4

Principles of Communication Assessment

Elizabeth Schoen Simmons

Learning Objectives

After reading this chapter, students will be able to

- Describe the main functions of the communication assessment
- Define norm-referenced and criterion-referenced measures
- List the metrics commonly provided by standardized assessment tools
- Summarize the procedures used in a comprehensive communication assessment
- Describe the domains commonly evaluated in toddlers, children, and adults

INTRODUCTION

One of the primary responsibilities of a speech-language pathologist (SLP) is to conduct communication assessments. A communication **assessment** or **evaluation** is the set of procedures that SLPs use to collect and interpret clinical information. If criteria for a communication disorder have been met, then a diagnostic label is typically assigned. Referrals for a communication assessment may come from teachers, physicians and psychologists, or clients and their families may self-refer if a communication disorder is suspected. The SLP is responsible for providing a diagnosis that describes the communication and/or swallowing skills of a client. For example, a client with Parkinson's disease who presents with a soft voice and unintelligible speech production may be referred to the SLP for assessment. The SLP may make a diagnosis of dysarthria, which describes the communication disorder of the client with a medical diagnosis of Parkinson's disease. A diagnosis is important because it is usually required to receive intervention services in educational (e.g., schools) and medical settings (e.g., hospitals, skilled nursing facilities, outpatient clinics).

Recommendations for intervention are another outcome or product of a communication assessment. If speech and language intervention is warranted, recommendations will describe the specific behaviors that require remediation. Recommendations may also include monitoring and follow-up assessment if no diagnosis is provided.

Finally, the results of the assessment should also include information from which the SLP will make a **prognosis,** which is an estimate of future communication skills. A prognosis may be influenced by factors such as client age, severity of communication disorder, concomitant impairments (e.g., cognition, motor functioning), and family support.

The communication assessment is a process by which the SLP collects information from the client and then synthesizes the information to provide recommendations for treatment, if required. Assessment requires collection of data from a variety of sources, selection of appropriate tools, accurate interpretation of the data, and subsequent analyses of those data that result in a diagnosis, prognosis, and recommendations as warranted. This chapter reviews these principles of communication assessment in detail. See Figure 4.1 for a flowchart of the assessment process from referral to evaluation to treatment.

FUNCTION OF ASSESSMENT

There are two primary purposes of a communication assessment: 1) to determine the presence or absence of a communication disorder and 2) to document progress of communication skills over time. Depending on the purpose of the communication assessment, procedures may vary somewhat.

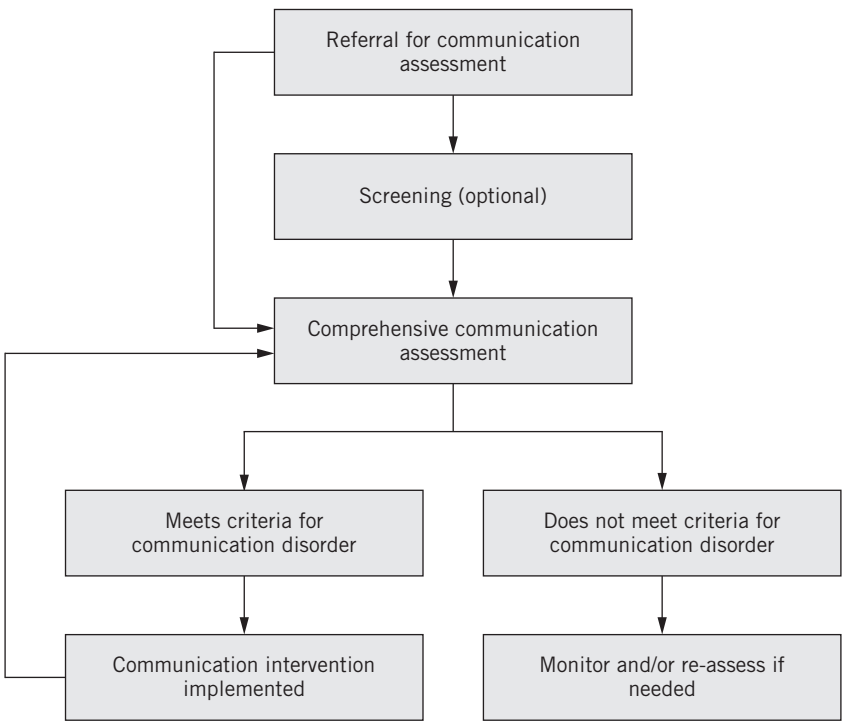


Figure 4.1. Flowchart depicting the interaction between assessment and intervention.

Determining Presence of a Communication Disorder

Many clients who are referred for a communication assessment will ultimately require some form of intervention. In order to receive services in a school or medical setting, the client must meet a set of diagnostic or eligibility criteria. These criteria vary depending on setting. The communication assessment will allow the SLP to ascertain whether a communication disorder exists, the severity of the impairment, and the appropriate diagnostic label, if applicable. The diagnostic label will often be adequate for meeting eligibility criteria, especially in medical settings such as hospitals and skilled nursing facilities. However, schools and early intervention programs often have specific or quantitative guidelines of eligibility for intervention services, and a diagnostic label may not suffice. Eligibility criteria may be stated as severity of impairment (e.g., 1.5–2 standard deviations [*SDs*] below the mean on a **standardized assessment** or set of standardized assessments) or described by affected areas (deficits in both expressive and receptive language). Standardized assessments compare the performance of a client on a given task to others of similar age. These tools are described in detail later in the chapter.

Assigning a diagnosis of a particular communication disorder is not merely putting a name on a set of symptoms, but it also entails determining the degree or severity of impairment. For instance, two children, Kara Lynn (see Box 4.1 for a brief description and Simucase.com for a full description of Kara Lynn) and Ethan, may each receive a diagnosis of speech sound disorder (SSD), but Kara Lynn may be almost completely unintelligible, whereas Ethan may make errors only on /s/ and /r/ phonemes. The goals and treatment methods that emerge from the assessment will not be the same for all clients with the same diagnosis. For Kara Lynn, the recommendation may be for more intensive services in terms of frequency and duration. She may also have a greater number of goals in order to appropriately meet her communicative needs.

Documenting Intervention Progress

We can think of the initial communication assessment as establishing a **baseline** level of functioning for a given client. A baseline describes the client's current communicative behavior, including both strengths and challenges, prior to receiving intervention. Collecting baseline information on communicative behaviors provides the SLP with a set of data that can be used to compare the client's behavior following a course of intervention. The data collected from a reevaluation will be compared to the baseline evaluation to determine whether progress has been made. Returning to the case example, at baseline, Kara Lynn produced sound substitutions and phonological processes that had a negative impact on her **intelligibility.** Perhaps she receives a

Box 4.1.

Kara Lynn is a 3-year, 6-month-old child who was referred for a comprehensive evaluation by her preschool teacher, Mrs. Jenkins. Mrs. Jenkins reports that Kara Lynn is difficult to understand and becomes frustrated when trying to communicate with others. Results of the assessment revealed significant speech sound errors that negatively affected her intelligibility (Simucase.com, n.d.).

course of treatment using the cycles approach (Hodson, 2010; see Chapter 6 for more on treatment). Following treatment, Kara Lynn is reassessed. Her speech production after treatment is compared with her baseline speech production from her initial evaluation. If Kara Lynn's scores on an assessment that measures speech production improved, this suggests that the treatment approach implemented by the SLP was effective. If Kara Lynn failed to make progress, the SLP would use this information to adjust intervention goals and/or chose a different treatment approach. In medical settings, insurance companies will require documentation of progress in order to continue providing reimbursement for services. For example, third-party payers—including private insurance companies, Medicare, and Medicaid—require that clients demonstrate progress toward their communicative goals in order to reimburse the facility providing treatment.

TOOLS OF ASSESSMENT

SLPs have many tools available in order to collect accurate information on clients' communicative strengths and challenges. The main set of tools include **screening, case history,** interviews and questionnaires, **norm-referenced tests, criterion-referenced measures,** and observational tools. Comprehensive evaluations typically include the use of all or most of these tools in order to gain the fullest insight into the client's communicative functioning.

Screening

A screening is a quick and efficient method of determining whether a full evaluation is warranted. Screening allows the clinician to rapidly assess a set of skills, usually resulting in either a *pass* or *fail* score. If the client fails the screening, a comprehensive evaluation will be completed. If the client passes the screening, monitoring of communication skills will be recommended but no further testing will be completed. The benefit of screening is that it may prevent those who do not need a comprehensive assessment from spending the time and resources on the process. However, a **false negative** may occur, meaning that the client passes the screening but in fact requires a comprehensive assessment. Similarly, a **false positive** may also result when the client fails the screening but does not require a full assessment. Choosing the appropriate screening tool for the client reduces the likelihood of false negatives and false positives.

Screening procedures vary from setting to setting. Some screenings are used as part of a protocol that is universal across a particular setting. For example, school systems may require screening of all children entering kindergarten. A hospital may employ aphasia screening for all patients who are admitted for a stroke. Screenings employed universally across many clients or patients typically evaluate a broad range of behaviors. However, some screenings may be more specific and focus on a single domain of functioning. Imagine that a classroom teacher refers a student to the SLP. The teacher states that the student seems to have difficulty following instructions, especially those that require multiple steps. The SLP may focus his or her screening on receptive language skills—specifically, comprehension of complex information. Table 4.1 gives examples of screening tools that can be used with either child or adult clients.

