Types of Assessment

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Introduction

Assessment is an area of psychology that has been the subject of tremendous research and development activity, since the beginning of the discipline. Accordingly, it is not surprising that a very large array of types of assessments have been created. Especially with the information technology revolution continuing to explode, it is anticipated that the large variety of types and formats of assessment that already exist will only grow. In this chapter, we review the major general types of assessments as they relate to assessment of individuals with autism spectrum disorders (ASD). With a topic as broad as this one, it will of course be impossible to achieve an exhaustive coverage. Instead, we attempt a broad-level survey and discussion of most major types of assessments. To illustrate our points, we discuss particular examples of each type of assessment and we focus on assessments that have good psychometric research support and which we have found to be useful for research and practice with individuals with ASD. Although there are many different domains in which individuals may need to be assessed, for the sake of space, it is not possible to cover all. This chapter is organized first by discussing each major type of assessment (e.g., indirect, direct, etc.). Within each section on each major type of assessment, further discussion of individual diagnostic, adaptive, cognitive, and functional assessments are included as illustrative examples.

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Types and Formats of Assessments

Obtaining a History with an Unstructured Interview

Obtaining a thorough clinical history through an unstructured interview is the most basic and fundamental of assessment processes. This is generally the very first thing the assessing clinician does when meeting with the client and/or his/her guardians. The purpose of this interview is to gain relevant information regarding all major medical and psychosocial variables that might be relevant, including the client's pre- and postnatal periods, developmental milestones and achievements, health and medical background, social and play development, adaptive functioning, psychological and psychiatric care, and academic/work histories. Interviews

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should ascertain historical information regarding previous diagnoses, treatment interventions and evaluations, and behavioral presentations. This initial interview also serves the very important function of establishing rapport between the clinician and the individual being assessed and/or his/her caregivers. Interviews can be conducted with the referred individual and his/her primary caregivers (e.g., parents, family members, legal guardians) depending on the client's age and level of functioning. In addition, teachers, intervention providers, and childcare workers may be interviewed.

Diagnostic

The purpose of the diagnostic interview is to obtain narrative information from caregivers and/or the client regarding areas of functioning that are relevant to the diagnostic criteria of ASD. For very young children, this will primarily consist of interviewing the parents. For older and more verbal children, direct conversations with the client are highly valuable. According to Jerome Sattler (2001), an unstructured interview with a child, depending on the child's age, can be useful in understanding how the child views the referral and his/her family, teachers, and peer group. When considered for an ASD diagnosis, an intake with the child may assist in determining the level of severity of the diagnosis if ASD criteria are met.

When conducting a diagnostic interview with adolescents or adults who perhaps never received a childhood diagnosis of ASD, a new diagnosis may be dependent on specific criteria of communication, socialization, and restricted, repetitive patterns of behaviors being met through historical recall of the client's behaviors during his/her early developmental period, the typical onset of pervasive symptomology (American Psychiatric Association, 2013). In addition, interviews should obtain information regarding the client's current presenting problem and behavioral concerns in order to develop a referral question for the purpose of conducting a thorough evaluation, incorporating one's clinical impressions with formal testing results in the form of a written report and in-person feedback, and providing comprehensive recommendations to the individual or family.

Clinical interviews can range in structure from informal, open-ended interviews to structured interviews, designed as standardized measures that are coded and scored to align with the diagnostic criteria of ASD. Multiple interviews across interviewees and designs can be utilized in constructing the most appropriate and comprehensive battery aimed at addressing the referral question of the client. More specifically, a structured diagnostic interview with a parent may be supported at the conclusion of a semi-structured intake interview with the same parent.

The unstructured clinical interview offers a free-flowing and less rigid approach which is ideal for building rapport with the interviewee. Although this approach is less direct, it is a good idea to have an idea going into the interview of specific topics to discuss. Information gathered in an ASD clinical interview will focus on the client's presenting concerns, development, and behavioral functioning across contexts (e.g., home, school, community), with specific attention paid to typical ASD symptomatology. More specifically, information should be gathered in the following domains, with ideas for subtopics listed:

- Presenting Concerns
  - Description of the Problem
  - Onset of Symptoms
- Developmental History
  - Milestones: Single Words, Sentences, Sitting, Crawling, Walking, Toileting, Riding a Bicycle, Dressing, Eating
  - Hobbies/Interests
  - Reaction to Puberty
  - Periods of Regression in Development
- Medical History
  - Current Diagnosis/Diagnoses
  - Medication History
  - Sleep
  - Feeding and nutritional history
- Psychological, Psychiatric, and Treatment History
  - Current Diagnosis/Diagnoses
  - Previous Evaluations

  - Treatment History
  - Suicidality/Homocidality
- Social Development
  - Engaged or Parallel Play
  - Current Play Behaviors
  - Peer Interests
- Academic and/or Work History
  - IEP services
  - Classroom Type
  - Part-Time/Full-Time Aid
  - Work History
  - Current Volunteer or Paid Employment
- Family History
  - Current Living Arrangements/Family Constellation
  - Married/Separated/Divorced
  - Language(s) Spoken in the Home, etc.
  - Family Medical/Psychological/Psychiatric History
  - Cultural Background
- Behavioral Presentation
  - Restricted/Repetitive Interests
  - Echolalia
  - Idiosyncratic Speech
  - Attention/Hyperactivity
  - Atypical Behaviors

Unstructured interviews are recognized for helping examiners establish a high level of rapport with the interviewees. In addition, they facilitate a broad and flexible exploration of the client's background. However, unstructured interviews have potential limitations, including subjectivity and potentially low reliability and validity. For these reasons, most clinicians prefer to supplement the interview process with structured and/or semi-structured interview procedures.

