

---

2022

## Developmental Language Disorder: A Literature Review

Laura M. Gaudette

*Bridgewater State University*

Follow this and additional works at: [https://vc.bridgew.edu/grad\\_rev](https://vc.bridgew.edu/grad_rev)



Part of the [Speech Pathology and Audiology Commons](#)

---

### Recommended Citation

Gaudette, Laura M. (2022) Developmental Language Disorder: A Literature Review. *The Graduate Review*, 7, 106-121.

Available at: [https://vc.bridgew.edu/grad\\_rev/vol7/iss1/14](https://vc.bridgew.edu/grad_rev/vol7/iss1/14)

This item is available as part of Virtual Commons, the open-access institutional repository of Bridgewater State University, Bridgewater, Massachusetts.

Copyright © 2022 Laura M. Gaudette

# Developmental Language Disorder: A Literature Review

LAURA M. GAUDETTE  
Bridgewater State University

## Introduction

### Overview of Condition

#### *What is Developmental Language Disorder?*

Developmental language disorder (DLD) is a lifelong language condition characterized by difficulty using and/or understanding language. DLD also impacts learning and acquiring language, making the effects cumulative (Rudolph & Leonard, 2016). These difficulties may first be apparent in childhood and are pervasive throughout the individual's life, causing substantial difficulty in everyday social situations and educational performance (Bishop et al., 2016, 2017). Though DLD sometimes co-occurs with other conditions, the language difficulties are considered independent of the co-occurring condition and are not caused by hearing impairment, autism,

or intellectual disability. According to the National Institute on Deafness and Other Communication Disorders (NIDCD, 2019), developmental language disorder is among the most common developmental conditions of early childhood, affecting around 7%-8% of kindergarten children. This translates to about 2-3 children in each class of 30 students. The identification and diagnostic process have several difficulties, which will be discussed next.

#### *Characteristics*

DLD is characterized by significant and variable deficits in receptive and expressive aspects of language (Leonard, 2013). Children with DLD may present with difficulties in phonologic, syntactic, morphologic, semantic, discourse, and pragmatic areas of language. Difficulty with some skills related to executive functioning is common in many children as well. Despite this variability, as mentioned earlier, research has identified some general areas of difficulty observed across all ages of those diagnosed with DLD and other specific key markers.

Thomas et al. (2019) conducted a qualitative study concerning the experiences of 17 qualified speech-language pathologists (SLPs) involved in the assessment and diagnosis process for DLD. The SLPs consistently identified what they considered key indicators of DLD, including word order errors, verb errors, word-finding problems, nonword repetition difficulties, and, to a lesser extent, difficulties in understanding and producing narratives and slow processing of verbal information. Related to difficulties in sentence repetition are weaknesses in working memory capacity for those with DLD (Hesketh &

Conti-Ramsden, 2013; McGregor et al., 2017).

However, only three key markers of DLD have been consistently reported across the literature. The first one is difficulty in sentence repetition tasks, reflecting deficits in short-term verbal memory, vocabulary knowledge, and grammatical skills (Archibald et al., 2009; Conti-Ramsden et al., 2001; Hesketh & Conti-Ramsden, 2013; Poll et al., 2010). Another standard marker is deficits in nonword repetition, reflecting short-term phonological memory and phonological processing difficulties (Poll et al., 2010; Thomas et al., 2019; Weismer et al., 2000). Finally, difficulties in grammatical sentence comprehension and production of verb morphology such as tense and agreement seem to be good predictors of DLD (Conti-Ramsden, 2003; Conti-Ramsden et al., 2001; Hendricks et al., 2019; Poll et al., 2010).

### ***Risk Factors and Predictors***

The NIDCD (2019) suggests a strong genetic aspect to DLD, where between 50%-70% of children with DLD have at least one family member with the condition. There are genetic and environmental risk factors to consider that play a role in early identification. Rudolph et al. (2017) caution that the presence of one of these factors will not undoubtedly predict DLD status, but that a combination of factors increases the child's risk and may warrant an evaluation from a speech-language pathologist.

Some general factors increase the risk for language impairments in children, including a family history of language or literacy difficulties and socioeconomic disadvantage (Christensen et al., 2017). Late talker status has long been considered a risk factor,

but more recent research has suggested that late word combiner status may be a better predictor of DLD status (Dollaghan, 2013; Rudolph & Leonard, 2016). Considering the type of language delays in children may better predict later language difficulties (Rudolph & Leonard, 2016). However, it is also important to note that Rudolph & Leonard (2016) found a proportion of children with DLD who did not exhibit early delays.

A systematic literature review by Rudolph (2017) identified clinically relevant factors in addition to late talker status that may be considered together to increase a child's risk of developing DLD. These include lower maternal education level; later birth order; child's biological sex (males have a higher risk); and a low 5-min Apgar score, a neonatal assessment given to newborns shortly after birth. Again, it is essential to consider multiple risk factors together for more accurate DLD identification.

### **Functional Impacts**

Many authors have highlighted the potential long-term outcomes that DLD can have on individuals into adulthood related to health, happiness, and success. Conti-Ramsden & Botting (2008) found that children with DLD are significantly more likely to experience clinical levels of anxiety and depression. Difficulties with peer relations, poor language/literacy skills, and associated behavioral problems experienced by people with DLD collectively have long-term effects on education and employment experiences. Conti-Ramsden & Durkin (2012) found that 19-year-olds with DLD tend to attain fewer qualifications, work less skilled jobs, and are at a greater risk of unemployment in the immediate post-school years. In a study by

Whitehouse et al. (2009), adults with a history of DLD were found to have persisting language and literacy difficulties, later developing pragmatic deficits.

