Expository and Narrative Discourse in Adolescents with Reading and Language Impairments: Assessment and Intervention

EXPOSITORY AND NARRATIVE DISCOURSE IN ADOLESCENTS WITH READING AND LANGUAGE IMPAIRMENTS: ASSESSMENT AND INTERVENTION

A Dissertation Presented

By

BEVERLY IULIANO

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DEDICATION

To my patient and loving husband who has always pointed me in the right direction.

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ABSTRACT

EXPOSITORY AND NARRATIVE DISCOURSE IN ADOLESCENTS WITH READING AND LANGUAGE IMPAIRMENTS: ASSESSMENT AND INTERVENTION

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The purpose of this current study was to first examine through assessments and the use of school-based disability criteria, the quantitative and qualitative patterns in phonological processing, phonological working memory, oral retellings, and oral and written narratives in middle school-aged children with reading disabilities (RD; N=10) and those with language impairments (LI; N=5) in order to provide data to further explain the complex profiles of these two clinical populations. Secondly, a single-subject multiple baseline across subjects design study examined the effectiveness of an intervention program targeting expository and narrative discourse in adolescents with language and reading deficits (N=4). Expository and narrative discourse assessments were replicated at post-intervention for pre and post comparisons of performance. The findings will assist speech-language pathologists in accurately and efficiently evaluating and treating these two clinical populations in linguistic areas that are critical to successful academic and social development.

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CHAPTER 1

READING AND LANGUAGE PROFILES

Reading is a language-based skill that shares many of the same processes that are used for communication, despite the fact that learning to communicate is primarily implicit, for most, and learning to read is explicit (Catts & Kamhi, 2005). Given this posited association, researchers continue to explore the complex relationship(s) between dyslexia and specific language impairment (Catts, Adlof, Hogan, & Weismer, 2005; Larkin & Snowling, 2008; Puranik, Lombardino, & Altman, 2007, and others).

Definitions of dyslexia vary depending upon the context of the research, the school or state district, and the professional discipline. Dyslexia is currently viewed as a specific type of neurobiological language-based reading disability with a core deficit in phonological processing. The dyslexic population presents with persistent deficits in the accurate and/or fluent recognition and decoding of printed words as well as poor spelling skills, despite adequate intelligence (Catts & Kamhi, 2005; Lyon, Shaywitz, & Shaywitz, 2003; Pennington, 2009; Shaywitz, 2003).

An identification of dyslexia does not include children who have received inadequate instruction, lack of opportunity, or those that present with other primary disabilities, such as intellectual disabilities or visual impairments (Catts & Kamhi, 2005; Lyon, et al., 2003). Decreased reading comprehension is considered a secondary effect of dyslexia, and because poor readers tend to read less than good readers, development of vocabulary and background knowledge may also be impaired (Catts & Kamhi, 2005; Lyon, et al., 2003). "The Matthew effect" is a term often used to describe the negative outcomes faced by children with reading impairments. The implications of the term are

that poor readers continue to demonstrate persistent failure as a result of limited practice, poor motivation, and low expectations (Catts & Kamhi, 2005; Shaywitz, 2003).

The diagnosis of dyslexia typically occurs in grade three or later. However, the later the identification of a reading impairment, the more persistent and more difficult the deficit is to remediate. Early identification while the brain is more malleable is critical in order for the redirecting of neural circuits to occur (Shaywitz, 2003).

Specific Language Impairment (SLI) is defined as deficits in semantics, syntax (including use of tense markers and marking of subject-verb agreement), and discourse in conjunction with normal nonverbal cognition (Norbury, Bishop, & Briscoe, 2001; Tager-Flusberg & Cooper, 1999). Deficits in nonword repetition (NWR) and recalling sentences are also markers of SLI. Weaknesses in these areas are suggested to be the result of phonological working memory deficits (Bishop, North, & Donlan, 1996; Rispens & Been, 2007). Children with SLI may also evidence deficits in phonological awareness (Goulandris, Snowling, & Walker, 2000), and approximately half of children identified with SLI present with significant word reading deficits (McArthur, Hogben, Edwards, Heath, & Menegler, 2000). The American Speech-Language-Hearing Association (ASHA; 1993) defines a language disorder as a deficit in the comprehension and/or use of oral, written, and/or symbol communication systems. Language impairments may manifest in any one or the combination of the areas of the form (phonology, morphology, syntax), the content (semantics), and/or the function (pragmatics) of language. The terms language impairment (LI) and specific language impairment (SLI) will be used interchangeably within this report, as will the terms reading disability (RD) and dyslexia.

Previous research has suggested various hypotheses to explain the relationships between dyslexia and SLI. The severity hypothesis and the dyslexia-plus hypothesis both suggest a common core deficit in phonological processing; however, the severity hypothesis suggests a more significant phonological processing deficit in children with SLI, and that dyslexia is a milder form of SLI. The severity hypothesis further posits that, as a result of a more significant deficit in phonological processing, children with SLI also present with deficits in word reading in conjunction with impaired oral language skills, falling in the more severe range of the continuum. In contrast, the dyslexia-plus hypothesis suggests that the observed oral language deficits in children with SLI are the result of cognitive deficits that function independently from phonological processing deficits (Bishop & Snowling, 2004; Catts et al., 2005; Larkin & Snowling, 2008; Puranik, Lombardino, & Altmann, 2007).

