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The Use of Descriptive Modifiers in the Narratives of Children with Developmental Language Disorder

by
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To the Graduate Faculty:

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“It only seems impossible until it is done.”

-Nelson Mandela

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The Use of Descriptive Modifiers in the Narratives of Children with
Developmental Language Disorder
Thesis Abstract – Idaho State University (2019)

This study examined the use of modifiers by school-age children. The participants were twenty-eight children between the ages of 6 and 8 years old. One group included fourteen children with typically developing language, and the second group of fourteen children met criteria for Developmental Language Disorder. The participants were age-matched within +/- 6 months for comparison. Each participant created three narratives elicited from the Test of Narrative Language, 3rd edition. The narratives were transcribed and coded for three elements of modification: adjectives, adverbs, and prepositional phrases. Each modifier category was calculated as a proportion of the child's total words in the sample. A repeated measures ANOVA revealed no main effect for group. No statistically significant difference in the proportion of modifiers was found between the two groups. There was, however, a difference in the three categories, with prepositional phrases used most frequently.

Key Words: developmental language disorder, modification, modifiers, language sample analysis, school-age children, language assessment, narrative

Introduction

In order to facilitate language learning in children with developmental language disorder (DLD), one must first understand the unique profile of strengths and deficits present in the learner. Although children with developmental language disorder comprise a heterogeneous group, and each child may display a slightly different profile of strengths and deficits, there are commonalities among them. Difficulty in word learning (Rice, Buhr, & Nemeth, 1990; Oetting, Rice, & Swank, 1995; Windfuhr, Faragher, & Conti-Ramsden, 2002; McGregor, Oleson, Bahnsen, & Duff, 2013), morphology (Bedore & Leonard, 1998; Leonard et al., 2007; Moyle, Karasinski, Weismer, & Gorman, 2011; Mabel L Rice & Oetting, 1993), and syntax (Eisenberg & Guo, 2013; Leonard et al., 2003) are particular deficits noted in children with DLD. Differences in the quality of oral narratives produced by children with DLD have been observed, as well. Their narratives tend to be shorter, less grammatically correct, and less complex than their typically developing peers (Colozzo, Gillam, Wood, Schnell, & Johnston, 2011; Kaderavek & Sulzby, 2000; Pearce, James, & McCormack, 2010; Ukrainetz & Gillam, 2009).

In contrast to what is known in the areas of word-learning, morphology, and syntax, few studies have examined the use of modifiers by children with DLD as compared to their typical peers. Modification includes using adjectives, adverbs, and prepositional phrases that add information about nouns or verbs. Unlike many other language components, the use of these elements by children with DLD has received limited attention. They have been examined as part of elaborated noun and verb phrases (Greenhalgh, & Strong; 2001), as indicators of noun and verb phrase complexity (Newman, & McGregor; 2006), and as elements that add to the quality of a narrative (Ukrainetz, & Gillam; 2009). Overall, there is limited empirical evidence on differences in modifier use by children with DLD and their typical peers. The use of adjectives, adverbs, and prepositional phrases are an important skill in the development of literate language.

They add specificity and a richness of description that the reader or listener often correlates with a higher quality of narrative (Newman, & McGregor; 2006). Greater understanding of the differences in the abilities of children with DLD to learn and use these elements will lead to more focused therapy treatments and more effective intervention. The current paper seeks to examine elements of modification, specifically, in the context of oral narratives of school age children.

Background

Language impairments in children can often be attributed to other, concomitant disorders. Children with Down Syndrome, for example, may experience difficulty in language learning as a result of their primary diagnosis. For some children, language impairment is the primary diagnosis, and is not explained by the presence of another disorder or disability. This type of language impairment is given the term Developmental language disorder (DLD). DLD is defined as, “significant limitations in language ability that cannot be attributed to problems of hearing, neurological status, nonverbal intelligence, or other known factors” (Leonard, 2014, p 34). Components of a diagnosis of DLD include standardized test scores suggesting language impairment on a diagnostically accurate test, a nonverbal IQ of at least 85, passing a hearing screening with no recent history of otitis media with effusion, no oral structural anomalies, and no symptoms of impairment in social interaction (Leonard, 2014).

Prevalence and Prognosis

It is estimated that DLD affects 7.4% of children (Tomblin, 1997). Of 7,000 kindergarten children assessed, DLD occurred at a rate of 8% in boys and 6% in girls. The prevalence of DLD was 7.4% overall. This stands as the current primary reference for prevalence of DLD in children. Many children for whom a language impairment is a primary diagnosis will continue to

have significant difficulties with language throughout their lives. During school-age years, children with DLD struggle with the development of literate language skills. Their oral narratives are shorter, less complex, and contain more grammatical errors than their typical peers (Colozzo et al., 2011; Eisenberg et al., 2008; Greenhalgh & Strong, 2001; Koutsoftas & Gray, 2012; Ukrainetz & Gillam, 2009). In later school age children, language difficulties also tend to be more pronounced in written language. Scott and Windsor (2000) compared the skills of school age children with and without language learning difficulties in the context of oral and written samples. The written samples were significantly more difficult for the children with DLD.

The effects of language learning difficulties do not just impact an individual academically. In adolescence, children with DLD also exhibit effects in other areas of their lives. They have been noted to have lower levels of emotional health than their typically developing peers (Conti-Ramsden & Botting, 2008), be less independent (Conti-Ramsden & Durkin, 2008), and have difficulty understanding specific terminology like those relating to driving (Pandolfe, Wittke, & Spaulding, 2016). In later years, adults with a history of developmental language disorder tend to have poorer economic situations (Conti-Ramsden & Durkin, 2012).

Developmental language disorder is a complex and multi-faceted disorder with implications across an individual's life. These deficits typically first manifest in during toddlerhood or preschool and continue throughout school-age and beyond. During the preschool and school years, children with DLD demonstrate deficits across several domains of language.

Morphology and syntax

Difficulties with verb morphology in children with DLD have been well documented (e.g., Conti-Ramsden & Jones, 1997; Leonard et al., 2007; Marchman, Wulfeck, & Ellis Weismer, 1999; Rice & Oetting, 1993). Children with DLD are slower to acquire inflectional

morphology overall, but have particular difficulty with tense morphology. Abilities related to tense morphology is perhaps most thoroughly studied in preschool children with DLD. This includes use of morphemes that mark tense and agreement, such as third person singular *-s*, past tense *-ed*, and forms of *be* and *do*. The errors related to these types of inflectional morphemes are of note because they are often not substitutions or overgeneralizations but omissions. In preschool, omission of these morphemes is considered to be a hallmark of children with DLD (Rice & Wexler, 1996; Bedore & Leonard, 1998). In obligatory contexts where they do produce these morphemes, they are generally produced correctly (Marchman, Wulfeck, & Weismer, 1999; Loeb & Leonard, 1991; Oetting & Horohov, 1997; Ullman & Gopnik, 1999; van der Lely & Ullman, 2001). A longitudinal study demonstrated that the deficits in production of *be* and *do* forms (auxiliary and/or copula) typically persist into adolescence and adulthood (Rice, Hoffman, & Wexler, 2009).