Table 4.1. Example of communication skills screening instruments by client age

Children		
Screening instrument	Age range	Domain assessed
Clinical Evaluation of Language Fundamentals Screening Test–Fifth Edition (CELF-5 Screening; Wiig, Semel, & Secord, 2013)	5 years–21 years	Language (receptive and expressive language; social-pragmatics)
Fluharty Preschool Speech and Language Screening Test, Second Edition (FPSLST-2, Fluharty, 2000)	3–6 years	Language (receptive and expressive skills) Speech (articulation)
Hodson Assessment of Phonological Patterns, Third Edition (HAPP-3; Hodson, 2004)	3–8 years	Speech (articulation and phonology)
Kindergarten Language Screening Test, Second Edition (KLST-2; Gauthier & Madison, 1998)	4–6 years	Language (school readiness concepts)
Preschool Language Scale–5 Screening Test (PLS-5 Screening Test; Zimmerman, Steiner, & Pond, 2011)	Birth–11 years	Language (receptive and expressive skills; social-pragmatics) Speech (articulation) Fluency Voice
Screening Test of Adolescent Language (STAL, Prather, Breecher, Stafford, & Wallace, 1980)	11–18 years	Language (receptive and expressive skills; abstract concepts)
Adults		
Screening instrument	Age range	Domain assessed
Brief Test of Heading Injury (BTHI; Helm-Estabrooks & Hotz, 1991)	14 years and up	Language (expressive and receptive skills; reading) Cognition (attention, memory) orientation
Mini-Mental State Exam, Second Edition (MMSE-2; Folstein & Folstein, 2001)	18 years and up	Language (reading, writing, expressive and receptive skills Cognition (attention, memory, orientation)
Montreal Cognitive Assessment (MoCA; Nasreddine et al., 2005)	55–85 years	Language (naming, verbal repetition) Cognition (attention, memory, orientation)
Oral Speech Mechanism Screening Examination, Third Edition (OSMSE-3; St. Louis & Ruscello, 2000)	5 years and up	Oral structures and functions

Case History

The assessment process typically begins by collecting background information on the client's communication skills and areas of concern. Areas of concern are sometimes called reasons for referral or the **referral question.** The type of background information collected during the case review will vary based on the client's age and communicative impairments; however, the purpose of the case history is the same for all clients. Gathering information on the clients' communication skills, in particular their difficulties, the context in which they need to communicate, and any known underlying medical conditions, family history of communication problems, and previous assessments and interventions, will help the SLP focus on the most important questions to

pursue during the evaluation and choose the assessment tools and procedures to meet the unique communicative needs of the client.

Interviews and Questionnaires

Following review of the case history, the clinician can decide what additional information would be helpful in planning the evaluation. This information can be gathered through the use of interviews and questionnaires. Interviewing involves person-to-person open-ended information gathering. Detailed procedures on interviewing are presented in Chapter 7. Questionnaires, sometimes in the form of checklists, are also an important aspect of the assessment process because they provide another viewpoint—that of parents, teachers, or other caregivers—on the communication skills of the client, in addition to the information documented in the case history and the clinician's own observations. Some examples of standardized questionnaires and checklists that can help clinicians determine how a client's communication skills may be affecting their daily functioning include the MacArthur-Bates Communicative Development Inventories (MB-CDIs) for children from 9 to 30 months (Fenson et al., 2007); the Children's Communication Checklist–Second Edition for children 4–16 years (Bishop, 2003); and the Vineland Adaptive Behavior Scales–Third Edition for children and adults from 1 to 90 years (Sparrow, Cicchetti, & Saulnier, 2016). Integrating information from history and direct assessment with that obtained from the client or significant others is a vital aspect of the assessment process. Input from these important informants about the way the client communicates on an everyday basis in real interactions can be obtained through interviews, questionnaires, and checklists.

Norm-Referenced Tests

Tests that allow a clinician to compare a client's performance to a **normative sample** are referred to as *norm-refenced tests.* These tests have specific **psychometric** properties that make them **reliable** and **valid.** This means they will consistently provide the same information and evaluate what they set out to measure. Norm-referenced tests yield a series of scores—a product of the norming process—that may be used as a metric for service eligibility. Norm-referenced scores are commonly used to help determine eligibility services in pediatric populations, especially in early intervention and school-based services. The following section will first review the psychometric properties of norm-referenced tests and then discuss the scores they provide and describe how the scores should be interpreted.

Psychometric Properties When considering assessment tools, all communication disorders professionals must consider the psychometric properties of the tool. Psychometric properties are the evidence that a test provides objective measurement of skills and knowledge, as evidenced by measures such as reliability and the validity of the assessment.

Norm Referencing Norm-referenced tests compare an individual's performance in a certain domain to that of other similar individuals. A representative sample is recruited, and scores from this sample are used to model the distribution of scores seen in a typical population. These data are used to develop the **standard scores.**

The samples need to be large enough, at least 100 participants per group (Salvia, Ysseldyke, & Bolt, 2007), in order to have enough variability and statistical power to ensure **representativeness.** Samples also need to be diverse and include participants from various geographic, socioeconomic, and ethnic backgrounds. Both males and females should also be included. Depending on the purpose of the assessment, some normative samples will restrict age range. For example, if researchers wanted to collect normative data on vocabulary in early childhood, they might restrict the ages of participants in the representative sample to only 5- to 9-year-olds. The representativeness of the normative sample is critical to the test's validity. Imagine creating a vocabulary assessment that measures people's knowledge of birds. If data are only collected from a sample of participants who live in suburban regions of the United States, they may be less familiar with pigeons and more familiar with robins. It is easy to imagine the cascading effect this could have on the test's validity.

Reliability and Validity You may know the words *reliability* and *validity* but may not be sure what they mean in the context of norm-referenced tests. Let's think about these concepts in everyday terms. We might think of our cars as reliable because every time we turn the key in the ignition, we get the same response (i.e., the car turns on). The same thing could be said for a scale at the doctor's office. We should get roughly the same, reliable weight measurement each time we step on it. The ability of a measure to yield the same score for the same individual over several different measurement occasions is what we mean by reliability. A norm-referenced test is considered a reliable instrument, or having **reliability,** if it yields the same set of results when administered multiple times to the same individual. Let's say we administered the Goldman-Fristoe Test of Articulation–Third Edition (GFTA-3; Goldman & Fristoe, 2015) to Kara Lynn multiple times. It should yield a similar standard score each time. This demonstrates reliability of the measure.

Validity is a bit more challenging to understand. Let's return to the scale at the doctor's office. The scale measures weight in a certain unit, pounds for example. The scale is a valid measure of weight because the number of pounds it gives as a measurement is an accurate representation of how much the individual weighs; that is, it is measuring what it sets out to measure, not height or head circumference, only weight. In the case of Kara Lynn, the GFTA-3 would be considered valid because it provides information on speech sound errors in words (i.e., articulation) and not on memory skills or language skills. Thus, we can accept it as a valid measure of speech sound production.

Standardization Norm-referenced tests undergo strict standardization during the development process. In order to ensure that the scores that tests provide are reliable and valid, clinicians need to carefully follow the administration procedures in the examiner's manual that comes with the test. The examiner's manual will provide a series of directions on how to administer the assessment, the types of prompts that are allowed (or not allowed), and how to assign credit for correct versus incorrect responses. The materials such as pictures, manipulatives, or audio files that are included with the test must be used and not replaced with other items. Any deviation from the procedures outlined in the examiner's manual or use of other materials not provided with the test violate standardization and will result in scores that may not be accurate.

Standard Scores Norm-referenced assessments are designed to compare a client's performance to other individuals similar to that client. We do this by looking at the standard scores that norm-referenced assessments yield. Standard scores help us determine how close (or far) from the average a client may be. As stated previously, standard scores are obtained by collecting data from a large group of individuals, the normative sample, and transforming the raw data collected into a set of standardized values using statistical calculations. The raw data are simply the number of correct responses obtained by the client during the assessment. We cannot compare raw scores between participants because typical children of different ages will respond correctly to different items. Ten items correct may be average for a 3-year-old, but not for a 7-year-old. The 7-year-old may need to get 20 items correct in order to be in the average range. For this reason, the data are transformed to standardized values using statistical computations. The data collected from the norming sampling will form a normal distribution of values, sometimes referred to as a bell-shaped distribution or curve (see Figure 4.2).

Standard scores may be on different scales, but regardless of scale, they each have a mean and standard deviation. The mean is the average performance for a group, usually an age group. The standard deviation is a unit describing how far from the mean an average individual's performance may be. The idea of standard score and standard deviation might be most familiar in the context of IQ assessment. Most IQ tests have a mean score of 100 and *SD* of 15. The majority of individuals (i.e., about 68%, see Figure 4.2) will fall within 1 *SD* (+/–1) from the mean for the test. Sixty-eight percent of people, then, will achieve a score between 85 and 115 on a standardized measure of IQ.

Many language assessments will give an overall standard score, like an IQ score, that serves as a general language quotient. This general language score will have a mean of 100 and *SD* of 15. Many language assessments are composed of subtests. For example, you might have three or four subtests that are used to calculate the general language quotient. Each subtest, or subscale, has its own set of standard scores.

