would be expected to show similar scores if the same instrument was given on more than one occasion. In psychopathological research, measures of long-term depression or trait anxiety would be expected to show a higher index of test–retest reliability than measures that reflect momentary feelings of mood.

Alternate-form reliability—As the name implies, alternate-form reliability asks whether different forms of an instrument give similar results. If you were giving an IQ test, for example, you would not want to ask the same question each time, since the individual could learn the answers from taking the test. Thus, it would be important to create alternate forms that reflect the same underlying construct.

Inter-rater reliability—Inter-rater reliability asks how similar two or more individuals are when they observe and rate specific behaviors. Psychopathology researchers often rate the emotional responses of children as they engage in various activities. An index of inter-rater reliability would measure how consistent different observers would be in rating the

We expect our bathroom scale to show the same reading if our weight has not changed. Likewise, researchers are concerned with the reliability, or consistency of measurement, by assessment instruments.

same situation. Historically, one of the motivating factors for developing the *DSM* classification system was the discovery that different clinicians in different locations watched a film of a person with a mental health disorder and diagnosed it in different ways.

Assessment Validity

Validity asks whether the instrument we are using is accurate. A clock, for example, could be reliable if it was always 5 minutes fast, but it would not be accurate. Unlike time, for which there is a definition in terms of atomic clocks, psychopathological disorders lack exact unchanging definitions. Although measures such as neuropsychological tests, brain images, and molecular and genetic changes suggest possible variables to be considered, there is currently no exact measure by which to diagnose psychopathology. This makes validity an important but complex concept. Partly for this reason, we consider a number of types of validity.

Content validity—the degree to which an instrument measures all aspects of the phenomenon. If a final exam only had questions from 1 week of the course, it would not be representative of what the students had learned. A variety of psychopathological disorders, such as depression, for example, have cognitive, emotional, and motor components. A measure that just asks if a person felt negative about the future would be seen as a less useful measure of depression than one that also asks about feeling sad and thoughts about suicide and self-worth.

Predictive validity—the degree to which an instrument can predict cognitions, emotions, or actions that a person will experience in the future. If an IQ test in high school predicted college performance, then it would be seen to have predictive validity. Many medical tests such as cholesterol measurements are designed to predict who is at risk for later medical conditions such as cardiovascular problems.

Concurrent validity—the ability of an instrument to show similar results as other established measures of the construct.

Construct validity—the extent that an instrument measures what it was designed to measure (Cronbach & Meehl, 1955). If a test was designed to measure what students learned in a course, then it would be a problem if the test was also sensitive to other factors such as intelligence or the ability to understand test questions asked in terms of double negatives.

Ecological validity—the manner in which data collected has been considered beyond the local context. For example, considering which cultural factors could be influencing the information obtained would improve the ecological validity of the data. This would also hold true in research studies involving mental illness in different cultures. That is, the meaning of a concept in one culture may be different from that in another.

CONCEPT CHECK

- What are five critical areas mental health professionals cover in an initial clinical interview?
- Why is it important for mental health professionals to understand the cultural context of an individual's mental disorder? What kinds of information does the CFI help mental health professionals obtain?
- In terms of assessment, what are four types of reliability you should be concerned with, and why?
- In terms of assessment, what are five types of validity you should be concerned with, and why?

Models of Assessment

In this section, I will consider different ways of assessing signs and symbols. These range from simply asking a person about his or her symptoms to comparing the person to others who have

a similar disorder. Specifically, I will discuss symptom subtests such as the Beck Depression Inventory, personality inventories that are based on psychometric formulations such as the Minnesota Multiphasic Personality Inventory, projective techniques such as the Rorschach inkblot test and the Thematic Apperception Test, neuropsychological approaches such as intelligence tests, and neuroscience approaches.

Symptom Questionnaires

At times, it is important to know what a person's symptoms are and how that person may compare with others in terms of reporting these symptoms. A variety of questionnaires have been developed that focus on particular sets of symptoms such as those associated with pain, sleep disorders, anxiety, and depression.

The **Beck Depression Inventory (BDI)** has been used in both clinical and research settings to assess symptoms associated with the experience of depression (A. T. Beck & Beck, 1972). The BDI has 21 items, each of which is presented in a four-choice format where the individual is asked to indicate which choice best fits his or her current experience. Here is an example:

Beck Depression Inventory (BDI): a questionnaire useful for determining the level of depressive symptoms that a person is reporting

I am not particularly discouraged about the future.

I feel discouraged about the future.

I feel I have nothing to look forward to.

I feel the future is hopeless and that things cannot improve.

A questionnaire such as the BDI is useful for determining the level of depressive symptoms that a person is reporting. Given that the measure has been in use for more than 40 years, there is considerable clinical and research data available in terms of level of depressive severity. The measure is also useful for noting changes in depression level during various types of treatment. During psychotherapy, for example, the measure could be given weekly to document changes in depressive experiences. A newer version of the scale (BDI-II) was developed in 1996 in response to the publication of *DSM–IV,* which changed a number of the diagnostic criteria for depression.

Personality Tests

For at least the past 2,000 years, there has been an understanding that individuals have a particular style for relating to the world and others. At the beginning of the last century, the personality styles of introversion and extraversion were studied. There was also an effort to examine the relationship between personality styles and psychopathology. A number of questionnaires have been developed to this end. One of the best known of these is the *Minnesota Multiphasic Personality Inventory (MMPI).*

Minnesota Multiphasic Personality Inventory (MMPI)

The **Minnesota Multiphasic Personality Inventory (MMPI)** is an assessment measurement of personality traits that is composed of more than 500 items of a true–false nature. The person taking the test simply indicates yes or no to statements such as, "I have trouble falling asleep." The test was developed in an interesting manner. The authors, S. R. Hathaway and J. C. McKinley, began with a large pool of items and then reduced these to 504 items that were determined to be independent of one another. They then gave these items to psychiatric inpatients at the University of Minnesota Hospital. These inpatients were further divided by diagnosis, and the responses of each group were compared with non-patients who had come to the hospital as visitors or relatives. The idea was to develop a scoring scheme that would differentiate those with mental disorders from those without. In this sense, the content of the item was less important than its ability to discriminate between those individuals with a specific disorder and those without, as well as between disorders.

Minnesota Multiphasic Personality Inventory (MMPI): an assessment measurement of personality traits, used in psychopathology to identify response patterns suggesting a psychological disorder based on empirical comparison to the general population

In 1989, a new version of the MMPI, the MMPI-2, was released, which improved the generalizability of the test. The new test was "normed" on a better representation of the general population in terms of race, age, occupational level, income, and geographic location. The new version contains 567 items and uses a true, false, or can't say format. One real advantage of the MMPI and MMPI-2 is that they were developed in a more empirical manner by comparing how the pattern of responding matched populations with specific disorders versus healthy individuals rather than the content of the items. It is also possible, by using a normal statistical curve, to determine how extreme an individual's responses are. Thus, the scales are presented in a dimensional manner, and it's easy to determine if a person endorses more or less of a category of experiences than the general population.

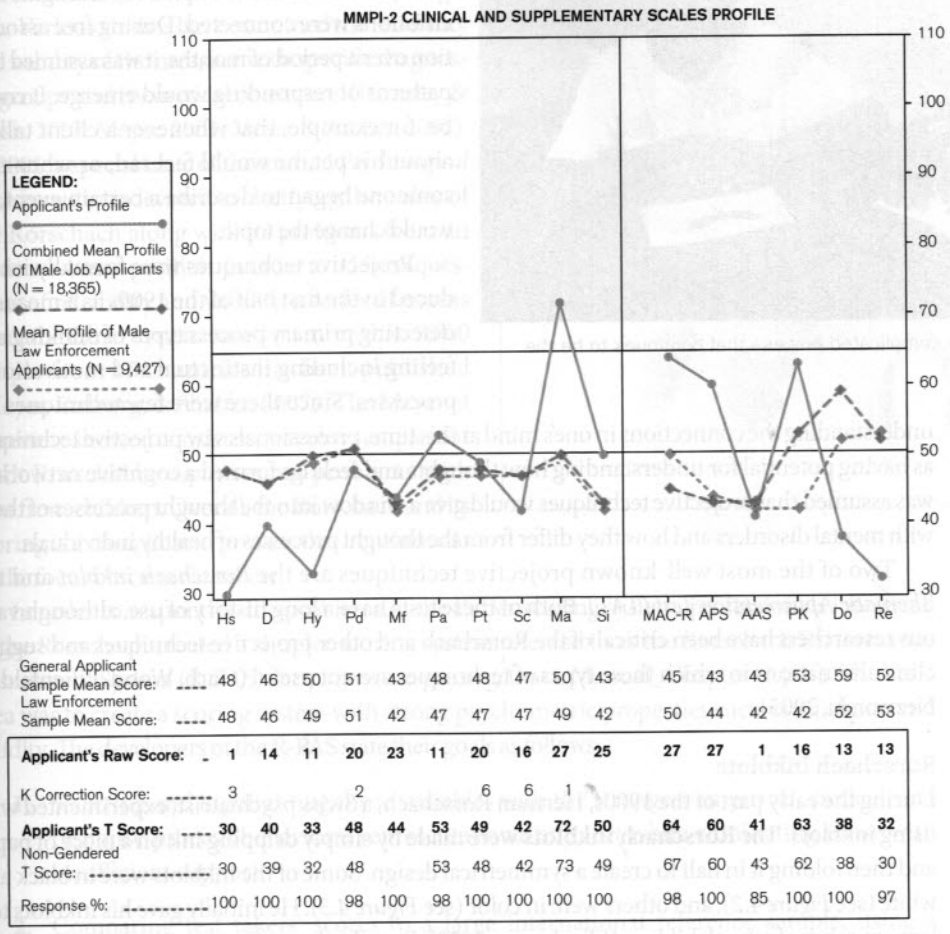
The clinical scale in the MMPI uses the following categories:

- *Hypochondriasis*—Individuals who endorse these items show an excessive concern with bodily symptoms.
- *Depression*—Individuals who endorse these items display characteristics of depression such as trouble sleeping, loss of appetite, feeling sad, suicidal thoughts, and loss of interest in positive events.
- *Hysteria*—Individuals who endorse these items tend to view and experience the world in an emotional manner. They may overdramatize their situation. They may also experience emotional difficulties through bodily symptoms such as headaches or upset stomach when in a difficult psychological situation.
- *Psychopathic deviate*—Individuals who endorse these items display antisocial tendencies and experience conflicts with their environment. They may also exploit others without remorse.
- *Masculinity-femininity*—These items reflect the degree to which an individual endorses the traditional gender role of males or females.
- *Paranoia*—Individuals who endorse these items display suspiciousness of others. They also view the world in terms of "who is out to get them."
- *Psychasthenia*—Individuals who endorse these items display excessive anxiety and obsessive behavior.
- *Schizophrenia*—Individuals who endorse these items display bizarre disorganized thoughts along with a lack of normal contact with reality including social aloofness. Various sensory problems such as hallucinations may be present.
- *Hypomania*—Individuals who endorse these items experience high-energy states associated with poor judgment and impulse control.
- *Social introversion*—These items reflect the extent to which an individual's answers indicate social introversion and extraversion.

By placing the responses of an individual to questions in each of the categories on a normal distribution, it is possible to see which categories deviate from responses seen in the general population (see *Figure 4.1*). In addition to the clinical scales, the MMPI also contains validity scales. These scales were designed to determine whether the person is trying to skew the results by either "faking good" or "faking bad." One type of item included in these scales would be one that most healthy individuals would not agree to such as, "I have never told a lie." This last item would be found on the lie or L scale. The infrequency or F scale is composed of items that are infrequently endorsed by the general population. Endorsing these items could come about because the person wanted to look as if he or she had psychological problems ("faking bad"). It could also be the case that the individual was confused or could not read or understand the items. The defensiveness, or K, scale seeks to identify individuals who deny having any psychological problems ("faking good"). The number of times the person responds with "can't say" can be noted to help determine the validity of the MMPI. Further, as might be expected after more than 70 years of use, a variety of additional scales have been developed, which have been used for both clinical and research purposes.

FIGURE 4.1 MMPI-2 Profile Reflecting Scores on Clinical Scales and Validity Scales

Source: *MMPI®-2 (Minnesota Multiphasic Personality Inventory®-2) Manual for Administration, Scoring, and Interpretation*, Revised Edition. Copyright © 2001 by the Regents of the University of Minnesota. Used by permission of the University of Minnesota Press. All rights reserved. "MMPI" and "Minnesota Multiphasic Personality Inventory" are trademarks owned by the Regents of the University of Minnesota.

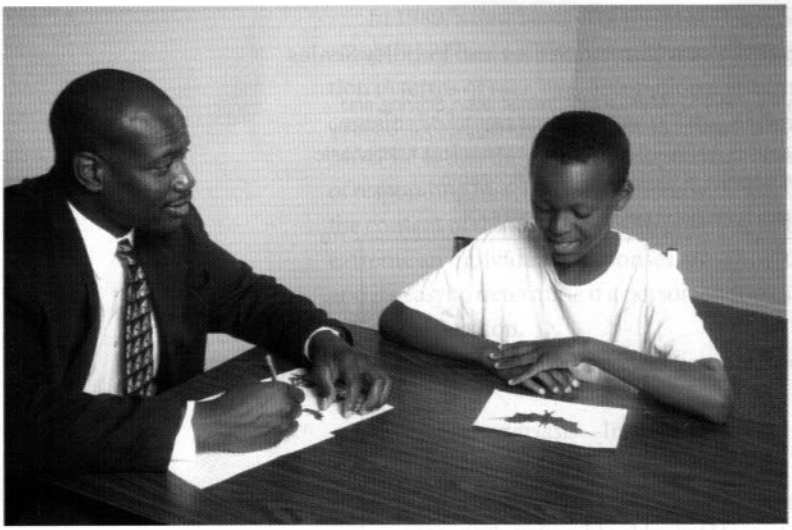


Projective Tests

Projective instruments: assessment tests that use ambiguous stimuli to elicit the internal cognitive and emotional organization of a person's primary thought processes

Projective instruments are assessment tests composed of ambiguous stimuli. They can range from seemingly random patterns such as an inkblot to ambiguous drawings of individuals or objects. The individual is asked to describe what the patterns look like, what they remind him or her of, or what is being depicted in the drawing.

The basic idea of projective testing is based on the theoretical ideas of Sigmund Freud and others who sought to understand the dynamics of the mind. One important distinction Freud made was between types of thinking (Erdelyi, 1985; Westen, Gabbard, & Ortigo, 2008). Primary process thought, which is seen in dreams or letting your mind wander, is not organized logically but in terms of associations between thoughts and feelings. Secondary process thought, on the other hand, is logically organized. Freud suggested that it was possible to understand the cognitive and emotional connections of a person's mind in terms of primary process. Freud's technique for exploring these connections was free association and dream analysis.



Lewis J. Merrim/Science Source

The Rorschach and its scoring is a complicated process that continues to be the focus of scientific debate.

The basic technique of free association was to have a person lie on a couch and say whatever came into his or her mind. Since the therapist sat behind the client, there was little in the environment for the client to react to. It was the therapist's job to notice how a person's thoughts and emotions were connected. During free association over a period of months, it was assumed that patterns of responding would emerge. It could be, for example, that whenever a client talked about his pet, he would feel sad, or whenever someone began to describe a certain event, he would change the topic.

Projective techniques were formally introduced in the first half of the 1900s as a means of detecting primary process types of thinking and feeling including instinctual and motivational processes. Since there were few techniques for understanding the connections in one's mind at this time, professionals saw projective techniques as having potential for understanding how thoughts and feelings formed a cognitive network. It was assumed that projective techniques would give a window into the thought processes of those with mental disorders and how they differ from the thought processes of healthy individuals.

Two of the most well-known projective techniques are the *Rorschach inkblot* and the *Thematic Apperception Test (TAT)*. Both of these tests have a long history of use, although various researchers have been critical of the Rorschach and other projective techniques and suggest clinical situations in which these types of techniques are not useful (Garb, Wood, Lilienfeld, & Nezworski, 2005).

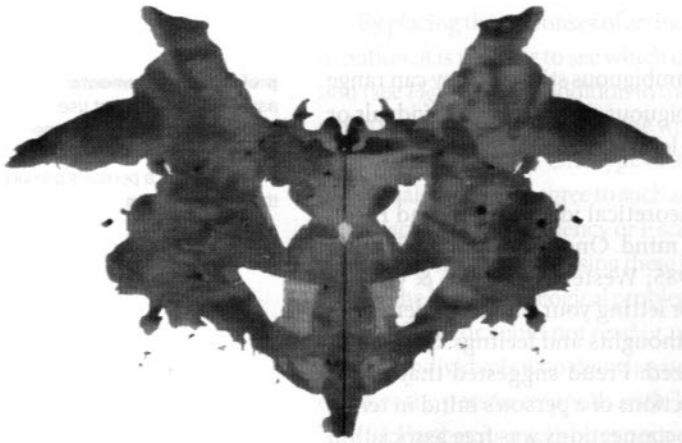
Rorschach Inkblots

Rorschach Inkblots: a projective test using inkblots; an individual's interpretation of the ambiguous ink patterns is evaluated to identify patterns in underlying thoughts and feelings

During the early part of the 1900s, Herman Rorschach, a Swiss psychiatrist, experimented with using inkblots. The **Rorschach inkblots** were made by simply dripping ink on a piece of paper and then folding it in half to create a symmetrical design. Some of the inkblots were in black and white (see *Figure 4.2*), and others were in color (see *Figure 4.3*). He initially gave his inkblots to a large number of schoolchildren (Ellenberger, 1970). Rorschach was interested in the sensory processing of these images, which he connected with Carl Jung's idea of introversion and extraversion.

■ **FIGURE 4.2** When You Look at This, What Do You See?

An example of a Rorschach inkblot in black and white.



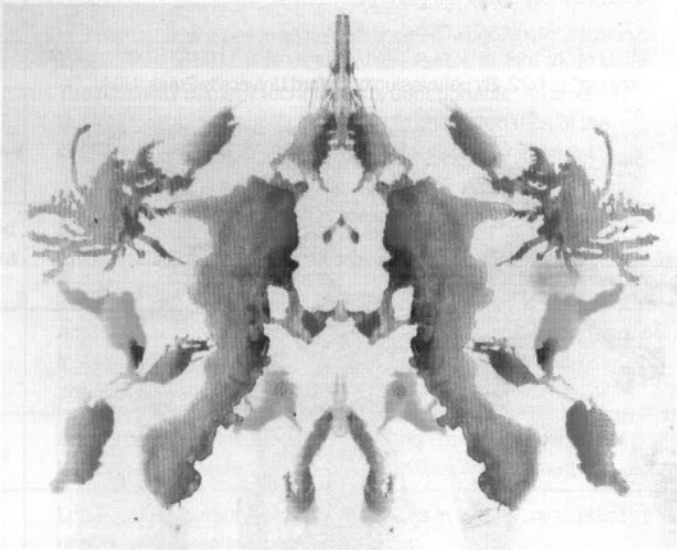
Rorschach saw introversion as focusing on the inner world of kinesthetic images and creative activity. Extraversion, on the other hand, was a focus on color, emotion, and adjustment to reality. For Rorschach, the content of what was seen in the inkblot was less the focus of the interpretation than the elements used, such as whether the person saw whole images or focused on small details of the blot. Viewing the image as containing movement and the use of the colors was also seen as important. A limited number of 10 plates were selected, and Rorschach published a book on the subject in German, *Psychodiagnostics*, in 1921. He died some months later at age 37. His book was translated into English in 1942.