In addition to deficits in verb morphology, difficulty with subject case pronouns is another characteristic of DLD. Loeb and Leonard (1991) compared subject case marking and the use of verb morphology in children with DLD and younger, typically developing, MLU-matched children. They found that the children with DLD performed significantly below the MLU-matched children in both subject case marking and verb morphology. Because these types of errors tend to be common in children with DLD, measures of the error frequency can be included in a measure of overall grammaticality.

Errors in verb morphology alone are not enough to differentiate those with DLD from their peers during the preschool years (Moyle et al., 2011). Children with DLD also demonstrate deficits in overall syntactic development. Eisenberg and Gou (2013) examined the diagnostic accuracy of three different measures of grammaticality in assessing the narratives of preschool

children. One measure, percentage sentence point, excluded utterances that did not contain a subject and/or main verb. The second looked only at verb tense errors, while the third measure, percentage of grammatical utterances, was a more comprehensive measure of grammaticality. Percentage of grammatical utterances included various syntactic errors such as fragments, argument structure errors, pronominal form errors, tense marker errors, grammatical morpheme errors, and other errors. They found that, although all three measures were sensitive in identifying children with language impairment, percentage of grammatical utterances had a higher specificity in differentiating the children with DLD from their typical peers (Eisenberg & Guo, 2013). A later study by the pair confirmed that percentage grammatical utterances had acceptable to good diagnostic accuracy for older children (3-8 years) as well (Eisenberg & Guo, 2016).

Older children with DLD continue to lag behind their typical peers in development of syntactic skills. Rice, Hoffman, and Wexler (2009) used a metalinguistic grammaticality judgement task to measure the ability of children with DLD as they aged. The judgement tasks included copula/auxiliary BE and auxiliary DO, assessed with yes/no and wh- questions of grammatical correctness. The children with DLD performed more poorly than their age-matched peers, and also more poorly than the younger, language-matched group, at each assessment. Many studies have shown that children with DLD lag behind their peers in developing the use of complex syntax (Balthazar & Scott, 2018; Colozzo et al., 2011; Fey, Catts, Proctor-Williams, & Tomblin, 2004; Greenhalgh & Strong, 2001; Koutsoftas & Gray, 2012). This includes the use of various clause types such as adverbial, relative, propositional, coordinate and infinitive clauses (Marinellie, 2004).

During young school age, the deficits in the area of syntax can be seen in the quality of oral narratives. The narratives of children with DLD contain more errors in syntax than their typically developing peers (Newman & McGregor, 2006). They are also less syntactically complex (Greenhalgh & Strong, 2001; Koutsoftas & Gray, 2012; Newman & McGregor, 2006). In adolescence, syntactic deficits are prominent in both narrative and expository writing tasks (Nippold, Mansfield, Billow, & Tomblin, 2008).

Semantic and lexical development

Children with DLD produce their first words later than their typically developing peers. In a retrospective study, first words for typical children occurred around 11 months. For children later diagnosed with DLD, first words did not occur until around 23 months (Trauner, Wulfeck, Tallal, & Hesselink, 2000). It has long been known that the lexicon of children with language impairment develops more slowly (Nice, 1925; Bender, 1940; Werner, 1945; Morley, Court, Miller and Garside, 1955). More recent research confirms that this is true for children with DLD (Hick, Joseph, Conti-Ramsden, Serratrice, & Faragher, 2002; Kan & Windsor, 2010; McGregor et al., 2013; Sheng & McGregor, 2010). This can be the first sign of the presence of DLD in a child.

Word learning difficulties are reflected in their fast-mapping skills. Fast-mapping is the ability to demonstrate knowledge of a word, in comprehension and/or production, given only a few exposures. Children with DLD perform more poorly than their peers on fast-mapping tasks overall (Jackson, Leita, & Claessen, 2016; Alt & Plante, 2006; Oetting, Rice, & Swank, 1995). A study by Dollaghan (1987) looked at the fast mapping abilities of a group of children with DLD with deficits in their expressive grammar. These children performed similarly to typical

age-matched peers fast mapping a nonsense word to a specific referent. However, when asked to produce the new word (i.e., “What is this called?”), they performed below their peers.

Nouns and verbs. In a study by Eyer et al. (2002), children aged 3 to 5 were presented with different classes of novel words, some nouns and some verbs. Children with DLD and the younger, language-matched children needed multiple morphosyntactic cues to deduce when the novel word represented an object. They were unable to use a single morphosyntactic cue (“I like *the* koob.” vs. “I like *to* koob.”) to determine word type, and all three groups of children were unable to use the cues to bootstrap verbs. The children with DLD needed more than one syntactic cue to determine that a word was a noun, but all the children had difficulty using cues to determine that a word was a verb. This difficulty with verbs was more pronounced in children with DLD.

Several studies have found that children with DLD show a more pronounced difficulty in learning verbs than their peers (Oetting, Rice, & Swank, 1995; Sheng & McGregor, 2010). Windfuhr, Faragher, and Conti-Ramsden (2002) assessed the ability of 4 and 5-year-olds to learn novel words. 14 children with DLD and 14 children with typical language development participated in the study. The authors investigated the critical mass theory of word learning. In this theory, children with DLD require more examples of a word in order to learn it, and more examples within a category in order to form a category in their lexicon. The authors speculate that the reason for the need for more exemplars is deficits in processing abilities, specifically short-term phonological memory (Gathercole, & Baddeley, 1990), or more general processing limitations (Leonard, 1998). The children with DLD demonstrated greater ability in learning nouns than verbs. They learned fewer verbs and at a slower rate than the typical group. The

children with DLD required about twice as many exemplars in order to learn a verb (Windfuhr, Faragher, & Conti-Ramsden, 2002).

This greater ease in learning nouns over verbs is reflected in the content of their lexicon. Children show greater ability to name nouns than verbs. Sheng and McGregor (2010) used a picture naming task to study naming abilities in 42 children aged 5 to 7. All children showed greater proficiency in naming nouns. They answered more quickly and accurately. The children with DLD, however, exhibited a more pronounced difficulty naming verbs. While their skills were below the typical, age-matched group's, their abilities were similar to the language-matched group, so the researchers concluded that the noun-verb gap was commensurate with their overall lower language abilities. However, a meta-analysis of word learning studies by Kan and Winsor (2010) concluded that, across multiple studies, children with DLD show more pronounced difficulty in learning verbs than their age-matched peers and their language-matched peers, as well.