In response to these possible negative effects, Bishop et al. (2016) emphasize the need for uniform tools to identify children at risk for persistent language impairments earlier as well as a more developed treatment evidence base. The authors indicate the need to develop methods to determine functional impacts of the condition. Early identification and treatment are essential to negate long-term negative consequences identified by research for those with DLD.

### **Assessment and Diagnosis**

Diagnosis of DLD requires a complete speech and language evaluation by a speech-language pathologist. These evaluations usually occur following a parent or other caregiver expressing concerns about their child's language or other academic, social, or psychiatric concerns. Any of the previously identified characteristics may trigger these concerns. As there is no comprehensive diagnostic battery for DLD, the integration of formal and informal testing methods is essential (Roddam & Skeat, 2020). Results from formal and informal measures will identify DLD and provide an idea of the child's strengths and weaknesses, which will be helpful in treatment planning. Methods for each will be discussed in the following two sections.

#### ***Formal Assessments***

Standardized tests are a valuable tool in identifying all speech, language, and communication difficulties. Professionals can compare the child's performance on various language skills to their peers of the

same age and effectively identify which children are at risk of academic failure (Bishop & McDonald, 2009). First, hearing and nonverbal I.Q. should be measured to rule out other possible diagnoses. Next, language should be evaluated.

As mentioned earlier, there is no standard method to look for DLD. However, Tomblin et al. (1996) developed a standardized protocol for diagnosing DLD called the EpiSLI system, which provided promising results comparable to clinician ratings. This system measured language performance on vocabulary, grammar, and narration tasks for comprehension and production (Tomblin et al., 1996). Based on the identified markers, such tests can help to describe the child's performance in speech, language, and other aspects of communication. However, a low score on a language test should be considered alongside the later mentioned informal assessments to determine the functional impact (Bishop et al., 2016).

In any case, there are gaps in the communication profile from formal language tests alone. For this reason, it is recommended that standardized questionnaires for parents or teachers are utilized. These tests, such as the Communication Checklist (CCC), help achieve a broader, standardized idea of the child's abilities (Norbury et al., 2004).

#### ***Informal Assessments***

Formal language tests and checklists alone may not accurately capture the child's language skills. For this reason, detailed family history, parent/caregiver interviews, direct observations, and language learning context should be considered in conjunction with formal assessments (Bishop et al., 2016).

Detailed family history and parent and caretaker interviews are advantageous in identifying common risk factors and markers for DLD (Bishop & McDonald, 2009; Camilleri & Law, 2013; Richterová & Málková, 2017). Interviews with parents and other caretakers may also provide more information on how the child uses their language in different contexts. Observations of children in natural contexts, such as in the classroom or during play, also offer insight into how the child naturally uses language (Camilleri & Law 2013). The diversified assessments allow the SLP to more comprehensively understand the ways in which a child uses language in daily life and interactions, thus better predicting the true impact of the condition.

### *Special Considerations*

Several factors complicate the identification, diagnosis, and treatment of DLD across the lifetime. These include a wide variety of names used in the literature, variability across individuals, and variability in individual's language profiles across the lifespan.

**Multiple Names.** Despite the high incidence and potential long-term impacts, DLD is significantly under-studied (Bishop, 2010). Bishop (2010) suggested the scarcity of DLD's research base may be related to the variable terminology used to describe the symptoms, many of which are also characteristic of other language conditions. Beyond DLD, the symptomatology as mentioned above has been referred to as specific language impairment (SLI), primary language impairment (PLI), and developmental aphasia or dysphasia, among other names.

The CATALISE group, consisting of 59 experts in speech-language pathology and related fields from

six different English-speaking countries, participated in the CATALISE project to collectively determine which term best describes the condition, recommending the term DLD be used (Bishop et al., 2016, 2017). For this paper, DLD will be used to discuss this neurodevelopmental language deficit.

**DLD as an Invisible Condition.** DLD is often referred to as an invisible condition, owing to an absence of any apparent physical manifestations of language difficulties. Many people with DLD have adapted to their difficulties and developed sufficient compensatory strategies to participate in daily life and familiar situations, without raising any concerns (Thomas et al., 2019). However, more linguistically demanding situations will likely unmask some of the language difficulties. Many individuals may go their whole lives without a diagnosis of DLD, despite the impact it has on their daily lives.

**Variability Impairment Profiles.** The presentation of associated symptoms of DLD is variable from person to person (McGregor et al., 2020). The variability may be related to the complex and overlapping nature of language. Difficulty in one language domain likely affects other language domains as well. The complex nature of language regarding the language profiles of individuals with DLD causes enduring difficulty in everyday social situations and educational performance. This variability also increases difficulty when it comes to the diagnosing DLD.

**Coexisting Disabilities Found in DLD.** Developmental language disorder frequently co-occurs with other conditions, including dyslexia, attention-deficit hyperactive disorder (ADHD), autism, or an array of emotional problems (McGregor et al., 2020). Consid-

ering many of these conditions have overlapping characteristics, issues surrounding differential diagnoses, and determining where one condition ends and the other begins are prevalent. Informal assessments provide a well-rounded view of the child's language profile and aid in the differential diagnosis process (Thomas et al., 2019). Following identification of DLD, the individual should be assessed for other problems in motor skills, attention, reading, social interaction, and behavioral areas to assure a full view of the child's needs (Bishop et al., 2016).

## **Memoir**

### **Background of Individual**

In his compelling memoir *Finding a Voice*, Damian Quinn (2020) describes his lifelong experiences with DLD. Having been diagnosed and treated early, Quinn offers a unique and well-rounded perspective on DLD and life with a disability overall.