Following Rorschach's death, various clinicians used the inkblot test in their clinical practice. For a

number of years, there was little scientific data concerning the reliability and validity of the measure. Since the late twentieth century, there has been a movement to standardize the presentation of the test and the manner in which it is scored. Exner (1986, 2003) offered one such system. Various studies have examined the reliability and validity of the measure with specific diagnostic groups and theoretical constructs (Hunsley & Mash, 2007; Meyer, 2001; Meyer & Archer, 2001). In 2001, a special issue of the journal *Psychological Assessment* was devoted to clarifying the utility of the Rorschach along with its problems from an evidence-based position. In order to address questions of reliability and validity, a series of norms using the Exner system based on more than 5,800 people from 17 countries has been published (Meyer, Erdberg, & Shaffer, 2007). The Meyer et al. review showed consistency across samples for adult Rorschach responses but problems with data from children. Overall, the Rorschach and its scoring is a complicated process that continues to be the focus of scientific debate.

■ **FIGURE 4.3** When You Look at This, What Do You See?

An example of a color Rorschach inkblot.



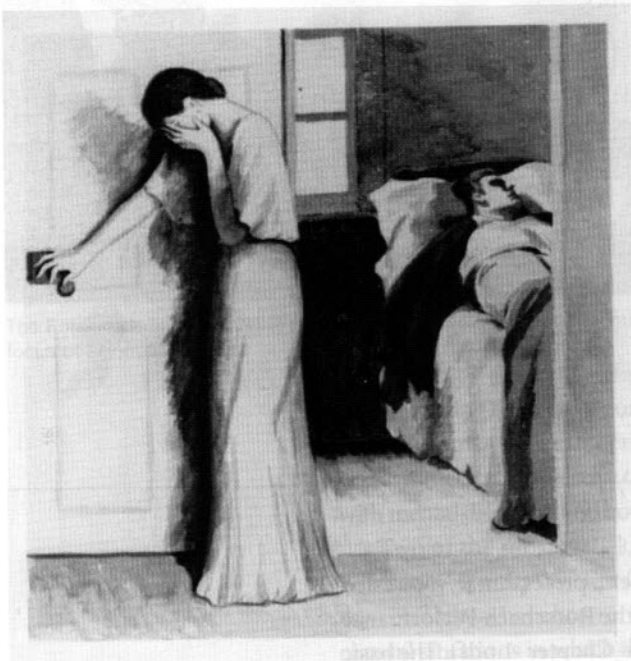
In order to respond to the problems of the Exner scoring system, professionals interested in the Rorschach created a simpler scoring system referred to as the Rorschach Performance Assessment System (R-PAS) (http://www.r-pas.org/Docs/Manual_Chapter_1.pdf). The basic idea was to create a scoring system with strong psychometric properties such as reliability and validity. The developers of the R-PAS state their goals as follows:

1. Selecting and highlighting those variables with the strongest empirical, clinical, and response process/behavioral representational support while eliminating those with insufficient support.
2. Comparing test takers' scores to a large international reference sample, using a graphic array of percentiles and standard score equivalents.
3. Providing a simplified, uniform, and logical system of terminology, symbols, calculations, and data presentation in order to reduce redundancy and increase parsimony.
4. Describing the empirical basis and psychological rationale for each score that is to be interpreted.
5. Providing a statistical procedure to adjust for the overall complexity of the record and a graphical illustration of its impact on each variable.
6. Optimizing the number of responses given to the task in order to ensure an interpretable and meaningful protocol, while drastically reducing both the number of times the task needs to be readministered because of too few responses and the likelihood of inordinately long and taxing administrations because of too many responses.
7. Developing new and revised indices by applying contemporary statistical and computational approaches.
8. Offering access to a scoring program on a secure, encrypted web platform from any device that can interface with the Internet (e.g., PC, laptop, smartphone, tablet).

■ **FIGURE 4.4** What Is Happening in This Picture?

Example of a TAT drawing. The person being evaluated is asked to create a story about the picture.

Source: Explorations in personality: A clinical and experimental study of fifty men of college age by Murray et al. (1938), "TAT drawing" p. 622. By permission of Oxford University Press, USA.



The R-PAS system was developed around 2006 and continues to be tested worldwide. An initial review and meta-analysis article was published in *Psychological Bulletin,* which described Rorschach variables with research support and those with little or no support (Mihura, Meyer, Dumitrascu, & Bombel, 2013).

Other researchers have begun to use neuroscience techniques such as brain imaging and electrophysiology to understand physiological processes underlying Rorschach responses. For example, Giromini and his colleagues (Giromini, Porcelli, Viglione, Parolin, & Pineda, 2010) examined movement responses on the Rorschach and how these were reflected in the EEG.

Thematic Apperception Test (TAT)

The **Thematic Apperception Test (TAT)** is composed of 30 black-and-white drawings of various scenes and people (see *Figure 4.4* for an example). The instrument was developed by Christiana Morgan and Henry Murray in the 1930s. Typically, an individual is shown 20 of the cards, one at a time, and asked to create a story about what is being depicted on the card. The basic idea is that by noting the content and emotionality of the individual's responses, it is possible to gain insight into his or her thoughts, emotions, and motivations including areas of conflict. For example, if an individual described many of the cards in terms of someone leaving another person, the clinician might ask if abandonment was an important issue for the person. Although the TAT technique may be useful to gain additional information concerning a person such as suicidal thoughts, it lacks scientific evidence to make it useful in obtaining a formal diagnosis. Similar problems of reliability and validity exist with the TAT as with the Rorschach.

Thematic Apperception Test (TAT): a projective testing instrument composed of black-and-white drawings of various scenes and people; by evaluating the individual's interpretive responses to the ambiguous drawings, it is possible to gain insight into his or her thoughts, emotions, and motivations including areas of conflict

Overall, projective techniques have been the subject of great debate and controversy. P. Frick, Barry, and Kamphaus (2010) presented some of the major pros and cons concerning the use of projective techniques (see *Table 4.1*). Some professionals see their value not in terms of giving exact diagnoses but in their ability to allow a professional to see how an individual responds to ambiguous stimuli—especially in terms of suicidal ideation as well as disorganized thought processes. This may lead to further discussions of areas that a professional would not normally discuss. The major disadvantage of projective techniques centers on questions of validity in terms of both the test's ability to identify specific disorders and the reliance of the test interpretation on a specific population such as children.

Neuropsychological Testing

Neuropsychological tests have been developed to help mental health professionals assess a person's general level of cognitive functioning. Intelligence tests, for example, are able to compare a given individual with his or her peers to determine level of functioning. The common intelligence tests, such as the **Wechsler Adult Intelligence Scale (WAIS),** have a number of subscales designed to measure verbal and performance tasks. The verbal tasks include measurements of acquired knowledge, verbal reasoning, and comprehension of verbal information. The performance tasks include nonverbal reasoning, spatial processing skills, attention to detail, and visuomotor integration.

Wechsler Adult Intelligence Scale (WAIS): a common intelligence test with a number of subscales designed to measure verbal and performance tasks

TABLE 4.1 Pros and Cons of Projective Tests

THE PROJECTIVE DEBATE	
PRO	**CON**
Less structured format allows clinician greater flexibility in administration and interpretation and places fewer demand characteristics that would prompt socially desirable responses from an informant.	The reliability of many techniques is questionable. As a result, the interpretations are more related to characteristics of the clinician than to characteristics of the person being tested.
Allows for the assessment of drives, motivations, desires, and conflicts that can affect a person's perceptual experiences but are often unconscious.	Even some techniques that have good reliability have questionable validity, especially in making diagnoses and predicting overt behavior.
Provides a deeper understanding of a person than would be obtained by simply describing behavioral patterns.	Although we can at times predict things we cannot understand, it is rarely the case that understanding does not enhance prediction (Gittelman-Klein, 1986).
Adds to an overall assessment picture.	Adding an unreliable piece of information to an assessment battery simply decreases the overall reliability of the battery.
Helps to generate hypotheses regarding a person's functioning.	Leads one to pursue erroneous avenues in testing, or to place undue confidence in a particular finding.
Non-threatening and good for rapport building.	Detracts from the time an assessor could better spend collecting more detailed, objective information.
Many projective techniques have a long and rich clinical tradition.	Assessment techniques are based on an evolving knowledge base and must continually evolve to reflect this knowledge.

Source: Frick et al. (2010), with kind permission from Springer Science+Business Media B.V.