The semi-structured interview is more goal-oriented than the unstructured interview, in that it provides a list of questions, yet it can be manipulated as needed. It is less rigid than the structured interview. Semi-structured interviews address domains similar to those listed above in the unstructured interview section. In addition, interviewers may construct semi-structured formats by converting relevant areas of functioning into specific questions (Groth-Marnet, 2009). More specifically, utilizing an expanded version of the subtopics included in the unstructured interview section and utilizing inquiries of frequency, duration, onset, description, importance, antecedent, and consequence, the interviewee can construct an elaborate, yet fluid, series of questions:

- "What are some of your concerns?"
- "Please describe the most important concern you have"
- "How often does this behavior occur?"

Overall, if administration time is a concern, a semi-structured interview may be the best choice. The interviewer can accomplish an established design of questions in a short period of time and the structured nature of the interaction tends to keep both clinician and caregiver on-track and on-time. If the client is demonstrating symptoms of multiple and conflicting diagnoses, an open-ended and unstructured interview may be appropriate in that it offers the interviewee the flexibility to probe distinct elements of the client's presentation that may be otherwise missed with the more agenda-like approach of a structured interview. Many clinicians prefer a combination of the two, particularly if time allows.

Functional Assessment

Unstructured clinical interviews are a crucial and foundational part of the process for conducting a functional assessment of challenging behavior in individuals with ASD. Many of the points discussed above also pertain to the functional assessment process and those points will not be repeated here. Instead, we will briefly summarize some of the points that are unique to conducting unstructured functional assessment interviews.

After obtaining a basic description of the problem and the main reasons for concern, the clinician will begin asking open-ended questions that attempt to identify the common antecedents (events in the environment that immediately precede challenging behavior) and common consequences (events in the environment that immediately follow challenging behavior), in order to obtain information about environmental events that may contribute to maintaining the

behavior. Researchers have shown that the vast majority of challenging behavior displayed by individuals with developmental disabilities is maintained by one or more of the following four basic functions: (1) access to attention (aka, "attention function"), (2) escape from non-preferred task or demands (aka, "escape function"), (3) access to preferred items or activities (aka "tangible function"), or (4) automatic reinforcement (aka "self-stimulatory") (Iwata et al., 1994). Therefore, when conducting an interview, it is wise to direct your questions and conversation toward obtaining information that will provide evidence for and against those primary four functions.

Some generic, open-ended questions that can be useful include:

- What time of day does the behavior usually occur?
- In what settings does the behavior usually occur?
- What are some common triggers for the behavior?
- What do you or other caregivers do that is likely to provoke the behavior?
- What reactions do you and other caregivers usually have to the behavior?
- How do you usually manage the behavior?
- Does the behavior occur when the individual is not receiving very much attention?
- Does the behavior occur when a caregiver asks the individual to do something he/she doesn't want to do?
- Does the behavior occur when a caregiver does not give the individual an item or activity that the individual wants?
- Does the individual do the behavior at a high rate, across settings and contexts, regardless of how caregivers respond?

Other less common functions, such as escape from attention, access to control over the environment, and access to stereotypy/rituals/routines have also been identified (Hanley, Iwata, & McCord, 2003). Although there is initial evidence that these functions exist, research has generally suggested that they are less common. Still, if the initial interview does not conclusively point to one of the more standard four functions described earlier, the clinician can ask questions such as these, in order to assess for the less common functions:

- Does the individual always need to be in control? Does he/she seem to be using his/her challenging behavior to be in control of the situation?
- Is he/she perfectly happy to be alone? Does he/she seem to be using his/her challenging behavior to get you to leave him/her alone?
- Does he/she engage in the challenging behavior when you interrupt him/her from engaging in his/her repetitive behavior/rituals/routines? Is he/she highly insistent that certain things or routines be done exactly the way they are supposed to? Is he/she particularly inflexible?

Because the interview is unstructured, the caregiver is encouraged to provide as much information as they can regarding the conditions in which the challenging behavior occurs. As the caregiver begins to specify particular events that might suggest one particular behavioral function or another, the clinician adjusts his/her questions to further pinpoint a likely function and to rule out other possible functions. It is often useful for the clinician to ask questions about whether the behavior occurs in conditions that one would expect it *not* to occur, given particular functions. For example, "Does the behavior occur when the individual is already receiving lots of attention?" If the answer is yes, then that would lend evidence against an attention function. Similarly, it is often useful in helping to rule out an escape function to ask whether the individual engages in the behavior when no one is asking him/her to do anything. If the answer is yes, an escape function seems unlikely, as there is nothing for him/her to be escaping from at such times. Another useful question to ask is "When the individual is engaging in the behavior, what is a sure way to get him/her to stop?" Answers to this question often identify the reinforcer for the behavior. For example, if the answer is something like "Stop asking him to do something," then that might point to an escape function, whereas an answer such as "Just give him the thing he wants," might point to a tangible function.

Records Review

Requesting formal records can be a useful means of obtaining a detailed history of a client's background. Thus, there is general consensus that any assessment process includes a records review early on.