A third hypothesis, the comorbidity hypothesis, suggests that dyslexia and SLI are discrete developmental disorders resulting in dissimilar cognitive deficits and behaviors. As in the previously discussed models, characteristics of dyslexia would include phonological processing deficits, but characteristics of SLI would consist of primary deficits in oral language development. When characteristics of both dyslexia and SLI are manifested in a child, it is suggested that this relationship is due to the comorbidity of the disorders (Caron & Rutter, 1991; as cited by Catts, et al., 2005).

An additional relationship between dyslexia and SLI has been hypothesized. Early language performance has been posited as a predictive measure of later reading performance; however, the domains of language analyzed in earlier studies have been rather limited to measures targeting phonological awareness and/or rapid naming skills

(Catts, Fey, Zhang, & Tomblin, 2001). More recent studies have begun to examine a diverse range of linguistic components in regards to the association between RD and SLI (Puranik et al., 2007).

Findings from empirical studies have provided an abundance of data suggesting a relationship between RD and LI in the area of phonological processing; however, a clear explanation of the effects of phonological processing on oral and written language in children with RD and LI remains less clear (Carroll & Snowling, 2004; Gathercole & Baddeley, 1990; Goulandris, Snowling, & Walker, 2000; Rispen & Been, 2007). Bishop and Snowling (2004) suggest that children with SLI are vulnerable to literacy deficits as a result of impaired phonological representations and phonological working memory. The authors posit that children with SLI, in contrast to children with dyslexia, present with semantic deficits that further impede their literacy development in that their ability to compensate by use of sentence context is diminished. Conversely, children with dyslexia would be expected to somewhat compensate for word reading deficits by tapping into their semantic knowledge and, thereby, apply contextual strategies. This "division of labor" can have a significant impact on orthographic development in children with RD. The reason is that the fine grained connections between phonology and orthography are not being developed; rather coarser level connections between whole-word and semantic knowledge are being developed. This latter type of system is insufficient for literacy development in a nontransparent orthography such as English.

Longitudinal studies report that approximately 50 percent of children with language impairments in preschool or kindergarten are diagnosed with reading impairments in later grades (Catts & Kamhi, 2005). Recent studies have also suggested

that children with dyslexia may present with deficits in the linguistic domains of semantics and grammar (Gallagher, Frith, & Snowling, 2000; Snowling, Gallagher, & Frith, 2003). In regards to these suspected language deficits in children with RD, Bishop and Snowling (2004) posited that these weaknesses may be the result of negative consequences faced by poor readers that were previously referred to, such as limited practice, poor motivation, and low expectations (Catts & Kamhi, 2005; Shaywitz, 2003).

Examination of oral and written discourse in children with RD and SLI is also of further interest to assist in classifying linguistic features of these disorders. One aspect of the relationship between oral and written language is their placement along a continuum of levels of formality (Westby, 1991; as cited by Paul, 2007). The least formal level of discourse is conversation, and the most formal level is literary language. The latter involves reading or listening to learn; therefore, it requires knowledge of complex sentence structures and novel vocabulary for academic success (Westby, 2005). Furthermore, oral and literate language differences are proposed to exist in function and topic (Paul, 2007; Westby, 1991; as cited by Greenhalgh & Strong, 2001). Oral language skills used during conversation rely heavily upon contextualization whereas literary language used in writing and lectures, including expository structures, provide the necessary information for comprehension in the language itself (Paul, 2007).

Westby (1991; as cited by Paul, 2007) further explained that narrative discourse falls midway between the extremes of conversational and literate genres. This is due to the structural level required for comprehension and the informal aspect of conversation. One of the key differences between narratives and conversation is that narratives are primarily monologues, whereas conversation is dyadic. Within this continuum, narrative

skills are posited to bridge oral to literate language. In contrast, it has been evidenced that children do not spontaneously transfer knowledge of strategies for narrative text comprehension to expository text structures (Vaughn, Gersten, & Chard, 2000). Paul (2007) further suggests that providing intervention in narrative skills assists in developing oral to written language. Expanding this theory, Vaughn et al. (2000) suggest that the explicit teaching of strategies designed specifically to support the comprehension of expository text structures is also critical to students' academic success.

In this study, phonological processing and linguistic performance were examined in adolescents with RD and LI in order to provide evidence to further describe an association between reading and language. Additionally, intervention targeting expository and narrative discourse was carried out with a portion of the participants from both clinical groups. Post-intervention assessments of the intervention group provide further analyses of performance across genres and modalities.