Children with DLD also appear to demonstrate greater proficiency with detecting errors that relate to nouns over verbs. Pawlowska, Robinson, and Seddoh (2014) assessed five-year-olds in the detection of errors (anomalies) embedded in stories. Both children with DLD and their typically developing peers were more proficient at identifying lexical anomalies with nouns (i.e., *I see the **pickles** in the nest* when the picture shows eggs in the nest) over verbs (i.e., *She is **peeling** the apples* when the picture shows a girl picking apples). However, the group with language impairment had even greater difficulty with verbs than their peers. Both groups were also better at detecting these lexical anomalies than morphological ones (i.e., *She **are** going to the store*), and performed better at the sentence level than story level. This study further demonstrates the noun-verb gap, this time in error detection, and also reinforces the theory that

the children with DLD exhibit deficits in processing ability. Verb tense may play a role in the extra processing demands, as well. Children with DLD show difficulty with morphology relating to tense and, in terms of processing ability, this may account for the greater ease with nouns. The authors suggested that the processing demands are lower at the sentence level. The child can hold the preceding word(s) in working memory long enough to notice the word in error. The processing demands are greater at the longer story level, hence the greater difficulty in detecting anomalies.

Modifier use. Studies evaluating how children learn nouns and verbs are much more frequent than studies that evaluate modifiers such as adjectives, adverbs and prepositional phrases. The available research indicates that learning of adjectives is similar to that of nouns. Many nouns are more imageable than verbs. This may make them easier to conceptualize and store in memory. For this reason, adjectives, words that describe, may be easier to learn as well. Kan and Windsor (2010) conducted a meta-analysis of the available research regarding word learning in children. They examined 28 studies, the vast majority of which exclusively examined noun and verb learning, and concluded that nouns are learned more easily than verbs for all children, with children with DLD demonstrating a more pronounced difficulty in verb-learning. Only 3 of the 28 studies in the meta-analysis included information about modifiers. Rice, Buhr, and Nemeth (1990) studied word learning in 5-year-olds. The abilities of a group with DLD were compared to an age-matched group and a language-matched group. Four types of words were presented (nouns, verbs, adjectives and affective state-adjectives like *irate* and *melancholy*) in the context of a narrative. The DLD group performed more poorly than both other groups in fast-mapping of each of the four word types. Overall, the three groups had greater success fast-mapping nouns and adjectives than verbs and affective states. Rice and colleagues (1990)

examined several theories regarding the differences in fast-mapping abilities. Attention deficits, processes related to existing lexical knowledge, limited grammatical development, and the contrast model were all examined. The authors concluded that they were all unsubstantiated or refuted as explanations by their results. It is possible that the nouns and adjectives were easier to learn because they are more concrete and imageable than the verbs and affective states.

A similar study by Rice, Buhr, and Oetting (1992) examined word learning, including modifiers, with a change in presentation. Three groups of 20 five-year-old children, one group with DLD, one age-matched group, and one language-matched group, were presented with novel words in two different contexts. The first context presented the words with normal prosody, and the second inserted a pause before the sentence-final novel word. They hypothesized that fast-mapping difficulties, such as those seen in the study by Rice, Buhr, and Nemeth (1990), could be attributed to an inability to parse out the target word. The authors tested whether a pause would increase emphasis on the word to be learned and increase the ability to fast-map. However, no effect was found when the pause was included. The noun-verb gap was seen in this study as well, but all children were able to learn the attribute words at a level equal to the nouns. In both studies the children with DLD performed below their age-matched peers. In the previous study by Rice et al. (1990), the DLD group also performed below the language-matched group. However, when the pause was included, they performed at the level of the language-matched group (Rice et al., 1992). The children learned adjectives and nouns similarly way to noun, as they did in the study by Rice, et al. 1990.

Oetting, Rice, and Swank (1995) measured word learning in slightly older children. The participants included 88 children aged 6-8. They assessed four semantic classes: object, action, attribute, and affective state. All children showed greater ability to learn object labels (nouns)

than actions (verbs). Similar to the study by Rice et. al (1992), the children with DLD demonstrated ability to learn attributes (adjectives) at a level similar to their noun-learning abilities. Oetting and colleagues suggested these deficits have less to do with working memory and storage of the phonological properties. Instead, they suggested a deficit in the processing (storage and retrieval) of the grammatical properties of the words. Aspects of several deficits may affect the ability of children with DLD to learn and retain novel words, and the authors underscore the importance of future research into the effects of both the linguistic and non-linguistic elements of words on word-learning (Oetting et al., 1995).

Shallower word knowledge. Not only do they have fewer words in their vocabulary, which develops more slowly, but children with DLD also demonstrate a shallower knowledge of the words that are in their vocabularies (McGregor, et al., 2013; Rice & Hoffman, 2015). This is evidenced by poorer naming skills (McGregor, Newman, Reilly, & Capone, 2002) and giving less information when defining a word (Marinellie & Johnson, 2002). Depth of word knowledge is indicated by elements like knowing how a word relates to other words, knowledge of categories, and ability to give a thorough definition of the word.

Another indication of lexical depth is the ability to select synonyms. In a study by Botting and Adams (2005), eleven-year-old children were given a task requiring them to select synonyms. The children with language impairment struggled in selecting appropriate synonyms for the target words. They performed below typical children their age, and also below younger, language-matched peers. Greater depth of word knowledge allows typical children to more easily make the connections needed to select synonyms. These abilities could enhance their narrative productions, making them richer and more interesting.