Diagnostic

In order to obtain relevant background information for the diagnostic assessment process, medical, psychological, psychiatric, academic, speech and language, physical and occupational therapy, and other forms of documented records may be requested to supplement information acquired through clinical interviews, screening measures, and parent surveys. Information provided in previous diagnostic evaluations, Individual Education Program (IEP) triennial reviews, genetic testing lab reports, and other records may indicate concerns in specific domains for the client you are evaluating or provide evidence ruling out concerns in other areas. Overall, reviewing client records can assist in answering the client's referral question with a more inclusive and supported interpretation of results.

Functional

When conducting a functional assessment of challenging behaviors displayed by an individual with ASD, the clinician should review what relevant functional assessment activities have been done in the past. In theory, if a good-quality functional assessment has been done on the same behavior relatively recently and that assessment produced what appear to be conclusive results, it may not be necessary to repeat a comprehensive assessment. Indeed, doing so may be a waste of the client and clinician's time. However, it is important to note that the functions of challenging behaviors often change over time, so if the previous functional assessment is more than a few months old, conducting a new one—particularly a brief one, such as an indirect assessment—may well be warranted. It is also worth noting that it is impossible to determine from a records review whether existing functional assessments succeeding in addressing all relevant environmental variables and settings. In other words, in a records review, you do not know what you do not know.

Limitations

Several drawbacks of record reviews are worth discussing. Depending on the nature of the request for information (e.g., client request versus agency to agency request), applicable privacy laws (i.e., Health Insurance Portability and Accountability Act of 1996 (HIPAA)) may come into effect and must be abided by. In such instances, a written authorization to disclose the requested protected health information (PHI) must be received by the releasing agency. If interagency communications regarding the care of the client are to be conducted, both agencies must obtain written authorization to disclose PHI. An additional limitation with record reviews is that records may not always be accurate or may be incomplete. Therefore, caution in interpreting records is warranted.

Formal Indirect Assessments

Indirect assessments are formal assessments that do not require direct contact between the clinician and the client to complete the assessment. Instead, the clinician has contact with parents, staff, or other caregivers. Indirect assessments include both instruments that are completed independently by an informant (e.g., inventories, rating scales) and those that are completed by the examiner, in a structured or semi-structured interview style with the respondent (e.g., questionnaires, checklists). Respondents typically include parents and caregivers, but other individuals may also be incorporated in the process, such as teachers.

Independent Measures

Independent measures, such as parent inventories and checklists, encompass a variety of developmental domains, which may include a client's functioning in the areas of diagnostic characteristics, adaptive abilities, social skills, executive processes, socio-emotional capacity, and many

more. These measures generally take 15–60 min to complete and can be completed by the caregiver while the examiner is working with the client directly.

The Vineland Adaptive Behavior Scales, Second Edition (Vineland-II), is a measure of an individual's adaptive skills, specifically in the areas of communication, socialization, daily living, and motor skills. The Vineland-II also assesses an individual's level of maladaptive behavior. The Vineland-II is conducted using two different methods, which include the Survey Interview Form and the Parent/Caregiver Rating Form. The rating scale format is an independent method of gaining insight into a client's behavior by having a respondent who is familiar with the client rate their behavior (Sparrow, Cicchetti, & Balla, 2005). This method may be susceptible to biased responses for various reasons. Therefore, it is preferred that the interview format be administered (Sparrow et al., 2005).

The Vineland-II was standardized on males and females ranging from birth to 90 years old and of various race/ethnicity, socioeconomic status, and geographic region (Sparrow et al., 2005). Furthermore, the Vineland-II gathered data from specific clinical groups in order to identify deficits in adaptive behavior, such as "attention- deficit/hyperactivity disorder, autism-nonverbal, autism- verbal, emotional or behavioral disturbances," etc. (Sparrow et al., 2005, p. 91).

The internal consistency reliability calculated for the Vineland-II, interview form and rating scale form, utilized the split-half method. Overall, the Vineland-II subdomain has a "reliability estimate … subdomain reliabilities", using the Spearman-Brown Prophecy, indicate more than half are 0.90 or greater, and only six are below 0.80" (Sparrow et al., 2005, p. 95).

The Gilliam Autism Rating Scale-3 (GARS-3; Gilliam, 2006) is a commonly used independent indirect diagnostic tool. The GARS-3 is a 56-item rating scale that can be completed by a parent, teacher, or clinician. The GARS-3 has been shown to have good internal consistency, test-retest reliability, and inter-rater reliability.

The Baby and Infant Screen for aUtistIc Traits (BISCUIT; Matson, Boisjoli, & Wilkins, 2007) is an informant-based behavior checklist that assesses ASD symptoms in children 17–37 months of age. In addition to screening for ASD traits and symptoms, the BISCUIT contains subscales that assess for comorbid symptomology, as well as challenging behavior. The BISCUIT has strong demonstrated reliability and validity (Matson et al., 2009).

Directly Administered Measures

Indirect measures that are conducted between the examiner and a respondent exist for assessing a large variety of areas of functioning. Since these measures are administered and led by the examiner, the duration of time spent may be longer than with independent measures, as the examiner may pose further questions to clarify responses or if the respondent requires an explanation of questions they are being asked. In addition, many of these measures are simply more comprehensive and therefore require more time to administer, as well as more prior training and experience on the part of the examiner.