Review of Literature

Phonological Development and Intervention

In order to appreciate the posited underlying relationships among phonological awareness, language, and reading development, a brief discussion of phonological development, as well as phonological awareness intervention methods, is warranted. As previously discussed, research data have supported the hypotheses of causal and predictive relationships between phonological skills and reading acquisition (Liberman, 1973; Moody, 2003; Wagner & Torgesen, 1987; Swank & Catts, 1994). Phonological information is hypothesized to be stored as cortical phonological representations (Elman, Bates, Johnson, Karmiloff-Smith, Parisi, & Plunkett, 1996; as cited by Hester & Hodsom,

2004). The accurate development of these mental phonological representations is a critical component of phonological awareness development. Individuals code linguistic information in mental representations of phonological, semantic, and syntactic forms (Wolf, Vellutino, & Berko, 1998; as cited by Hester & Hodson, 2004).

At the phonological level, the sounds and the rules for sequencing the sounds in one's ambient language are stored (Storkel & Morrisette, 2002; Velleman & Vihman, 2002). Initially these representations are posited to be gestalt-like (Fowler, 1991; as cited by Hester & Hodson, 2004), but as the phonological system develops, at approximately the 50-word stage, these representations become more discrete, allowing for the development of a linguistic system. This system is comprised of critical information related to morphemes, syllables, phonemes, and the features of sounds (Barlow, 2002). The inadequate or inaccurate formulation of lexical representations may result in weaknesses in the retrieval of words for spoken language and of linguistic or graphemic information for decoding or encoding a word (Storkel & Morrisette, 2002; Velleman & Vihman, 2002).

Anthony and Francis (2005) further discuss three phonological processing abilities that have been identified in research: phonological awareness, phonological memory, and access to lexical storage. Phonological awareness is defined as one's level of conscious sensitivity to the sound structure of oral language, including recognition, discrimination, and manipulation of sounds. Phonological memory refers to the coding and storage of phonological information in a sound-based representational system. Phonological access to lexical storage refers to the retrieval of phonological codes in an efficient manner from memory. These phonological processing abilities are strongly

interrelated and are correlated with reading development; however, phonological awareness is the phonological process that is most significantly related to reading.

Stackhouse and Wells (1997) emphasize the importance of an intact speech processing system for phonological awareness development. They suggest that a deficit at the level of input causes a "knock-on" effect because it results in inaccurate storage of phonological representations; therefore, deficits are evident at input, processing, and output levels. This results in deficits in expressive phonology, phonological awareness, reading, and spelling.

Further theories of phonological awareness development are reported in the literature. The connectionist model suggests an interconnected neural network. A computer generated model depicts neurons as nodes that are activated by other connected nodes, and in turn, activate additional connected nodes. The nodes can be excitatory or inhibitory. The level of activation represents the extent of exertion that is required in sending information. Different levels of nodes provide semantic, lexical, or phonological information. The connectionist model can also simulate changes that occur as a result of the learning process. Change in the "weight" of a connection corresponds to the increase in correlations between similar patterns and the decrease in dissimilar patterns providing ongoing generalization of new inputs (Baker, Croot, McLeod, & Paul, 2001). Bishop and Snowling (2004) suggest that within the connectionist framework the networks of phonological representations are reduced in phonological dyslexics. The more impaired the phonological network, the more severe the word reading deficit.

In order to decode words, one must be able to distinguish and separate phonemes in words (The National Reading Panel, 2000). At the basic level of phonological

awareness is a child's ability to divide words into syllables, identify and formulate rhymes, and produce alliterations. These are considered shallow-level skills (Schuele and Boudreau, 2008). Syllable segmentation and rhyming abilities have been demonstrated by children even prior to alphabet or grapheme knowledge (Hester & Hodson, 2004). At a deeper or more complex level of phonological awareness is phonemic awareness. Phonemic awareness is characterized by the ability to isolate and manipulate individual sounds or phonemes. Phonemic awareness has been identified as a contributory link to early word decoding abilities (Anthony & Lonigan, 2004; Torgesen, Morgan, & Davis, 1992; Wagner & Torgesen, 1987; Wagner, Torgesen, Laughon, Simmons, & Rashotte, 1993).

Phonological awareness intervention is critical during the beginning stages of literacy; however, Boudreau and Hedberg (1999) suggest that over time some speech and language deficits may no longer be apparent, as was evidenced by Goulandris et al. (2000), but delays in phonological processing may continue to persist. Therefore, as noted earlier, it is important to carefully follow up and monitor older children with early histories of speech and language impairments.

Gillon and Dodd (1995) found that targeting intervention at the level of children's underlying phonological, semantic and syntactic processing difficulties increases both reading accuracy and comprehension. In a later study conducted by Gillon (2000), findings indicated that an intervention approach that incorporated phonological awareness had a better outcome in simultaneously improving reading and phonological awareness skills, as well as speech production, in comparison to children receiving more traditional speech and language interventions. These results support the theory of an

underlying deficit in phonological processing and the importance of strengthening phonological representations. This author suggests that strengthening this underlying deficit leads to improved storage, access, and retrieval of information that will be evident in a child's expressive phonology, grammar, vocabulary, phonological awareness, word reading, and reading comprehension.