Quinn was born in the U.K. to two loving and supportive parents, who first expressed concerns about Quinn's language abilities when he had virtually no speech at two years old. Following the judgment of his grandmother, a speech pathologist, Quinn's parents began bringing him to see a speech therapist. His resistance to treatment and continued difficulties led to a diagnosis of dysphasia, or DLD. After many early morning speech therapy sessions and a year at a school for children with complex language and communication needs, Quinn had found his voice and began speaking at the age of 9. Quinn attended many schools and endured every adversity life threw at him with schools, careers, and relationships. He was surrounded by friends and family, through love and support, accept-

ed him. Despite his diagnosis and lifelong struggles, Quinn has created a life that is undefined by his DLD.

### **Examples of Hardship**

Quinn's DLD manifested in many ways, which led to lifelong difficulties. He described difficulties learning, using, and understanding language from the time he was a child. Quinn also had co-occurring difficulties, including dyscalculia, a difficulty in performing arithmetical calculations resulting from damage to the brain, and some behavioral issues.

Formulating coherent and fluent sentences was always difficult for Quinn, which he learned to compensate by speaking slowly. This made his speech sound more hesitant, and there were times people bullied Quinn for it, calling him "slow". People would interrupt or finish his sentences, which he found immensely frustrating. He also sometimes had difficulties understanding people. In combination, this made communicating difficult and highly anxiety-inducing. As his condition was hidden, he would get anxious about speaking to new people and having them think he was a "freak". Many people in his life described him as shy and quiet in his childhood and early adulthood.

Quinn's dyscalculia made math extremely difficult, which he felt led to a long-term lack of financial independence and poor money management skills throughout his life. Quinn valued education and spent much of his life in school, but his difficulties made it very discouraging. Unfortunately, he failed many important exams and classes. One of his most shameful experiences was when he was forced to leave college. He felt that he had disappointed his parents, tutors, but worst of all, himself. Quinn regretfully discussed the



ill feelings expressed by his mother, who he believes was disappointed in him until the day she tragically passed away. Quinn believes there were educational, social, career, and financial setbacks that affected his outcomes in life. Quinn had to exert tremendous effort to succeed in school, careers, interpersonal relationships, and many things that seemed so simple for those around him.

### **Moments of Inspiration**

Despite the struggles Quinn endured due to his DLD, his memoir is not one of anguish. His story includes tales of resilience, pride, and service. Quinn credits much of his success to the adults who worked with him throughout his primary education experiences. He was inspired by their dedication to working with children like him and creating a safe learning environment.

Quinn was once described as quiet and shy but was later commended for his growth, confidence, adaptability, and outgoing nature. He was kind and funny, always looking to make others laugh. He had many friends from childhood, school, and careers. Quinn had met his wife, Libby, in university. Relationships were always difficult for him, but he found solace in Libby and described his gratitude for her patience. Quinn was very involved in campus life and was nominated as the Disabled Students Officer, where he advocated for hidden disabilities. He shared a Facebook post about the adversity he and others with DLD face in making new friends and was nominated for an award from his college's student magazine, which was reserved for exceptional articles.

Quinn was passionate about education and was committed to computer science-related fields, tak-

ing many classes and receiving certifications. Quinn detailed his experiences building a computer from scratch, learning and using code, and using various computer software programs. He developed his own website, advocating and raising awareness for DLD.

This determination carried throughout his life. Though Quinn struggled with school, he always persevered toward varied jobs that he enjoyed. He worked as a lifeguard, in first aid, in I.T., as a web developer, and as a security guard at the Olympics in 2012.

Quinn had always been a fierce advocate for DLD. After sending his article from college to Afasic, a charity Quinn's mother worked at raising awareness for DLD, he was offered the opportunity to talk to parents and professionals. In the following years, he was asked to give more talks on behalf of Afasic and was later appointed as a spokesperson. After ten years in this role, he was appointed vice president of the charity, in which he still serves today. He is extremely proud of his role in raising awareness for DLD.

### **Summary**

Through his detailed reflection on his experiences living with DLD, Damian Quinn is proof that with the appropriate support, early identification, and proper treatment, individuals with language disabilities can live successful and fulfilling lives. Despite his hardships, Quinn looks back at his life fondly and with pride. His aspiration and tenacity led him to live a life he loved. The accounts shared by friends and family of their experiences with him reinforce Quinn's kind, resilient, and hard-working nature that can be acknowledged after reading his book.

## Case Study

### Motivation for the Case Study

#### *Background*

A case study completed by Howard et al. (2012) expands the evidence base regarding the use of gestures by children with DLD to facilitate communication. The subject of the study was observed to use an idiosyncratic and novel type of gesture referred to here as a rhythmic gesture (R.G.). The authors sought to describe it and determined the extent to which the gesture facilitated or constrained communication.

#### *Role of Gesture in Language*

Gesture use has been closely linked with different aspects of speech, language, and communication. Based on previous research, the authors suggested that children with communication disorders and differences may use gestures as a facilitatory mechanism (Weismer & Hesketh, 1993). Gestures were found to facilitate communication expression, language comprehension, and learning of new words for children with and without DLD.

#### *Purpose*

A formal assessment of Lucy did not describe her use of novel rhythmic gesture and led to identifying three aims for this study: (1) to detail this novel rhythmic gesture; (2) to determine how the gesture interacts with speech rhythm, word juncture, syntax, pragmatics, and discourse; and (3) to determine the extent to which the gesture is facilitative or constraining on the participant's speech.