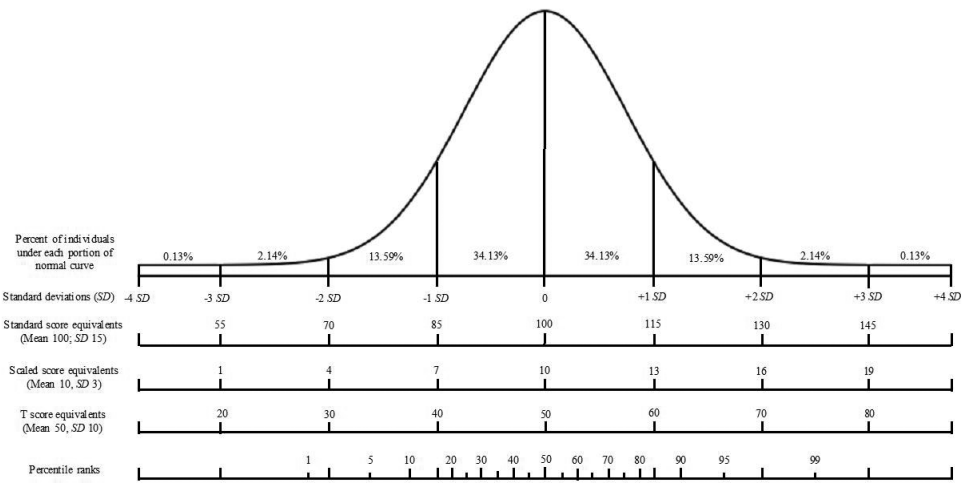


Figure 4.2. Normal distribution curve and associated standard scores.

Subtest or scaled scores often have a mean of 10 and *SD* of 3, so most individuals will score between 7 and 13. Another popular standard metric is *T*-score. Assessments that use *T*-scores have a mean of 50 and *SD* of 10. This means that most people will score between 40 and 60.

Other Quantitative Metrics Most norm-referenced tests will yield other metrics, such as percentile ranks and age equivalencies. These numbers are also derived from the norming sample and are yet another statistical conversion from a raw score. A percentile rank tells us the percentage of individuals from the normative sample who perform at or below a given standard score. If a client has a standard score of 100 (right at the mean), he will be in the 50th percentile, meaning his score is at or above the score of 50% of the norming sample. If another client scores at the 37th percentile, this means that 37% of the norming sample achieved the same score or lower. Another interpretation of a percentile rank of 37 would be that 63% of the normative sample achieved a higher standard score.

Raw scores may also be converted to age or grade equivalencies. These equivalencies tell the average raw score for a given age range or grade level. For example, if Kara Lynn has a raw score of 18 on a standardized measure of articulation, the normative information would tell us that, on average, 30-month-old children typically achieve this raw score. Both percentile ranks and age/grade equivalencies are sometimes used, in addition to standard scores, when relaying results to caregivers. These metrics are typically not used to determine eligibility for services.

Whereas standardized or norm-referenced tests have a set of manualized procedures to follow while collecting data on a given client, human error may occur. For example, maybe Kara Lynn correctly produced the /k/ phoneme in /kæt/, but you thought she produced a /g/ phoneme instead. This is a data collection error, which can occur occasionally even with the most seasoned clinicians. Client factors like fatigue, boredom, or illness may also influence standard scores by several points. To account for this variability or uncertainty, standardized tests provide confidence intervals. A confidence interval gives a range of scores within which the client's true score (score unaffected by human error) is likely to fall within. Most standardized tests provide both 90% and 95% confidence intervals, meaning that we can choose how confident or certain we are that the client's true score falls within the range provided. For example, Kara Lynn received a standard score of 62 on the GFTA-3. A 90% confidence interval gives us a range of standard scores from 56 to 68. This means we are 90% confident that Kara Lynn's true score is somewhere in that range, even if there was human error during data collection or if Kara Lynn did not perform at optimal levels due to fatigue. A 95% confidence interval means that we are more confident that a client's true score falls between a given range of scores, but the range of scores gets larger in order for us to be more confident. Confidence intervals are computed from **standard error of measurement (*SEM*).** *SEM* reflects the likely amount of error in a test. As stated above, error can be attributed to examiner influences (e.g., incorrect data collection procedures), client influences (e.g., fatigue, boredom), and the standardized test itself (e.g., poor reliability).

Some norm-referenced tests provide other standardized metrics to compare client performance across time. This can be especially helpful when using standard scores to track progress following intervention. For example, many norm-referenced tests published by Pearson (www.pearson.com) include a **growth scale value (GSV).**

A GSV is computed through statistical transformations of the raw score. The GSV is not calculated by comparing the client to same-age peers as a standard score would. Rather, it compares the client to the entire population. This means that even small improvements in the client's behavior will be captured by the GSV, whereas his or her standard score may not reflect improvement. Although standardized assessments are important for determining eligibility for services and diagnosing communication impairments, they are often less sensitive to change following intervention. Metrics like the GSV offer a more sensitive measure of clients' response to intervention over time.

Interpreting Norm-Referenced Scores What does it mean if a client receives a standard score of 82 on a language assessment or a scaled score of 13 on a subscale of a language test? For most norm-referenced tests, individuals scoring between 1 *SD* below and 1 *SD* above the mean are considered to fall within the average range. This means that any scores between 85 and 115 are considered average standard scores. These numbers will vary for standardized scores on different scales (e.g., scaled scores between 7 and 13 are considered average). The further from the mean an individual's score lies, fewer people have achieved a similar score. For example, only about 14% of individuals will be between 1 and 2 *SD*s below the mean and even fewer, about 2%, will fall between 2 and 3 *SDs* below the mean. Standard scores 1 *SD* below the mean are typically considered in the below-average range. SLPs may use standard scores, as one of several pieces of information, to determine if a communication disorder is present. Standard scores are commonly used to determine eligibility for services, especially in school systems and early intervention programs. Each agency sets its own requirements for eligibility. For example, some agencies will require clients to present with significant language impairments, 2 *SDs* below the mean on at least two language measures, in order to meet eligibility for intervention services. Other agencies might have less constrained eligibly criteria; at least 1.5 *SDs* below the mean on a single language measure will gain the client access to services. Although there is no universal set of eligibility criteria, these criteria usually include standard scores. For this reason, norm-referenced assessments are almost always included as part of the comprehensive assessment.

Norm-referenced tests can provide a wealth of clinical information. They can confirm our clinical intuition by telling us if a client has impaired communication skills compared to peers. They can help to determine eligibility for services by providing a quantitative metric of performance, which is required by many early intervention agencies, school districts, and insurance companies that reimburse for services. They also provide a profile of strengths and challenges that clinicians can use for intervention planning. Table 4.2 lists commonly used standardized tests for children and adults to assess speech, language, and communication.

Norm-referenced tests are only one of the tools used as part of comprehensive assessment. Norm-referenced tests are good at measuring static behavior—for example, if a client already knows a vocabulary word and can point to its picture. They do not, however, allow for prompting, cueing, or providing the client with any type of support. This means that we do not know whether the client can produce a given behavior with a little help, an important consideration in targeting goals for intervention. Imagine trying to measure conversational abilities, a dynamic skill that requires a person to monitor the conversational partner and rapidly repair communication

Table 4.2. Examples of tests for adults and children used to assess speech, language, and communication

Name	Age	Assessment area
	Articulation and phonology	
Arizona Articulation Proficiency Scale–Third Revision (Arizona-3; Fudala, 2000)	1.5–18 years	Articulation
Goldman-Fristoe Test of Articulation–Third Edition (GFTA-3; Goldman & Fristoe, 2015)	2–21 years	Articulation
Hodson Assessment of Phonological Patterns–Third Edition (HAPP-3; Hodson, 2004)	3–8 years	Phonological processes
Khan-Lewis Phonological Analysis–Third Edition (KLPA-3; Khan & Lewis, 2015)	2–21 years	Phonological processes
	Fluency	
Stuttering Severity Instrument for Children and Adults–Fourth Edition (SSI-4; Riley, 2009)	2 years–adult	Fluency
Test of Childhood Stuttering (TOCS; Gillam, Logan, & Pearson, 2009)	4–12 years	Fluency
	Language	
Child		
Clinical Evaluation of Language Fundamentals–Fifth Edition (CELF-5; Semel, Wiig, & Secord, 2013a)	5–21 years	Language: receptive and expressive morphology, syntax, semantics; auditory memory
Comprehensive Assessment of Spoken Language–Second Edition (CASL; Carrow-Woolfolk, 2017)	3–21 years	Language: comprehension, expression, lexical and semantic retrieval, syntax, pragmatics, supralinguistic areas
Diagnostic Evaluation of Language Variation (DELV; Seymour, Roeper, & de Villiers, 2005)	4–9 years	Language: syntax, pragmatics, semantics, phonology
Expressive Vocabulary Test–Third Edition (EVT-3; Williams, 2018)	2.6-90+	Language: expressive vocabulary
MacArthur-Bates Communicative Development Inventories–Second Edition (MB-CDIs; Fenson et al., 2007)	8–37 months	Language: receptive and expressive vocabulary, gestures, syntax, morphology
Peabody Picture Vocabulary Test–Fifth Edition (PPVT-5; Dunn & Dunn, 2018)	2.5–90+ years	Language: receptive vocabulary
Preschool Language Scales–Fifth Edition (PLS-5; Zimmerman, Steiner, & Pond, 2011)	Birth–7 years	Language: receptive and expressive semantics, syntax, morphology, articulation
Test of Adolescent and Adult Language–Fourth Edition (TOAL-4; Hammill, Brown, Larsen, & Weiderholt, 2007)	12–24 years	Language: receptive and expressive semantics and syntax; reading, writing, auditory comprehension
Test for Auditory Comprehension of Language–Third Edition (TACL-4; Carrow-Woolfolk, 2014)	3–12 years	Language: auditory comprehension of semantics, syntax, morphology

(continued)

