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Language Development and Disorders: Guidelines for Assessment and Treatment

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Communication disorders are characterized by difficulty with verbal and nonverbal communication (American Psychiatric Association [APA], 2013). The APA (2013) states that these difficulties are persistent and cannot be explained by low cognitive ability. The difficulties include challenges in spoken and written language, speech, and social communication skills (APA, 2013) and can be summarized as impairments in the language functioning of an individual in the areas of language form, content, and/or use (Center for Disease Control and Prevention [CDC], 2021c). In the area of language, the APA (2013) categorizes communication disorders as a language disorder and a social (pragmatic) communication disorder (SCD).

A language disorder is defined as difficulties in acquisition and the use of language that persists across language modalities such as spoken, written, or sign language and is demonstrated by comprehension and production deficits and substantially and quantifiably below age expectations (APA, 2013). The APA (2013) characterizes an SCD by persistent challenges with the social use of verbal and nonverbal communication. Difficulties are evidenced by deficits in an individual's ability to understand implicit information (i.e., not explicitly stated), understand nonliteral language, follow conversation rules and storytelling, use communication to match the needs of a listener, and use functional communication in social contexts (APA, 2013; American Speech-Language-Hearing Association [ASHA], n.d.-b). Therefore, communication disorders may be referred to as language disorder, social communication disorder, language delay, language impairment, and other related names (Law et al., 2004; Montgomery et al., 2010). The term language disorder (LD) will be used throughout this chapter.

Symptoms of an LD vary across individuals and may depend upon the language domain affected, severity or level of disruption to communication, age, and stage of linguistic development (ASHA, n.d.-

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c, n.d.-d). An LD may impact phonology (speech sound system of a language), syntax (rules for how words are combined to form sentences), morphology (rules that govern the minimal meaningful units of language), semantics (the meaning of words), and pragmatics (rules associated with use of language in conversation and social situations) (ASHA, n.d.-c, n.d.-d; Berko Gleason, 2005). While these are categorized as different domains, they are not discrete, but are interrelated across each domain.

An LD may present in isolation or accompany autism spectrum disorder (ASD), intellectual disability (ID), developmental disability (DD), attention deficit hyperactivity disorder (ADHD), traumatic brain injury (TBI), learning disability, aphasia and psychological/emotional disorders, and hearing loss (ASHA, n.d.-b, n.d.-c); many risk factors exist as a result of these disorders (ASHA, n.d.-c; Fahey et al., 2018). For example, longitudinal research studies have followed children with an early LD, from preschool through elementary school, and have consistently demonstrated a link between early developmental LD and subsequent academic achievement problems, especially dyslexia, which is characterized by reading, writing, and spelling deficits (Fahey et al., 2018). Research that has compared children classified as "language impaired" with those classified as "reading impaired" has shown that both groups are characterized by a variety of oral language deficits, specifically phonological and memory problems, as well as language comprehension deficits (Fahey et al., 2018). Whether these common deficits derive from speech-specific mechanisms, or from more basic neural processing deficits, has been the focus of considerable research and theoretical debate (Fahey et al., 2018). Other risks associated with an LD include difficulty participating in social settings, developing peer relationships, and being successful in academic and vocational settings (ASHA, n.d.-b). These risk factors shed light on why treatment is so important and the necessity for differentiating between a disorder and a difference as well as identifying the specific language skills that need interventions.

This chapter will broadly define and discuss the process for assessment and diagnosis of an LD. This chapter has been designed to provide an overarching understanding of the various components and skills encompassed under the area of language and how difficulties with these skills may negatively impact daily functioning for individuals in a wide array of settings and situations. Additionally, various intervention techniques, modalities, and service delivery options will be discussed.

Assessment and Diagnosis of Language and Social Communication Disorder

Language and Social Development Milestones

Human behavior is complex, resulting from a varied individual learning history. When assessing for a language disorder, a case history and interview are used to explore all aspects of a child's background to include prenatal and birth history, medical history, early developmental history, and educational history. However, unless there are obvious connections between a cause, such as a traumatic brain injury and the presence of a language disorder, a one-to-one correspondence cannot be made (Fahey et al., 2018). The communication characteristics of each individual child along with environmental or historical factors may account for the disorder. In some cases, factors that perpetuate a disorder, such as hearing loss or low parent interaction, may be addressed and changed through intervention. Other factors that may influence the development of a language disorder include reduced environmental stimulation, poor motivation for learning, and emotional issues that suppress learning (Fahey et al., 2018).

No biological or organic pathology has been identified as the cause of an LD (Reed, 2018). As described by Reed (2018), an organic cause would be related to the pathology of an organ system in the body such as hearing loss and deafness, genetic syndromes, or neurological and intellectual dis-

abilities. A pathology could occur congenitally (being present at birth; CDC, 2020) or be acquired environmentally such as a traumatic brain injury (CDC, 2021a) or a degenerative neurological condition such as Down syndrome (CDC, 2021b). Reed (2018) asserted that understanding the relationship between environmental and biological systems and the resulting effect on language development is important as knowledge of the possible origin determines whether educational interventions and/or a referral for medical management is required.