The National Reading Panel (2000) reported a list of key components necessary for effective readers: phonemic awareness, phonics, fluency, vocabulary, and text comprehension. In regards to phonemic awareness, instruction targeting one or two skills, such as segmenting and blending, yields greater transfer to reading skills versus a multi-skilled approach. In addition, instruction in phonological awareness paired with letter-sound correspondences results in the greatest improvement.

In regards to phonics instruction, the use of an explicit and systematic program was found to be most successful in improving the reading skills of at risk or reading impaired children. Understanding phonics helps children break the code so that they are better able to decode words via both direct and indirect routes (The National Reading Panel, 2000; Lerner & Johns, 2009). A direct route of word reading involves accessing one's mental lexicon (i.e., recognizing familiar words) whereas an indirect or sublexical route requires individual segmentation, processing each letter then assembling the whole "from scratch" (as one would do with pseudowords; Shaywitz & Shaywitz, 2008). In general, there must be a sufficient duration and intensity of reading instruction for the RD population in order to develop accuracy and fluency (Shaywitz, 2003).

To review, the interrelationships among phonological memory, phonological awareness, and access to lexical storage play vital roles in the development of speech,

language, and literacy (Anthony & Francis, 2005). The precision with which the phonological representations of sounds are inputted, stored, and retrieved relates to how efficiently sounds can be utilized for speech, language, and literacy tasks. Treatment targeting the underlying phonological deficit in children with language or reading weaknesses is suggested to have the greatest impact on overall language and literacy development (Gillon & Dodd, 1995; Gillon, 2000).

Phonological Processing in Children with RD and LI

Efficient phonological working memory is posited to be essential in literacy development for providing beginning readers with the maximum cognitive resources in order to complete the complex task of blending phonemes into words (Wagner & Torgesen, 1987). Gathercole and Baddeley (1990) further investigated the phonological element of working memory in regards to language acquisition. The authors compared a group of children (ages 7;02-8;10; N=6) identified as LI to two control groups, one group matched on verbal skills and the other on nonverbal intelligence. The LI group performed more poorly than the controls on measures of nonword repetition. The LI group demonstrated difficulty in repeating single syllable nonwords; however, the greatest difficulty in NWR for the LI group, which clearly differentiated the clinical group from the control groups, was at the three and four syllable word levels. These findings support the view that children with LI present with a central deficit in their short-term phonological storage in working memory.

Characteristics of phonological processing, literacy, and language were examined by Goulandris, Snowling, and Walker (2000). The aim of the study was to examine two hypotheses regarding the relationship between dyslexia and SLI. The first hypothesis

suggests that dyslexia may result as a residual deficit from a resolved SLI. The second hypothesis posited by the authors suggests that SLI is a risk or predictive factor for RD. The authors recruited three clinical groups of adolescents, one group with a childhood history of RD (mean age 15;9), and two groups with an identification of SLI in preschool: resolved (mean age 15;5) and persistent SLI (mean age 15;9). Two control groups were also selected. One control group was matched to the dyslexic group based on chronological age and nonverbal IQ scores (CA-controls), and the other was matched to the dyslexic group on the basis of nonverbal IQ and matched to both clinical groups based on word reading skills (Goulandris et al., 2000).

A test battery to assess receptive and expressive language processing, phonological processing (i.e., NWR, spoonerisms/phoneme manipulation) and literacy skills was administered to all participants. Performance profiles among the three clinical groups revealed that the persistent SLI (PSLI) group showed deficits across all tasks, especially in the areas of NWR and of recalling sentences, as was evidenced in the study conducted by Catts et al. (2001). The resolved SLI (RSLI) group and the RD group performed similarly to age-matched controls on oral language competence; however, both of these clinical groups demonstrated weaknesses on measures of phonological processing. The RD and PSLI groups performed similarly on print-related tasks with both of these groups demonstrating weaknesses on reading and spelling measures. Although the RSLI group demonstrated only mildly impaired performance on reading tasks in comparison to controls, this group demonstrated difficulty on the nonword spelling task at a level close to that of the RD group (Goulandris et al., 2000).

The findings suggest that children with resolved SLI continue to present with residual deficits in phonological processing; however, this group is able to develop normal literacy skills. The authors, therefore, refute the first proposed hypothesis that dyslexia is a residual deficit from a resolved SLI. The authors reported mixed results in regards to the second proposed hypothesis that SLI is a risk factor for RD. Findings suggest a common core phonological processing deficit in both children with RD and SLI. On the other hand, the RSLI group, as previously noted, was able to develop literacy skills suggesting a greater capability to compensate for persistent weaknesses in phonological processing.

Carroll & Snowling (2004) assessed the phonological processing skills of 51 young children (ages 3;11 to 6;06). The participants were categorized into three groups: a family-risk of dyslexia group, a speech-impaired group, and a control group. Phonological processing tasks included a mispronunciation detection task as a measure of input phonology, a NWR task as a measure of output phonology, and an expressive phonology task as a measure of articulation.