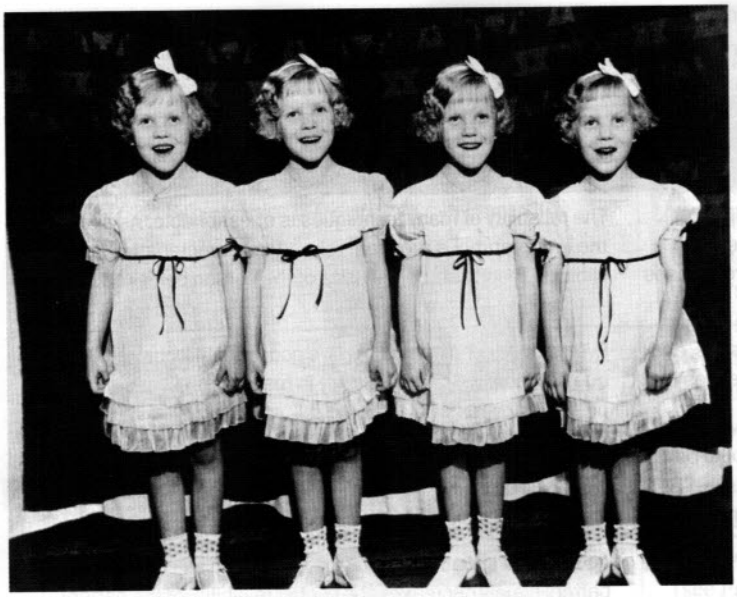
Other neuropsychological tests have been designed to assess specific types of brain functioning as well as brain damage. These include memory, attention, reasoning, emotional processing, and motor processes including inhibition of action. One advantage of traditional neuropsychological tests is that they have been given to a large number of people so that norms could be established. Thus, it is possible to know whether a 70-year-old individual is showing a normal memory decline in certain areas or if there might be the beginning of a neurocognitive disorder, such as Alzheimer's disease.

Although neuropsychological testing was initially developed to assess brain damage resulting from accidents, strokes, or war, it is now finding a use in delineating deficits in those with mental illness. Today, there is a coming together of neuropsychological tests, measures of cognitive processes in normal individuals, and brain imaging techniques. For example, the **Wisconsin Card Sorting Test (WCST)** requires that an individual sort cards into four piles. Each card has a specific shape on it, such as a circle or square, and a specific number of these shapes. Each card is also printed in a specific color. Thus, you could sort the cards by shape, by number, or by color. The person administering the test makes note of whether the individual is sorting each card correctly or not. After a number of sorts, the administrator changes the correct sort category. Individuals with frontal lobe damage have difficulty responding to changing demands. Individuals with schizophrenia also have difficulty responding to changing task requirements.

Another test that is commonly used in psychopathology research is the **Continuous Performance Test (CPT),** which measures attentional characteristics. In one version of the test, participants are shown a series of letters and must respond whenever a particular letter is displayed. The test then requires that the person respond when one particular letter followed by another letter is displayed. Children with ADHD have problems with this task. Thus,

Wisconsin Card Sorting Test (WCST): an assessment instrument that requires an individual to sort cards into four piles; each card has a specific shape on it and a specific number of these shapes, and each card is printed in a specific color; thus, the cards could be sorted by shape, number, or color. The sort criteria are changed throughout the test. The purpose of the test is to measure the person's ability to adjust to changes in sorting criteria

Continuous Performance Test (CPT): a test that measures attentional characteristics



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These sisters were identical quadruplets who all developed schizophrenia by age 24. When they became subjects of study because of their shared disorder, they were given the pseudonym of the "Genain" quadruplets to protect their identity. The word *genain*, from Greek, translates to "bad gene."

neuropsychological tests are also being used to understand brain processes in those with mental illness.

Neuropsychological Tests and Mental Illness

Neuropsychological tests can help identify cognitive changes associated with a particular disorder. For example, there is a rare occurrence of four sisters who all developed schizophrenia in their twenties. The Genain sisters were monozygotic quadruplets born in the United States in the early 1930s (see photo on this page). These sisters have been studied throughout their lives in terms of genetic makeup as well as cognitive functioning. When the sisters were 66 years of age, Allan Mirsky and his colleagues (2000) readministered a number of neuropsychological tests including the WAIS, the CPT, and WCST. The scores for each sister at age 66 were compared with their performance at ages 27 and 51. By showing that the test scores of the sisters over their lifetime had not changed, these researchers were able to show that cognitive decline is not part of schizophrenia.

Using Neuroscience Techniques to Identify Mental Illness

As more and more researchers and clinicians have come to see mental illness as representing problems with the brain, there have been a variety of projects to utilize neuroscience approaches to describe psychopathology (Andreasen, 2001). These have ranged from identifying the presence of certain genes and the manner in which they turn on and off in psychopathology to structural and functional descriptions of brain processes and psychophysiological changes measured throughout the body. The potential for using neuroscience approaches to classify mental illness and inform its treatment is an important one (see Cuthbert & Insel, 2010, 2013; Glannon, 2015; Halligan & David, 2001; Hyman, 2007, 2010; Insel, 2009; G. Miller, 2010; Sumner, Powers, Jovanovic, & Koenen, 2015).

Traditionally, psychopathology has been defined in terms of signs and symptoms. The experiences of the client and what is observed by the professional are one level of analysis. In general, the mental health professional identifies symptoms that group together and the time of their appearance. Neuroscience techniques offer another level of analysis. From a research standpoint, scientists have sought to identify underlying markers associated with specific mental disorders. Using various brain imaging techniques described in Chapter 2 such as magnetic resonance imaging (MRI), functional magnetic resonance imaging (fMRI), electroencephalography (EEG), and magnetoencephalography (MEG), there has been a search for structural and functional changes associated with psychopathology. For example, researchers have been able to distinguish individuals with autism (Ecker et al., 2010) and with bipolar disorder (Rocha-Rego et al., 2013) from those without the disorder based on fMRI data.

Part of the potential for using neuroscience markers is related to the fact that not every individual with schizophrenia, for example, reports the same symptoms. Some individuals describe auditory hallucinations, whereas others describe visual hallucinations. This is also the case with depression in that some individuals report different types of depressive symptoms than others. This suggests to some researchers that there might be different underlying brain processes involved in these variations. What now is considered as a single disorder may be better represented as separate disorders based on underlying mechanisms. Further, certain mental disorders

also show gender differences. For example, females tend to develop schizophrenia later than males, but both males and females show similar rates of the disorder. However, females do show higher rates of mood and anxiety disorders.

Overall, neuroscience methods may lead to better diagnostic procedures as well as understanding the mechanisms of the disorder. For example, genetic research suggests similarities between schizophrenia and bipolar disorder in terms of the genes involved. It is also possible to use neuroscience techniques to follow the course of a disorder over time. One study (Raj, Kuceyeski, & Weiner, 2012) based on brain imaging methods suggests that neurocognitive disorders follow specific pathways in the brain. Another potential for neuroscience methods is that by knowing the underlying brain and genetic processes involved in a particular disorder for a particular person, it would be possible to create a treatment that is designed specifically for that individual.

National Institute of Mental Health

The potential for using neuroscience approaches to classify mental illness and inform its treatment is an important one.

CONCEPT CHECK

- For each of the following types of assessment, what kinds of information can you obtain from it and what is one example of it?
  - Symptom questionnaire
  - Personality test
  - Projective test
  - Neuropsychological test
  - Neuroscience technique

Diagnostic Considerations in Psychopathology

Over the past 100 years, there have been a variety of debates on how to diagnose and classify mental disorders. In the past 50 years, the emphasis has been on reliability of diagnosis such that mental health professionals in one location would diagnose the same individual in the same manner as professionals in another location. As part of this emphasis, there has been a push for observable characteristics that would define a specific disorder. Such characteristics as depressed mood over the day, diminished interest in activities, weight loss, insomnia, fatigue, feelings of worthlessness, difficulty thinking, and thoughts of suicide would be considered in the diagnosis of depression. These types of criteria make up the structure of the ***Diagnostic and Statistical Manual of Mental Disorders (DSM)***, published by the American Psychiatric Association (APA), and the ***International Classification of Diseases (ICD)***, published by the World Health Organization (WHO). The *DSM* is used in North America, whereas the *ICD* is used in Europe. In general, the criteria used in the *DSM* and *ICD* are signs and symptoms that are delineated through observation of, and conversation with, the individual.

Diagnostic and Statistical Manual of Mental Disorders (DSM): a publication of criteria for diagnosis by the American Psychiatric Association (APA), used in North America

International Classification of Diseases (ICD): a publication of criteria for diagnosis by the World Health Organization (WHO), used in Europe

Categorical Versus Dimensional Approaches

The historical considerations of psychopathology emphasized careful observation and interaction with the afflicted individuals as important methods for understanding the nature of the disorder. Based on these observations of symptoms and signs, individuals were diagnosed and classified as falling into discrete categories of disorders. This is an important level of analysis and

one I will emphasize throughout this book. However, there are other levels of analysis for understanding psychopathology.

With progress in the neurosciences in general and brain imaging and genetics in particular, other levels of analysis have become possible. These new levels of analysis offer different perspectives for the field of mental illness. What seemed like discrete categories of psychopathology previously are now seen to cluster in new and different ways when considered from the standpoint of genetics. Additional groupings have emerged as scientists have considered the neural networks involved in particular manifestations of psychopathology. This has led to the realization that mental disorders can be described in both a **categorical** and a **dimensional** manner.

categorical: in psychopathology, describes the approach to determining whether a person has or does not have a disorder based on the presence or absence of a certain set of symptoms

dimensional: in psychopathology, describes the assessment of severity of a disorder on a continuum, in terms of differing degrees

As shown in the physical sciences, there are times in which a phenomenon can be described both categorically and dimensionally. For example, when water is heated, the rise in temperature can be described in a dimensional manner in terms of a certain number of degrees. However, at a critical point, the water turns to steam, which is a categorically different state from water. Likewise, a reduction in temperature changes water into a different categorical state—ice. The question for the study of psychopathological disorders is to determine the underlying dimensional changes that are associated with categorical-like transformations leading to a disordered state. Further, different underlying processes may actually allow for the presence of more than one disordered state at the same time.