There are many ways in which the environment plays a role in the prevalence of a language disorder. Premature (i.e., born before 36 weeks gestation) and low-birth-weight (i.e., less than 5.5 pounds) babies have underdeveloped vascular systems, feeding and digestive difficulties, and respiratory problems (Rosetti, 2001). These infants are at risk for language and learning disabilities (Fahey et al., 2018; Turnbull & Justice, 2017). In addition to prematurity and low birth weight, a small group of children have complications at birth leading to neurological damage such as partial (hypoxia) or total (anoxia) lack of oxygen to the brain that can cause severe damage to the cerebral cortex. The damage often results in severe communication disorders, motor disorders, impaired cognition, and feeding and swallowing disabilities (Fogel, 2008). Unfortunately, these problems are not reversible, and the challenges are lifelong. Additionally, when there is deprivation of positive social interaction, abuse and/or neglect of the child, reduced conversational turns and spoken words, and limited opportunities for learning experiences, the child is at risk for an LD (Fahey et al., 2018).

Bowen (1998) explains that language is a learned code or system of rules enabling communication of ideas or the expression of wants and needs. Forms of language include reading, writing, gesturing, and speaking. There are generally two main divisions of language: receptive language, the ability to understand what is said, written, or signed; and expressive language, the ability to speak, write, or sign. Language is acquired through the interaction with people in one's environment. Progress should be steady even though children learn at different rates. Developmental milestones are general guidelines, and each individual may be a little ahead or behind and still be within the typical developmental range. A comprehensive overview of developmental language milestones (e.g., phonology, semantics, play, syntax-morphology, and pragmatics) for children aged zero months through seven years is outlined by Gard et al. (n.d.).

Assessment and Diagnosis

The cause of an LD can be difficult to determine (ASHA, n.d.-c) and currently no known cause has been identified (Fahey et al., 2018; Reed, 2018; Turnbull & Justice, 2017). For an individual to receive a diagnosis of an LD, that individual must display language difficulties significant enough to adversely impact the individual's functioning educationally and socially (Reed, 2018). A referral for an LD evaluation commonly occurs when an individual within the child's life notices a delay in the child's language ability when compared to same-aged peers (ASHA, n.d.-c; Turnbull & Justice, 2017).

Once a referral has been made, a Speech and language pathologist (SLP) will begin to gather data using a screening process to select an appropriate evaluation based on the child's individual needs (ASHA, n.d.-c; Turnbull & Justice, 2017).The screening process assesses what difficulties are present and compares these difficulties with developmental milestones and cultural variances to determine whether or not additional information is needed (ASHA, n.d.-b; ASHA, n.d.-c; ASHA, n.d.-d). Eligibility for treatment depends upon the criteria set by the organization or agency such as a private therapist or public school and to some degree the components of the assessment may be determined by the setting (Reed, 2018). Objectives of assessment include determining whether or not a child has an LD and also whether or not they meet eligibility criteria for treatment within the setting for which they are being evaluated (Reed, 2018).

Assessment Components

The process by which a comprehensive language assessment is conducted includes normative assessments, observational data, and historical data obtained from parents or caregivers (ASHA, n.d.-b). Delayed functioning must be present in more than one of these components for an LD to be determined. The components of a comprehensive language assessment typically include the following: (a) relevant case history, including birth and medical history; (b) family history of speech, language, reading, or academic difficulties; (c) the family's concerns about the child's language (and speech); (d) languages and/or dialects used in the home, including age of introduction of a second language, and as appropriate, circumstances in which each language is used; (e) teachers' concerns regarding the impact of the child's language difficulties in the classroom; (f) a hearing screening, if not available from prior screening; (g) oral mechanism examination; (h) spoken language testing, including phonology, phonological awareness, semantics, morphology, and syntax; (i) pragmatics, including discourse-level language skills (conversation, narrative, expository); (j) literacy assessment; (k) an articulation or speech sound assessment; and (l) an assessment of the potential benefit of implementing augmentative and alternative communication (AAC) strategies (ASHA, n.d.-b).

Norm-Referenced Assessments

Norm-referenced assessments are required as part of the assessment process for determining the presence of an LD. Norm-referenced assessments, sometimes referred to as standardized assessments, may be used to identify broad characteristics of language functioning (ASHA, n.d.-c). Turnbull & Justice (2017) explained:

> These assessments often require the use of commercially available tests, such as the Clinical Evaluation of Language Fundamentals – Preschool-2 (Wiig et al., 2004). This norm referenced test is used with children ages 3-6 years, 11 months and includes six subtests that cover expressive and receptive language skills in the areas of morphology, syntax, and vocabulary. Scores derived from norm-referenced tests demonstrate how a child's language skills in different domains of language compare to those of a large population of children at the same age. These scores are often an important aspect of the diagnosis of an LD, as the diagnosis is based on showing that the child's language skills are underdeveloped relative to age-based expectations. (p. 326).

If a norm-referenced assessment was given with translation, such as with English as a second language learner, the scores should not be reported or used as a basis for diagnosis because they would no longer be valid (ASHA, n.d.-a). ASHA (2016, 2017, & n.d.-b) emphasized that it is imperative that an individual's communication pattern be assessed as it relates to their linguistic background and care should be taken to identify differences that may be related to limited exposure of a new cultural communication pattern rather than labeling these as a disorder. For an LD diagnosis to be provided, the LD must be severe enough to influence effective use of symbols and message processing in the language used by the speaker (ASHA, 2016; ASHA, 2017; ASHA, n.d.-b). A dialectal variation resulting from cultural difference should not be identified as an LD (ASHA, n.d.-c). These cultural differences will be discussed below. Two commonly used norm-referenced tests include the Comprehensive Assessment of Spoken Language Second Edition (CASL-2; Carrow-Woolfolk, 2017) and the Test of Early Language Development Fourth Edition (TELD-4; Hresko et al., 2018).