Results indicated a significant effect for group with both clinical groups performing more poorly across measures in comparison to the control group; however, the speech-impaired group demonstrated the most pronounced deficit. The findings suggest that children presenting with impaired expressive phonology are on a continuum with children at a familial risk for dyslexia. The shared factor, phonological processing, is hypothesized to be linked to poorly developed phonological representations. This deficit then impedes children's ability to acquire orthographic and phonological associations (Ham & Seidenberg, 1999; Carroll & Snowling, 2004).

Catts et al. (2005) reported on a longitudinal study examining the phonological processing skills in a subsample of children (21 children with dyslexia; 43 children with SLI; 18 children with comorbid SLI and dyslexia; and a control group) from a previous epidemiologic study of language impairments in kindergarten children (Tomblin, Records, Buckwalter, Zhang, Smith, & O'Brien, 1997). The authors predicted that deficits in the area of phonological processing would be more closely related with dyslexia versus SLI. This view suggests that RD and SLI are two distinct developmental disorders.

The SLI group consisted of the children previously identified as having SLI in kindergarten and normal reading skills in grade four. The comorbid, SLI and dyslexic group, consisted of the children previously identified with SLI in kindergarten and dyslexia in grade four. The third clinical group consisted of the children previously diagnosed with dyslexia in grade four and who had had normal language skills in kindergarten. The final group of children included those whose performance on both language in kindergarten and reading achievement in fourth grade fell within the normal range. Measures of phonological processing (phoneme/syllable deletion and pseudo-word repetition) were administered to each participant (Catts et al., 2005).

Findings indicate that participants with dyslexia and those with comorbid dyslexia and SLI demonstrated deficits on phonological processing tasks across grades in comparison to the SLI and normal groups. These findings support the hypothesis that these two clinical groups, dyslexia and SLI, are distinct with phonological processing deficits primarily found within the dyslexic group. It is important to note that the SLI group did, however, perform more poorly than the normal group on these phonological

processing measures but not to the extent of the other clinical groups. These findings support the co-morbidity hypothesis in that the phonological processing weaknesses were judged to impact the dyslexic and comorbid groups to a greater extent in contrast to the SLI group (Catts et al., 2005).

The phonological processing skills of children with RD and LI were also analyzed by Rispens and Been (2007). The sample consisted of three groups of age-matched children, a dyslexic group of 19 children (mean age of 8;6), a SLI group of 11 children (mean age of 8;4), and a typically developing control group (mean age of 8;7). Participant selection for the dyslexic group was based upon a discrepancy between IQ and reading level. Reading measures consisted of word recognition and nonword reading tasks. Children were identified as having SLI based on at least 1.5 SD below the mean on a minimum of two language measures (receptive and expressive language, morphosyntactic skills, and vocabulary) and nonverbal IQ within normal limits. The participants in all three groups were administered phoneme deletion and NWR tasks in order to measure phonological processing skills (Rispens & Been, 2007).

Consistent with other reported findings (Catts et al., 2001; Larking & Snowling, 2008), both clinical groups demonstrated a significantly greater number of errors on the phoneme deletion task in comparison to the control group with the SLI group and dyslexic group demonstrating similar performance. Error analysis indicated that the controls and the dyslexic group made more errors when deleting an initial phoneme whereas the SLI group made more errors on final consonant deletions (Rispens & Been, 2007).

In regards to the NWR task, the SLI group performed more poorly in comparison to the dyslexic group, and the control group outperformed both clinical groups. Error analysis showed that the performance of the SLI group began to diminish in words containing four syllables whereas the performance of the dyslexic group began to decrease in words containing five syllables (Rispens & Been, 2007). This finding is supportive of the hypothesized phonological memory deficit in children with LI (Larkin & Snowling, 2008).

Larkin and Snowling (2008) further reported supporting evidence of phonological processing deficits in children with RD and LI. Measures of phoneme deletion, phonological memory, spelling accuracy, and phonetic spelling were obtained from a sample of 23 children with a primary identification of LI (mean age of 10;9), 22 children identified with RD (mean age of 10;5), and two control groups, one matched on chronological age and the other on reading age (Larkin & Snowling, 2008).

Similar to findings from previous literature (Goulandris et al., 2000), Larkin and Snowling (2008) also found that both clinical groups demonstrated more difficulty spelling words in acceptable sound-symbol patterns in comparison to controls, but in this case, the LI group performed more poorly than the RD group in overall phonological spelling skills, a characteristic that typically underlies dyslexia. In addition, findings indicated weaker phonological memory skills in the LI group than the RD group. The RD group's performance was not significantly different than that of the controls on this measure. Both clinical groups demonstrated weaker performance on the phoneme deletion task in comparison to controls (Larkin & Snowling, 2008).

In summary, the noted studies (Carroll & Snowling, 2004; Gathercole & Baddeley, 1990; Goulandris et al., 2000; Larkin & Snowling, 2008; Rispens & Been, 2007) begin to explain the phonological processing profiles of children with RD and LI. The studies support the hypothesis of a common core deficit in phonological processing in these two clinical populations. Evidence of persistent phonological processing deficits in adolescents with resolved LI is also noteworthy in attempting to describe the interrelatedness of phonological processing and language growth in older children.