Prepositions. Different types of prepositions are learned and mastered at different times throughout a child's development. Semantically, these closed-class words add information about location, direction and place. Locative prepositions are most often learned and used relatively early in a child's development (Brown, 1973). Use of *in* and *on* are typically seen in Brown's Stage II of development, occurring around 27-30 months of age (Brown, 1973). Use of these locative prepositions begins around two years of age, but children continue to learn other types of prepositions throughout the preschool years (Rice, 1999; Wasanka, 1984). A study by Goodluck (1986) found that typical children were using particles and prepositional phrases around 4 to 5 years of age. Few studies have examined the use of prepositions by children with DLD. Watkins and Rice (1991) looked at the use of words that can either function as verb particles (kick *over* the box) or as prepositions (jump *over* the box) in preschool children with DLD and their typically developing peers. The DLD group had greater difficulty with verb particles than with the prepositions. They performed more poorly than both the age-matched and language-matched groups. The authors speculate this is due to the greater complexity of verb particles. Particles, along with the verb, form a multi-word unit, whereas prepositions function independently in the sentence. Children must coordinate the particle with word order and agreement with the subject noun phrase. The addition of more complex rules of order and agreement makes particles more challenging for children with DLD. Grela, Rashiti, and Soares (2004) studied the use of locative prepositions (*in*, *on*) and a later developing, dative preposition (*to*) by children with DLD, a group matched by age, and a group matched by language ability. The children, ranging in age from 4 to 7, were presented with twenty-four scenarios with an example of *put* or *give* in each. The actions represented either the transfer of an object (e.g., The horse is giving the block *to* the cow) or the placement of an object *in* or *on* another (e.g., The dog

is putting the bone *on* the plate). They were asked to tell what was happening in each scenario. Grela and colleagues found that the dative preposition was more difficult for the children with DLD to produce correctly. They concluded that this difficulty lies more in the realm of semantics. The children seemed to lack understanding of the semantic relationship between the verb and preposition in the sentences. These deficits in semantic and lexical development have been studied further in the context of narratives.

Narrative characteristics

When producing oral narratives, young children with DLD demonstrate skills below their age-matched peers (Kaderavek & Sulzby, 2000; Koutsoftas & Gray, 2012; Newman & McGregor, 2006; Scott & Windsor, 2000). Differences in the quality of the narratives can be seen as early as preschool. Kaderavek and Sulzby (2000) examined the narratives and emergent readings (retelling of a familiar storybook) of 40 children (20 with DLD, 20 typically developing) aged 2 to 4 years old. They found that the narratives of children with DLD had a lower MLU and demonstrated less frequent use of the past tense verb form. Past tense verb use is important as past tense is often used in a narrative to signify a “retelling”. The group with typical language skills is beginning to learn this skill. In the oral context, the DLD group employed less frequent use of first-person pronouns. They did, however, frequently refer back to the character in order to keep specifying the referent. Thus, the children with DLD tended to over-specify their subjects instead of using pronouns. The authors highlighted the interrelationship of literacy and language. This interplay of deficits in language and literate language skills is evident as children with DLD progress through the school years.

Westby (1999) outlined four markers of literate language, two of which involve the use of modifiers, elaborated noun phrases and adverbs. Since these elements figure prominently in

the quality of writing and oral narration in school-age children, examining the abilities of children with DLD to use modification is warranted. Adverb use is among several forms of modification. Modifiers are, “a class of words that provide additional information about nouns, pronouns and verbs” (Justice & Ezell, 2002, p. 268). A largely optional function, modification includes elements such as adjectives in the noun phrase and intensifying adverbs in the adverb phrase (Quirk, Greenbaum, Leech, & Svartik, 1985). Children begin to use adjectives in simple noun phrase elaboration (“big dog”) as early as 19-22 months of age. Adverb use begins with simple, deictic words, such as *here* and *there*, and adverb phrases, such as *on top* or *in here* (deVilliers & deVilliers, 1978). As they progress through school, understanding and use of modifiers continues to develop (Nippold, 1998). Use of modification is considered a key element in literate language.

Greenhalgh and Strong (2001) looked specifically at these elements in the narratives of typical children and those with language impairments. The authors examined the narratives of children aged 7 to 10. Narratives were elicited using four different wordless picture books, and children were asked to look at the pictures and tell the story. The narratives were then analyzed for number of different words, conjunctions, elaborated noun phrases (adjective(s) + noun), mental and linguistic verbs, and adverbs. They found that the typical group outperformed the language impaired group in each category, with effect sizes ranging from small to moderate. The group means were not significantly different for use of adverbs or mental and linguistic verbs. The lack of statistical difference could be due to the relatively few instances of adverbs and linguistic verbs in the samples overall. However, the groups did differ in use of conjunctions and elaborated noun phrases per C-unit. The children with DLD used fewer adjectives to add information to their story.

Newman and McGregor (2006) analyzed the narratives of 20 children (10 with DLD, 10 with typically developing language skills) ages 5-7. The children looked through a wordless picture book and then used the pictures to help them tell the story. The children with DLD produced shorter stories overall. Their stories were lower in number of total words, number of C-units, and had fewer morphemes per C-unit. They also contained a higher proportion of ungrammatical C-units. However, there was no statistical difference in noun or verb phrase complexity. Noun phrase complexity was calculated as the proportion of nouns that included any pre- or post-modification (excluding the determiners *a* and *the*). Verb phrase complexity was the proportion of verb phrases that included an aspect, infinitival *to* verbs, or were catenatives. The stories of the DLD group were judged at a lower overall quality by a group of teachers and laypeople. In this study, the quality difference cannot be attributed to less frequent use of modification.

An analysis of slightly older children's narratives reveals that children with DLD continue to struggle with developing literate language skills in early school-age years. Ukrainetz and Gillam (2009) examined the narratives of children from two age groups: a group of 6 year-olds and a group of 8 year-olds. Each age group was further divided to include a group of children with DLD and a group with typically developing language. Narratives were elicited using the "Late for School" and "Aliens" pictures found in the *Test of Narrative Language* (Gillam & Pearson, 2004). The children were instructed to look at the pictures and tell the story. The 8 year-olds demonstrated gains in narrative skill by both the typical children and those with DLD. However, the gains were greatest in the typical 8 year-olds. Elements that make the story more elaborate and improve the quality of the narrative, such as dialogue, internal states, relationships and modifiers, were measured and used significantly more often by the typical

language group. The typical children showed greater ability, at both ages, to add information to their stories and a greater ability in modification. The children with DLD performed below their typical peers not only in simple measures of story elements (introduction, naming a character, signaling the ending), but also in measures of expressive elaboration. The DLD group used fewer modifiers, idiomatic expressions, and less dialogue. This is evidence that, while the typical children are learning to use decontextualized, literate language to tell stories, the skills of children with DLD are not progressing at the same rate. These skills are crucial to the quality of writing and narratives in older children. As they progress in school, children with DLD struggle to balance the demands of using literate language to tell more elaborate stories and forming grammatically correct utterances. When the narratives of 13 children in grades 2-4 were compared with their typical peers and evaluated for content and form, children with DLD demonstrated an imbalance (Colozzo et al., 2011). Either their stories had poor content but were grammatically correct or were more elaborate with more errors in grammaticality.