Comprehensive Assessment of Spoken Language Second Edition. The Comprehensive Assessment of Spoken Language Second Edition provides an in-depth evaluation of oral language skills for children from 3 years old to young adults 21 years old (Carrow-Woolfolk, 2017). The CASL-2 consists of 14 stand-alone tests measuring a specific oral language skill which can be interpreted separately or combined to represent broader areas of oral language function (Carrow-Woolfolk, 2017). The 14 tests include receptive vocabulary, antonyms, synonyms, expressive vocabulary, idiomatic language, sentence expression, grammatical morphemes, sentence comprehension, grammatical-

ity judgment, nonliteral language, meaning from context, inference, double meaning, and pragmatic language (Carrow-Woolfolk, 2017).

Test of Early Language Development Fourth Edition. The Test of Early Language Development Fourth Edition assesses oral language abilities for children aged 3 years to 7 years 11 months of age (Hresko et al., 2018). It comprises two subtests, Receptive Language and Expressive Language, and within each of these subtests are items measuring semantics, syntax, and morphology (Hresko et al., 2018).

Observational Measures

While norm-referenced tests provide data which compare the child's language abilities to same-aged peers, these scores cannot be used in isolation to determine qualification as LD (ASHA, 2004). As described by Turnbull & Justice, 2017:

Observational measures examine children's language form, content, and use in naturalistic activities with peers or parents. Two types of observational measures are commonly used in language assessment. The first is *conversational analysis*. In conversational analysis, the professional observes a child during interactions with other people to study his or her ability to initiate conversation, to use different communicative intentions, to take turns, to maintain topics, to identify breakdowns in conversation, and to attend to listener needs. The second type is *language sample analysis* (LSA). With LSA, the professional collects a sample of spontaneous language from the child, typically comprising at least 50 utterances, then analyzes the sample for all aspects of language (p. 313).

Additional Observational Assessments. Additional types of assessments that may be used include systematic observation/contextual analysis, ethnographic interviewing, and curriculum-based assessments. Systematic observation/contextual analysis is an observation conducted in various settings and contexts used to describe overall communication functioning and to identify areas of difficulty within the natural setting (ASHA, n.d.-c). Ethnographic interviewing is a way to obtain historical information from the student, their family/caregiver, and/or teachers and specifically avoids the use of leading questions and "why" questions (Westby et al., 2003). Instead, it uses restatements, open-ended questions, and summarizing for clarification. This type of interviewing is designed to gain information from the child's perspective or that of others in the child's environment. Curriculum-based assessments consist of protocols, probes, and direct assessment which are used to assess the child's ability to successfully participate with and succeed with the language demands of their school curriculum (ASHA, n.d.-a). Potential results of an assessment may include diagnosis of an LD which may include receptive or expressive language or a combination of both, distinguishing a delay (due to environmental factors) from a disorder, a description of the characteristics of the diagnosis, identification of literacy difficulties, identification of hearing problems, and data to support recommendations for interventions and support or a referral to other professionals such as an audiologist or school psychologist (ASHA, n.d.-c).

Cultural Considerations for Assessment

Cultural dimensions influence the way language and social communication are used in communicative interactions (ASHA, n.d.-a). ASHA (n.d.-a) asserted that a failure to understand these varied cultural dimensions may result in crucial miscommunications. Distinguishing between a language difference and an LD is critical for accurate diagnosis of an LD (ASHA, n.d.-a). ASHA (n.d.-a) provided best practice recommendations for distinguishing between a language difference and an LD. Recommendations stated that practitioners should (a) recognize that cultural dimensions and individual variation may influence eye gaze behavior, facial expressions, body language, rules for social interaction, child-rearing practices, perceptions of mental health, illness, and disability, and the patterns of superior and subordinate roles relative to status by age, gender, gender identity, and class; (b)

review cultural and linguistic variables influencing communication to determine if the patterns may be related to cultural background; (c) understand that differences may be related to limited exposure to and development of new cultural communication patterns; (d) identify a disorder as a breakdown in communication sufficient to negatively impact the effective use of symbols and message processing in the language of the speaker; (e) identify a communication difference as a variation of a symbol system used by a group of individuals reflected and determined by shared regional, social, cultural, or ethnic factors; and (f) recognize that a regional, social, or cultural variation of a communication system is rule based and should not be considered a disorder of speech or language (ASHA, n.d.-a).

Treatment

Following assessment of a language disorder it is critical for the learner to receive effective, evidence-based, and quality intervention. Typically, SLPs play an essential role in the treatment of an LD by providing specialized and targeted interventions (Selin et al., 2019). This intervention can take place in many different instructional formats, including one-to-one instruction, small-group instruction, and large-group instruction (Law et al., 2017). Additionally, it is common to see intervention being provided in multiple settings, including in the learner's home, community, and school (Law et al., 2017). The interventionist should consider the learner's culture, diagnosis, setting in which they are working, family's involvement, and intensity needed to provide the most effective, affirming, and individualized intervention possible.