Comorbidity, Internalizing Disorders, and Externalizing Disorders

Technically, when an individual is seen to have more than one disorder at the same time, the disorders are referred to as **comorbid.** In the National Comorbidity Survey, a large number of individuals with one disorder were found to have one or more additional diagnoses (Kessler et al., 1994). For example, individuals with generalized anxiety disorder will often also show symptoms of depression. Further, these two disorders have overlapping genetic and environmental risk factors (Kendler, Neale, Kessler, Heath, & Eaves, 1992). The number of diagnoses found in the National Comorbidity Survey was associated with the severity of the symptoms. This has suggested to researchers that there exists a general underlying vulnerability to psychopathology that may be independent of the particular symptoms expressed (Pittenger & Etkin, 2008).

comorbid: descriptive term used when an individual has more than one disorder at the same time

A related approach is to consider which disorders co-occur with one another. In general, two clusters have been found. The first is referred to as **internalizing disorders**. The focus of these disorders is the inner world of the person, and they include anxiety and depression. The second cluster is referred to as **externalizing disorders**. The behavioral focus of these disorders is the external environment of the person. These disorders include conduct disorder, oppositional defiant disorder, antisocial personality disorder, substance use disorder, and in some studies attention deficit/hyperactivity disorder (ADHD). These studies of comorbidity clusters have led scientists to search for common factors such as genetics, brain processes, and environmental risk profiles that might be associated with each cluster. Overall, research has supported the idea that mental disorders can be clustered and that it is possible to identify underlying risk factors (Kendler, et al., 2011).

internalizing disorders: disorders that are experienced internally such as anxiety and depression

externalizing disorders: disorders that are manifested in the external world by the person's behavior, such as conduct disorder (CD), antisocial personality disorder, and other behavior-based disorders

Given these new perspectives, it is not surprising that with new scientific discoveries the field of mental illness is in flux. In this section, I want to describe the nature of some of the current considerations of how we should approach the field of psychopathology from these larger perspectives. In later chapters of this book, I will describe specific approaches in greater detail.

Utilizing Neuroscience Methods in Diagnosis and Treatment

As noted, there has been a push to find more objective markers that can be used in the diagnosis and treatment of mental disorders using neuroscience research. With the advent of the various levels of analysis available to neuroscientists including brain imaging, genetics, biochemical and electrophysiological processes, brain networks, behavior, and experience, a variety of researchers

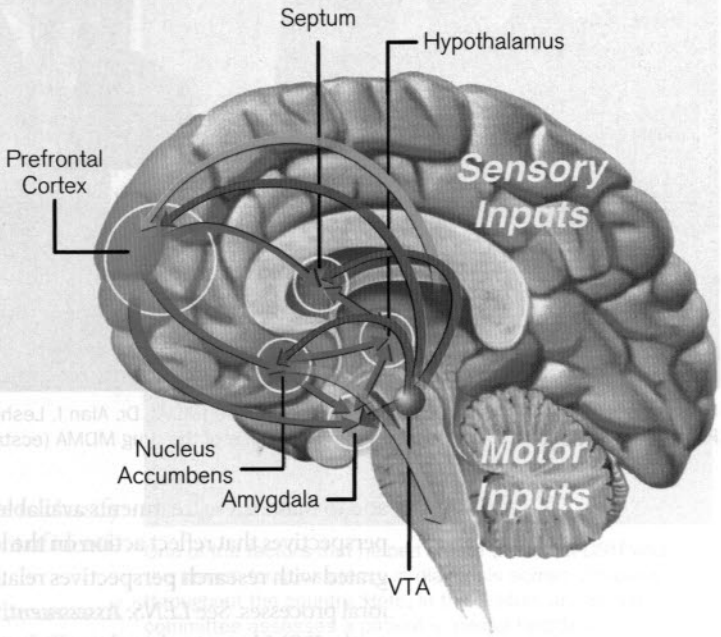
have sought to describe cognitive, emotional, and motor processes in both health and illness. This has resulted in a better articulation of what underlies these processes.

One such underlying process is memory. It is possible to describe its underlying process including specific brain areas such as the hippocampus, the brain networks involving memory, and the biochemical and structural changes among neurons as new information is retained. With this knowledge, it is also possible to explore psychopathological conditions such as amnesia or delusions that involve the memory system.

Another example is the **reward system.** Humans seek rewards from a variety of sources, including food, sex, power, acclaim, and affiliation, as well as drugs. A number of studies show that particular brain structures, especially the nucleus accumbens part of the ventral striatum, are influenced by an increase in dopamine during a reward (see *Figure* 4.5). In fact, all addictive drugs result in dopamine release in the nucleus accumbens (Pittenger & Etkin, 2008). Individuals with alcoholism show greater activation to alcohol-related cues in the nucleus accumbens and the anterior thalamus. The activation of the nucleus accumbens also correlates with the degree of craving. One approach involving the reward system is to note its involvement in active reward processes such as those seen in addiction or mania as well as those disorders in which reward is reduced such as depression or schizophrenia (Russo & Nestler, 2013).

■ **FIGURE 4.5** Reward System of the Brain

Dopamine is an important part of the reward system. A number of studies show that particular brain structures, especially the nucleus accumbens part of the ventral striatum, are influenced by an increase in dopamine during a reward.



reward system: particular brain structures, especially the nucleus accumbens part of the ventral striatum, influenced by an increase in dopamine during a reward

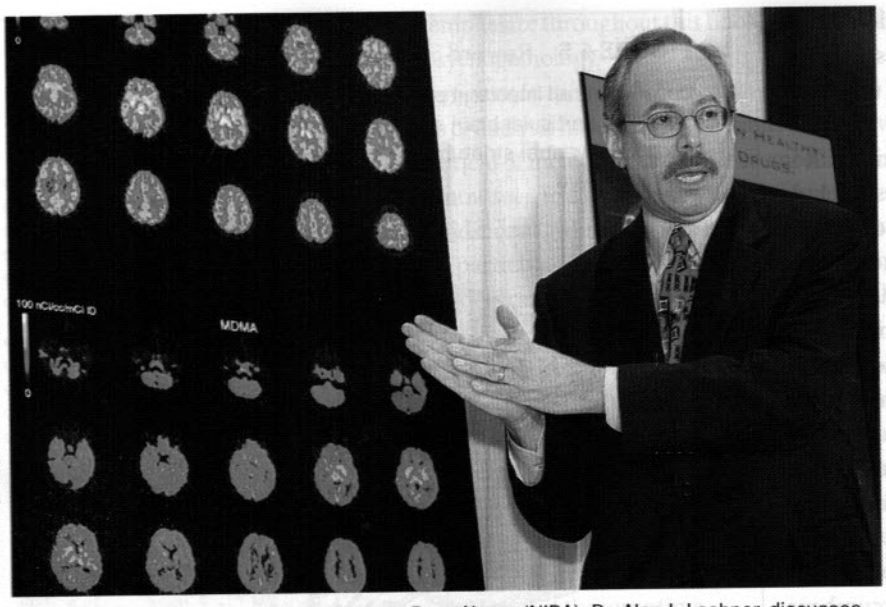
Since the beginning of the twenty-first century, a number of researchers and clinicians have asked whether it would be possible to use neuroscience approaches to classify mental illness and inform its treatment (Cuthbert & Insel, 2010; Halligan & David, 2001; Hyman, 2007, 2010; Insel, 2009; G. Miller, 2010; Sanislow et al., 2010). Part of this desire stems from the fact that not all individuals with depression, for example, report the same symptoms. This suggests to some researchers that there might be different underlying brain processes involved in what appears as a single disorder. By knowing the underlying processes involved in a particular disorder, it would be possible to create a treatment that was specific to a given individual.

Neuroscience perspectives can also help validate theoretical constructs used in a variety of theoretical orientations. For example, Carhart-Harris and Friston (2010) examined the relationship between brain network processes and Freudian constructs. Likewise, DeRubeis, Siegle, and Hollon (2008) examined the different pathways of treatment for depression found in cognitive therapy versus medication. These researchers suggested that cognitive therapy works through a top-down approach by increasing higher cortical functioning associated with the frontal lobes, whereas medication works in a more bottom-up approach by decreasing excessive emotional responsiveness associated with the amygdala.

One large organization emphasizing the utilization of neuroscience information to understand mental illness is the **National Institute of Mental Health (NIMH)** in the United States (Insel, 2009). Through its research mission, NIMH developed four major objectives:

> The plan calls for research that will (1) define the pathophysiology of disorders from genes to behavior, (2) map the trajectory of illness to determine when, where, and how to intervene to preempt disability, (3) develop new

National Institute of Mental Health (NIMH): agency of the U.S. government that advances the understanding and treatment of mental disorders



Michael Smith/Staff/Hulton Archive/Getty Images

Former director of the National Institute on Drug Abuse (NIDA), Dr. Alan I. Leshner, discusses PET scans showing brain activity before and after use of the drug MDMA (ecstasy).

interventions based on a personalized approach to the diverse needs and circumstances of people with mental illnesses, and (4) strengthen the public health impact of NIMH-supported research by focusing on dissemination science and disparities in care. (Insel, 2009, p. 128)

As can be seen, the objectives are designed to identify the manner in which brain processes are involved in a specific disorder, to better describe the course of a mental disorder including when the first signs appear—even if abnormal processes are not yet seen—so as to use this knowledge to create a treatment related to a given individual, and to make these treatments available to all members of society. Thus, traditional neuroscience perspectives that reflect action on the level of genetics, the neuron, and neural networks are integrated with research perspectives related to more system-level cognitive, emotional, and behavioral processes. See *LENS: Assessment, Classification, and Clinical Practice: The RDoC Alternative to the* DSM later in this chapter for a discussion of the *Research Domain Criteria (RDoC)* approach that is being explored by NIMH.