### Background of Lucy

The subject of this study, going by the pseudonym Lucy, is a girl aged 4 years, 10 months who had been diagnosed with DLD by a team of SLPs based on Baird's (2008) diagnostic criteria, where language difficulties are disproportionately relative to other aspects of development, most notably non-verbal ability. Lucy had no significant medical history. At the time of the study, Lucy attended a nursery school and had been receiving speech services for a year prior to target speech-sound discrimination and expressive syntax.

Lucy's standardized test scores fell below the mean for children her age in several domains of expressive, receptive, and nonverbal language. Several phonological processes uncharacteristic for her age also led to reduced intelligibility. Lucy exhibited appropriate pitch and intonation patterns of spoken English but used variable stress patterns and speech rhythms.

### Method and Results

The methodology of this qualitative analysis is exploratory, data-driven, and hypothesis-driven. Analysis of a video- and audio-recorded naturalistic interaction allowed simultaneous consideration of multiple processing levels during communication. Repetitive reanalysis of the primary data in chunks served to refine the hypothesis and pose new and relevant questions constantly. Given that each clinical question and method was formed following the results of previous questions, the methods and findings will be discussed concurrently.



### ***Identifying Lucy's Gestures and Detailed Account of Lucy's Rhythmic Gesture***

An hour-long conversation between Lucy and Sara (the first author) was video- and audio-recorded in a university television recording studio. Materials from speech and language assessments were used to facilitate a conversation to examine oral narrative skills, phonology, and syntactic structures. These conversations were elicited to observe the natural ways children integrate gestures with other components of language.

Results suggest that Lucy's use of R.G.s was closely tied to her spoken output, and the authors identified, described, and compared Lucy's gestures based on guidelines set forth by McNeill (1992). Lucy's R.G.s consisted of a series of recurrent beats. The rhythmic pattern of the tapping is similar to beat gestures (B.G.), though the R.G.s were not used for emphasis or to convey heightened emotion as a B.G. does. Lucy was observed combining gestures: R.G.s with iconic gestures (I.G.) that represents a concrete object, and deictic gestures (D.G.) that serve to identify an object. The R.G.s seemed perceptually synchronized with stressed syllables and other rhythmic properties.

### ***Lucy's Rhythmic Gesture and Speech Rhythm***

Given the initial analysis results, more specific questions regarding the nature of Lucy's R.G. use were created. The authors utilized perceptual and acoustic-phonetic analysis to determine the temporal and distributional relationships between Lucy's R.G.s and her speech rhythm, stress, and word juncture. Four specific questions were addressed:

- (1) Does perceptual and acoustic-phonetic analysis confirm initial auditory impressions

- that R.G.s are in a one-to-one relationship with spoken syllables in Lucy's utterances?
- (2) Do R.G.s only co-occur with stressed syllables?
- (3) Do R.G.s interact with the prosodic organization in any other ways in Lucy's speech?
- (4) Do R.G.s facilitate rhythmic patterns in Lucy's speech?

Two linguists phonetically transcribed the utterances containing the R.G.s and checked the transcriptions against acoustic analyses to address these questions. Frame-by-frame analysis of video footage was used. Acoustic analyses of syllable duration, pitch, and amplitude were conducted. These analyses provided objective evidence of how pitch, amplitude, and duration contributed to the perceptual impression of contrasting syllable stress patterns and rhythm.

Results indicated that the R.G.s had an inhibiting effect on Lucy's speech rhythm. The acoustic analysis confirmed that the R.G.s were used with stressed syllables, many of which would not have typically been stressed in adult speech when using this gesture. R.G.s could be completely synchronized with the utterance, begin part way through an utterance, occur slightly before the utterance, or sometimes, occur longer than the utterance. Once begun, R.G.s will never end before the final word of the utterance.

### ***Rhythmic Gesture: Facilitative or Constraining?***

The final analysis calculated Lucy's mean length of utterance (MLU) to determine if the R.G.s facilitate other aspects of language production. A systematic link between spoken language and R.G.s had been identified but not yet described, leading to two

further questions.

The first question explores the relationship of R.G.s to syntactic complexity. To do so, the authors examined Lucy's use of R.G.s and compared them to her utterance length. R.G.s appeared to have a facilitative effect on syntactic complexity, more so than any other gesture type identified. R.G.s never occurred with single-word utterances and lasted the entirety of longer utterances.

The second question looks for contextual triggers, leading to the use or avoidance of R.G.s by analyzing the different conditions that might lead to Lucy's R.G.s use. The authors found that a portion of the instances, where Lucy used the R.G.s, was in answering open-ended questions, suggesting higher cognitive load and processing demands that may trigger the use of R.G.s.

## **Conclusions**

Through several qualitative and quantitative measures, Howard et al. (2012) characterized the mechanisms behind Lucy's use of this novel gesture, referred to as a rhythmic gesture. The authors provided a detailed account of the rhythmic gesture (R.G.) to determine relationships between R.G.s and speech rhythm, word juncture, syntax, pragmatics and discourse, and assessed the extent of R.G.s as facilitative or constraining on Lucy's spoken communication.

Results found that R.G.s interact with speech rhythm, word juncture, other gesture types (I.G.s and D.G.s), syntax, pragmatics, discourse, visual processing, and general processing demands (Howard et al., 2012). This interaction supports previous research, suggesting that speech and gesture are a part of an in-

tegrated and complementary system (Goldin-Meadow, 2000). Though Howard et al. (2012) could not determine why R.G.s facilitated syntax over prosodic patterns, they speculated Lucy's use of R.G.s as an attempt to meet the language demands set forth by the researchers in their interaction. The authors believe the results of their study support the work by Perkins (1998, 2007) that suggests symptoms of communication differences may be physical manifestations of adaptation on multiple processing levels rather than a specific underlying deficit.