One goal of intervention is to stimulate overall language development by teaching language skills in an integrated manner and in context, in order to enhance everyday communication skills and to improve access to academic content (ASHA, n.d.-c). Therefore, goals are generally chosen with consideration for developmental appropriateness and potential for improvement of overall communication, academic readiness, and social skills (ASHA, n.d.-c). The goals of intervention should be functional so that the language will more likely occur in natural settings and result in the learner meeting their needs. As such these goals will hopefully result in the learner generalizing their new repertoire toward their natural environment. As part of a comprehensive approach, ASHA's (n.d.-b) treatment recommendations include addressing phonology, semantics, morphology and syntax, and pragmatics for all age ranges.

Goals of Intervention

ASHA (n.d.-c) recommends that LD intervention goals vary throughout an individual's lifetime. Preschool goals may include phonology, increasing the consonant repertoire and the accuracy of sound productions, phonological awareness, semantic skills, morphology and syntax, and pragmatic skills (ASHA, n.d.-c). For elementary school-aged children ASHA (n.d.-c) recommends targeting functional communication skills, literacy skills, and metacognitive and metalinguistic skills, as well as continuing to target phonological skills, morphology and syntax, and pragmatic skills. LD intervention for middle- and high-school-aged children should continue to target any areas that were previously targeted but not fully addressed at a younger age as well as self-management of language and communication development strategies (ASHA, n.d.-c). Finally, intervention for students in post-secondary school and adulthood should target the social communication skills needed to develop meaningful relationships and gain and sustain employment (Ayers et al., 2017; Dutta et al., 2009).

Preschool

In preschool, intervention typically involves the targeting of phonology. This should include addressing impaired intelligibility because if a child is unintelligible it could result in frustration for the learner (Coplan & Gleason, 1988; ASHA, n.d.-c) and could mask difficulties with other language issues such as semantics and syntax (ASHA, n.d.-c). Another skill that should be targeted is increasing the consonant repertoire and the accuracy of sound productions (Masso et al., 2017). Interventionists should also target phonological awareness, which should be addressed with the acquisition skills of rhyming, blending, and segmenting words by syllable and phonemes (Lyster et al., 2021; Stoel-Gammon, 1988). Targets for semantic skills include vocabulary acquisition with a focus on pronouns, conjunctions, verbs, and basic concept vocabulary (Lyster et al., 2021). Targeting morphology and syntax is also an important goal at this stage of intervention (ASHA, n.d.-c; Lyster et al., 2021). Targets around morphology and syntax should include addressing sentence length, complexity, type of sentences (e.g., statements or inquiries), and facilitation of age-appropriate morpheme usage with a focus on articles, auxiliary verbs, and pronouns (ASHA, n.d.-c). Teaching pragmatic skills is also critical (Bouchard et al., 2020). Specific pragmatic skills that could be targeted would be (a) narrative skills, (b) conversational turn-taking, (c) language flexibility to match the needs of varying contexts, and (d) use of imaginative play (ASHA, n.d.-c). Finally, interventionists should target literacy skills by targeting print and book awareness, understanding of story structure, letter knowledge, and matching speech to print (ASHA, n.d.-c; Masso et al., 2017).

Elementary School

For elementary school-aged children with spoken language disorders, language intervention should focus on acquisition of the key skills necessary to function successfully in the classroom environment (ASHA, n.d.-c). Goals should be based on the curriculum for the child's grade level, which means that a curriculum-based approach should be taken. In the school setting, planning and implementation of goals should be a coordinated team effort with the SLP, classroom teacher, and other pertinent school specialists (Committee on the Evaluation of the Supplemental Security Income (SSI) Disability Program for Children with Speech Disorders and Language Disorders et al., 2016). Literacy skills would be addressed in greater detail than for the younger ages, in order to include improved decoding, reading comprehension, and narrative skills (ASHA, n.d.-c; Cadima et al., 2010). Interventionists should also focus on metacognitive and metalinguistic skills (ASHA, n.d.-c; Roebers et al., 2014). Teaching these skills would consist of increasing the awareness of rules for using various language forms, self-monitoring, and self-regulation, all critical skills for development of higher level language skills (ASHA, n.d.-c).

Interventionists should continue to work on improving phonology skills by working on phonological awareness and eliminating speech error patterns that contribute to unintelligibility. Interventionists should also work on improving semantic skills by (a) increasing vocabulary knowledge, (b) attention to vocabulary depth (e.g., changes in word meaning based on context); (c) abstract and figurative language, (d) multiple meanings, (e) paraphrasing, (f) comprehension, and (g) the ability to ask for clarification (ASHA, n.d.-c).

Morphology and syntax are still important to target during this age. Interventionists can target morphology and syntax by (a) targeting changing words (e.g., medicine to medical), (b) analyzation of prefixes/suffixes, (c) analyzation of complex sentences such as declarative versus questions, (d) use of compound sentences, and (e) the ability to recognize and correct errors of grammar (ASHA, n.d.-c; Nagy et al., 2006).