CONCEPT CHECK

- Why is the reliability of diagnosis an important aspect of psychological treatment?
- What does it mean that mental disorders can be described in both a categorical and a dimensional manner?
- Why is comorbidity of psychological disorders an important consideration? Discuss some of the advantages of including underlying processes in the study of psychopathology.
- Identify three specific ways in which neuroscience approaches have been utilized to classify mental illness and inform its treatment.

Classification Systems for Mental Disorders

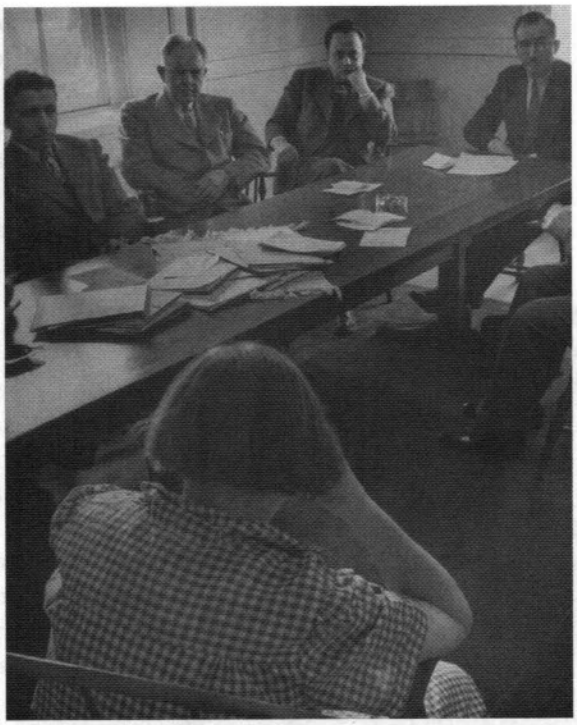
classification: in psychopathology, a way to name, organize, and categorize the collections of symptoms seen in mental disorders

Classification is a way to name, organize, and categorize the diversity of symptoms seen in mental disorders. Blashfield and Draguns (1976; see also Blashfield, Flanagan, & Raley, 2010) suggest five different purposes of classification:

1. As a *nomenclature*—The purpose here, in giving a name to a disorder, is to present a way for mental health professionals to describe and discuss the clients they see.
2. As a *basis of information retrieval*—Classifying disorders allows for individuals who may not be professionals to search for information concerning mental disorders.
3. As a *descriptive system*—The name of the disorder summarizes the behaviors, thoughts, and emotions of individuals with the disorder.
4. As a *predictive system*—In this case, the classification allows one to know the course of the disorder if untreated and particular treatments that may be effective.

5. As a *basis for a theory of psychopathology*—The focus in this case is to use classification to understand the disorder.

Over the past 200 years, numerous systems have been developed concerning the diagnosis and classification of mental disorders. In the past 50 years, the emphasis has been on reliability of diagnosis such that mental health professionals in one location would diagnose the same individual in the same manner as professionals in another location. As part of this emphasis, there has been a push for observable characteristics that would define a specific disorder. These types of criteria make up the structure of the *DSM* and the *ICD*. In general, the criteria used in the *DSM* and *ICD* are signs and symptoms that are delineated through observation of, and conversation with, the individual. Since *ICD* codes are used by many health facilities in the United States, I will note the similarities and differences in *ICD* and *DSM* criteria of mental disorders throughout this book.



JERRY COOKE/The LIFE Picture Collection/ Getty Images

One of the factors that helped create the initial *DSM* was the search for consistency in diagnosis across clinicians throughout the country. Here, in the 1940s, an asylum committee assesses a patient's mental health.

International Statistical Classification of Diseases and Related Health Problems

The *ICD*, currently used in over 100 countries worldwide to classify disorders, has an interesting history. It began with the intent of identifying causes of death.

Based on earlier attempts, a system for recording the cause of death was developed by the French statistician Jacques Bertillon in the late 1800s. This came to be known as the International List of Causes of Death. In 1898, the American Public Health Association suggested that the United States, Canada, and Mexico use this system and support its revision every 10 years. In 1948, the World Health Organization took over the *ICD*. The WHO collected health-related data worldwide. The sixth edition of the *ICD* published in 1949 included a section related to mental disorders. Currently, the *ICD* includes two sections, one for medical disorders and the other for mental and behavioral disorders. Because of the *ICD* inclusion of medical disorders, it is used for Health Insurance Portability and Accountability Act (HIPAA) purposes such as insurance in the United States.

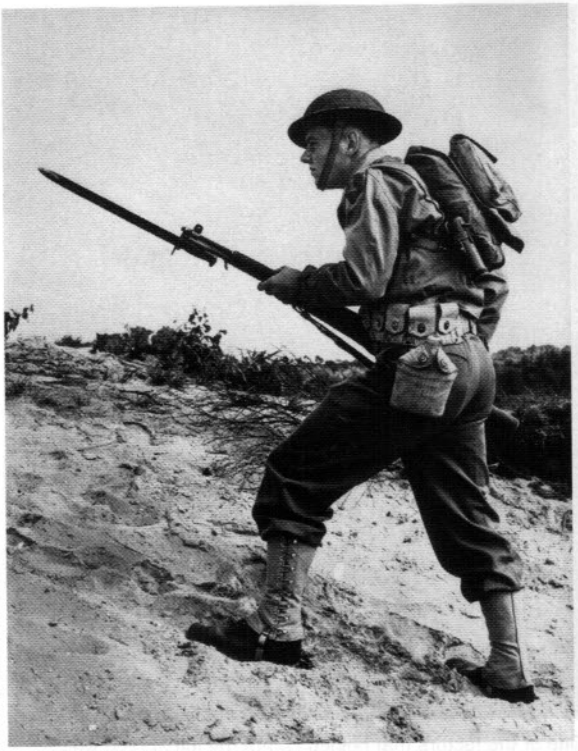
ICD-10 is currently in use but is being updated for the eleventh edition in 2018. Mental disorders in the *ICD-10* are more of a short narrative describing the condition, rather than specific criteria as seen in the *DSM–5*.

Diagnostic and Statistical Manual of Mental Disorders

The *DSM* was created by a group of psychiatrists in the 1940s who had been involved in directing mental hospitals and directing the mental health services for the U.S. Army and Navy during World War II, and others who were part of the American Psychiatric Association. The first version of the *DSM (DSM–I)* was published in 1952 (see Grob, 1991).

Origins of the *DSM*

A number of factors helped to create the initial *DSM*. One was the search for consistency in diagnosis across clinicians throughout the country. In this sense, *DSM–I* sought to bring together and standardize the classifications used in state and private mental hospitals, those classifications developed during World War II, and those used by professionals in private practice. Another factor that gained emphasis during World War II was the realization that environmental stress associated with combat was related to the expression of mental disorders. A related understanding was that these disorders could be treated without prolonged institutionalization. In addition,



H. Armstrong Roberts/ClassicStock/Archive Photos/Getty Images

During World War II, mental health professionals realized that environmental stress associated with combat was related to the expression of mental disorders.

treatment worked best if begun early in the course of the disorder. This required that professionals be able to differentiate those who could be treated and sent back to battle and those who needed long-term care.

Early Versions of the *DSM* and the Eventual Focus on Diagnostic Criteria

The classification system used by *DSM–I* divided disorders into two broad categories. The first category was those disorders such as Huntington's chorea or neurocognitive disorders (then called dementias) resulting from brain pathophysiologies. These were disorders that resulted from hereditary origins, infections, long-term drug addictions, tumors of the brain, and other such factors. The second category was those disorders that included an environmental component in which the individual found it difficult to cope with his or her world. This second category was further divided into three different types of disorders. The first was psychosis, including schizophrenia and other psychotic disorders. The second was neurosis, such as anxiety disorders. The third was referred to as character disorders such as psychopathy, which were involved in forensic decisions. As you will see later, those individuals who demonstrate psychopathic tendencies often find themselves accused of crimes such as cheating others. In general, it was assumed that the neurotic disorders would be more amenable to psychological treatment.

DSM–II was released in 1968. Although it did not differ greatly from *DSM–I*, it did offer an opportunity for the mental disorder categories of *ICD-8* and *DSM–II* to be almost identical. This allowed for a worldwide classification system, which increased the ability to collect statistics on particular mental disorders. One difference that did exist was that the *ICD* manual just listed the disorders, whereas the *DSM* included brief definitions.

During the 1970s, there were a variety of changes in issues of importance to both the scientific and larger lay community that influenced the next version of the *DSM*. In the scientific study of psychopathology, there was an increased emphasis on greater precision in describing the signs and symptoms associated with a particular psychopathology. In addition, there was an emphasis on differentiating one disorder from another as well as on using experimental research to inform these definitions. There was also an understanding that some individuals manifest a particular disorder in different ways. For example, as noted earlier in this chapter, some individuals with schizophrenia will hear voices, while others will have visual hallucinations.

When *DSM–III* was released in 1980, it included a number of major changes from *DSM–I* and *DSM–II* (see Blashfield et al., 2010). One major change was that it sought to rely on observable evidence to create a scientific system rather than just focus on the interpretations of experts in the field. Another change was that *DSM–III* described disorders in terms of specific criteria rather than the more general descriptions of a disorder seen in *DSM–I* and *DSM–II*. *DSM–III* also introduced a five-level system or axes to give a more complete picture of the person. Axis I described the individual's psychopathological symptoms. Axis II described the person's personality or mental retardation. Axis III described any medical disorders that the person had. Axis IV described significant environmental factors in the person's life. Lastly, Axis V described the person's level of functioning and any significant role impairment. Overall, *DSM–III* sought to be theory neutral and only use observable terms. *DSM–III* was adopted in a number of countries and translated into 16 languages. In 1987, *DSM–III* was revised in terms of diagnostic criteria and referred to as *DSM–III–R*.