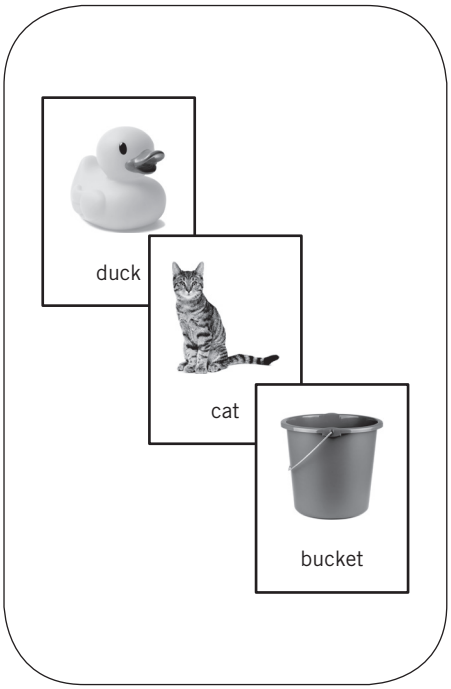
Table 4.2. *(continued)*

Name	Age	Assessment area
	Language	
Adult		
Boston Diagnostic Aphasia Examination–Third Edition (BDAE-3; Goodglass, Kaplan, & Barresi, 2001)	Adult	Language (aphasia): auditory and written language comprehension, oral expression, writing
Boston Naming Test–Second Edition (BNT; Kaplan, Goodglass, & Weintraub, 2000)	Adult	Language (aphasia): word retrieval
Communication Activities of Daily Living–Third Edition (CADL-3; Holland, Fromm, & Wozniak, 2018)	Adult	Language (aphasia/brain damage): semantics, pragmatics, reading, writing
Western Aphasia Battery–Revised (WAB-R; Kertesz, 2006)	Adolescent to adult	Language (aphasia): auditory comprehension, verbal fluency, naming, information content
	Cognition	
Assessment of Language-Related Functional Activities (ALFA; Baines, Heeringa, & Martin, 1999)	16–95 years	Language-related functional activities
Behavior Inattention Test (BIT; Wilson, Cockburn, & Halligan, 1987)	19–83 years	Functional skills relevant to visual neglect
Cognitive Linguistic Quick Test–Plus (CLQT1; Helm-Estabrooks, 2017)	18–89 years	Attention, memory, executive functions, language, visuospatial skills
Detroit Tests of Learning Aptitude–Fourth Edition (DTLA-4; Hammill, 1998)	6–17 years	Cognition
Primary Test of Nonverbal Intelligence (PTONI; Ehrler & McGhee, 2008)	3–9 years	Visual and spatial perception, sequential reasoning, category formula
Ross Information Processing Assessment–Second Edition (RIPA-2; Ross-Swain, 1996)	15–90 years	Memory, temporal orientation, spatial orientation, problem solving, abstract reasoning, auditory processing and retention
Scales of Cognitive Ability for Traumatic Brain Injury (SCATBI; Adamovich & Henderson, 1992)	Adolescents and adults	Perception/discrimination, orientation, organization, recall, reasoning

breakdowns when they occur, all while using grammatically appropriate language structures. A standardized test might not capture the fluid changes that occur during conservation. Due to these limitations, clinicians will want to have other tools of assessment available to use to help fill the gaps left by norm-referenced tests.

Criterion-Referenced Procedures

Most standardized tests only provide one or two opportunities for a client to produce (or demonstrate comprehension of) a given language or speech form. This is where **criterion-referenced measures** or probes can provide additional information about the client's communicative competence. A criterion-referenced measure does not compare an individual's performance against others, but rather it compares performance to a predetermined set of criteria. Some criterion-referenced measures are commercially available, such as the Rossetti



Child's name:
DOE:

/k/ initial	Correct	Incorrect	Comments
cup			
clip			
cat			
cart			
comb			
/k/ medial			
bucket			
pickle			
taco			
jacket			
bacon			
/k/ final			
book			
duck			
bike			
truck			
rake			

Figure 4.3. An example of a criterion-referenced probe materials

Infant-Toddler Language Scale (Rossetti, 2006). This checklist gives caregivers or clinicians the opportunity to elicit or observe speech, language, and communication behaviors in infants and toddlers. The client's performance can then be compared to typical age expectations.

Clinicians may opt to create their own criterion-referenced probes to establish a baseline for specific speech and language behaviors identified during standardized testing. For example, Kara Lynn may have demonstrated inconsistent errors in the production of the /k/ phoneme on the GFTA-3. How do we know if we should target this phoneme in treatment? The SLP can create a criterion-referenced probe to assess this phoneme in greater depth. For this task, Kara Lynn will be presented with picture cards that represent words containing the /k/ phoneme in initial, medial, and final word positions. She will receive 10 pictures for each word position for a total of 30 trials. See Figure 4.3 for an example of the materials that could be used for this task.

Informal Tools

Clinicians will typically use a combination of standardized assessments and informal tools during a communication assessment. Informal tools may include communication sampling procedures (see Chapter 5 for a detailed discussion on this method), behavioral observations, and dynamic assessment.

Behavioral observations can be used to collect informal information about a client during the assessment process. These observations may not only provide additional insight into the client's communication functioning, but they may also yield insightful information on **collateral domains** of functioning. For example, a clinician working

in a pediatric clinic might use the time while greeting parents and explaining the assessment process to observe the child in the waiting room. Is the child exploring the environment? Is he or she sitting quietly while playing with a single toy or rapidly moving from object to object? Does the child respond to his or her name when introduced to the clinician? These types of observations can be an invaluable part of the assessment process. Behavioral observations can occur at any time throughout the evaluation, such as walking down the hallway to the assessment room or while the client talks to a spouse after formal assessment is completed.

Clinicians collect information about what the client can and cannot do independently during the assessment, but what about the skills that the client may learn to do with support? This is where **dynamic assessment** can help. For Kara Lynn, it is clear from her standardized assessment results and criterion-referenced probes that she is substituting /d/ for /k/. Using the word list from the probes, a clinician can complete a quick dynamic assessment to see, when provided with simple therapeutic strategies such as visual and verbal cues, if Kara Lynn can produce the /k/ phoneme. This dynamic assessment, sometimes called a stimulability assessment when evaluating speech production, helps determine the types of treatment techniques that Kara Lynn may benefit from during intervention.

DOMAINS OF ASSESSMENT

After discussing the tools used to collect information during the assessment, the next step is to examine what specific skills are assessed. Depending on the age of the client and the characteristics of the disorder, the areas evaluated during the assessment process may vary. A clinician would not, for example, evaluate reading and writing in a toddler but may want to assess written language in an adult following a traumatic brain injury (TBI). Broadly speaking, speech, language, feeding/swallowing, and hearing are typically assessed during the evaluation process. For very young children, nonverbal communication is also examined. This usually includes use of gestures, vocalizations, and gaze. Figure 4.4 provides a schematic of the types of skills that could be measured during a communication assessment.

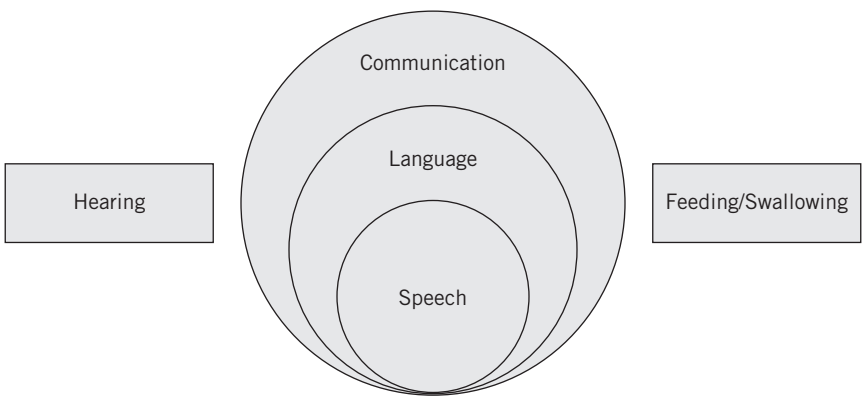


Figure 4.4. Domains of communication functioning and collateral behaviors assessed during comprehensive evaluation.

Language

The seminal Bloom and Lahey (1978) framework of language domains, including form (syntax, morphology, phonology), content (semantics), and use (pragmatics), can be used to help organize the areas of language that should be evaluated. Figure 4.5 provides an adapted version of the framework. These domains need to be evaluated both expressively and receptively, collecting information about the language the client produces and what the client comprehends. In many ways, it is easier to assess the client's expressive language skills because they are overt, observable behaviors. Language comprehension or processing, however, occurs in private inside the client's mind. Thus, clinicians end up drawing conclusions about the client's receptive language skills based on the client's behavioral responses (Miller & Paul, 1995). A clinician may ask clients to point to pictures or objects or follow a series of instructions. But what if a client who is asked to point to a picture of a man swimming from a field of three pictures of men each performing a different action fails to point to the correct picture? Does this mean that he or she does not comprehend the verb *swimming?* Or was he or she not attentive during the presentation of the auditory information? Does he or she have a motor planning impairment that makes pointing difficult? These inferences about the client's comprehension may not be straightforward. Supplementing direct clinician questions with informal observations in communicative interactions can help clinicians better interpret the client's behavior during receptive language tasks.