The Autism Diagnostic Interview-Revised (ADI-R; Lord, Rutter, & Le Couteur, 1994) is considered a "gold standard" assessment tool and is a 93-item standardized, semi-structured interview that is designed to assess for potential ASD diagnosis. The ADI-R can be used with children with a mental age of at least 2 years. Administration takes 90–150 min, including scoring time. The assessment produces categorical scores in three domains: (1) Language/Communication, (2) Reciprocal Social Interactions, and (3) Repetitive Behaviors/Interests. The ADI-R has been found to have good reliability and validity (Lord et al., 1994). Advantages of the ADI-R include the fact that it is highly detailed and widely respected. A disadvantage is that it is time-consuming and requires advanced training to administer.

Indirect Functional Assessments

A variety of structured, examiner-administered indirect functional assessments have been developed and researched. All indirect functional assessments probe knowledgeable caregivers for information regarding the common antecedents and consequences of the challenging behavior.

For example, the Questions About Behavioral Function (QABF; Matson, Bamburg, Cherry, & Paclawskyj, 1999) consists of 25 questions that caregivers rate in terms of frequency, by answering a Likert-type scale of "never," "rarely," "some," or "often." The QABF yields results that suggest one or more of the following potential functions: attention, escape, tangible, physical, and nonsocial. The QABF has been shown to have good psychometric properties, including good validity (Matson et al., 1999), test-retest reliability (Paclawskyj, Matson, Rush, Smalls, & Vollmer, 2000), inter-rater reliability (Nicholson, Konstantinidi, & Furniss, 2006), internal consistency (Shogren & Rojahn, 2003), and convergent validity with experimental functional analyses (Tarbox et al., 2009).

Indirect functional assessments enjoy many of the same strengths as diagnostic and other indirect assessments. For example, they are generally the lowest cost, both in terms of time and financial resources. They are entirely safe, in that they do not require direct contact with challenging behavior. Finally, they are often the only viable choice for bringing functional assessment to scale in the broader community. For all of these reasons, indirect functional assessments have become a standard part of a best practices approach to functional assessment of challenging behavior in individuals with ASD.

Despite their many strengths, indirect functional assessments, like other indirect assessments, also suffer from a number of weaknesses. First, they depend on the recall capability of the caregivers who answer the questions on the assessment. Caregiver recall can be inaccurate, exaggerated, or unreliable. Second, since the clinician does not directly observe the behavior and the environment in which it occurs, many relevant variables may be missed, that otherwise might be apparent from direct observation. Finally, even at best, the relations that indirect assessments suggest between behavior and environmental variables are only correlational. Even if caregiver recall was perfect, merely noting that a particular consequence frequently follows behavior (e.g., attention) does not guarantee that attention is the maintaining consequence of the behavior. It is common for caregivers to reprimand individuals when they engage in challenging behavior, so it is quite common for attention to be the most common consequence of challenging behavior, even when attention is in no way relevant to maintaining the behavior. For all of these reasons, best practices generally suggest that indirect functional assessments be supplemented with descriptive and experimental analyses, which will be discussed later in the chapter.

Direct Assessments

Direct assessments are standardized tools conducted with the client and are used to measure an array of functioning (e.g., cognitive, language, achievement, executive functioning, etc.). Direct assessments provide an opportunity for the examiner to observe and document the client's performance in specified areas of functioning, as well as behavior toward test—taking and compliance in a novel situation, with a novel individual. Direct assessments vary in the degree of structure and demand placed on the client. For instance, some direct measures require a client to sit at a table with the examiner for a specific duration of time (e.g., WISC-IV), while others include more naturalistic efforts (e.g., ADOS-2; Lord, Rutter, DiLavore, & Risi, 2008).

Semi-Structured Administrations

Semi-structured direct assessments involve procedures that specify some part of the interaction between the clinician and client but do not structure the entire interaction. A classic example in diagnostic assessment is the Autism Diagnostic Observation Scale, Second Edition (ADOS-2; Lord et al., 2008). The ADOS-2 consists a "gold standard" diagnostic assessment and consists of a semi-structured direct assessment, wherein the assessor and client engage in scenarios that assess communication, social interaction, play, and restricted repetitive behaviors. Scenarios are conducted in a standardized manner and a standardized scoring rubric is used to score the client's responses. Five different modules of scenarios are available for the assessor to implement,

depending on the age and communication level of the client. The time required to administer the ADOS-2 ranges from 40 to 60 min. Advantages of the ADOS-2 include that it is widely respected and that directly observing the client engage in social interactions helps give the clinician information that they may miss when only interviewing caregivers. A major disadvantage is that extensive training is required to administer the ADOS-2 in a reliable manner.

Structured Administrations

Structured assessments are more commonly used than semi-structured ones and comprise much of an assessment battery, be it developmental, cognitive, or other. Among the most commonly used structured assessments is the Wechsler series of intelligence tests. The Wechsler Preschool and Primary Scale of Intelligence, Third Edition (WPPSI-III; Wechsler, 2002), is a test of cognitive ability for children ages 2:6–7:7. The test requires 30–60 min to administer, depending on age, and yields full-scale IQ scores, as well as primary and ancillary index scores. The Wechsler Intelligence Scale for Children, Fourth Edition (WISC-IV; Wechsler, 2003) is designed for older individuals, ages 6 through 16. The WISC-IV requires 60–90 min to administer and yields full-scale IQ scores, index scores, and subtest scaled scores. Both Wechsler tests are very widely respected and have well-established psychometrics.