In 1994, *DSM–IV* was released. One goal of this release was to coordinate this revision with *ICD-10*. There was also an attempt to increase the scientific evidence underlying the diagnostic

criteria for each specific disorder. To achieve this goal, a steering committee composed of 27 members oversaw the work of 13 different work groups. The task of the work groups was a three-step process. The first step was to extensively review the scientific literature related to a particular disorder. The second step was to utilize and reanalyze descriptive data from researchers who studied particular disorders. The third step was to conduct a series of field trials using the diagnostic criteria and to modify the criteria based on these trials. *DSM–IV* was expanded in 2000 with the publication of *DSM–IV–TR* (*TR* stands for text revision). *DSM–IV–TR* did not make major changes to the diagnostic criteria but did expand the text information describing each disorder.

DSM–5: The Current Version

DSM–5 was released in May of 2013, and the rationale for the changes can be viewed at the website www.psychiatry.org/dsm5. You may note that *DSM* went from using Roman numerals in previous editions to Arabic numerals for this edition. According to the *DSM–5* development website (www.dsm5.org), *DSM–5* sought to expand the scientific basis of diagnosis begun in *DSM–III* by working with the NIMH. An initial conference was held in 1999. Participants developed a series of reports that sought to examine a variety of broad topics beyond diagnosis itself. These topics included developmental issues, gaps in the current system, disability and impairment, neuroscience, nomenclature, and cross-cultural issues. In later papers, age and gender issues were also considered. Further, international organizations such as the WHO offered input into the composition of *DSM–5*, and 13 conferences were held.

This 5th edition of *DSM* presents the initial usage of dimensional assessments. As noted earlier, dimensional assessment is designed to determine the severity of a particular symptom on a continuum, or range, rather than just acknowledging its presence or absence. In addition, what have been considered to be separate disorders may be better viewed as part of a spectrum. For example, although individuals with autism, childhood disintegrative disorder, pervasive developmental disorder, and Asperger's syndrome may vary in their symptoms and abilities, there are similarities to the disorders. Thus, it would be more accurate to describe autism as falling on a spectrum ranging from mild to severe. In *DMS–5*, the term *Asperger's* is no longer used. Another example is bipolar disorder. Someone diagnosed with bipolar disorder may have a number of severe mood episodes involving mania and depression or just a few. In either case, there is a single category of either having the disorder or not. Dimensional analysis allows for more accurate representation of the disorder by reflecting the severity of the conditions. However, as you will see throughout this book, *DSM–5* still has a number of disorders that use a categorical definition. That is, if the person meets the criteria, the person has the disorder, and if they do not meet the criteria, they would not be considered to have the disorder. The following table shows the diagnostic criteria for diagnosing a specific phobia. As you can see in *Table 4.2*, *DSM–5* lists a number of different criteria, including duration and intensity, for the clinical diagnosis to be made.

The *DSM–5* suggests that every case begins with a careful clinical history as well as the social, psychological, and biological factors that have contributed to the development of the disorder. It is important to understand the nature of the distress that the person is experiencing, since distress is a critical component of a *DSM* disorder. It is also important to understand if the distress and the individual's behavior should be considered as part of a mental disorder or simply as deviant from the individual's cultural, religious, or other significant groups. Thus, *DSM–5* is more than just a list of symptoms to be checked off by the mental health professional. It is seen as a manual for organizing types of symptoms, which can suggest treatment approaches. However, *DSM–5* does not specify any particular treatment. Although *DSM–5* suggests that the person be considered within a larger context, it dropped the multiaxial system seen in *DSM–III* and *DSM–IV*. A clinician may continue to note cultural, environmental, and other conditions related to a given disorder, but Axes III, IV, and V are now eliminated. Further, personality disorders are no longer described on a separate axis (Axis II).

TABLE 4.2 *DSM-5* Diagnostic Criteria for Specific Phobia

A. Marked fear or anxiety about a specific object or situation (e.g., flying, heights, animals, receiving an injection, seeing blood).

Note: In children, the fear or anxiety may be expressed by crying, tantrums, freezing, or clinging.

B. The phobic object or situation almost always provokes immediate fear or anxiety.

C. The phobic object or situation is actively avoided or endured with intense fear or anxiety.

D. The fear or anxiety is out of proportion to the actual danger posed by the specific object or situation and to the sociocultural context.

E. The fear, anxiety, or avoidance is persistent, typically lasting for 6 months or more.

F. The fear, anxiety, or avoidance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

G. The disturbance is not better explained by the symptoms of another mental disorder, including fear, anxiety, and avoidance of situations associated with panic-like symptoms or other incapacitating symptoms (as in agoraphobia); objects or situations related to obsessions (as in obsessive–compulsive disorder); reminders of traumatic events (as in posttraumatic stress disorder); separation from home or attachment figures (as in separation anxiety disorder); or social situations (as in social anxiety disorder).

Another change from previous versions is in the organization of *DSM–5*. The placement of disorders is based on underlying vulnerabilities as well as symptom characteristics. The chapters are organized by general categories such as neurodevelopmental, emotional, and somatic to reflect how a variety of disorders may have some common underlying similarities. Recent advances in brain imaging, genetics, and the neurosciences have suggested similarities not understood previously. For example, genetic research suggests a closer connection between schizophrenia and bipolar disorder than previously assumed. However, these still remain as separate disorders in *DSM–5*. A detailed list of changes from *DSM–IV* to *DSM–5* can be found on the website (www.psychiatry.org/dsm5).

Since *DSM-5* is used in a variety of settings, it carries with it a number of difficulties (Frances & Widiger, 2012). *DSM–5* is used by mental health professionals as a means to assess individuals. It has traditionally been used by researchers to study psychopathology. Further, our legal system uses it in court trials in which the outcomes can depend on whether the person is experiencing a mental disorder. All of these usages carry with them different types of demands. The research seeks to understand underlying processes of a disorder, whereas the clinician seeks to know how to use the diagnosis to define treatment and induce change. As you will see in later chapters, cultural considerations also play a role. For example, in earlier editions of the *DSM*, homosexuality was considered a disorder that could be treated. In later chapters of this text, where I discuss the details of specific disorders, I will include occasional *Understanding Changes in* DSM–5 feature boxes that highlight changes to and criticisms of *DSM–5* in relation to specific disorders. *LENS Assessment, Classification, and Clinical Practice: The RDoC Alternative to the DSM* explores the current initiative to create an alternative classification system, known as the **Research Domain Criteria (RDoC)** (https://www.nimh.nih.gov/research-priorities/rdoc/index.shtml).

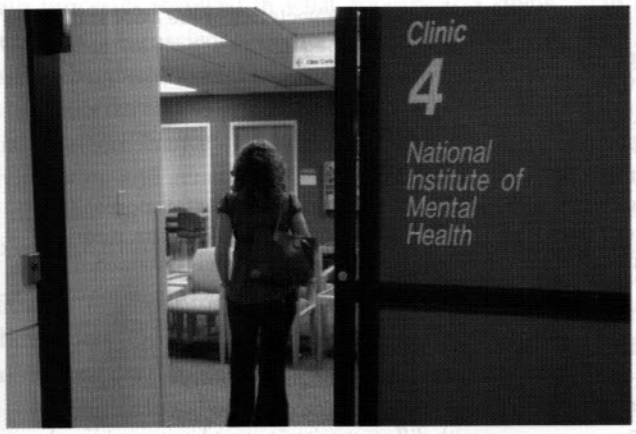
Research Domain Criteria (RDoC): an alternative classification system for mental disorders that emphasizes evaluating five domains established by the National Institute of Mental Health (NIMH) to better clarify our understanding of psychopathology

CONCEPT CHECK

- What are some of the reasons for setting up a classification system for mental illness, such as the *ICD* or the *DSM*?
- How are *ICD* and the *DSM* similar? How are they different?
- What are two major changes in the way disorders are classified in the most recent edition, *DSM–5*, compared with its predecessor, *DSM–IV*?

LENS

Assessment, Classification, and Clinical Practice: The RDoC Alternative to the *DSM*



National Institute of Mental Health

The National Institute of Mental Health (NIMH) has begun a program to better study, prevent, and treat mental disorders.

Classification of mental disorders in the United States relies on the *Diagnostic and Statistical Manual of Mental Disorders (DSM)*, published by the American Psychiatric Association. The current version is *DSM-5*, which was published in 2013. *DSM-5* uses very specific psychological signs and symptoms as the main determination for diagnosing a mental disorder.

As noted by Cuthbert and Insel (2013), whereas significant advances have been made recently in terms of reducing the rates of traditional medical problems such as cardiovascular disease, the same prevention and reduction have not been seen in relation to mental disorders. The National Institute of Mental Health (NIMH) has begun a program to better study, prevent, and treat mental disorders. One important aspect of this program is to develop a new way to classify mental disorders, referred to as Research Domain Criteria (RDoC).

In order to create a classification system, four steps were emphasized. The first was to identify the fundamental behavioral components such as affect regulation or executive functions that go across a number of disorders. The second was to identify the full range of human functioning. By doing this, variations in normal functioning can be used to identify psychopathology. The third step was to identify reliable and valid measures that can be used in research and treatment. The fourth step was to bring together components from a number of levels including genetics, brain functioning, behavioral aspects, and environmental aspects to describe the mental disorder.

In contrasting the NIMH RDoC approach to that of the *DSM*, Bruce Cuthbert and Tom Insel (2013) suggest there are seven significant differences.