Expressive language skills may be elicited through the presentation of pictures that have to be named or described. Clients may be asked to imitate sentences of

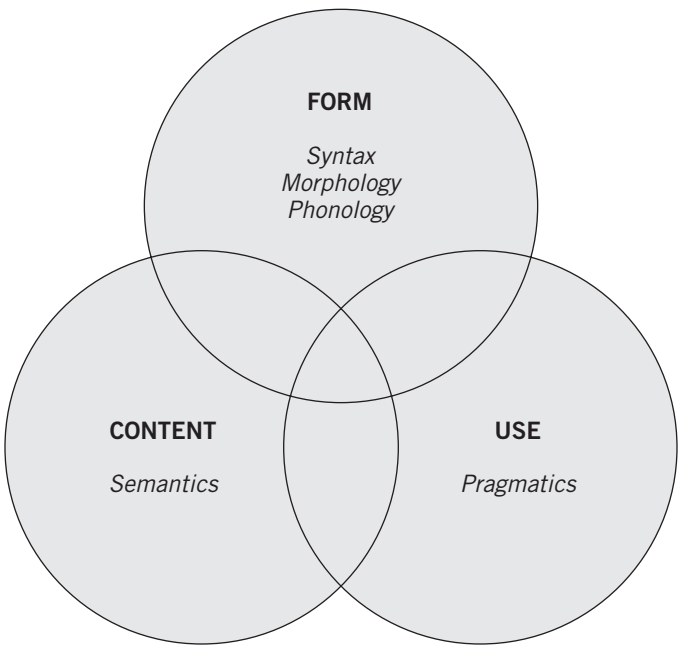


Figure 4.5. Language domains assessed as outlined by Bloom and Lahey (1978). (Bloom, L., & Lahey, M. [1978]. *Language development and language disorders.* Hoboken, NJ: Wiley.)

increasing length and linguistic complexity. SLPs may also collect a sample of client language during conversation, when telling a story or explaining an event. Clinicians generally use expressive language tasks to evaluate the client's syntax, morphology, phonology, semantics, and pragmatic skills. For older children and adults, we may also want to assess aspects of literacy, including phonological awareness, reading, and writing.

In infants and toddlers, language assessment focuses on the building blocks of speaking and understanding. SLPs may use standardized instruments like the Preschool Language Scale–Fifth Edition (PLS-5; Zimmerman, Steiner, & Pond, 2011) and the Communication and Symbolic Behavior Scales™ (CSBS™; Wetherby & Prizant, 2003a) to evaluate both comprehension and production of basic language forms. These assessments use pictures and manipulatives to evaluate the child's comprehension of simple language input such as responding to name, identifying common objects and body parts, and following directions. These tools also evaluate expressive language including the types of words the child produces, word combinations used, and grammatical morphemes. Direct clinician measures of infant and toddler language can then be supplemented with parent questionnaires such as the MB-CDIs (Fenson et al., 2007), a parent measure of expressive and receptive language that provides information on early vocabulary, syntax, and morphology in infants and toddlers. It is important to use both formal and informal methods for measuring language in young children because they may not respond to probes during standardized assessment due to a variety of factors (e.g., fatigue, inattention, reticence to communicate with an unfamiliar adult). Evaluation of pragmatics, or language use, in very young children can be done by using informal tools such as an observation of the client engaging with another child or caregiver. There are also commercially developed parent questionnaires, such as the Language Use Inventory (LUI; O'Neill, 2007), which provide a standardized measure of how toddlers use language for social-pragmatic purposes.

For preschool-age children, SLPs will want to measure language using standardized measures normed for this age group. For example, the Clinical Evaluation of Language Fundamentals–Preschool: Third Edition (CELF-P; Semel, Wiig, & Secord, 2020) will provide information on both expressive and receptive morphology and syntax. Preliteracy skills and reading should also be assessed in this age group given their importance to academic success and the fact that having a language disorder is a risk factor for a reading impairment. Again, there are standardized instruments that can provide information on phonological awareness (i.e., the manipulation of sounds in words), print awareness, and alphabetic knowledge (e.g., Test of Preschool Early Literacy; Lonigan, Wagner, & Torgesen, 2007). Criterion-referenced procedures can also be created to evaluate the child's production of rhyming words and how the child can manipulate sounds to create new words (e.g., replace the sound /h/ in *hat* with /k/ to create a new word, *cat*).

School-age children and adolescents need language for not only basic communication purposes but also to access the academic curriculum. In addition to assessing syntax, morphology, phonology, semantics, and pragmatics, clinicians want to evaluate clients' ability to succeed in the classroom environment. Classroom language is decontextualized and requires metalinguistic competence and sophisticated pragmatic skills (Nippold, 2016; Paul, Norbury, & Gosse, 2018). Although there are widely available norm-referenced assessments that can provide information on core language skills of school-age children and adolescents, such as the Comprehensive Assessment

Table 4.3. Language characteristics assessed in aphasia

Domain	Description
Repetition	Ability to repeat syllables, words, and sentences following the clinician's model
Naming	Ability to name pictures or items that belong to a given category, or complete cloze phrases (e.g., "salt and _____")
Verbal fluency	Ability to produce grammatically and syntactically correct sentences
Comprehension	Ability to understand language from simple (single words) to complex (paragraph-level discourse)

of Spoken Language–Second Edition (CASL-2; Carrow-Woolfolk, 2017), it is important to use other information sources, including teacher interviews and classroom observation, to evaluate how the child's language skills affect academic performance. Once children reach school age, formal reading assessment is completed by a reading specialist; however, the SLP may collaborate with the specialist to assess phonological awareness and comprehension skills.

Adults who require language assessment typically have experienced some form of brain injury or have a neurogenerative disorder that has changed their language functioning. **Aphasia** is a loss or change in language functioning due to stroke, brain tumor, TBI, or other brain anomaly. As for child language assessment, there are commercially available tools that are used to evaluate language functioning, such as the Boston Diagnostic Aphasia Examination–Third Edition (BDAE-3; Goodglass, Kaplan, & Barresi, 2001). The BDAE-3 evaluates language deficits commonly observed in aphasia, including repetition, naming, verbal fluency, and comprehension. See Table 4.3 for common language deficits observed in aphasia. Core language deficits observed in aphasia vary depending on the source of the brain injury or type of neurogenic disorder. For example, someone with a fluent aphasia, sometimes referred to as Wernicke's aphasia, will present with impaired repetition, naming, and comprehension but good verbal fluency. Contrast this profile with an individual who has Broca's aphasia with poor naming and verbal fluency but good comprehension. Measuring language skills such as fluency, repetition, naming, and comprehension will help the SLP determine the type of aphasia a client may have. Reading and writing will also be evaluated because **alexia** (the inability to read) and **agraphia** (the inability to communicate through writing) commonly co-occur with aphasia.

Speech

Speech sound disorder is an overarching term used to describe any impairment observed in the production, perception, motor movements, and planning of speech (American Speech-Language-Hearing Association, n.d.). This means that SLPs will want to assess how sounds are produced in terms of motor planning and execution as well as how the client perceives sounds. In addition, the clinician will evaluate how well clients' speech can be understood, or their speech **intelligibility.** To do this, SLPs typically ask clients to produce syllables, words, and sentences while describing pictures. SLPs may also collect a speech sample to evaluate how many of the client's words can be understood in more naturalistic speaking contexts. Assessment of perception involves presenting clients with minimal or identical pairs of words (*key* vs. *bee; bee* vs. *bee)* and asking the client if those words sound the same or different.

Infants, toddlers, and preschoolers are rapidly acquiring their native sound system with the majority of phonemes being produced correctly by age 6, although residual errors on phonemes /r/, /s/, /z/, /ʃ/, and /ð/ may persist through age 8 (Sander, 1972; Templin, 1957). Toddlers are approximately 50% intelligible at 2 years of age, 75% intelligible at 3 years of age, and 100% intelligible at 4 years of age (Paul et al., 2018). A speech sample can be collected for very young children, who are not speaking much, to determine their **phonemic inventory.** The clinician can generate a list of the consonants and vowels the child is producing during the sample and compare them to the typical order of acquisition (Shriberg, 1993). For preschoolers and school-age children, there are standardized tools like the GFTA-3 (Goldman & Fristoe, 2015) and the accompanying Khan-Lewis Phonological Analysis–Third Edition (KLPA-3; Khan & Lewis, 2015). The GFTA-3 presents the child with a set of standardized materials to evaluate the production of speech sounds in varying word positions. The KLPA-3 uses the information collected from the GFTA-3 to evaluate patterns of errors, or **phonological processes,** that may be present. Because motor speech and articulation skills are typically mastered by age 7 (Fudala, 2000), children of this age should be able to complete both production and perception measures.

Speech disorders in adulthood are typically different from those observed in early childhood because these are acquired due to brain injury or disease (e.g., stroke, tumor, TBI, Parkinson's disease). Both **acquired apraxia of speech** and **dysarthria** are referred to as motor speech disorders (Duffy, 2013) and may co-occur with aphasia. Apraxia of speech is a neurological speech disorder that makes it difficult to plan the sensorimotor movements necessary for normal phonemic and prosodic production (Duffy, 2013). Dysarthria describes a group of neurologically based speech disorders that negatively affect strength, speed, range, tone, and accuracy of movements needed for speaking. These impairments impact respiration, articulation, phonation, and resonation (Duffy, 2013). Speech assessment in adults with acquired SSDs includes both an oral-mechanism examination exam (described in the next section) and speech intelligibility assessments. These tools help the clinician with differential diagnosis between the disorders. The Apraxia Battery for Adults–Second Edition (ABA-2; Dubal, 2000) provides a structured set of materials to evaluate motor planning needed for speech production. The Frenchay Dysarthria Assessment–Second Edition (FDA-2; Enderby & Palmer, 2008) is a norm-referenced assessment that provides information on speech intelligibility and functioning of the subsystems (respiration and articulation) needed to support speech.

Oral-Mechanism Examination

All comprehensive communication assessments should include an oral-mechanism examination. This will provide critical information about the client's oral-motor functioning and whether or not deviances in structure and function may be responsible for problems with speech production and intelligibility. The oral-motor assessment will examine facial symmetry, dentition, function, and structure of the articulators and the speech subsystems of phonation, respiration, and resonance. The exam begins with a visual examination of the facial features and then gradually moves to the intraoral structures. Swallowing may also be screened during this time if concerns regarding dysphagia are reported. Clinicians should employ universal precautions by thoroughly washing their hands with soap and warm water prior and following the oral-mechanism assessment. Gloves should be worn for the duration of the examination. Figure 4.6 provides a set of structured observations and data recording form that can be used during an oral-mechanism examination.