Interventionists would still want to target pragmatic language with a focus on (a) the ability to use language in varying contexts (e.g., being polite), (b) provide clarifications, (c) persuasiveness, (d) discourse skills (e.g., narrative, academic, expository, and social interaction), (e) making relevant

contributions to classroom discussions, (f) repairing conversational breakdown, and (g) knowledge of what to say and not to say in various situations, as well as when to talk or not talk (ASHA, n.d.-c; Feider & Saint-Pierre, 1987).

Middle and High School

For children who are in middle school and/or high school, basic language skills, such as those noted for younger ages, may still need to be addressed (ASHA, n.d.-c). At this stage of development, it may not be possible to close the gap between skill level and grade level, and compensatory strategies may become the focus (Bowen, 1998). Older students should be encouraged to collaborate in the development of goals, as well as learn self-advocacy that could be used in the classroom, such as telling the teacher when they need a direction repeated or do not understand assignments (ASHA, n.d.-c; Downing et al., 2007). The focus for intervention shifts to teaching rules, techniques, and principles needed for acquisition and use of information along a range of settings and situations, with an emphasis on *how* to learn rather than *what* to learn. Instructional strategies include using context to understand meaning and infer or identify main ideas, using checklists and graphic organizers for completing assignments, and using spelling and grammar checks when editing writing (ASHA, n.d.-c; Faggella-Luby & Deshler, 2008).

Post-Secondary School and Adulthood

Transition planning should include students and parents, along with secondary school personnel (Cameto et al., 2004). Sensitivity to the student and family's culture and values should be exercised (ASHA, 2016), and self-advocacy skills should be a priority (Sievert et al., 1988). Families should be made aware of post-secondary services that are available and that might help to maintain previously established social communication skills (Dutta et al., 2009). Social communication skills are important beyond high school and are crucial for development of meaningful relationships and obtaining and maintaining employment (Ayers et al., 2017; Dutta et al., 2009). These skills will be needed throughout an individual's adulthood.

Evidence-Based Interventions for LD

When working with individuals diagnosed with an LD it is critical that the interventionist implement those procedures which are considered an Evidence-Based Practice (EBP) (ASHA, 2005). Per ASHA's policy statement (2005), EBP is the approach wherein an interventionist considers the best research evidence, their own clinical expertise, and the values and preferences of the client to determine which procedure to implement. As such, an interventionist needs to take a response approach to treatment selection, based on the learner's unique needs; however, the interventionist should also ensure the selected approaches are supported by the best empirical evidence (Leaf et al., 2016). Additionally, interventionists should not implement procedures which fall out of their scope of competence (ASHA, 2016a, b; Behavior Analyst Certification Board ® [BACB], 2020, 1.05). Finally, it is imperative that professionals implement procedures in consultation with the direct consumers or stakeholders (ASHA, 2016a, b; BACB, 2020, 2.13).

The use of EBP is consistent with position statements developed by ASHA's Joint Coordinating Committee, in that audiologists, speech-language pathologists, and other treating professionals incorporate the principles of evidence-based practice in clinical decision-making (ASHA, 2005). There are several evidence-based approaches for treating an LD (Geiger et al., 2012). These approaches include but are not limited to shaping (Fleece et al., 1981), discrete trial teaching (Geiger et al., 2012), functional communication training (Carr & Durand, 1985), incidental teaching (Haring, 1992; Hart &

Risley, 1968), pivotal response training (Gengoux et al., 2019), parent-mediated interventions (Ingersoll et al., 2016), and augmentative and alternative communication (Binger & Light, 2007).

Shaping

Shaping is the process of molding desired behaviors through the use of differential reinforcement of successive approximations of a terminal behavior (Cooper et al., 2019). Fleece et al. (1981) used shaping to treat a social communication LD for two preschoolers with low voice volume. The interventionist used a voice volume apparatus and manually adjusted the voice-activated relay throughout phases of the shaping process. For example, in the earlier phases, the device was more sensitive to voice volume and was activated by lower volumes. However, gradually louder voice volume was required for each subsequent treatment phase. Voice volume that met the criteria for the treatment phase was reinforced by illumination of a light up display. Corrective feedback was provided for voice volume that did not meet the criteria. Following intervention, voice volume increased to appropriate levels for both participants. Furthermore, voice volume was generalized to the classroom setting and maintained during a one- and four-month follow-up.

Ghammaeghami and colleagues (2018) evaluated the efficacy of a shaping procedure for treating a social communication LD for two children diagnosed with ADHD. Shaping was used to develop complex functional communication responses (FCRs). The shaping procedure included the use of differential reinforcement and extinction to gradually shape approximations of more complex FCRs. Within this procedure, the criterion for reinforcement was gradually increased, and FCRs that did not meet this criterion (i.e., appropriate volume and tone) were placed on extinction (i.e., reinforcement was withheld). A changing criterion design was employed to assess the effect of this shaping procedure to increase the complexity of the participants' FCR. The shaping procedure successfully progressed simple FCRs to more complex FCRs and replaced challenging behavior with more functional communication across participants.