Language Performance in Children with RD and LI

Given the identified common phonological processing deficits in children with RD and LI, it is critical to also examine additional aspects of language development in order to more fully understand the complex relationship between these two clinical groups. As such, a study conducted by Joanisse, Manis, Keating, and Seidenberg (2000) examined speech perception deficits in a sample of third grade children with dyslexia and the relationship of such deficits on phonology and morphology. Reading and language tasks were administered to a dyslexic group and two control groups (age-matched and reading-level matched). For purposes of analyses, the dyslexic group was then categorized into three separate subgroups: phonological dyslexics, delay-type dyslexic, and LI dyslexics.

The phonological dyslexics presented with a significant phonological deficit in the absence of impaired speech perception. In addition, the phonological dyslexic group showed below normal inflectional morphology skills. The authors suggest a relationship between impaired inflectional morphology and phonological processing abilities due to the impact of deficient phonological representations. It is posited that well developed

phonological representations are necessary for successful performance on both of these tasks (Joanisse et al., 2000).

Furthermore, performance of the LI dyslexic group was similar to that of the phonological dyslexic group in that they also exhibited deficits on word reading (exception words and nonwords) and phoneme deletion. In contrast, however, the LI dyslexic group also demonstrated deficits on speech perception tasks and a more severe deficit in morphological competence. Although the LI dyslexic group represents the presence of comorbid reading and language impairments, the reported patterns also lend support for the severity hypothesis in that this group demonstrated more severe deficits in tasks tapping phonological processing in contrast to the phonological dyslexic group. In addition, the LI dyslexic group demonstrated a greater deficit on tasks targeting linguistic competence (Kamhi & Catts, 1986; Catts et al., 2005; Joanisse et al., 2000).

The delay-type dyslexic group demonstrated commensurate skills in comparison to younger typically developing readers. This group did not present with deviant patterns of reading development, but rather a delay in their literacy development. Speech perception was not disordered for this subgroup. One explanation for these patterns may be that other learning or environmental factors may have produced the delay. Another plausible explanation may be the severity of the phonological impairment. A mild phonological processing deficit may not manifest across a range of tasks as was evidenced in the phonological and LI dyslexic groups (Joanisse et al., 2000).

The linguistic profiles of children with RD and LI were also examined by Rispens and Been (2007). Aside from the previously reviewed measures of phonological processing, a grammatical judgment task was administered to participants in all three

groups (age-matched, dyslexic, and SLI) in order to examine similarities and differences in receptive syntax. The children were required to determine grammatical versus ungrammatical sentences after listening to sentence stimuli.

The results indicated that the SLI group performed significantly lower on the grammatical judgment task in comparison to the dyslexic group. Error analyses indicated that the dyslexic group showed knowledge of subject-verb agreement, although less than the controls. On the other hand, the SLI group demonstrated chance level performance, suggesting limited sensitivity to subject-verb morphology (Rispens & Been, 2007).

The findings support the view that children with dyslexia may also present with weaknesses, not only in the areas of literacy and phonological processing, but also in morphosyntactic skills. A significant correlation between performance on the nonword repetition task and the grammatical judgment task was revealed (r=0.62). This finding indicates that deficits in the area of morphsyntactic skills may also be the product of deficits in phonological working memory, and the variance between the two clinical groups was posited to be related to the severity of the phonological working memory deficit, thereby, supporting the severity hypothesis (Bishop & Snowling, 2004; Catts, et al., 2005; Larkin and Snowling, 2008; Rispens & Been, 2007).

Microanalysis of sentence production in children with dyslexia (N=13; ages 8-22 years) in comparison to a control group (N=22; ages 8-22 years) was explored by Altmann, Lombardino, and Puranik (2008). The administered tasks required participants to formulate grammatically correct sentences from a series of three-word stimuli. Each word set contained a proper name, an inanimate noun, and a verb. Verbs representing regular morphology (e.g., cracked) were identified as control verbs. Verbs demonstrating

agent-patient (IRR) with irregular morphology (e.g., woven) and theme-experiencer (TE) with regular morphology (e.g., confused) were identified as experimental verbs. The experimental verbs assessed participants' metalinguistic competence, in that, orthographic, phonological, and lexical-syntactic constraints needed to be detected in order to formulate grammatically correct sentence structures.

The dyslexic group was found to produce significantly fewer complete sentence structures and fewer grammatically correct sentence structures in comparison to the control group. The dyslexic group also demonstrated a significant effect for verb type, producing a greater number of errors on the experimental verbs versus the control verbs with IRR verbs presenting the most difficulty. This pattern was primarily evident with the younger dyslexic participants indicating a developmental trajectory. An effect on verb type did not reach statistical significance in the control group. The noted difficulty with IRR verbs in the dyslexic group was hypothesized by the authors to be due to the fine phonemic features that require consideration when formulating grammatically correct sentences (Altmann et al., 2008). Results further support the view that some level of delayed language is often evidenced in children with dyslexia as a result of impaired phonological representations (Perfetti & Hart, 2001; as cited by Altmann et al., 2008). These findings support a somewhat modified version of the severity hypothesis with the RD population evidencing linguistic deficits, although to an overall lesser degree than the LI population.