Name: _____ Date: _____

1. Lips

   a. Structure

      Touch when teeth are in occlusion: yes _____ no _____

      Upper lip length: normal _____ short _____ long _____
      (describe)

      Evidence of cleft lip or other structural impairment: yes _____ no _____

   b. Function

      Can retract unilaterally

      Left: yes _____ no _____

      Right: yes _____ no _____

      Equal retraction bilaterally: yes _____ no _____

      Number of times can produce /pʌ/ in 5 seconds:

      trial 1 _____ trial 2 _____ trial 3 _____

      Does stabilizing the jaw facilitate the activity? yes _____ no _____

   c. Adequacy for speech: 1 ____ 2 ____ 3 ____ 4 ____

2. Teeth

   a. Structure

      Occlusion: normal _____ neutroclusion _____

      distoclusion _____ mesioclusion _____

      Anteroposterior relationship of incisors: normal _____

      Mixed (some in labioversion, some in linguoversion) but all upper and lower teeth contact; all upper incisors lingual to lower incisors but in contact ____ not in contact _____

      Vertical relationship of incisors: normal ____ openbite ____ closebite ____

      Continuity of cutting edge of incisors: normal ____ rotated ____ jumbled ____

      missing teeth ____ supernumerary teeth ____

      If lack of continuity, identify teeth involved and describe nature of deviation.

Figure 4.6. Oral-mechanism evaluation form. (Delmar Learning, from Tomblin, J. B., Morris, H. L., & Spriestersbach, D. C. [2000]. *Diagnosis in speech-language pathology* [2nd ed., pp. 95–97]. Clifton Park, NY: Delmar Learning; permission conveyed through Copyright Clearance Center, Inc.)

(continued)

b. Dental appliance or prosthesis: yes _____ (describe) no _____

c. Adequacy for speech: 1 ____ 2 ____ 3 ____ 4 ____

3. Tongue

a. Structure

Size in relation to dental arches: too large _____ appropriate _____ too small _____

symmetrical _____ asymmetrical _____

b. Function

Can curl tongue up and back: yes _____ no _____

Number of times can touch anterior alveolar ridge with tongue tip without sound in 5 seconds:

trial 1 _____ trial 2 _____ trial 3 _____

above average _____ average _____ below average _____

Number of time can touch the corners of mouth with tongue tip in 5 seconds:

trial 1 _____ trial 2 _____ trial 3 _____

above average _____ average _____ below average _____

Number of times can produce /tʌ/ in 5 seconds:

trial 1 _____ trial 2 _____ trial 3 _____

above average _____ average _____ below average _____

Number of times can produce /kʌ/ in 5 seconds:

trial 1 _____ trial 2 _____ trial 3 _____

above average _____ average _____ below average _____

Restrictiveness of lingual frenum:

not restrictive _____ somewhat restrictive _____ markedly restrictive _____

c. Adequacy for speech: 1 ____ 2 ____ 3 ____ 4 ____

4. Hard palate

a. Structure

Intactness: normal _____ cleft, repaired _____ cleft, unrepaired _____

Figure 4.6. *(continued)*

Palatal fistula: yes _____ (describe) no _____

Alveolar cleft: yes _____ (describe) no _____

Palatal contour:

normal configuration ____ flat contour ____ deep and narrow contour ____

b. Adequacy for speech: 1 ____ 2 ____ 3 ____ 4 ____

5. Palatopharyngeal mechanism

a. Structure

Soft palate

Intactness: normal _____ cleft, repaired _____ cleft, unrepaired _____

symmetrical _____ asymmetrical _____

Length: satisfactory _____ short _____ very short _____

Uvula

normal _____ bifid _____ deviated from midline to right _____

to left _____ absent _____

Oropharynx

Depth: shallow _____ normal _____ deep _____

Width: narrow _____ normal _____ wide _____

b. Function

Soft palate

Movement during prolonged phonation of /ɑ/:

none _____ some _____ marked _____

Movement during short, repeated phonations of /ɑ/:

none _____ some _____ marked _____

Movement during gag reflex:

none _____ some _____ marked _____

If some movement, then amount:

same for both halves _____ more for right half _____ more for left half _____

Figure 4.6. *(continued)*

Oropharynx

Mesial movement of lateral pharyngeal walls during phonation of /a/:

none _____ some _____ marked _____

Mesial movement of lateral pharyngeal walls during gag reflex:

none _____ some _____ marked _____

Audible nasal emission while blowing out a match:

yes _____ (describe) no _____

Inconsistency in nasal emission during speech or blowing tasks:

yes _____ (describe) no _____

Patient stimulable to oral productions of pressure consonants:

yes _____ (describe) no _____

Nares construction during speech or blowing tasks:

yes _____ (describe) no _____

Oral manometer ratio (instrument _____)

trial 1: nostrils open _____ nostrils closed _____ ratio _____

trial 2: nostrils open _____ nostrils closed _____ ratio _____

trial 3: nostrils open _____ nostrils closed _____ ratio _____

c. Adequacy for speech: 1 ____ 2 ____ 3 ____ 4 ____

6. Fauces

a. Structure

Tonsils: normal ____ enlarged ____ atrophied ____ absent ____

Pillars: normal ____ scarred ____ inflamed ____ absent ____

Area of faucial isthmus: above average ____ average ____ below average ____

b. Function

Posterior movement during phonation of /ɑ/: none ____ some ____ marked ____

Mesial movement during phonation of /ɑ/: none ____ some ____ marked ____

Restriction of velar activity by pillars: none ____ some ____ marked ____

c. Adequacy for speech: 1 ____ 2 ____ 3 ____ 4 ____

Figure 4.6. *(continued)*

For the youngest clients, toddlers and preschoolers, some assessment tasks can be turned into games. For example, a clinician could say, "Your mom says you are a really good bubble blower. Can you show me how you blow bubbles?" This game can be used to demonstrate lip rounding. School-age clients without significant developmental disabilities should be able to complete all the activities required during the oral-mechanism exam. For older clients who are lower functioning, clinicians can use some of the game-like tasks employed with toddlers and preschoolers.

The oral-motor examination is particularly critical for adults with speech motor disorders because this procedure will help with differential diagnosis of acquired apraxia of speech and dysarthria. The SLP will conduct a cranial nerve exam (see Table 4.4 for an overview) to evaluate functioning of the nerves that innervate the speech production subsystems. **Diadochokinetic rate** will also be collected to evaluate the client's ability to produce repeated syllables in terms of speed and clarity.

Table 4.4. Summary of physical examination results and patient complaints for cranial nerves V, VII, X, and XII

Cranial nerve	Function	Technique of examination	Patient complaints	Changes in structure
V—Trigeminal	Motor—masticatory muscles	Opening the mouth, clenching the teeth for palpation of the masseter and temporalis muscles	Motor—chewing difficulty, drooling, jaw difficult to close	Jaw may hang open
	Sensory—face and mucosal surfaces of the eyes, tongue, and parts of the nasopharyngeal space		Sensory—decreased sensation in face, cheek, tongue, teeth, or palate	
VII—Facial	Muscles of expression	Furrowing the brow, screwing up the eyes, sniffling, whistling, pursing the lips	Drooling, biting the cheek or lip when chewing or speaking, difficulty keeping food in the mouth	Affected side sags at rest; nasolabial fold is often flattened
X—Vagus (recurrent branch only)		Vocal characteristics; laryngoscopic examination		
XII—Hypoglossal	Innervation of tongue muscles	Tongue protrusion	Problem with oral articulation and chewing; difficulty handling saliva; tongue feels "thick"	Atrophy on the weak side
X—Vagus (above the pharyngeal branch)	Motor and sensory—innervation of the muscles of the soft palate, pharynx, and larynx	Gag reflex symmetry; vocal characteristics; laryngoscopic examination	Changes in voice and resonance; nasal regurgitation during swallowing	Soft palate hangs lower on the side of the lesion
X—Vagus (superior branch only)		Vocal characteristics; laryngoscopic examination	Voice changes	

Source: This table was published in *Motor Speech Disorders: Substrates, Differential Diagnosis and Management, Third Edition*, by J. R. Duffy. Copyright Mosby 2013.

Voice

Clients with suspected voice disorders are usually referred to an otolaryngologist prior to evaluation by an SLP to evaluate organic causes of voice impairments (e.g., tumor, nodules). The SLP may start with a screening to determine whether a full voice evaluation is warranted. Figure 4.7 provides a sample voice screener. During a full voice evaluation, the SLP will take both perceptual and acoustic measures to evaluate voice functioning during a set of structured activities. With specialized training, SLPs may also use instrumental assessment including laryngeal imaging such as **videolaryngendoscopy** and **videolaryngostroboscopy,** which allow for a direct visualization of vocal fold structure and function. Clinical voice assessment usually involves obtaining a speech sample and collecting acoustic measurements on pitch range, dynamic range, the *s/z* ratio (completed by having the client produce *s* for as long as possible and *z* for as long as possible), and perceptual observations of voice and resonance quality. Acoustic measurements such as pitch and intensity can be collected with specialized hardware such as Computerized Speech Lab (CSL, by KayPENTAX) or readily available free software (i.e., PRAAT; www.fon.hum.uva.nl/praat/).