Fifth- and sixth-graders with DLD performed below their age-matched peers in composing both a narrative and expository sample when standard writing analysis was used and also when a more holistic measure was applied (Koutsoftas & Gray, 2012). The first measure, an analytic one, looked at productivity (number of total words), semantic use (number of different words), grammaticality (proportion of grammatical errors), sentence complexity (clauses per T-unit), and proportion of spelling errors. A second measure, the six-traits writing rubric, examined elements like ideas and content, organization, voice, word choice, sentence fluency, and conventions. These rubric measures would be influenced positively by use of modifiers, especially in the areas of ideas and content and word choice. Those two categories include elements like, “rich details” and the ability to “transmit ideas in an interesting and appropriate

way for the audience” (Koutsoftas & Gray, 2012; p 397-398). In narrative composition, the group with typical language skills scored significantly higher than the DLD group on 5 analytic measures and all 6 rubric measures. In the expository composition, the DLD group scored significantly lower on 3 analytic measures and all 6 rubric measures. The DLD group demonstrated a greater deficit in the more holistic measure of story quality, influenced by the use of modifiers. Their stories lacked the elements of literate language that make a typical child’s story more interesting and robust.

Hypothesis and Predictions

Deficits in word learning and narrative abilities in children with DLD are seen as early as preschool. In later school years, these deficits are most apparent in the context of oral and written narratives. Older children are learning to use elements of literate language, which pose a challenge for children with DLD. Several of these elements involve the use of modification to add information and interest to the story.

Greenhalgh and Strong (2001), examining modification in the narratives of school-aged children aged 7-10, found no significant difference in adverb use. However, there were relatively few instances in the samples in both groups. The DLD group did use fewer elaborated noun phrases (ENP). In addition to modifiers (e.g., the old, dead log), this measure of ENPs included qualifiers (e.g., a hole in the ground), appositives (e.g., this boy, Tom, had a dog), and relative clauses (e.g., the boy took the baby that liked him home). One other study of narratives included information about modifiers. The results were similar to those of Greenhalgh and Strong (2001). In the study by Ukrainetz and Gillam (2009), the narratives of two groups of children with DLD, aged 6 and 8, were compared to their typical peers of the same age. The children with DLD demonstrated less frequent use of simple story elements in both age groups. In this study,

modifiers were all coded together and included as one of the elements of *evaluations* in the story. No specific information regarding number of adjectives, adverbs or prepositions was calculated.

Although modification has at times been included in measures of quality, little has been reported about the specific frequency of use of adverbs, adjectives, and prepositional phrases by children with DLD. The current paper seeks to examine the use of three forms of modification in the context of narratives by school-aged children with and without DLD. The following hypotheses were proposed:

1. Children with DLD will produce fewer adjectives, adverbs and prepositional phrases in their narratives than their typically developing peers.
2. Because of their earlier development and decreased syntactic complexity, use of adjectives will be greater than the use of adverbs and prepositional phrases.
3. Use of adverbial prepositional phrases will be greater than use of adjectival prepositional phrases.

Method

The narrative samples were drawn from a larger dataset collected for use in an earlier study by Idaho State University's Child Language Lab. They were elicited by trained Speech-Language Pathology students between January 2013 and January 2018.

Participants

The participants were children aged 6 to 8. All were monolingual English-speakers residing in Idaho. Each participant passed a hearing screening at 20dB in both ears and were observed to have no oral motor impairments. They all scored in the normal range, above -2 standard deviations (*SD*), on the *Test of Non-verbal Intelligence-Fourth Edition* (TONI-4;

Brown, Sherbenou, & Johnsen, 2010). Participants in the DLD group were matched with a TL participant by age and non-verbal intelligence. Age-match is within +/- 3 months and standard scores on the TONI-4 is within 1 *SD* for each pair.

Assessment and sample collection. Participants were administered several assessments across two sessions. The *Clinical Evaluation of Language Fundamentals-Fourth Edition* (CELF-4; Semel, Wiig, & Secord, 2003) was administered to determine eligibility in the larger study. This consisted of 4 core language subtests: Concepts & Following Directions, Word Structure (WS), Recalling Sentences (RS), and Formulated Sentences (FS). The Expressive Language Index (ELI) was calculated using the WS, RS, and FS subtests. In the current study, this ELI score was used for comparison purposes.

Oral narratives were elicited utilizing three expressive language subtests of the *Test of Narrative Language* (TNL; Pearson & Gillam, 2003). Each participant constructed a narrative for: *McDonald's Retell* (MR), *Late for School Story* (LSS), and *Aliens Story* (AS). The samples were transcribed into the Systematic Analysis of Language Transcripts (SALT) software using standard SALT conventions, as well as codes specific to the larger study.

Group inclusion criteria. This study utilized samples from the existing dataset to form a group of children with DLD and a group of age-matched peers with typical language development. Participants in the DLD group were matched with a TL participant by age and non-verbal intelligence. Age-match was within +/- 3 months. For non-verbal intelligence match, standard scores on the TONI-4 were within 1 *SD* for each pair.

Criteria for the DLD group included: a score at or below 1.25 *SD* below the mean on the Expressive Language Index (ELI) of the CELF-4, no history of sensory impairments, and no history of other acquired, genetic, or developmental disabilities. The DLD group was comprised

of 14 children (6 female, 8 male) between the ages of 6;2-8;9, with an average age of 7;3, who met the criteria for eligibility. See Table 1 for a summary of the characteristics and test data for the DLD participants.

Table 1

DLD Participant Characteristics

Participant	Age	Gender	TONI-4	CELF-4 ELI	TNL Oral_Narr
1	7;5	F	94	55	7
2	7;9	F	94	57	5
3	6;2	M	92	61	8
4	6;2	M	108	75	9
5	7;2	M	102	67	5
6	8;1	M	106	73	6
7	8;2	M	89	61	4
8	6;2	F	97	73	6
9	6;6	M	100	69	7
10	8;9	M	110	61	8
11	7;9	F	117	71	8
12	6;10	F	92	61	7
13	8;2	M	95	67	6
14	6;11	F	111	59	5

Note. Age reported as years;months. Gender reported as M = male, F = female. Test scores are reported as standard scores for TONI-4 and CELF-4 ELI. Test score are reported as scaled scores for TNL Oral_Narr. DLD = developmental language disorder group. TONI-4 = Test of Nonverbal Intelligence, fourth edition, CELF-4 = Clinical Evaluation of Language Fundamentals, forth edition, ELI = expressive language index, TNL Oral_Narr = Test of Narrative Language, Oral Narration scaled score

The typical language group (TL) had scores above 1.25 *SD* below the mean on the CELF-4 ELI. They also had no history of sensory impairments or other acquired, genetic, or developmental disabilities. This control group included 14 age-matched (+/- 3 months) peers (7 female, 7 male), with typical language (TL), between the ages of 6;2-8;10, with an average age of 7;3, who met the criteria for eligibility. See Table 2 for a summary of the TL participants' characteristics and test data.