## **Evidence-Based Practice for SLP**

### **Overview of Treatment**

There are many treatment options available for children and adults with DLD. In any case, treatment should be targeted and specific to the individual's needs and should address the impact specific difficulties have on academic, professional, and interpersonal outcomes (Rinaldi et al., 2021). This is especially relevant for those with enduring and pervasive language difficulties. Treatments may be direct or indirect and target any combination of vocabulary, grammar, or general language-related skills. A common theme extracted from the upcoming research is the lack of evidence-based research in these different treatments.

Given the pervasive nature of language difficulties in those with DLD, research indicates that treatment should utilize multiple intervention modalities. Parents and caregivers, such as teachers and other school staff, should collectively agree upon personalized treatment goals that functionally address the child's communication needs. It is crucial that treatment targets functional goals to maximize growth in

specific language competencies and interaction success (Roddam & Skeat, 2020). Intervention continues to be important from early childhood into adolescence (Rinaldi et al., 2021).

Regardless of the service delivery model, continued monitoring by the SLP is a critical component of every treatment for individuals with DLD. This assures that the treatment is effective and allows the SLP to adjust goals as needed (Roddam & Skeat, 2020). Ongoing monitoring is vital at transitional points, such as switches in educational settings (Roddam & Skeat, 2020). This follows through to later in life, as individuals may need to reconsider their compensatory strategies to ensure maximum quality of life.

### **Direct Versus Indirect Therapy Techniques**

The SLP's role in the treatment of DLD includes direct and indirect intervention approaches (Roddam & Skeat, 2020). Direct intervention approaches utilize one-on-one or group delivered therapy with an SLP as the interventionist. The SLP establishes indirect intervention approaches in agreement with the child, their family, and teachers/school staff, and these interventions are provided by someone other than the SLP. Treatment may be provided by a parent or through class instruction. For children with pervasive language difficulties, individualized treatment may be required as well as collaboration with the child's school staff and family (Roddam & Skeat, 2020).

#### ***Direct Therapy***

Direct therapy is when services are delivered directly by the SLP. Services may be provided during a one-on-one intervention or in a small group, where the

children may help each other interact and learn from one another. Direct therapy will directly target specific language domains and skills, where the child is struggling.

A literature review by Rinaldi et al. (2021), determining the efficacy of several treatments for DLD, highlighted the need for early identification and treatment of language difficulties based on their potential impacts on school success. The authors found that interventions targeting a combination of phonological skills, morphosyntactic skills, and semantic skills are essential in the treatment of DLD.

**Phonological Intervention.** Phonological skills are related to speech sound production and the meanings behind their patterns. The research base for such interventions in children with DLD was scarce. However, a group study and case study by Best et al. (2020) examined the effects of targeting phonological attributes on targeted words to improve word-finding in children with DLD-related semantic or phonological difficulties. Word webs and phonological cues were used to break down the word. Children with nonword repetition and other phonological processing-specific difficulties, but relative semantic strengths, benefited most from the phonological intervention. Results indicate that phonological treatment is not as effective as a semantic-based word finding intervention in treating children with semantic-based difficulties.

Children with deficits in speech comprehension and working memory capacity related to phonological processing may also benefit from auditory stimulation training with music (ASTM) (Roden et al., 2019). The authors measured working memory, phoneme discrimination, and speech perception skills before and fol-

lowing treatment; improvements were identified across all measures for the treatment group. Children showed significant gains following treatment on number sequence repetition, nonword recall, and recall sentences tasks, suggesting an increase in phonological working memory capacity. This article suggests that incorporating ASTM in the treatment of children with DLD can improve receptive working memory capacities, phoneme discrimination, and speech processing.

**Semantic Intervention.** Interventions targeting semantics or related vocabulary skills focus on difficulties related to word meaning, word-finding, and general vocabulary comprehension and expression. The group study and case study by Best et al. (2020) cited in the phonological interventions section provided a comparison group, where semantic attributes of target words were utilized to target word-finding difficulties. Children with more prevalent semantic difficulties benefited far more from this semantic intervention over the phonological treatment. Direct vocabulary interventions can effectively treat older children with DLD and improve vocabulary learning (Wright et al., 2017).

**Morphosyntactic Intervention.** Morphosyntactic interventions target grammatical skills, a common deficit area for many children with DLD (Hesketh & Conti-Ramsden, 2013). Research suggests that implicit interventions, which affectively teach new grammatical forms and also teach, maintain, and generalize new grammatical structures in children with DLD, are more effective than implicit intervention alone (Finestack, 2018). Recasting, focused stimulation, modeling, and elicited production when used to teach grammatical structures are beneficial techniques

used in intervention that have been shown to improve the length of utterances and grammatical complexity (Bruinsma et al., 2020). Though the benefits of recast have been described in different studies (Bruinsma et al., 2020; Eidsvåg et al., 2019), the use of hierarchical cueing for inaccurate grammatical productions seemed more efficient at improving oral grammatical skills (Owen Van Horne, 2020). This is a growing area of research, but there remains no set guidelines on which interventions are more appropriate for each child (Rinaldi et al., 2020).

### ***Indirect Therapy***

Contrastively to the provision of direct therapy, indirect methods use family or other professionals to deliver intervention. Collaboration is an essential component of treating any child with language difficulties, especially in indirect therapy. Interventionists may include parents, teachers, or other school staff. Research shows intervention provided by other professionals is not as effective without ongoing support from the SLP (McCartney et al., 2010). As mentioned earlier, indirect treatment requires continued involvement with the SLP related to training, knowledge, and maintenance of evidence-based practice (Ebbels et al., 2017).