Direct Descriptive Functional Assessment Methods

A variety of direct functional assessment methods are commonly used to assess the challenging behavior of individuals with ASD. Since space does not permit an exhaustive review of the various methods, we will briefly discuss the most common two types: structured and unstructured antecedent-behavior-consequence recording (ABC recording). In both types of ABC recording, the clinician observes the client in his/her natural environment and, each time the target challenging behavior occurs, the clinician records the antecedents and consequences of the behavior. It is important for the clinician to observe the client across a variety of settings in which the challenging behavior is likely. It is also important for the clinician to observe the client across a variety of settings that allow for the opportunity of behaviors of various functions to occur. For example, if the client is always receiving large amounts of attention during the observation, attention-maintained behavior may never occur, and therefore, attention may not be identified as a function, yielding a potential false-negative result for attention. Similarly, if the client is never asked to complete non-preferred task demands during the observation, it is unlikely that he/she will engage in escape-maintained behavior, and therefore, escape would likely not be identified as a function, again potentially yielding a false-negative result for escape.

In unstructured ABC recording, the clinician records narrative data of the antecedents and consequences. When the observation is complete, the narrative data are then coded in terms of the categories of antecedents and consequences that they indicate and the data are summarized, according to function. In structured ABC recording, the clinician uses a datasheet that contains prespecified categories for antecedents and consequences and he/she indicates all categories that were observed each time the target behavior occurs. Table 2.1 is a sample structured ABC recording datasheet.

Unstructured ABC data have the advantage of allowing the clinician to record anything that might be relevant and to then analyze the relevance of each detail later. Disadvantages of unstructured ABC data are that it can be time-consuming and effortful to write the narrative and it may not be possible to write fast enough when observing particularly high-rate behavior. In addition, the necessity for interpreting the narrative after the observation introduces an additional source of potential subjectivity in the process. Structured ABC recording enjoys the advantages of being faster and easier to record in the moment and being relatively less subjective. A disadvantage is that the prespecified categories on the datasheet may fail to capture all relevant variables that the clinician observes. However, the clinician can always jot down any other anecdotes in the margin of the datasheet or

Table 2.1 Sample structured antecedent-behavior-consequence (ABC) recording datasheet. The clinician uses structured categories to record behaviors, as well as events that occur immediately before and after them.

Antecedents:
LA = Low attention, Dem = Demand given, Tang = Preferred item removed, None = None of the above
Behaviors:
(1) _____ (2) _____ (3) _____ (4)_____
Consequences:
Att = Attention given, Esc = Escape given, Tang = Preferred item given, None = No consequence

Antecedent	Behavior	Consequence
LA/Dem/Tang/None	1/2/3/4	Att/Esc/Tang/None
LA/Dem/Tang/None	1/2/3/4	Att/Esc/Tang/None
LA/Dem/Tang/None	1/2/3/4	Att/Esc/Tang/None
LA/Dem/Tang/None	1/2/3/4	Att/Esc/Tang/None
LA/Dem/Tang/None	1/2/3/4	Att/Esc/Tang/None
LA/Dem/Tang/None	1/2/3/4	Att/Esc/Tang/None
LA/Dem/Tang/None	1/2/3/4	Att/Esc/Tang/None

in a section of the datasheet that is designed for additional comments.

Regardless of whether data are collected via structured or unstructured ABC recording, the clinician must then summarize the data and interpret the results according to function. It is worth keeping in mind that, as discussed in the section on indirect functional assessments above, the vast majority of research has shown that more than 90 % of challenging behaviors displayed by individuals with developmental disabilities are maintained by attention, escape, tangible, automatic reinforcement, or some combination. Therefore, it is prudent for the clinician to look for these potential functions first, before becoming overly creative with potential interpretations of the descriptive data.

Direct descriptive functional assessments have several strengths and limitations worth noting. One strength is that they allow the clinician to directly observe behavior, so it is possible that he/she will identify important environmental variables that would be missed in an indirect assessment. Another strength is that they are relatively easy to implement and only require sound observational data collection procedures. Finally, a strength of descriptive assessments is that they are safe, in that the clinician need not interact with the individual engaging in challenging behavior, they need only observe. Like any other assessment, descriptive assessments also suffer from limitations. First, like indirect assessments, the information they produce is only correlational. It is possible that the relations observed between behavior and environment during the assessment are mere correlation and do not actually point to the maintaining variables for the behavior. Perhaps the most concerning limitation is that several studies have shown that a large proportion of descriptive assessments produce either invalid or inconclusive results (Lerman & Iwata, 1993; Tarbox et al., 2009).

Experimental Functional Analyses

In particularly severe or perplexing cases, or when indirect and descriptive functional assessments produce inconclusive results, best practices often call for simpler functional assessments to be supplemented by experimental functional analyses (EFA; Iwata, Dorsey, Slifer, Bauman, & Richman, 1982). An EFA is a procedure where antecedents and consequences for challenging behavior are intentionally manipulated to determine which antecedents reliably evoke the behavior and which consequences reliably reinforce the behavior. The classic procedure involves randomly alternating five analogue conditions: (1) attention, (2) escape, (3) tangible, (4) alone or no interaction, and (5) a control or play condition. Each of the first four experimental conditions test one putative function of challenging behavior by setting up antecedent conditions that

Table 2.2 Conditions of an experimental functional analysis for challenging behavior