Fluency

Speech production that is effortful, discontinuous, and choppy is known as **stuttering.** The onset of stuttering usually occurs in early childhood, around a child's second birthday (Mansson, 2000), and may last throughout adulthood. Developmental dysfluencies may be observed in toddlers and preschool children and typically resolve on their own without turning into a true fluency disorder. Stuttering, or fluency disorder, has both behavioral and psychosocial components. The behavioral components are the disfluent speech productions (e.g., repetitions of sounds, syllables, words, prolongations of sounds), whereas the psychosocial consequence of the disorder may be anxiety during speaking situations. Fluency is commonly evaluated by collecting a speech sample in various contexts and coding for the types and frequency of dysfluencies present in the sample. Because stuttering may be more frequent in certain speaking contexts, samples are collected in both high pressure (structured activities with frequent clinician interruptions) and low pressure (free play or conversation) situations. The clinician is looking for core stuttering behavior in these samples, including partial word repetitions ("du-du-du-duck"), phoneme prolongations ("mmmmmommy"), and blocks (tense pauses before a word) (Guitar, 2014). Secondary behaviors that occur before or during the stuttered words such as eye blinks, throat clearing, or head movements are also recorded. To determine the severity of stuttering, the clinician calculates the percentage of dysfluent syllables, the type of dysfluencies produced, and the presence of any secondary behaviors. Commercially available tools for evaluating speech dysfluencies in children and adults, such as the Stuttering Severity Instrument–Fourth Edition (SSI-4; Riley, 2009) and Test of Childhood Stuttering (TOCS; Gillam, Logan, & Pearson, 2009), can also be helpful. Assessment of the psychosocial aspects of stuttering, usually accomplished with interviews or questionnaires, is also an important aspect of the evaluation.

Feeding and Swallowing

Clients of all ages should be queried about any problems in eating or swallowing that occur. Many SLPs screen children for these troubles by observing the client eat and

Name: _____

Birth Date: _____ Screening Date: _____ Age: _____

Speech-Language Screening Date: _____ Passed Failed

If failed, describe communication status:_____

Hearing Screening Date: _____ Passed Failed

If failed, describe hearing status:_____

Pertinent medical and social history: _____

_____

Directions: The Quick Screen for Voice should be conducted in a quiet area. Elicit verbal activities, such as spontaneous conversation, picture description, imitated sentences, recited passages, counting, and other natural samples of voice and speech, or perform the tasks requested. The screening test is failed if one or more disorders in production are found in any area, indicating that a more thorough evaluation is needed.

Mark all observations that apply, as the individual produces connected speech:

Respiration

_____ Inhalatory stridor or expiratory wheeze
_____ Infrequent breaths; talking too long on one breath
_____ Limited breath support for speech
_____ Reduced loudness or vocal weakness

_____ Normal respiration for speech

Phonation

_____ Rough or hoarse quality
_____ Vocal strain and effort
_____ Persistent glottal fry
_____ Conversational pitch is too high or too low
_____ Conversational voice is limited in pitch or loudness variability
_____ Breathy quality
_____ Aphonia
_____ Hard glottal attacks
_____ Conversational voice is too loud or too soft

_____ Normal voice quality

Resonance

_____ Hyponasality (observed during humming, nasal consonant contexts: Mommy makes me muffins; Man on the moon; Many men make money, etc.).
_____ Consistent mouth breathing
_____ Hypernasality (observed during vowel and oral consonants)
_____ Nasal turbulence or audible nasal emission (observed during pressure consonant contexts: Counting from 60 to 69; Popeye plays baseball; Give Kate the cake; Buy Bobby a puppy, Take a ticket to Daddy, etc.).
_____ Juvenile resonance characteristics

_____ Normal resonance

Nonverbal Vocal Range and Flexibility

Model the series of nonverbal tasks that are described on the test form. Multiple trials are allowed. Visual cues such as hand gestures, moving a toy car across the table (for maximum phonation time) or up and down a hill (for pitch range), etc. may be used to supplement the auditory model.

1. Habitual pitch and loudness task: "Count from 1 to 10. Repeat, but stop at 'three' and hold out the /i:/."

_____ Abnormal pitch and/or loudness

_____ Normal pitch and loudness

Figure 4.7. Sample voice screening form. (Lee, L., Stemple, J. C., Glaze, L., & Kelchner, L. N. [2004]. Quick screen for voice and supplementary documents for identifying pediatric voice disorders. *Language, Speech, and Hearing Services in Schools, 35,* 308–319.)

(continued)

2. Maximum phonation time (MPT) task: "Take your biggest breath and hold out an /a:/ as long as possible." Record time with a secondhand.

_____ Number of seconds /a/ was sustained.

_____ MPT less than:

Age (years)	Normal Mean in Seconds (Range)*
3	7 (3–11)
4	9 (5–15)
5	10 (5–16)
6–7	13 (5–20)
8–9	16 (5–29)
10–12	20 (9–39) Males
	16 (5–28) Females
13–17	23 (9–43) Males
	20 (9–34) Females
18+	28 (9–-62) Males
	22 (6–61) Females

Note. MPT values are related to age and height; multiple attempts also influence results.
*Data summarized from Kent, Kent, & Rosenbek (1987)

_____ MPT within normal limits

3. Pitch range task: "Make your voice go from low to high like this (demonstrate upward pitch glide on the word 'whoop'). Now go down from your highest to low (demonstrate rapid downward pitch glide like a bomb falling)." Or, model and elicit a fire siren sound.

_____ Little pitch variation
_____ Voice breaks in pitch glides up or down

_____ Acceptable pitch range and flexibility

Other Comments or Observations

_____

_____

_____

_____

Figure 4.7. *(continued)*

drink during the assessment as well as looking for and asking about drooling, food leakage, difficulties with chewing and/or swallowing, and fussiness or refusal of food or liquid. Patients in medical settings can be administered 3 ounces of water to swallow as a part of a screening protocol for **dysphagia.** When screening procedures or observations of feeding and swallowing behavior present difficulties, SLPs can administer noninstrumental assessments, such as observation of the patient eating or being fed food items with a range of consistencies; assessment of labial seal, anterior spillage, and evidence of oral control; identification of signs and symptoms such as throat clearing or coughing before/during/after the swallow; and/or an assessment of cough strength, to name a few. Instrumental assessments can also be administered by the SLP, either independently or in collaboration with other professionals. A videofluoroscopic swallowing study (VFSS) or fiberoptic endoscopic evaluation of swallowing (FEES) requires appropriate training and education for the SLP. Trained SLPs can interpret and apply the results of these objective tests to the formulation of dysphagia treatment plans.

Hearing

Hearing is critical for acquiring and comprehending spoken language. Therefore, all comprehensive speech and language evaluations should include a hearing screening. Audiologists are the professionals responsible for full hearing evaluations that

usually include a range of diagnostic tests to determine the type and degree of hearing loss. However, SLPs can conduct screenings using basic **audiometry** to ascertain whether a full audiological evaluation is needed.

Hearing can be assessed throughout the life span, with different methods and measurements utilized in order to obtain reliable and valid results. Newborns have their hearing screened at birth as mandated by the federal universal newborn infant hearing screening program of the Early Hearing Detection and Intervention (EHDI) Act of 2017 (PL 115-71) through objective measurements such as **otoacoustic emissions** (OAEs) and **auditory brainstem responses** (ABRs). These measurements do not require an overt response from the infant and can be conducted while the child is sleeping. As infants age, the goal becomes to obtain behavioral responses—in other words, the child's reaction to sound stimuli. Methods include **behavioral observation audiometry** (BOA), **visual reinforcement audiometry** (VRA), and **conditioned play audiometry** (CPA). Hearing is commonly screened during physicals at the pediatrician's office and typically is state-mandated for school-age children attending public school. In addition to conducting a hearing screening, SLPs should also ask about hearing in the case history interview and include questions about any history of ear infections (Shriberg, Friel-Patti, Flipsen, & Brown, 2000).

Typically developing school-age children, adolescents, and adults can complete a comprehensive audiological exam, which includes **conventional audiometry** methods in combination with objective measurements. Similar methods are used across the life span through adulthood, although they are modified as the patient ages. Gradual hearing loss, known as **presbycusis,** is a common consequence of aging and is often seen in older adults. This type of hearing loss affects the higher frequencies, so those with the disorder have greater trouble hearing in noisy situations, particularly for high-pitched sounds, such as sibilants (e.g., /s/, /f/). In addition to presbycusis, other types of hearing insults such as noise, ototoxic medications, and some infections can further degrade an adult's hearing system. The SLP should include a comprehensive set of questions as part of the case history interview to better understand the hearing status of the client and to determine whether a full audiological evaluation should be conducted if it has not yet already been completed. Speech and language goals can be adjusted depending on the client's hearing and amplification status.

CONCLUSION

One of the main responsibilities of the SLP is to conduct communication assessments. The outcome of these evaluations typically results in a diagnosis of a specific communication impairment and determination of eligibility for intervention services. The evaluation process starts with a referral question. Data are collected from multiple information sources using a variety of methods including formal and informal procedures. Domains assessed may vary depending on the client's age, level of functioning, and concomitant medical conditions; however, speech, language, and communication functioning are usually evaluated along with hearing and feeding/swallowing. Results of the communication assessment ultimately help SLPs determine whether the client requires intervention, establish a category of communication disorder(s), identify baseline level of communicative functioning, and target appropriate goals for intervention. Ongoing assessment allows clinicians to monitor progress over the course of the intervention program.

Study Questions

1. What are the main purposes of the communication assessment?
2. Describe the differences between norm-referenced tests and criterion-referenced measures.
3. Summarize the types of communication skills assessed during a comprehensive evaluation.
4. Why is it important to gather background information on a client prior to assessment?
5. Why are oral mechanism examinations and hearing screenings commonly included as part of the comprehensive communication evaluation?
6. List the different types of tools SLPs can use to collect data during a communication evaluation.
7. What are the benefits of using a screening tool prior to conducting a full communication evaluation?