To summarize, phonological processing continues to emerge as a common deficit area in children with RD and LI. The literature suggests that language deficits may also be a consequence of phonological processing deficits, lending support to a continuum of

severity. This potential relationship continues to gain credence; however, further investigation and comparison studies into the varying linguistic profiles of children with RD and LI is required.

Predictive Relationships of RD in Early SLI

Longitudinal studies examining literacy skills in children with histories of LI provide valuable information for explaining the multifaceted and predictive relationship of RD in this clinical population (Catts et al, 2001). Earlier studies exploring linguistic precursors in young children with LI who later demonstrated reading weaknesses found expressive grammar, mean length of utterance (MLU) and utterance complexity, to be an associated factor in later reading achievement (Bishop & Adams, 1990; Scarborough, 1990). Furthermore, Bishop and Adams (1990) found children with unresolved LI at 5 ½ years of age to be more likely to present with later reading difficulties.

In a more recent study, Snowling, Bishop, and Stothard (2000) examined the literacy skills of adolescents with early histories of SLI. This longitudinal study recruited an experimental group of 56 adolescents with SLI (mean age of 15;6) from an original group of preschool children identified with SLI (Bishop and Edmundson, 1987). In addition, a cross-sectional control group of 52 adolescents with no history of speech-language therapy was also recruited (Snowling et al., 2000).

Each participant was administered measures of general cognitive abilities (nonverbal and verbal abilities), literacy skills (word recognition, spelling, reading comprehension, nonword reading), and phonological processing skills (spoonerisms, nonword repetition). Statistical analyses substantiated that, on average, the children with a history of SLI in preschool presented with literacy deficits in adolescence. The authors

implemented a criterion initially used by Bishop and Adams (1990) to identify how many of the adolescents in the experimental group could be identified as dyslexic. Implementation of the diagnostic criteria revealed an increase in children identified with reading accuracy deficits from 6% at age 8 to 43% at age 15, and from 6 to 23% for deficits in reading comprehension (Snowling et al., 2000).

Identified reading deficits were found to be robustly associated with poor phonological processing skills. Findings support the hypothesis that dyslexia and SLI have a common core deficit in phonological processing; however, the authors further posited that the SLI group exhibited additional language deficits that may have inhibited their ability to compensate for weaknesses in phonological processing (Snowling et al., 2000).

As previously noted, many earlier studies examined the relationship between RD and SLI through administration of phonological processing tasks. In a study conducted by Catts et al. (2001), the authors included a number of additional language measures in order to determine which measures are more sensitive in predicting later reading performance. The authors recruited a subsample of children from the previously referred to epidemiologic study by Tomblin et al. (1997). This methodology provided an opportunity to analyze skills in children presenting with a wide range of oral language and reading abilities. A total sample of 604 children was recruited for the study: 123 children categorized with LI, 103 children categorized with nonverbal cognitive impairments (NVD), 102 children categorized with combined LI and NVD, and 276 controls (Catts et al., 2001).

The primary purpose of this follow-up study was to develop a method for the early identification of reading difficulties in kindergarten children by examining reading performance of those children in the sample found to be at risk for RD in grade two. To accomplish this, the children were categorized into two groups, those who demonstrated reading deficits in grade two, and those who did not. Reading difficulties were characterized by scores falling more than 1 SD below the mean on composite reading comprehension measures. From the sample, 183 children were identified as demonstrating reading deficits in grade two (Catts et al., 2001).

Since the sample contained a higher percentage of children with LI and NVD than would be expected in the general population, weighted scores were implemented for statistical analyses in order to more closely represent the percentage of good and poor readers found in the general population. Five significant factors were identified that uniquely predicted the probability of reading problems in grade two. The strongest predictor was letter identification, which was followed closely by sentence imitation, and then mother's education, performance on deletion tasks, and rapid automatic naming (RAN) performance (Catts et al., 2001).

Based upon these findings, the authors recommend that any child presenting with a history of speech-language difficulties should be screened in kindergarten using the four diagnostic measures noted above. This population of children is at a significantly greater risk for later reading deficits. Teacher referrals for children demonstrating early literacy difficulties, such as limited familiarity with books, delayed speech and language development, difficulty with rhyming tasks, and other phonological awareness curriculum tasks are critical for early identification (Catts et al., 2001).

Further investigation into predictive measures of later literacy difficulties was carried out by Botting, Simkin, and Conti-Ramsden (2006). The authors examined word reading skills in children with a history of SLI. The participants were originally recruited for a large scale language study at 7;5-8;9 years of age (See Conti-Ramsden & Botting, 1999a, 1999b; Conti-Ramsden, Crutchley, & Botting, 1997). Botting et al. (2006) re-assessed 200 of the original cohort at 10;1-11;10 years of age in the areas of grammar, vocabulary, cognition, and literacy.