Table 2

TL Participant Characteristics

Participant	Age	Gender	TONI-4	CELF-4 ELI	TNL Oral_Narr
1	7;4	M	109	87	10
2	7;11	F	92	105	8
3	6;2	M	106	99	9
4	6;2	M	120	116	11
5	7;2	M	105	108	17
6	8;0	F	110	118	13
7	8;1	M	100	91	10
8	6;2	F	104	122	10
9	6;3	F	104	122	12
10	8;10	M	98	105	11
11	7;10	F	109	108	8
12	7;0	F	94	98	11
13	8;2	M	101	112	13
14	6;10	F	116	112	8

Note. Age reported as years;months. Gender reported as M = male, F = female. Test scores are reported as standard scores for TONI-4 and CELF-4 ELI. Test score are reported as scaled scores for TNL Oral_Narr. TL = typical language group. TONI-4 = Test of Nonverbal Intelligence, forth edition, CELF-4 = Clinical Evaluation of Language Fundamentals, fourth edition, ELI = expressive language index, TNL Oral_Narr = Test of Narrative Language, Oral Narration scaled score

Procedures

Narrative samples in the existing dataset had been densely coded for previous studies. The current study added codes for the following elements: adjectives (ADJ), adverbs (ADV), and adjectival and adverbial prepositional phrases (PP Adj, PP Adv). The codes were added to the samples within SALT, to allow for analysis.

Adjectives. These elements serve to modify a noun. They can be prenominal- before the noun they modify (The *angry* boy ran away) or postnominal- after the noun (The boy was *angry*). In this study, this distinction was included when coding. Adjectives are considered an open class, meaning that as our language changes, new words can be added (Quirk et al., 1985). The focus of the present study was on descriptive modifiers. Therefore, some modifiers with a primarily syntactic role were not included as descriptive modifiers. There is some overlap between adjectives and other word classes, especially when the function of the word is considered. While modifying a noun, articles (a, an, the) are considered a distinct syntactic class, a type of determiner, and are not included as descriptive adjectives. However, some determiners were included as adjectives for the purposes of this study. Quantifiers come before the noun and can be viewed as adjectives or determiners. Because they serve as an element of descriptive semantics, several quantifiers function as adjectives. Cardinals (*two* kids, *eight* aliens), Ordinals (*first* in line, the *second* time), and general quantifiers (*all*, *many*, *some*, *few*) were included as adjectives. In addition, participle phrases that serve to modify the noun are also included (The boy *named Joe*, The book *given to him* was new). For a list of modifiers that were coded as descriptive adjectives, see Appendix B.

Adverbs. Perhaps the most difficult to characterize on the basis of function, adverbs serve to modify a verb, an adjective, or another adverb. The difficulty lies in the diversity of words

considered to be adverbs. Quirk and colleagues (1985) state, “Because of its great heterogeneity, the adverb class is the most nebulous and puzzling of the traditional word classes. Indeed, it is tempting to say simply that the adverb is an item that does not fit the definitions for other word classes.” In order to maintain consistency in coding, boundaries for inclusion and exclusion in this word class had to be clearly defined. The purpose of the current study is to examine elements of descriptive modification used by children with and without DLD. Therefore, the decision was made to include only those adverbs which truly served to descriptively modify another element in the sentence. Simple descriptive adverbs can modify the verb, occurring before the verb (He *carelessly* poured the milk) or after the verb (He poured the milk *carelessly*). This also includes temporal adverbs (e.g., *yesterday*, *today*), giving more information about time at which verbs/events occur. They can also modify an adjective (She was *very* happy to see them), or another adverb (They were *really* quite annoyed by the dog). For the purposes of this study, only simple descriptive adverbs are included and a distinction was made between preverbal and postverbal adverbs. Conjunctive adverbs (*then*, *so*, *so that*), location adverbs, that often take on a nominal role (*in here*, *over there*) were excluded. , Wh- words that can be characterized as interrogative pronouns or as adverbs (*where*, *when*, *why*) were also excluded as they don’t serve a descriptive role modifying a verb, adjective or other adverb and serve in nominal roles or as complementizers.

Prepositional phrases. Prepositional phrases can be used to modify both nouns and verbs. “Prepositional phrases consist of a preposition followed by a prepositional complement, which is normally a noun phrase” (Quirk et al., 1985). Phrases that modify nouns are considered to be adjectival prepositional phrases. They may give information about location (The dog *by the bowl* is hungry.) or provide description (She grabbed the book *with the blue cover*.). Those that modify

verbs are considered to be adverbial. They can be used to detail direction (He flew *over the house.*), and give temporal (She went to the store *on Tuesday.*) or spatial (The frog was *in the basket.*) information.

Reliability

Inter-rater reliability measures were conducted for coding accuracy in the samples. Two narrative samples from each group (14.3%) were randomly selected. Following training on specific inclusion and exclusion criteria for the modifiers in the study, the samples were independently coded by a professor in the Department of Communication Sciences and Disorders. The samples were then compared line-by-line for agreement in coding. Inter-rater reliability was calculated as 93.67%.

Results

The TL samples and the DLD samples were compared across groups using Univariate ANOVA for Total Utterances, Total Number of Words, and Number of Different Words. No significant difference was found in Total Utterances ($M = 10.43$, $SE = 4.28$, $p = .097$). However, the TL group was significantly higher in Total Number of Words ($M = 115.07$, $SE = 43.34$, $p = .013$) and Number of Different Words ($M = 31.57$, $SE = 14.06$, $p = .033$). Differences in sample lengths in words could account for differences in the numbers of modifiers used. Therefore, when examining use of the various elements, a proportion of total words was calculated for each major category to compensate for differences in length. See Table 3 for means and standard deviations for each group.

Table 3

Mean Differences by Group

Group	Total Utterances	<i>SD</i>	Total Number of Words	<i>SD</i>	Number of Different Words	<i>SD</i>	<i>N</i>
DLD	35.71	14.943	202.21	91.658	98.71	34.841	14
TL	46.14	17.033	317.29	133.761	130.29	39.433	14

Note. Totals listed are the mean for each group; DLD = Developmental Language Disorder group; TL = Typical language group; *SD* = Standard Deviation; *N* = number of participants

A 2 x 2 Category (Adjectives, Adverbs, Prepositional phrases) X Group (TL, DLD) repeated measures analysis of variance (ANOVA) was conducted to determine if mean differences existed between the major categories or the groups.