FURTHER READING

Kara Lynn's case, discussed throughout this chapter, was taken from SimuCase (www.simucase.com).

REFERENCES

Adamovich, B. B., & Henderson, J. (1992). *Scales of Cognitive Ability for Traumatic Brain Injury.* Austin, TX: PRO-ED.

American Speech-Language-Hearing Association. (n.d.). *Speech sound disorders: Articulation and phonology.* Retrieved from https://www.asha.org/Practice-Portal/Clinical-Topics/Articulation-and-Phonology/

Baines, K. A., Heeringa, H. M., & Martin, A. W. (1999). *Assessment of Language-Related Functional Activities.* Austin, TX: PRO-ED.

Bishop, D. (2003). *Children's Communication Checklist–2.* San Antonio, TX: Pearson.

Bloom, L., & Lahey, M (1978). *Language development and language disorders.* Hoboken, NJ: Wiley.

Carrow-Woolfolk, E. (2014). *Test for Auditory Comprehension of Language* (4th ed.). Austin, TX: PRO-ED.

Carrow-Woolfolk, E. (2017). *Comprehensive Assessment of Spoken Language* (2nd ed.). San Antonio, TX: Pearson.

Dubal, B. (2000). *Apraxia Battery for Adults, Second Edition.* Austin, TX: PRO-ED.

Duffy, J. R. (2013). *Motor speech disorders: Substrates, differential diagnosis and management* (3rd ed.). St. Louis, MO: Mosby.

Dunn, L. M., & Dunn, D. M. (2018). *Peabody Picture Vocabulary Test* (5th ed.). Minneapolis, MN: Pearson.

Early Hearing Detection and Intervention (EHDI) Act of 2017, PL 115-71, §§ 652, 115 U.S.C.

Ehrler, D. J., & McGhee, R. L. (2008). *PTONI: Primary Test of Nonverbal Intelligence.* Austin, TX: PRO-ED.

Enderby, P., & Palmer, R. (2008). *Frenchay Dysarthria Assessment* (2nd ed.). Austin TX: PRO-ED.

Fenson, L., Marchman, V. A., Thal, D. J., Dale, P. S., Reznick, J. S., & Bates, E. (2007). *MacArthur-Bates Communicative Development Inventories (CDIs)* (2nd ed.). Baltimore, MD: Paul H. Brookes Publishing Co.

Fluharty, N. B. (2000). *Fluharty Preschool Speech and Language Screening Test* (2nd ed.). Austin, TX: PRO-ED.
Folstein, M. F., & Folstein, S. E. (2010). *Mini–Mental State Examination–Second Edition* (MMSE-2). Lutz, FL: Psychological Assessment Resources.
Fudala, J. B. (2000). *Arizona Articulation Proficiency Scale–Third Revision.* Torrance, CA: Western Psychological Services.
Gauthier, S. V., & Madison, C. L. (1998). *Kindergarten Language Screening Test* (2nd ed.). Austin, TX: PRO-ED.
Gillam, R. B., Logan, K. J., & Pearson, N. A. (2009). *Test of Childhood Stuttering.* Austin, TX: PRO-ED.
Goldman, R., & Fristoe, M. (2015). *Goldman-Fristoe Test of Articulation* (3rd ed.). San Antonio, TX: Pearson.
Goodglass, H., Kaplan, H., & Barresi, B. (2001). *Boston Diagnostic Aphasia Examination* (3rd ed.). Philadelphia, PA: Lea & Febiger.
Guitar, B. (2014). *Stuttering: An integrated approach to its nature and treatment* (4th ed.). Baltimore, MD: Lippincott Williams & Wilkins.
Hammill, D. D. (1998). *Detroit Tests of Learning Aptitude* (4th ed.). Austin, TX: PRO-ED.
Hammill, D. D., Brown, V. L., Larsen, S. C., & Wiederholt, J. L. (2007). *Test of Adolescent and Adult Language* (4th ed.). San Antonio, TX: Pearson.
Helm-Estabrooks, N. (2017). *Cognitive Linguistic Quick Test–Plus.* San Antonio, TX: Pearson.
Helm-Estabrooks, N., & Hotz, G. (1991). *Brief Test of Head Injury.* Austin, TX: PRO-ED.
Hodson, B. W. (2004). *Hodson Assessment of Phonological Patterns* (3rd ed.). Torrance, CA: Western Psychological Services.
Holland, A. L., Fromm, D., & Wozniak, L. (2018). *Communication Activities of Daily Living* (3rd ed.). Austin, TX: PRO-ED.
Kaplan, E., Goodglass, H., & Weintraub, S. (2000). *Boston Naming Test* (2nd ed.). Austin, TX: PRO-ED.
Kertesz, A. (2006). *Western Aphasia Battery* (Rev. ed.). San Antonio, TX: Pearson.
Khan, L., & Lewis, N. (2015). *Khan-Lewis Phonological Analysis* (3rd ed.). San Antonio, TX: Pearson.
Lee, L., Stemple, J. C., Glaze, L., & Kelchner, L. N. (2004). Quick screen for voice and supplementary documents for identifying pediatric voice disorders. *Language, Speech, and Hearing Services in Schools, 35,* 308–319.
Lonigan, C. J., Wagner, R. K., & Torgesen, J. K. (2007). *Test of Preschool Early Literacy.* Austin, TX: PRO-ED.
Mansson, H. (2000). Childhood stuttering: Incidence and development. *Journal of Fluency Disorders, 25,* 47–57.
Miller, J. F., & Paul, R. (1995). *The clinical assessment of language comprehension.* Baltimore, MD: Paul H. Brookes Publishing Co.
Nasreddine, S., Phillips, N., Bédirian V., Charbonneau, S,. Whitehead, V., Collin, I, . . . Chertkow, H. (2005). The Montreal Cognitive Assessment (MoCA): A brief screening tool for mild cognitive impairment. *Journal of the American Geriatrics Society, 53,* 695–699.
Nippold, M. (2016). *Later language development: School-age children, adolescents, and young adults.* Austin, TX: PRO-ED.
O'Neill, D. (2007). *Language Use Inventory.* Waterloo, Canada: Knowledge in Development.
Paul, R., Norbury, C., & Gosse, C. (2018). *Language disorders from infancy through adolescence* (5th ed.). St. Louis, MO: Elsevier.
Prather, E., Breecher, S., Stafford, M., & Wallace, E. (1980). *Screening Test of Adolescent Language.* Torrance, CA: Western Psychological Services.
Riley, G. D. (2009). *Stuttering Severity Instrument for Children and Adults* (4th ed.). Austin, TX: PRO-ED.
Rossetti, L. (2006). *The Rossetti Infant–Toddler Language Scale.* East Moline, IL: LinguiSystems.
Ross-Swain, D. (1996). *Ross Information Processing Assessment* (2nd ed.). Austin, TX: PRO-ED.
Salvia, J., Ysseldyke, J. E., & Bolt, S. (2007). *Assessment in special education and inclusive education* (10th ed.). New York, NY: Houghton Mifflin.
Sander, E. K. (1972). When are speech sounds learned? *Journal of Speech and Hearing Disorders, 37*(1), 55–63.

Semel, E. M., Wiig, E. H., & Secord, W. (2013a). *Clinical Evaluation of Language Fundamentals* (5th ed.). San Antonio, TX: Pearson.
Seymour, H. N., Roeper, T. W., & de Villiers, J. (2005). *Diagnostic Evaluation of Language Variation.* San Antonio, TX: Pearson.
Shipley, K. G., & McAfee, J. G. (2009). *Assessment in speech-language pathology: A resource manual* (4th ed.). Clifton Park, NY: Cengage Learning.
Shriberg, L. D. (1993). Four new speech and voice-prosody measures for genetics research and other studies in developmental phonological disorders. *Journal of Speech, Language, and Hearing Research, 36,* 105–140.
Shriberg, L. D., Friel-Patti, S., Flipsen, P., Jr., & Brown, R. L. (2000). Otitis media, fluctuant hearing loss, and speech-language outcomes: A preliminary structural equation model. *Journal of Speech, Language, and Hearing Research, 43,* 100–120.
Sparrow, S., Cicchetti, D., & Saulnier, S. (2016). *Vineland Adaptive Behavior Scales* (3rd ed.). San Antonio, TX: Pearson.
St. Louis, K. O., & Ruscello, D. M. (2000). *Oral Speech Mechanism Screening Examination* (3rd ed.). Austin, TX: PRO-ED.
Templin, M. (1957). *Certain language skills in children: Their development and interrelationships.* Minneapolis: University of Minnesota Press.
Tomblin, J. B., Morris, H. L., & Spriestersbach, D. C. (2000). *Diagnosis in speech-language pathology* (2nd ed.). Clifton Park, NY: Delmar Learning.
Wetherby, A., & Prizant, B. (2003a). *Communication and Symbolic Behavior Scales, Normed Edition.* Baltimore, MD: Paul H. Brookes Publishing Co.
Wiig, E. H., Secord, W., & Semel, E. M. (2013). *Clinical Evaluation of Language Fundamentals, Screening* (5th ed.). San Antonio, TX: Pearson.
Wiig, E. H., Semel, E. M., & Secord, W. (2020). *Clinical Evaluation of Language Fundamentals, Preschool* (3rd ed.). San Antonio, TX: Pearson.
Williams, K. (2018). *Expressive Vocabulary Test* (4th ed.). Minneapolis, MN: Pearson.
Wilson, B. A., Cockburn, J., & Halligan, P. W. (1987). *Behavioral Inattention Test.* San Antonio, TX: Pearson.
Zimmerman, I. L., Steiner, V. G., & Pond, R. E. (2011). *Preschool Language Scales* (5th ed.). San Antonio, TX: Pearson.