Discrete Trial Teaching

Discrete trial teaching (DTT) is an instructional approach which breaks the target skill down into smaller steps and teaches those steps one at a time (Bogin et al., 2010; Leaf et al., 2014; Mitsch & Riggleman, 2020). DTT consists of three main components, including an instruction from the interventionist, a response from the learner, and delivery of a consequence contingent upon the learner's response (Weiss et al., 2017). An optional fourth step of DTT is the interventionist providing a prompt (after the instruction) that increases the probability of the learner responding correctly (Leaf et al., 2014; Mitsch & Riggleman, 2020). DTT is typically implemented in a highly structured, one-to-one format (Mitsch & Riggleman, 2020), although it could be implemented in a group instructional format (Leaf et al., 2013). DTT is effective for treating an LD in the areas of expressive language (e.g., speech and sign vocabulary, responding to questions), receptive language (e.g., responding to instructions), and social communication skills (e.g., increasing social initiation and interaction) (Conallen & Reed, 2016; Garcia-Albea et al., 2014; Geiger et al., 2012).

Geiger et al. (2012) used an adapted alternating treatment design to evaluate the efficacy of traditional DTT procedure compared to an embedded DTT procedure to teach responding to instructions (i.e., receptive language) to two preschoolers diagnosed with autism. The traditional DTT procedure consisted of the presentation of a stimulus (e.g., a picture) followed by an instruction. Each participant was provided three seconds to respond and received response-specific delivery of a consequence (i.e., praise and an edible for an accurate response and redelivery of the instruction with a prompt for an incorrect response or no response). The embedded DTT procedure involved the traditional DTT procedure with an embedded instruction. That is, the provided instruction was presented within the con-

text of naturally occurring activities. Results indicated that both traditional and embedded DTT were similarly effective for teaching receptive language discriminations.

A study conducted by Secan et al. (1989) assessed the effect of a DTT picture training procedure to teach generalized responding to wh- questions to four students demonstrating delays in social communication and language skills. Responding was evaluated across persons, situations, and time, using a modified multiple-probe design. During the DTT picture training procedure, the interventionist presented a picture and told the student to attend to the item. The interventionist then asked a wh-question related to the picture presented, and the wh- word was emphasized (e.g., "WHAT is the boy doing?"). The student was provided 10 seconds to respond, and differential consequences were delivered contingently. The consequence for correct responses was the delivery of praise. Incorrect responses (or absence of responding) were followed by the interventionist modeling the correct response and restating the question. If the student then emitted a correct response, praise was delivered. If another error or no response occurred, the interventionist repeated the question and provided a model of the correct response. The trial was then terminated. The DTT picture training procedure successfully resulted in generalized responses to wh- questions.

Functional Communication Training

Functional communication training (FCT) is another evidence-based practice used to decrease challenging behaviors such as aggression, self-injury, and property destruction by increasing appropriate (functional) language and communication skills (Carr & Durand, 1985; Ghaemmaghami et al., 2018; Ghammaeghami et al., 2021; Muharib et al., 2019). In a seminal study, Carr and Durand (1985) taught functional communication skills to four adolescents with diagnoses of brain injury, autism, developmental delay, and hearing impairment. Through the use of FCT (i.e., differential reinforcement of a functional communication response), the participants were taught to either ask for help or recruit adult attention. Participants were taught to use "I don't understand" to recruit assistance during challenging tasks and "Am I doing good work?" to recruit praise during easier tasks. FCT resulted in a decrease in challenging behaviors and an increase in FCRs during the training contexts.

Muharib et al. (2018) investigated effects on challenging behavior of using GoTalkNow on an iPad for two children with ASD who had little or no speech skills and a social communication LD. Muharib et al. (2018) employed least-to-most prompting and natural reinforcement (i.e., delivery of the requested item) to increase the participants' functional communication. The findings suggested a functional relation between the FCT intervention (independent variable) and challenging behaviors (dependent variable) with a decrease in the challenging behaviors.

Incidental Teaching

Incidental teaching is a form of instruction that capitalizes on naturally occurring opportunities within the individual's learning environment (Haring, 1992; Hart & Risley, 1968). When using incidental teaching to treat an LD, the interventionist has to manipulate the environment in a manner which encourages the learner to communicate (Hart & Risley, 1975). The steps of incidental teaching include (a) the manipulation of the environment; (b) an initiation from the learner; (c) an elaboration from the interventionist; and (d) reinforcement. An example of application of this methodology is toward increasing mand repertoires for a learner (Farmer-Dougan, 1994; Rogers-Warren & Warren, 1980). An interventionist might place a desired item (e.g., light up toy) out of reach of the learner and wait for the learner to make a communicative response (e.g., saying "help me" or "toy"). This would be followed by an elaboration (e.g., "You want the toy?") from the interventionist and the learner receiving the item. Researchers have demonstrated that incidental teaching can be effective in mitigating an LD in the areas of expressive language (McGee et al., 1985; Rogers-Warren & Warren, 1980), receptive language (McGee et al. 1986), and social communication (Kohler et al., 2001) and can be used to

develop skills such as manding (Farmer-Dougan, 1994; Rogers-Warren & Warren, 1980), using prepositions (McGee et al., 1985), reading (McGee et al., 1986), elaborating language complexity (Hart & Risley, 1975, 1980, 1982), and social interaction (Kohler et al., 2001).