Within groups

There was a statistically significant main effect within groups among the major categories $F(2.0, 25) = 13.582, p < .0001$, with an effect size of $\eta_p^2 = .033$. The subjects produced significantly different numbers of the three types of modifiers. A post hoc pairwise comparison with Bonferroni corrections was used to compare the three types. There was a significant difference between adjectives ($M = .041$) and adverbs ($M = .031$), $p = .025$. When comparing adjectives and prepositional phrases ($M = .052$) $p = .019$. Finally, when comparing adverbs and prepositional phrases the mean difference was $p < .0001$. See Table 4 for a summary of mean differences by modifier type.

Table 4

Mean Differences by Modifier Type

	Mean Difference	Significance
Adj vs. Adv	.009*	.025
Adj vs. PP	-.011*	.019
Adv vs. PP	-.021*	<.0001

Note. Totals listed are the mean for each category; *SD* = Standard Deviation; *N* = number of participants; * denotes statistically significant mean differences

The participants used prepositional phrases in the greatest proportion, followed by adjectives, and adverbs. It was hypothesized that adjectives would be used the most, but this was not supported.

Between groups

No significant main effect for group was found, $F(1) = .881$, $p = .357$. Children in the TL group did not produce statistically significant higher proportions of any of the modifiers. The DLD group produced slightly higher proportions of adjectives and adverbs. See Figure 1 for proportions of modifiers by group.

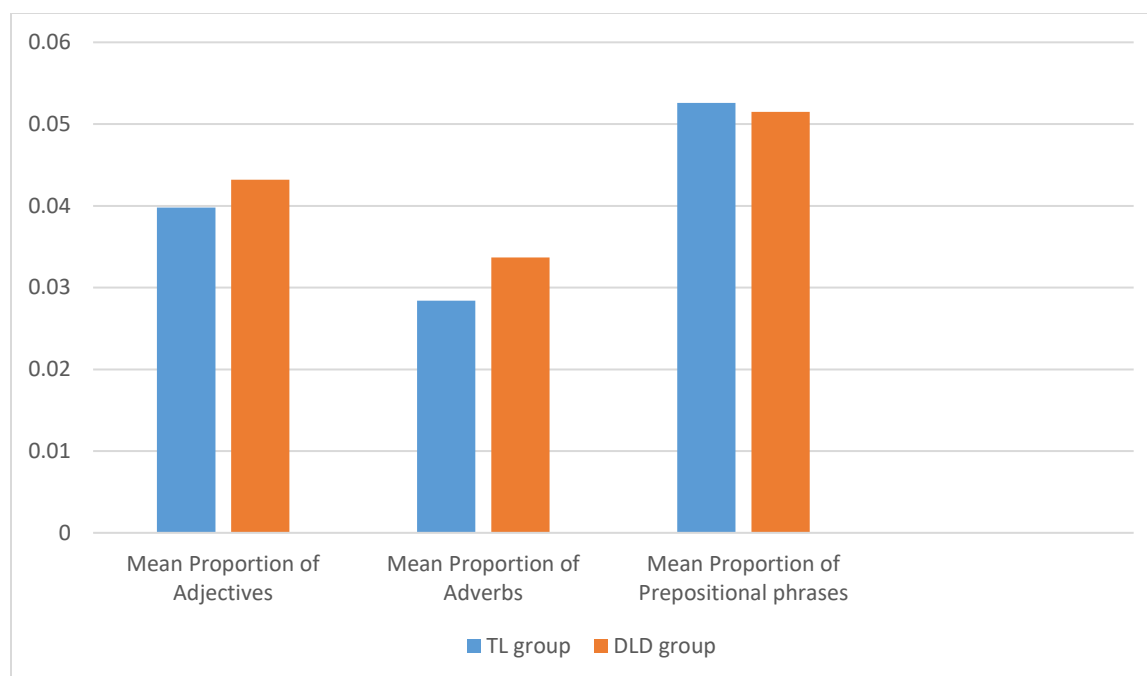


Figure 1. Mean proportion of modifier by group

The original hypothesis that the DLD group would produce smaller proportions of these elements of modification was not supported.

Discussion

Surprisingly, this study found no significant difference between the TL and DLD groups in proportions of modification. However, this information still has implications in the understanding and treatment of DLD. It would appear that, in the young school-age years, the use of modification is a relative strength for children with DLD and their skills are similar to those of their peers. This strength could be built upon in therapy and used to improve the quality of the child's narratives. Research has demonstrated that as children with DLD get older, their narratives tend to be judged of lesser quality (Newman & McGregor, 2006), and they tend to use fewer elements of literate language- modified noun phrases being one of these elements (Greenhalgh & Strong, 2001). If indeed children with DLD are using elements of modification

with similar frequency as their peers at a young age, this provides clinicians with a strength on which to capitalize. By giving greater attention to these elements, and how they enrich the quality of a narrative, clinicians can help children with DLD maintain this strength as they progress through school.

Elements of descriptive modification were an area of relative strength, despite many children in the DLD group displaying multiple other types of errors. In a study by Colozzo, Gillam, Wood, Schnell & Johnston (2011), the authors noted an imbalance in the narratives of the DLD group. Their stories were either strong grammatically and weak in content or vice-versa. The same pattern was noted in this study. Most children in the DLD group used these elements of modification to add to the content, despite many morphological and syntactic errors. One example from the DLD group reads, “And him still tired.” Here one notes an error in using the objective pronoun and omission of the verb. Yet the participant used an adverb and a postnominal adjective. In another example, “it alien bus with all octopus, a octopus dog”, the child uses incorrect articles, omits the verb and the conjunction, and fails to use the correct plural form. However, this utterance includes two adjectives and a prepositional phrase. The use of descriptive modification adds detail to narratives and improves their quality. Children with DLD can be encouraged to build their narrative and clinicians can then use them to teach correct article and pronoun use, among other skills.

Additionally, since they can use prepositional phrases, this skill can be further developed. The use of prepositional phrases can be used to teach more complex syntax. The fragmented utterances with interesting modifiers can be used, and the clinician can help the child combine them into longer, more complex utterances. Demonstrations of coordination and subordination

would be more relevant and engaging when using the child's own narrative. Children can be taught to use this area of relative strength to develop longer and more interesting stories.

Much has been discovered regarding the various weaknesses, error patterns, and areas of deficit in children with DLD. It is refreshing and exciting to discover a skill at which they seem to keep pace with their peers in the early school years. In many ways, this finding is more informative and applicable than simply reporting another area where children with DLD lag behind their peers. Their strengths should be celebrated, pointed out to them, and incorporated into therapy to build up other skills. Descriptive modification is a crucial part of literate language. As they progress through school, children can use this strength to improve the quality of their narratives and other modes of communication.