Condition name	Potential function	Antecedent	Consequence for challenging behavior
Attention	Social attention	Pay no attention to client	Brief social attention
Escape	Escape from or avoidance of demands	High rates of low-preferred task demands	30-s break from task demands
Tangible	Access to preferred items of activities	Denied access to preferred items or activities	30-s access to preferred items or activities
Alone/ no interaction	Automatic reinforcement/ self-stimulation	No items or activities, no demands, no social contact	None
Play/control	N/A	High attention, no demands, continuous access to preferred items and activities	None
	Serves as a control for other conditions		

are likely to evoke the behavior, if indeed it has that particular function, and consequences that are likely to reinforce the behavior, if indeed it has that particular function. The fifth condition serves as a control condition, wherein none of the antecedents are in place and none of the consequences are delivered. Table 2.2 depicts the conditions and the antecedents and consequences that are presented in each. Sessions of each condition are repeated in a random order until differentiation in the rate of challenging behavior between conditions is observed or until it becomes apparent that the analysis is not producing interpretable results.

Experimental functional analyses have several advantages. First, substantial research has shown that they produce interpretable results in a large percentage of cases. For example, a large-scale review of research on EFAs found that 95.9 % of EFAs produce differentiated results (Hanley et al., 2003). However, it should be noted that this was a review of EFAs published in research, not a review EFAs actually done in real-life settings, so it is possible that the actual real-life success rate of EFAs is lower. A significant disadvantage of EFAs is that they require specialized training to administer and very few clinicians are available who possess that training. Even among Board Certified Behavior Analysts, the population of clinicians who possess the greatest training and expertise in functional assessment, only a very small minority possess the skills to safely and validly conduct EFAs. The unfortunate result is that EFAs are very rarely done in real clinical practice, despite their being considered the "gold standard" for functional assessment in research.

Clinical Judgment in the Assessment Process

As has been discussed throughout this chapter, clinicians use a wide variety of tools and procedures when assessing an individual with ASD. Some tools and procedures have come to be referred to as "gold standard" procedures. For example, the ADOS and ADI-R are often referred to as gold standard diagnostic procedures. Similarly, EFAs are often referred to as gold standard functional assessment procedures. However, in both diagnostic and functional assessments, it is worth noting that gold standard procedures tend to be more costly and labor intensive and require specialized training that a very small percentage of the population of clinicians possess. Even when a clinician does possess the resources and expertise required to implement gold standard procedures, it is critical to remember that no one modality or instrument is more valuable than clinical judgment. It is important to remember that results from any one modality (e.g., cognitive evaluation, diagnostic observation, functional assessment, etc.) comprise only a single component of the full evaluation process. For example, results of a single measure may indicate strengths and weaknesses in domains of intellectual functioning, but not account for possible delays in the realm of social development or

compensatory adaptive skills. While findings may provide insight to a particular observed behavior, they may be based on a limited sample of time or a novel setting. Parental endorsements may suggest a high or low frequency of a behavior in one setting that is not observed as generalizing to other settings. Similarly, even though an EFA is likely to produce the most reliable and valid functional assessment results, it is, by definition, analogue and contrived and therefore may produce behavior that occurs in reaction to clinician-contrived circumstances, rather than behavior that is representative of the client's real behavior in everyday life. Although little or no research has demonstrated it, it is hypothetically possible to "shape up" a new function for challenging behavior that was never before present, merely by systematically giving a particular consequence for a behavior during an EFA. Put differently, it is possible that a client may actually learn for the first time that a particular challenging behavior can earn him/her access to preferred items or activities.

Overall, no measure should be considered in isolation for the purpose of diagnosis or determining eligibility for services. In addition, measures should be evaluated and interpreted against one another in the evaluation process. A caregiver report should be evaluated against the clinician's direct observation and subsequent findings. It is clinical judgment that incorporates the individual modalities of testing together and produces a cohesive evaluation. Clinical opinion is invaluable in the diagnosis of ASD and functional assessment of challenging behavior and cannot be substituted, only strengthened, with carefully considered and administered measures of development, cognition, language, and executive functioning; diagnostic observations and structured interviews; surveys, questionnaires, and inventories related to social skills, behavioral, emotional, and adaptive functioning; review of psychological and medical records; functional assessment tools; and detailed histories obtained by caregivers and teachers. Furthermore, a clinician has the ability to draw from the findings of one measure to inform his/her decision to administer additional measures as he/she attempts to answer the referral question. During the interpretation of data, an individual's test performance in one domain of functioning can assist in the understanding of another domain. More specifically, a clinician can utilize an individual's performance in the areas of cognition and language to support his/her interpretation of that individual's functioning in the areas of social and communication abilities (Lord et al., 2012).

Behavioral Observations Impacting Interpretations

The behavioral observation section of an ASD evaluation focuses on the behaviors witnessed throughout the testing session(s). The behaviors exhibited by the client are described in an objective manner and can support the clinical judgment of the clinician in his/her determination or ruling out of a diagnosis. Often, the behaviors described in the behavioral observation section will be referenced in subsequent areas of the report, including the summary and diagnostic section, in which in vivo observations in combination with parent interview and behavioral questionnaires play a large role in supporting diagnostic criteria.