SLPs can support integrating the provision of strategies by teachers and other educational professionals into the classroom. Roddam and Skeat (2020) suggest that the purpose of such strategies is to implement communication techniques and to create a communication-friendly classroom to maximize language learning and use. Improving the communication environment is beneficial for children with and without language difficulties. Myers and Ankrum (2018) reported on two

case studies of kindergarten children with DLD to suggest that rich, explicit vocabulary instruction, embedded in an interactive read-aloud activity, can improve vocabulary learning for children with DLD as well as with their peers. However, maintenance of skills was not reported. For older children, 11-14 years old, a phonological-semantic science vocabulary intervention delivered by secondary school teachers reported increased word knowledge higher than is usually seen with standard teaching measures (Lowe et al., 2019). This emphasizes the potential of joint phonological-semantic-based intervention.

Parents can also help stimulate language growth in their children with DLD. Parents play an essential role in the treatment and management of their child's language. Roddam's and Skeat's (2020) review suggests that including parents in their child's therapy can help broaden their understanding of the child's language at present and is viable for young and older children with DLD. Generalization of skills is an essential aspect of speech therapy, and including the parents can positively impact the carryover of skills outside of the therapy room or classroom.

### **Conclusions**

Developmental Language Disorder (DLD) is a lifelong language condition that affects language learning, use, and comprehension. Individuals with a diagnosis of DLD will have widespread difficulties with language skills related to semantics, syntax, morphology, phonology, and discourse as well as a higher likelihood of social-emotional related difficulties (Rinaldi et al., 2021). DLD is diagnosed through an array of formal and informal diagnostic tests, administered

by SLPs, that provide a profile of strengths and weaknesses useful in intervention planning.

DLD is under-researched, and awareness by the general public lacks due to many reasons indicated by the literature reviewed. DLD has been called many different names in the research. DLD is considered an invisible disability, as there are not any physical manifestations of the condition. The language difficulties are diffuse, causing a great deal of variability in language profiles, as seen by the case study of Lucy. (Howard et al., 2012) and the memoir by Damian Quinn (2020). DLD also can co-occur with other disabilities or mimic other conditions. Raising awareness and increasing research are a necessity in this field.

There are direct and indirect methods of treating children's specific language and overall communication difficulties. Skills related to syntax, semantics, morphology, and phonology may be delivered by a SLP, educational professionals, or parents. Given the wide variety seen in individuals with DLD, there are no strict treatment guidelines set forth by the research.

A common theme seen in the research is the need for more evidence-based research on the diagnosis, prediction, and treatment of DLD. Raising awareness for DLD is another critical step to better define the condition and formulate treatment guidelines. There are serious consequences children may eventually face if not given the support necessary to communicate more effectively and offset the associated language difficulties. However, if provided early treatment and appropriate support, people with DLD can go on to live accomplished and happy lives.



## References

- Archibald, L. MD., Joanisse, M., & Edmunds, A. (2009). Specific language or working memory impairments: A small scale observational study. *Child Language Teaching and Therapy*, 27(3), 294-312.
- Baird, G. (2008). Assessment and investigation of children with developmental language disorder. In C. F. Norbury, J. B. Tomblin, & D. V. M. Bishop (Eds.), *Understanding developmental language disorders: From theory to practice* (pp. 1–22). Psychology Press.
- Best, W., Hughes, L., Masterson, J., Thomas, M. S. C., Howard, D., Kapikian, A., & Shobbrook, K. (2021). Understanding differing outcomes from semantic and phonological interventions with children with word-finding difficulties: A group and case series study. *Cortex*, 134, 145–161. <https://doi.org/10.1016/j.cortex.2020.09.030>
- Bishop, D. V. M. (2010). Which neurodevelopmental disorders get researched and why? *PLOS ONE*, 5(11), e15112.
- Bishop, D. V. M., & McDonald, D. (2009). Identifying language impairment in children: Combining language test scores with parental report. *International Journal of Language & Communication Disorders*, 44, 600–615.
- Bishop, D. V. M., Snowling M. J., Thompson, P. A., Greenhalgh, T., & CATALISE consortium (2016). CATALISE: A multinational and multidisciplinary Delphi consensus study. Identifying language impairments in children. *PLoS ONE* 11(7): e0158753. doi:10.1371/journal.pone.0158753
- Bishop, D. V. M., Snowling, M. J., Thompson, P. A., Greenhalgh, T., & CATALISE-2 Consortium. (2017). Phase 2 of CATALISE: A multinational and multidisciplinary Delphi consensus study of problems with language development: Terminology. *The Journal of Child Psychology and Psychiatry*, 58(10), 1068–1080.
- Bruinsma, G., Wijnen, F., & Gerrits, E. (2020). Focused stimulation intervention in 4- and 5-year-old children with developmental language disorder: Exploring implementation in clinical practice. *Language, Speech, and Hearing Services in Schools*, 51(2), 247–269. [https://doi.org/10.1044/2020\\_lshss-19-00069](https://doi.org/10.1044/2020_lshss-19-00069)
- Camilleri, B., & Law, J. (2013). Dynamic assessment of word learning skills of pre-school children with primary language impairment. *International Journal of Speech-Language Pathology*, 16(5), 507–516. <https://doi.org/10.3109/17549507.2013.847497>
- Christensen, D., Taylor, C. L., & Zubrick, S. R. (2017). Patterns of multiple risk exposures for low receptive vocabulary growth, 4-8 years, in the longitudinal study of Australian children. *PLOS ONE*, 12(1). <https://doi.org/10.1371/journal.pone.0168804>
- Conti-Ramsden, G. (2003). Processing and linguistic markers in young children with specific language impairment (SLI). *Journal of Speech, Language, and Hearing Research*, 46(5), 1029–1037. [https://doi.org/10.1044/1092-4388\(2003\)082](https://doi.org/10.1044/1092-4388(2003)082)
- Conti-Ramsden, & Botting, N. (2008, May). Emotional health of adolescents with and without a history of specific language impairment (SLI). *Journal of Child Psychology and Psychiatry*, 49(5), 516-525. doi: 10.1111/j.1469-7610.2007.01858.x
- Conti-Ramsden, G., Botting, N., & Faragher, B.