Limitations

It is impossible to separate the elicitation method from the quality of narratives. Any elicitation will have some influence on the end product. In this study, the initial story (*The McDonald's Story*) is read to the child, and they are asked to retell it. This story contains numerous examples of modification, which may affect their use of modification in the retell. They demonstrate the ability to use these forms following a model. Subsequent stories are elicited using pictures as stimuli. *Late for School* shows a panel of five sequential pictures that the child uses to build their story. This sequencing lends itself to temporal adverbs and familiar phrases about school. The final story elicited, *Aliens*, uses one picture with many characters and actions in it. It could be that these stimuli, however benign they seem, could be influencing the end narrative. The children demonstrate use of modification given the support of an oral story, a panel of pictures, and a picture with many elements to talk about. It would be interesting to investigate how their skills in the story retell (in which the children have just heard these

descriptive elements used) compare to those of the single-picture narrative. Future research could also examine how elements in a story retell compare to those in a self-generated story with no picture stimuli. One would assume these elicitation methods provide some measure of support. Perhaps a more representative example of their skills could be obtained without them.

The power of this study is also limited by small participant groups. Although useful information is revealed about the use of descriptive modifiers by children with DLD, generalization to the group as a whole is limited. It is possible that a significant group effect may be seen with a larger group of participants.

Inclusion and exclusion decisions in coding may also have influenced results. Adverbs, in particular, were difficult to categorize and operationalize. For the purpose of this study, the function of modification was used to guide these decisions, but different guidelines may include more or fewer adverbs. These decisions may allow for a finer grained analysis of the data and a richer picture of the skills of each group.

Conclusion

Modification was shown to be an area of relative strength for young school-age children with DLD. Although they contained fewer words, their narratives contained roughly the same proportion of descriptive modification as their typical peers. This skill can be used to help them increase the sophistication and overall perceived quality of their expressive language. Adding information and description with modifiers is a crucial part of literate language, and these skills become more important as a child progresses through school. Identification of this area of relative strength in skills gives clinicians an opportunity to focus on a strength when teaching more complex syntax, as well. Overall, information concerning use of descriptive modifiers

gives a more complete and well-rounded picture of a child with Developmental Language Disorder's deficits, and perhaps more importantly, their strengths.

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Appendix

Appendix. Summary of Levels of Evidence of References Used

Study	Participants	Method	Results	Level of Evidence
Bedore & Leonard, 1998	38 children; 19 with SLI, 19 with TL; ages 3;7-5;9	Spontaneous speech samples were collected over 6-8 sessions; samples were transcribed and coded for verb morphology, noun morphology, and MLU.	Verb morphology- fair sensitivity for SLI, very good sensitivity for TL. MLU- sensitive for SLI, but specificity lower for TL. Verb composites and MLU were most sensitive for classifying SLI vs. TL.	III– Case-Control Study
Colozzo, Gillam, Wood, Schnell & Johnston, 2011	26 children; 13 with SLI, M age=9;0; 13 with TL, M age=9;2	TNL used to elicit narratives that were then coded and scored for content and form	SLI narratives lower in both content and form; also showed an imbalance, stories were either stronger in content and weaker in form or (less often) stronger in form and weaker in content	III- Case-Control Study
Eisenberg & Guo, 2013	34 children; 17 with LI, 17 with TL; ages 3;0-3;11	Language samples collected from a picture description task; scored for percentage grammatical utterance (PGU) and 2 less comprehensive measures of grammaticality- percentage sentence point (PSP)(a measure that excluded utterances without a subject and/or main verb) and percentage verb tense usage (PVT) (looked only at verb tense errors)	All 3 measures 100% sensitive; PGU showed a specificity of 88%, and both PSP and PVT showed a specificity of 82%; PGU less likely to misclassify children with typical language	II- Prospective comparative cohort trial
Eisenberg et al., 2008	115 students with TL; 3 groups: ages 5 (36 children), 8 (40 children), & 11 (39 children)	TNL was used to elicit 3 narratives; noun phrases categorized into 4 types: Simple designating noun phrases, simple descriptive noun phrases, complex premodification with two or more pre-noun modifiers, and complex postmodification	By age 5, all children produced simple designating noun phrases; By age 8, all children produced simple descriptive noun phrases; By age 11, all children produced noun phrases with postmodification. All noun phrase types were produced more in object than in subject position. All were produced more in the single picture context than in the picture sequence context.	IV- Cross-sectional study
Greenhalgh & Strong, 2001	104 children, 52 with LI and 52 with TL; 13 in each group at each age level:	Narratives were collected using a story retell task for 3 different stories; scored for literate language features: conjunctions,	Measures of conjunctions and elaborated noun phrases differentiated children with LI from those with typical language. BUT when NDW was normalized for sample length, use of these	II- Prospective comparative cohort trial

	7, 8, 9, and 10 years old	elaborated noun phrases, mental and linguistic verbs, and adverbs. NDW was also calculated	elements as a general language performance measure was not supported.	
Kaderavek & Sulzby, 2000	40 children; 20 with LI, 20 with TL; ages 2;4-4;2	Compared 2 different narratives; one oral narrative and one elicited as a retelling of a familiar storybook	Both groups included more elements of written language in the retelling; DLD group- less use of past tense verbs, and use of personal pronouns in the retelling	II- Prospective comparative cohort trial
Kan & Windsor, 2010	Meta-analysis of Word-Learning research;	28 studies met the criteria for inclusion in the meta-analysis	LI groups showed significantly lower word learning performance	I- Meta-Analysis
Newman & McGregor, 2006	20 5–7-year-olds, 10 with SLI and 10 ND age-mates.	quality of narratives analyzed by twenty-seven laypersons and 21 teachers; used interval scaling to rate narratives; The narratives were also analyzed objectively for fluency, length, sentence-level syntax, and story grammar and themes.	Objective measures of story length, grammaticality, and thematic development differentiated SLI and ND groups; Mean length of C-unit and number of thematic units positively predicted quality ratings.	II- Prospective comparative cohort trial
Sheng & McGregor, 2010	42 children aged 5-7; 14-SLI, 14 age-matched (AM) controls, and 14 expressive vocabulary-matched (VM) controls	Looked at accuracy, latency, and errors of noun (object) and verb (action) naming;	Performance of the SLI group was similar to that of the vocabulary-matched group; their skills, though lower than their peers, were commensurate with their vocabulary level	II- Prospective comparative cohort trial
Ukrainetz & Gillam, 2009	96 children; 48 with SLI, 48 with TL; ages 6 and 8	Two imaginative narratives were scored for 14 elements of expressive elaboration in 3 categories. A subset of simple elements was analyzed separately	Children with SLI (whether 6 or 8 years of age) and younger TL children produced stories with significantly fewer appendages, orientations (e.g., name, personality feature), and evaluations (e.g., interesting modifier, dialogue) than older TL children	II- Prospective comparative cohort trial