Observations to be Considered

- Effort
- Basic sustained attention
- Cooperation
- Speech—volume, intonation, articulation, rhythm
- Frustration tolerance
- Compliance
- Rapport
- Handedness, pencil grip
- Restless motor behaviors
- Balance/Gait
- Vision and hearing

Observations Prevalent in ASD

- Speech (e.g., one-word labels, 3–4 word phrases, fluent speech), topic flexibility
- Eye contact
- Distractibility
- Toleration of task demands
- Task initiation
- Perseveration/Rigidity
- Repetitive and stereotyped behaviors
- Self-monitoring/Self-correcting
- Transitioning between tasks

Assessment Results Versus Actual Everyday Functioning

When completing any assessment, be it diagnostic, functional, or otherwise, it is critical to consider that the client may perform different in structured assessment situations than he/she does in the course of his/her everyday life. There are many variables that may result in performance under testing conditions diverging from everyday performance. First, controlled assessment environments generally have less distractions and extraneous stimuli than real life. Particularly since many individuals with ASD have difficulty with complex, overstimulating environments, the quiet assessment environment may produce performance that is higher than that which actually occurs in real life. However, the demands of test-taking situations may have the opposite effect for some individuals with ASD. For example, some individuals may be frightened by novel environments or novel clinicians. In addition, individuals with ASD who have difficulty with language may score lower on a test that is highly verbal than what their true functioning ability may be in real life, where ample, nonvocal cues and feedback may be available. In the case of EFAs, if the assessment is conducted in a novel, empty room, with an unfamiliar clinician and no parents present, novel challenging behaviors may be evoked, such as those aimed at escaping the room. Such behaviors may appear severe to the clinician but may not actually represent the real challenging behaviors displayed by the individual in their daily life. It is of course not possible to determine a priori all of the variables that may enhance or worsen client performance under assessment conditions. Rather, it is important for clinicians to remain apprised of the potential for such problems and so supplement structured testing conditions with thorough caregiver interview and observations in the natural environment.

Progression Through Assessment Process

Each assessor and each clinic possesses traditions and preferences regarding how to progress through the entire assessment process. Each purpose for assessment will also largely dictate how the clinician progresses through the assessment process. For example, if the only purpose of assessment is to identify a diagnosis, then primarily diagnostic assessments may be administered, with other areas of functioning done in a supporting manner. However, if the purpose of assessment is to confirm diagnosis and conduct a comprehensive workup of a child's overall development and functioning, for example, then a much larger battery of assessments will likely be done. Finally, if the purpose of assessment is only to identify the function of a single challenging behavior, then the process will be much narrower and focus almost exclusively on functional assessments.

Regardless of the purpose of assessment, some clinicians resort immediately to effortful, time-consuming, costly assessment batteries, while others may attempt to use only low-cost, rapid methods. We suggest a third route, that is, progressing gradually from less to more intrusive, depending on the purpose of assessment and on the ongoing data produced during the assessment process. For example, when diagnosing a child with autism, an experienced diagnostician may find that, in some cases, merely conducting a thorough interview and completing one or two indirect diagnostic tools with the child's parent, plus a brief in-person observation of the client in the clinician's office, may suffice to confirm an ASD diagnosis and rule out other possible diagnoses.

However, in cases where these low-cost, rapid approaches do not yield conclusive results, something requiring more time and expertise, such as an ADOS, may be needed. Finally, conducting a lengthy and costly structured interview, such as the ADI-R, may be needed in cases that are not entirely clear. All of these options may well need to be supplemented by observing the client in their natural environment.

Taking a least-to-most intrusive and costly approach is also common in functional assessment of challenging behavior. In relatively straightforward and less severe cases, a simple interview with caregivers and completion of an indirect assessment, such as the QABF, might suffice to produce a clear hypothesis regarding behavioral function. If this is the case, the clinician might be wise to move directly to a rapid treatment analysis to confirm the results of the assessment. In cases where indirect assessments produce inconclusive or conflicting results and/or in cases where the behavior is of sufficient severity, progressing to a descriptive functional assessment is often warranted. Furthermore, when a descriptive assessment does not produce conclusive results, progressing to an EFA may be warranted. Another occasion upon which an EFA may be warranted is when treatments have been attempted on the basis of the results of indirect or descriptive functional assessments and the treatments have failed, suggesting that the results of those assessments may have been incorrect or incomplete. Interestingly, although EFAs are generally considered more labor intensive and time-consuming than descriptive assessments, that is not always the case. For example, Tarbox et al. (2009) spent approximately the same amount of time on ABC and EFA assessments and found that EFAs produced interpretable results in 100 % of cases, whereas ABC assessments produced interpretable results in only 57 % of cases. Therefore, at least in that study, EFAs were arguably more efficient and less costly than descriptive assessments because they required about the same amount of time but produced conclusive results, whereas almost half of the descriptive assessments still required additional assessment to be done afterward, in order to produce interpretable results.

Although ample research has demonstrated the utility of EFAs, the current reality is that very few clinicians are actually trained to conduct them. Therefore, the vast majority of behavior analysts, psychologists, and school districts simply are not equipped to conduct EFAs and therefore conduct only indirect and descriptive functional assessments. In these cases, the choice of indirect and descriptive is not based on a rational clinical decision making process, it is the only choice available.