1. Rather than beginning with a symptom-based definition as in the *DSM*, RDoC begins with the function of normal human processes. By examining the normal, it is possible to determine what is a variation from the normal range of functioning that would be considered a mental disorder. Also, by starting with normal functioning with its long history of research, it will be easier to identify underlying mechanisms seen when normal functions are no longer present.
2. Since RDoC emphasizes the full range of human functioning across a number of levels, mental disorders will be described in terms of dimensional components. In general, the *DSM* emphasizes categories such as major mood disorder, personality disorder, PTSD, or generalized anxiety disorder. *DSM-5* has begun to consider dimensional aspects such as autism spectrum disorder, but a number of disorders remain as categorical; you either have the disorder or you do not.
3. The third point emphasizes the reliability and validity of measures of human functioning. By using a dimensional approach, research can better note changes along the entire range of human functioning. In medicine, presenting blood pressure measurements along a continuum has allowed for advancements in the field in terms of who needs to be treated and at what level. For example, research suggests that those over the age of 60 may experience a higher blood pressure before treatment is needed than those who are younger (James et al., 2014). Looking at levels of anxiety and depression by studying their underlying components on a continuum would better identify who needs treatment and at what age.
4. The fourth point is related to how the *DSM-5* and RDoC dictate the type of research design

(Continued)

(Continued)

that is used. *DSM* research typically uses the diagnosis category as the independent variable. For example, individuals with anxiety according to the *DSM* are compared with a control group of individuals without anxiety. RDoC does not allow this type of approach. RDoC begins with a selection procedure. You might begin by looking at everyone who presented themselves at a VA clinic focusing on the treatment of PTSD. Another approach would be to study those who had experienced a trauma in the past month. You would then choose one or more independent variables that fit your research hypothesis. It could be distress, sleep, brain imaging, and so forth.

5. The fifth point relates to a search for an integrated understanding of behavioral and brain processes. This is understood in the RDoC approach to mean that both the behavioral measure and the brain measure or other physiological measure would be valid in themselves as a component of a particular disorder. The *DSM*, on the other hand, emphasizes signs and symptoms, without using specific neuroscience measurement techniques.
6. The sixth point reflects the different development trajectories of the *DSM* and RDoC. RDoC began with a focus on those disorders with solid research. Although the *DSM* seeks to be informed by research, the disorders included began with historical precedence.
7. Since RDoC is an experimental approach to understanding mental disorders, it can change as new information is obtained. This has less of an effect on society in terms of insurance payments, legal considerations, and the collection of prevalence rates. That is, every time diagnostic criteria for a *DSM* disorder changes, older studies of a disorder with different criteria must be reconsidered.

Thought Question: What are the advantages and disadvantages of *DSM-5* and RDoC?

SUMMARY

Psychological assessment is the process of gathering information about a person to be able to make a clinical decision about that person's symptoms. Most mental health professionals use a clinical interview to initially gather information concerning the status of an individual with whom they are working. Worldwide, the clinical interview, referred to as the mental status exam, has been organized into major assessment categories including the person's appearance and behavior, mood and affect, speech quality, thought processes, perceptions and general awareness of surroundings, and intellectual functioning and insight. With the most recent edition of the *DSM (DSM-5)*, the SCID has been developed to set forth specific assessment questions in a structured approach along with a decision tree for directing follow-up questions. Over the past 40 years, there has been an increasing awareness that mental illness takes place within the context of a particular culture, and a fuller understanding of psychopathology requires an understanding of this context. With *DSM-5*, a CFI has been developed to help mental health professionals obtain information concerning the person's culture.

Concerns about the accuracy of assessment and classification of psychopathology require us to consider questions of reliability and validity: (1) whether the person being assessed is giving us accurate information and (2) whether the assessment instrument measures the construct consistently (reliability) and accurately (validity). In terms of assessment, there are a number of types of reliability: internal reliability, test–retest reliability, alternate-form reliability, and inter-rater reliability. Although measures such as neuropsychological tests, brain images, and molecular and genetic changes suggest possible variables to be considered, there is currently no exact measure by which to diagnose psychopathology. This makes validity an important but complex concept. In terms of assessment, there are a number of types of validity: content validity, predictive validity, concurrent validity, and construct validity.

There are several models of assessment that represent different ways of assessing signs and symbols. These include symptom questionnaires, personality tests, projective tests and neuropsychological testing. Neuroscience technique

offer an additional level of analysis to the models of assessment that focus on signs and symbols. Scientists have sought to identify underlying markers associated with specific mental disorders. Using various brain imaging techniques such as MRI, fMRI, EEG, and MEG, there has been a search for structural and functional changes associated with psychopathology. There might be different underlying brain processes involved in what appears as a single disorder. Thus, neuroscience methods may lead to better diagnostic procedures. It is also possible to use these techniques to follow the course of a disorder over time. Another potential for neuroscience methods is that by knowing the underlying brain and genetic processes involved in a particular disorder for a particular person, it would be possible to create a treatment particular to a given individual.

Classification is a way to organize the diversity seen in mental disorders. Over the past 200 years, numerous systems have been developed; however, in the past 50 years, the emphasis has been on reliability of diagnosis. There has been a push for observable characteristics that would define a specific disorder—signs and symptoms delineated through observation of, and conversation with, the individual. In general, these types of criteria make up the structure of the *DSM*, published by the APA and used in North America, and the *ICD*, published by the WHO and used in Europe. One overall change in the most recent edition of *DSM (DSM-5)* is the use of dimensional assessments and spectrum-related disorders. Another change is in the placement of disorders based on underlying vulnerabilities as well as symptom characteristics to reflect how a variety of disorders may have some common underlying similarities. The National Institute of Mental Health (NIMH) has begun a program to better study, prevent, and treat mental disorders, which includes developing a new way to classify mental disorders, referred to as Research Domain Criteria (RDoC). Beginning with the next chapter, I will turn to focusing on particular disorders.

STUDY RESOURCES

REVIEW QUESTIONS

1. What are some of the advantages of conducting a structured interview for an initial mental health assessment? In addition, what specific advantages do the mental status exam and the SCID offer?
2. How do reliability and validity relate to the assessment and classification of psychopathology?
3. How can neuropsychological testing help us understand mental illness?
4. What important areas of potential do neuroscience techniques offer in the assessment and classification of mental illness?
5. "Classification is a way to organize the diversity seen in mental disorders." From what you have read about *ICD* and *DSM*, the advantages of classification are clear, but are there any disadvantages or things that are overlooked?

FOR FURTHER READING

Frances, A. (2013). *Saving normal: An insider's revolt against out-of-control psychiatric diagnosis,* DSM–5, *big pharma, and the medicalization of ordinary life.* New York, NY: Harper Collins.

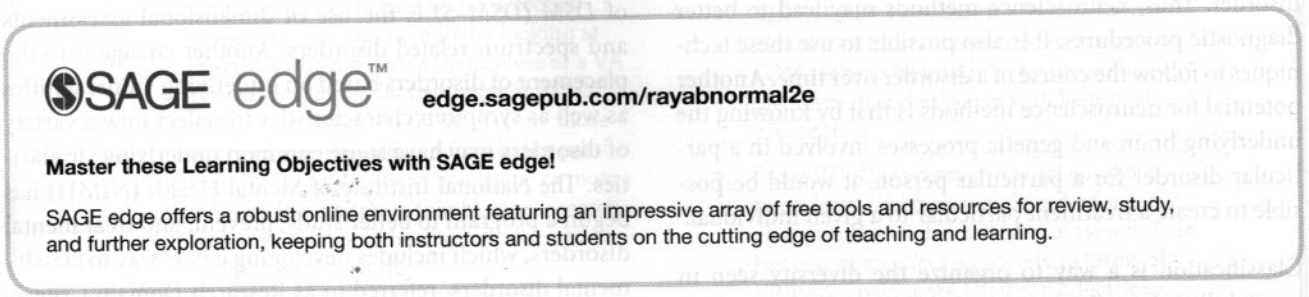
Kitayama, S., & Cohen, D. (2007). *The handbook of cultural psychology.* New York, NY: Guilford Press.

Meehl, P. E. (1954). *Clinical versus statistical prediction.* Minneapolis: University of Minnesota Press.

KEY TERMS AND CONCEPTS

Beck Depression Inventory (BDI) 131
categorical 140
classification 142
comorbid 140
Continuous Performance Test (CPT) 137
Cultural Formulation Interview (CFI) 127
delusional thinking 126
Diagnostic and Statistical Manual of Mental Disorders (DSM) 139
dimensional 140
externalizing disorders 140
flight of ideas 126
internalizing disorders 140
International Classification of Diseases (ICD) 139
mental status exam 125
Minnesota Multiphasic Personality Inventory (MMPI) 131

National Institute of Mental Health (NIMH) 141
obsessional thinking 126
projective instruments 133
psychological assessment 125
reliability 129
Research Domain Criteria (RDoC) 146
reward system 141
Rorschach inkblot 134
Structured Clinical Interview for *DSM* Disorders (SCID) 126
structured interview 126
Thematic Apperception Test (TAT) 136
Wechsler Adult Intelligence Scale (WAIS) 136
Wisconsin Card Sorting Test (WCST) 137



4.1 Explain what the mental status exam is and how it is used.
- A Psychiatrist's Prescription

4.2 Identify cultural and other considerations used in the assessment of psychological disorders.
- Assessing Psychological Disorders

4.3 Identify the tests and techniques used in assessing mental illness.
- Clinical Neuropsychology & Cognitive Rehabilitation
- Diagnosis of Self-Injury Disorder

4.4 Discuss diagnostic considerations in approaching psychopathology.
- Amy Wenzel Discusses Psychology
- The Marshmallow Test

4.5 Explain the significance of the *DSM–5* and RDoC in the classification of mental disorders.
- The New Alternative *DSM–5* Model
- APA: *DSM–5* Development