- (2001). Psycholinguistic markers for specific language impairment (SLI). *Journal of Child Psychology and Psychiatry*, 42(6), 741–748. <https://doi.org/10.1111/1469-7610.00770>
- Conti-Ramsden, G., & Durkin, K. (2012). Postschool educational and employment experiences of young people with specific language impairment. *Language, Speech, and Hearing Services in Schools*, 43(4), 507–520. [https://doi.org/10.1044/0161-1461\(2012/11-0067\)](https://doi.org/10.1044/0161-1461(2012/11-0067))
- Conti-Ramsden, G., Durkin, K., & Walker, A. J. (2011). The messages they send: E-mail use by adolescents with and without a history of specific language impairment (SLI). *International Journal of Language & Communication Disorders*, 47(2), 217–228. <https://doi.org/10.1111/j.1460-6984.2011.00096.x>
- Dollaghan, C. (2013). Late talker as a clinical category. In L. A. Rescorla and P. S. Dale (Eds.), *Late talkers: Language development, intervention, and outcomes* (pp. 91-112). Brookes.
- Ebbels, S. H., Wright, L., Brockbank, S., Godfrey, C., Harris, C., Leniston, H., Neary, K., Nicoll, H., Nicoll, L., Scott, J., & Marić, N. (2016). Effectiveness of 1:1 speech and language therapy for older children with (developmental) language disorders. *International Journal of Language & Communication Disorders*, 52(4), 528–539. <https://doi.org/10.1111/1460-6984.12297>
- Eidvag, S. S., Plante, E., Oglivie, T., Privette, C., & Mailand, M.-L. (2019). Individual versus small group treatment of morphological errors for children with developmental language disorder. *Speech and Hearing Services in Schools*, 50, 237-252. [https://doi.org/10.1044/2018\\_LSHSS-18-0033](https://doi.org/10.1044/2018_LSHSS-18-0033)
- Finestack, L. H. (2018). Evaluation of an explicit intervention to teach novel grammatical forms to children with developmental language disorder. *Journal of Speech, Language, and Hearing Research*, 61(8), 2062–2075. [https://doi.org/10.1044/2018\\_jslhr-1-17-0339](https://doi.org/10.1044/2018_jslhr-1-17-0339)
- Hendricks, A. E., Adlof, S. M., Alonzo, C. N., Fox, A. B., & Hogan, T. P. (2019). Identifying children at risk for developmental language disorder using ab, whole-classroom screen. *Journal of Speech, Language, and Hearing Research*, 62(4), 896–908. [https://doi.org/10.1044/2018\\_jslhr-1-18-0093](https://doi.org/10.1044/2018_jslhr-1-18-0093)
- Hesketh, A., & Conti-Ramsden, G. (2013). Memory and language in middle childhood in individuals with a history of specific language impairment. *PLoS ONE*, 8(2). <https://doi.org/10.1371/journal.pone.0056314>
- Howard, S. J., Perkins, M. R., & Sowden, H. (2012). Idiosyncratic gesture use in atypical language development, and its interaction with speech rhythm, word juncture, syntax, pragmatics and discourse: A case study. *Clinical Linguistics & Phonetics*, 26(10), 882–907. <https://doi.org/10.3109/02699206.2012.714048>
- Leonard, L. B. (2013). Specific language impairment across languages. *Child Development Perspectives*, 8(1), 1–5. <https://doi.org/10.1111/cdep.12053>
- Lowe, H., Henry, L., & Joffe, V. L. (2019). The effectiveness of classroom VOCABULARY intervention for adolescents with language disorder. *Journal of Speech, Language, and Hearing Research*, 62(8), 2829–2846. [https://doi.org/10.1044/2019\\_jslhr-1-18-0337](https://doi.org/10.1044/2019_jslhr-1-18-0337)
- McCartney, E., Boyle, J., Ellis, S., Bannatyne, S., & Turn-