Hart and Risley (1975) used incidental teaching to increase vocabulary and frequency of language for 11 preschool children. The incidental teaching procedure was employed when the child initiated an interaction with a request. The interventionist then used this interaction to provide a learning opportunity for language development through the use of least-most prompting in order to evoke vocabulary growth and language frequency. Once the participant emitted a correct response, a naturally occurring reinforcer (e.g., the item requested) was delivered. Incidental teaching resulted in substantial increases in vocabulary growth and the frequency of language use.

Incidental teaching is also effective in increasing vocabulary, initiations for social interactions, responsiveness to initiations, and the overall complexity of an individual's language skills used within social interactions (Warren & Kaiser, 1986). In 2001, Kohler and colleagues employed an incidental teaching approach for four preschoolers with disabilities. The children's teachers were taught to use naturalistic teaching procedures such as joining the activity, using comments or questions, and using novel materials to evoke the children's interest and facilitate social communication and interaction while engaged in free play. Incidental teaching resulted in increased social interactions for all four participants.

Pivotal Response Training

Pivotal response training (PRT) is a comprehensive intervention model that is used to increase language and social behavior, decrease challenging behavior, and improve the overall quality of lives for their learners (Vernon, 2017). PRT is considered a naturalistic and child-initiated behavioral treatment (Koegel et al., 1987). There are five critical motivational variables in PRT: choice, interspersal, task variation, use of natural rewards, and rewarding attempts to emit a target behavior (Vernon, 2017). The research behind this model supports that increasing pivotal behaviors may lead to collateral skill acquisition (i.e., acquiring skills that were not specifically targeted for teaching) and challenging behavior reduction and may lead to overall improvements in the learner's life (Koegel et al., 1999; Koegel & Koegel, 2006). Researchers have demonstrated that PRT can be effective in reducing challenging behaviors, improving socialization, and establishing the learner as a valued member of a peer group with social activities (Koegel & Koegel, 2006).

Koegel et al. (1987) conducted a multiple baseline study with two children diagnosed with ASD to assess the ability of the PRT motivation strategies (e.g., child selection of intervention materials, bids to attract the child's attention, interspersing of mastered and novel tasks, logically related and natural reinforcers, and immediate reinforcement for any appropriate response) to increase language development. Within the PRT teaching procedure, a preferred stimulus (e.g., a toy) was presented to the participants and the participant was prompted to make a verbal request. The stimulus was provided, contingent upon the verbal response. Results demonstrated improvement in language development for both participants (Koegel et al.,1987).

Gengoux et al. (2019) conducted a randomized controlled study which compared a 24-week PRT package (PRT-P) group with a delayed treatment group (DTG). Forty-eight children that were diagnosed with ASD and significant language delays and their parents were randomly assigned to the PRT-P group or the DTG group. The PRT-P included a 12-week intensive phase which was followed by a 12-week maintenance phase. The intensive phase occurred from week 1 to week 12 and provided the parents with weekly 60-minute parent training sessions on how to conduct PRT. Also, during the intensive phase, the children received 10 hours per week of treatment in the clinic setting. Treatment targeted the development of the child's communication skills. Weeks 12–24 consisted of a maintenance phase wherein parent training sessions were reduced to once per month and the treatment pro-

vided to the children was reduced to five hours per week and was conducted in the home. While the PRT-P group received the PRT-P intervention, the DTG group received stable community-based interventions. Following 24 weeks, analysis revealed that the number of utterances increased for the PRT-P group as compared to the DTG. PRT-P improved the child's social communication skills and strengthened parent implementation of PRT procedures.

Parent-Mediated Intervention

Parent-mediated intervention (PMI) is the specific involvement of parents in the delivery of treatment for their child (Casagrande & Ingersoll, 2017). As described by Bearss et al. (2015), PMI involves the systematic training of parents to implement treatment strategies to be utilized with their child. PMI is used to help parents manage their child's behavior and develop specific skill areas (Casagrande & Ingersoll, 2017). As described by Casagrande and Ingersoll (2017), PMI is often utilized in a treatment package in conjunction with other treatment procedures. PMI can increase the intensity of the child's intervention (Casagrande & Ingersoll, 2017), reduce the amount of treatment resources needed (Chasson et al., 2007), and improve the parent–child relationship and overall family functioning (Casagrande & Ingersoll, 2017; Karst & Van Hecke, 2012; Strauss et al., 2012). The evidence for PMI for mitigating an LD is somewhat limited, with recent studies reporting null findings (Carter et al., 2011; Rogers et al., 2012; Turner-Brown et al., 2019) and reviews discovering methodological flaws in the literature on PMI for treatment of an LD (Beaudoin et al., 2014; Oono et al., 2013). However, some studies successfully demonstrated the use of PMI to increase social communication skills (Ingersoll et al., 2016; Kaiser et al., 2007; Turner-Brown et al., 2019; Wetherby & Woods, 2006).