Troubleshooting

No matter how experienced the clinician or how well-validated the assessment tools are, mistakes can happen and, even in the absence of any mistakes, some amount of inconsistency between and within various assessments is possible. Therefore, when interpreting the results of assessments, it is often necessary for clinicians to engage in various troubleshooting strategies. One important option is to reinitiate contact with caregivers to ask for additional follow-up information that may serve to clarify information and/or help to resolve inconsistencies in how the assessment data can be interpreted. In addition to following up with caregivers, conducting additional naturalistic observations is always a good option. In reality, traveling to the client's natural environment to observe again may be prohibitively expensive or time-consuming but there is often no substitute for the wealth of information that direct observation in the natural environment can provide. Finally, no matter how well trained and experienced a clinician may be, he/she will someday encounter a client for whom the clinician does not possess all the needed skills to complete the assessment satisfactorily. In cases such as these, the clinician has an ethical responsibility to either seek consultation from colleagues or refer the client out to another clinician who has a greater degree of competence in the particular specialty the client requires.

Additional Considerations

While taking a multifaceted approach to ASD evaluation (e.g., clinical interview, clinical observation of the child in a natural environment, indirect questionnaires, standardized testing, reviewing of previous test records) is preferred and may be regarded as "best practice," the clinician ought to be thoughtful about how many and which direct measures to administer. When previous test records are available, the clinician is encouraged to minimally review the types of tests that the child was given in order to safeguard against practice effect and, in contrast, may consider the entire report at the clinician's discretion. For example, it is commonly agreed upon that most IQ tests should not be readministered within a year because of practice effects. However, IQ scores are often used for diagnostic and treatment intervention purposes, in which case, the clinician must exercise caution when choosing when to readminister such tests. Some authors suggest using a different intelligence test and then compare the results from both tests (Prifitera, Weiss, & Saklofske, 1998). Some clinicians prefer to approach the evaluation with a blank state, thus, form their own hypothesis about the client's presenting concerns. Nonetheless, being fully aware of all assessment that has been done in the past allows the clinician to fully appreciate the client's diagnostic profile and would typically help enhance the diagnostic formulation.

Evaluating Adults with Suspected ASD

Due to increased public awareness of ASD within the past decade, more adult clients are self-referred to clinicians for an evaluation of ASD. These clients typically present with a complex clinical picture. They may seek a differential diagnosis of higher-functioning autism or they may experience social and behavioral difficulties due to other mental health conditions. Many of them are reportedly higher functioning and were able to navigate academic, vocational, and social demands in their primary years until those demands exceeded their personal resources to cope. Others sought an ASD evaluation in search for an answer to the challenges confronting them in various arenas of life that are not better accounted for by other mental health conditions such as depression, anxiety, attention-deficit hyperactivity disorder, and so on.

In order to qualify for an ASD diagnosis per the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5), one of the criteria is that "symptoms must be present in the early developmental period." For clinicians, establishing that the symptoms were present in the early developmental period for an adult client can be a highly challenging task. Establishing a developmental history relies upon gathering information from the client's caregivers. Instruments such as the ADI-R can be excellent tools for such use and are widely used by clinicians. However, such an interview with caregivers may be unobtainable due to practical reasons such as the caregiver not being available to participate in the evaluation either by choice or by circumstance (e.g., caregivers are deceased).

Other Considerations That Dictate Types of Assessments

ASD evaluation is a multifaceted process and there are many additional factors that may affect the assessment process. Ultimately, it is the clinician's responsibility to select the appropriate measures for the client while being cognizant of the client's culture, language, mobility, education, and so on. Funding source is another factor that may influence the type of test the clinician employs. In an ideal world, the choice of assessments would be dictated solely by what is deemed best clinical practices. In the real world, third-party funding agencies may require certain assessments to determine eligibility for initial or continued treatment funding, even when those assessments are not the best options clinically. In other cases, third-party funding agencies may provide insufficient funding to cover a sufficiently comprehensive battery of assessments. In such cases, the clinician is left with the unfortunate

choice of doing what they deem to be clinically necessary and not billing for the cost overruns, or attempting to conduct a clinically adequate evaluation in a shorter-than-ideal amount of time.

Technological Advances

The future of psychological assessment in general and ASD evaluation more specifically is going to evolve in parallel with advances in technology such as computerized assessment and long-distance service delivery through telehealth. Computerized assessment is predicted to help increase test administration efficiency. For example, computer programs may be able to generate specific test items utilizing a complex decision rule, thus, eliminating unnecessary items (Lichtenberger, 2006). It will also help immediately score each item, hence enabling the clinician to attend better to relevant factors such as client's dynamics (e.g., test-taking behaviors, pattern of responses, reaction to specific type of task, reaction to the examiner). Leading test publishing companies such as Pearson have launched Q-interactive, making numerous tests available through the iPad. This may be a welcome frontier given that current and future generations grow up with increased familiarity, access, and affinity for computers and tablets. Research will be needed to identify the ways in which technological advances make assessment of individuals with ASD more reliable, valid, and efficient.

Conclusion

Assessing individuals with ASD is a complex process that is affected by myriad variables. Among the most important variables is the choice of type and format of assessment tools and procedures to include in the overall assessment process. This chapter has provided a broad overview of the most common types of assessment, with discussions of strengths and limitations of each type, as well as illustrative examples of each type of assessment that have been found to have good psychometric properties, as well as being useful in clinical practice. Overall, it is generally the case that less structured, indirect assessments tend to be less costly, more efficient, and more flexible, but less valid and reliable. More structured, "gold standard" assessments tend to be more reliable, more valid, but require a large amount of training and experience that most clinicians simply do not possess. In the end, the strengths and limitations of each type of assessment must be weighed against one another when creating an individualized, customized evaluation for each individual with ASD, and it is important to keep in mind that no amount of standardization or professional consensus will ever supplant the critical role of clinical judgment in the assessment process.

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