- bull, M. (2010). Indirect language therapy for children with persistent language impairment in mainstream primary schools: Outcomes from a cohort intervention. *International Journal of Language & Communication Disorders*, 100824014249025. <https://doi.org/10.3109/13682820903560302>
- McGregor, K. K., Goffman, L., Van Horne, A. O., Hoggan, T. P., & Finestack, L. H. (2020). Developmental language disorder: Applications for advocacy, research, and clinical service. *Perspectives of the ASHA Special Interest Groups*, 5(1), 38–46. [https://doi.org/10.1044/2019\\_persp-19-00083](https://doi.org/10.1044/2019_persp-19-00083)
- McGregor, K. K., Gordon, K., Eden, N., Arbisi-Kelm, T., & Oleson, J. (2017). Encoding deficits impede word learning and memory in adults with developmental language disorders. *Journal of Speech, Language, and Hearing Research*, 60(10), 2891–2905. [https://doi.org/10.1044/2017\\_jslhr-l-17-0031](https://doi.org/10.1044/2017_jslhr-l-17-0031)
- McNeill, D. (1992). *Hand and mind: What gesture reveals about thought*. University of Chicago Press.
- Myers, J. M., & Ankrum, J. W. (2018). Explicit vocabulary instruction in kindergarten: Case studies of students with and without language disorders. *Early Childhood Education Journal*, 46(6), 683–691. <https://doi.org/10.1007/s10643-018-0896-8>
- Norbury, C. F., Nash, M., Baird, G., & Bishop, D. V. (2004). Using a parental checklist to identify diagnostic groups in children with communication impairment: A validation of the children's communication checklist—2. *International Journal of Language & Communication Disorders*, 39(3), 345–364. <https://doi.org/10.1080/13682820410001654883>
- Owen Van Horne, A. J. (2020). Forum on MORPHOSYNTAX assessment and intervention for children. *Language, Speech, and Hearing Services in Schools*, 51(2), 179–183. [https://doi.org/10.1044/2020\\_lshss-20-00018](https://doi.org/10.1044/2020_lshss-20-00018)
- Perkins, M. R. (1998). Is pragmatics epiphenomenal? Evidence from communication disorders. *Journal of Pragmatics*, 29, 291–311.
- Perkins, M. R. (2007). *Pragmatic impairment*. Cambridge University Press.
- Poll, G. H., Betz, S. K., & Miller, C. A. (2010). Identification of clinical markers of specific language impairment in adults. *Journal of Speech, Language, and Hearing Research*, 53(2), 414–429. [https://doi.org/10.1044/1092-4388\(2009/08-0016\)](https://doi.org/10.1044/1092-4388(2009/08-0016))
- Quinn, D. (2020). *Finding a voice*. Grosvenor House Publishing.
- Richterová, E., & Málková, G. S. (2017). Specific language impairment in the long-term perspective – The importance of assessment procedures, reading skills, and communicative competence. *Health Psychology Report*, 4, 273–284. <https://doi.org/10.5114/hpr.2017.69660>
- Rinaldi, S., Caselli, M. C., Cofelice, V., D'Amico, S., De Cagno, A. G., Della Corte, G., Di Martino, M. V., Di Costanzo, B., Levorato, M. C., Penge, R., Rossetto, T., Sansavini, A., Vecchi, S., & Zoccolotti, P. (2021). Efficacy of the treatment of developmental language disorder: A systematic review. *Brain Sciences*, 11(3), 407. <https://doi.org/10.3390/brainsci11030407>
- Roddam, H., & Skeat, J. (2020). Best practice in working with children who have developmental language disorder: A focused review of the current research evidence base (article in English).

- Listy Klinické Logopedie*, 4(1), 72–78. <https://doi.org/10.36833/lkl.2020.014>
- Roden, I., Früchtenicht, K., Kreutz, G., Linderkamp, F., & Grube, D. (2019). Auditory stimulation training with technically manipulated musical material in preschool children with specific language impairments: An explorative study. *Frontiers in Psychology*, 10. <https://doi.org/10.3389/fpsyg.2019.02026>
- Rudolph, J. M. (2017). Case history risk factors for specific language impairment: A systematic review and meta-analysis. *American Journal of Speech-Language Pathology*, 26(3), 991–1010. [https://doi.org/10.1044/2016\\_ajslp-15-0181](https://doi.org/10.1044/2016_ajslp-15-0181)
- Rudolph, J. M., & Leonard, L. B. (2016). Early language milestones and specific language impairment. *Journal of Early Intervention*, 38(1), 41–58. <https://doi.org/10.1177/1053815116633861>
- Thomas, S., Schulz, J., & Ryder, N. (2019). Assessment and diagnosis of developmental language disorder: The experiences of speech and language therapists. *Autism & Developmental Language Impairments*, 4, 239694151984281. <https://doi.org/10.1177/2396941519842812>
- Tomblin, J. B., Records, N. L., & Zhang, X. (1996). A system for the diagnosis of specific language impairment in kindergarten children. *Journal of Speech, Language, and Hearing Research*, 39(6), 1284–1294. <https://doi.org/10.1044/jshr.3906.1284>
- U.S. Department of Health and Human Services. (2019, July). *Specific language impairment*. National Institute of Deafness and Other Communication Disorders. <https://www.nidcd.nih.gov/health/specific-language-impairment>.
- Weismer, S. E., Tomblin, J. B., Zhang, X., Buckwalter, P., Chynoweth, J. G., & Jones, M. (2000). Nonword repetition performance in school-age children with and without language impairment. *Journal of Speech, Language, and Hearing Research*, 43(4), 865–878. <https://doi.org/10.1044/jslhr.4304.865>
- Whitehouse, A. J., Line, E. A., Watt, H. J., & Bishop, D. V. (2009). Qualitative aspects of developmental language impairment relate to language and literacy outcome in adulthood. *International Journal of Language & Communication Disorders*, 44(4), 489–510. <https://doi.org/10.1080/13682820802708080>
- Wright, L., Pring, T., & Ebbels, S. (2017). Effectiveness of vocabulary intervention for older children with (developmental) language disorders. *International Journal of Language & Communication Disorders*, 53(3), 480–494. <https://doi.org/10.1111/1460-6984.12361>

### About the Author

**Laura Gaudette** is a double-bear, pursuing her Master of Science in Speech Language Pathology. Her research was completed in fall 2021 under the mentorship of Dr. Margaret Kjelgaard as part of her capstone experience. Altruist family values have heavily influenced Laura’s career path, and she spent the past six years falling in love with speech pathology. Laura is inspired by the opportunities to address health, education, and other disparities that disproportionately affect people with communication/swallowing differences and disorders. Communication is a basic human right, and Laura looks forward to a career of learning and advocating to uphold that message, following graduation in May 2022.