Ingersoll et al. (2016) implemented a randomized controlled trial (RCT) pilot study. A PMI treatment was designed to increase social engagement, language skills, and other skills outside the domain of social communication (e.g., play). Parents were divided into a self-directed (i.e., the parent independently engaging with the interactive program) or a therapist-assisted program (i.e., the parent was provided with assistance from a professional therapist). Twenty-four individual or group parent–child sessions were provided biweekly for one hour each session. The children within both groups demonstrated increased learning skills, with slightly larger gains in the therapist-assisted group. Treatment resulted in increased fidelity of parental use of treatment, decreased parental stress, and more positive child perceptions. Greater fidelity and more positive child perceptions were reported in the therapist-assisted group. Therefore, PMI is a potentially effective treatment for improving an LD (Ingersoll et al., 2016; Wetherby & Woods, 2006). Casagrande and Ingersoll (2017) suggested that careful consideration of several factors could increase the effectiveness of PMI for developing social communication skills. Prior to employing PMI, practitioners should consider the interventions used (e.g., DTT), the social communication skills selected, the format of parent training (i.e., group vs. individual), the dosage of parent training, and specific parent variables (e.g., stress) (Casagrande & Ingersoll, 2017).

Augmentative and Alternative Communication

Augmentative and Alternative Communication has been considered both an intervention and a behavior that is taught (ASHA, n.d.-c). For example, the Picture Exchange Communication System (PECS) would be considered an intervention (AAC Institute, 2021); however, when a learner responds using a Proloquo (Van der Meer et al., 2013) to communicate, that would be considered a behavior. AAC is utilized for the supplementation or replacement of natural speech and/or writing and is an integrated group of components used to enhance communication (AAC Institute, 2021). Aided AAC refers to systems that are additional to the person communicating, some form of external tool such as pictures, drawings, speech-generating devices, or objects (AAC Institute, 2021); unaided AAC refers to communication systems that do not require additional equipment or items and would include manual sign,

gestures, or finger spelling (AAC Institute, 2021). AAC is augmentative when used to supplement existing speech, is alternative when replacing speech that is absent or dysfunctional, and is temporary when used postoperatively in intensive care cases (Elsahar et al., 2019).

PECS has been shown to increase spoken communication (Yoder & Stone, 2006). A randomized group experiment was conducted by Yoder & Stone (2006) which compared the effect of Responsive Education and Prelinguistic Milieu Teaching (RPMT) and PECS on the use of nonimitative spoken communication acts and nonimitative words. Both treatments were provided for a total of 24 hours and broken into three 20-minutes sessions weekly over 6 months. The RPMT sessions occurred on the floor 1:1 and taught gestures, gaze, vocalizations, and words using mands and explicit imitation prompts to evoke spoken communication. The PECS sessions were conducted in a chair with 2:1 for phases I, II, III, and IV of PECS (per the PECS manual) and 1:1 for the remainder of phases. The growth rate of nonimitative words was faster with the PECS group (for children who began the treatment with relatively high object exploration behavior). However, for participants who began with relatively low object exploration, the RPMT group was more successful.

AAC models are another type of AAC intervention (Binger & Light, 2007). Binger et al. (2007) examined the use of an AAC model for language intervention (i.e., increasing the use of multisymbol messages) for five preschool children between the ages of three and five years. Two children used a voice output (speech-generating device) and two children used a communication board (pictures on a board). The participants were taught to use their AAC device to directly select a picture by touching it with an index finger. The AAC model was delivered through the use of natural speech while pointing to and labeling a graphic symbol on an AAC device. Four of the five participants demonstrated an increase in use of multisymbol messages suggesting that AAC modeling had a positive effect on increased sentence length (Binger & Light, 2007).

Conclusion

In order to appropriately address skill acquisition, set meaningful goals, and help learners progress in any of the broad areas encompassed under the area of language, a clinician should have a basic knowledge and understanding of developmental milestones and benchmarks. Understanding how typical language development looks is important for knowing when a learner is delayed or missing core language skills. Knowledge of the developmental process allows the clinician the ability to understand when to refer to the appropriate professionals and who that professional may be. Language impacts many skills and when there are difficulties in this area, there may be a negative impact across multiple other developmental areas. A language disorder may negatively impact the basic ability to communicate with others to meet one's needs or wants as well as affecting the establishment and growth of relationships.

Hallmarks of a language disorder include impaired comprehension and/or expression of spoken, written, or other symbol systems as well as social interactions. When identifying a language disorder, professionals must consider the extent to which the language difficulties (a) impact adversely on social, psychological, and educational functions, (b) represent a difference rather than a disorder, and (c) are significant enough to be labeled a disorder (Turnbull & Justice, 2017). Considerations must also be given to cultural dimensions that may influence both verbal and nonverbal behaviors. Distinguishing between a communication difference and a communication disorder is a skill required for clinical competence. The importance of understanding, diagnosing, and treating an LD cannot be overemphasized. LD can have many negative consequences which include but are not limited to lower academic achievement (e.g., decreased reading ability, lower level of education), social anxiety that results in difficulty establishing relationships, increased risk of bullying and victimization and

decreased self-esteem, and a risk for sexual assault in adulthood (Rice, 2018). It is imperative that the professionals who work with individuals with LD (and/or who are on teams that address the needs for individuals with LD) have a concrete understanding and working knowledge of the many facets of language. A foundational understanding of language skills, language development, language components, and the distinction between a disorder and a cultural difference is critical for accurate diagnosis and treatment; this working knowledge leads the professional to select appropriate intervention, in order to avoid the aforementioned risks and progress barriers. By collaborating through use of evidence-based practices, professionals (i.e., SLPs, behavior analysts, psychologists, educators) and family members can offer meaningful support toward optimized clinical outcomes and improved quality of life.

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