A majority of the children with an early history of SLI were found to present with weaknesses in reading accuracy (67%) and reading comprehension (80%) with a quarter of the scores falling within the severe deficit range (below 2 SD). Single word reading measures at 7 years of age were found to be significantly correlated to both areas of reading difficulty at 11 years of age. In regards to initial language measures, tasks targeting receptive and expressive syntax were strongest in predicting later literacy ability (Botting et al., 2006).

Thus, the studies reviewed in this section provide evidence for the sensitivity of language and phonological processing tasks as predictive measures of later RD in children with early histories of LI. This predictive association further supports a relationship between language and literacy. The findings suggest the importance of early screening and treatment in areas of literacy for children with early histories of LI as well as continued monitoring of these skills in adolescents with such histories (Bishop & Adams, 1990; Botting et al., 2006; Catts et al., 2001; Scarborough, 1990; Snowling et al., 2000).

Genetic Basis of RD and SLI

Twin studies are another area of research pertinent to explaining the relationship between RD and LI. Twin studies allow for the investigation of genetic and environmental influences on LI and RD, thereby aiding in defining these clinical profiles. Bishop (2001) examined data from two such studies in order to investigate whether LI and RD are distinct from one another or co-exist (see Bishop, North, & Donlan, 1995; Bishop, Bishop, Bright, James, Delaney, & Tallal, 1999). In the first study, Bishop (2001) examined the commonality of RD in children with SLI and explored whether RD and LI have similar genetic causes. Data from the second study was analyzed in order to determine if an association between language and a nonword reading task was evident in the general population sample of twins.

Participants from the first study being examined by Bishop (2001; Bishop et al., 1995) included same-sex twins, ages 7 to 16 years, with one or both twins having a history of speech and language weaknesses. Each twin was administered a psychometric test battery of nonverbal skills and four language measures. In addition, a nonword repetition task was administered to the children aged 7 to 9 years (80% of participants). Literacy skills were assessed with word reading and spelling tasks.

Following completion of the assessment battery, each proband (clinical subject) was identified with one, or a combination of, an expressive language disorder, a receptive language disorder, or a speech sound disorder. Initial findings indicated that the level of literacy ability was correlated to the number of impaired language domains. Participants demonstrating LI in a single domain of language were not found to be significantly different from the nonprobands in rate of RD. Subjects presenting with deficits in two or

three language domains performed more poorly on literacy measures. Overall, the children with SLI were more likely to present with RD in comparison to the nonprobands in the study (Bishop, 2001).

Additional analyses were conducted in order to explore the hypothesis of a genetic basis for commonalities in language and literacy. To do so, the probands were defined by the type of LI and performance on the nonword repetition task. The analyses supported the view that genes contribute greatly to reading and spelling disabilities in the LI population, and, furthermore, LI and RD manifest from the same underlying genetic basis. The analyses also provided evidence supporting the theory that genes suspected of influencing deficits in nonword repetition also influence literacy skills (Bishop, 2001).

The second study, examined by Bishop (2001; Bishop et al., 1999) examined the heritability of characteristics of LI and the relationship between LI and RD. Two separate samples of children participated in this study. The first sample included a portion of the children classified as LI from the original study (Bishop et al., 1995), and a second sample of children, a normative group, was also recruited. In addition to the same psychometric assessment battery, the Picture Completion and Object Assembly subtests from the WISC-III (Wechsler, 1992; as cited by Bishop, 2001) and a pseudoword reading test were administered (Bishop, 2001).

For the children that participated in both studies, correlations of literacy scores from the first study and pseudoword reading scores from the second study were carried out. The analyses supported the hypothesis that the decoding of pseudowords is associated with the reading and spelling of real words; however, the heritability of pseudoword reading was analyzed with scores from only the second sample of children

so as not to over-represent poor readers. Findings suggested heritability of poor pseudoword reading to be highly dependent on pseudoword repetition skills. The analyses, however, unexpectedly suggested a stronger role of shared environment on pseudoword reading abilities versus genetic influence. The author posited that two causes of RD may exist, one environmental and one genetic, with the latter accounting for the more severe forms of RD (Bishop, 2001).

In short, the findings of Bishop (2001) suggest a continuum of severity in children with SLI and RD. These two impairments were posited to manifest diversely but result from the same underlying genetic deficit. This finding lends support to the theory proposed by Lewis (1992) that a broad verbal deficiency that is heritable can be manifested as diverse speech, language, and/or literacy deficits.

In addition to the phonological processing weaknesses reported by Bishop (2001), the children's literacy performance also revealed correlations with the severity of their SLI. Furthermore, the hypothesis of a genetic basis for literacy deficits in children with SLI was supported. However, environmental factors are also suggested to contribute to deficits in literacy development.

Overview of Narrative Skills

Narratives naturally occur in a variety of environments, including home and school, and are a natural part of daily social interactions. Narratives are important for social development because they are a vital element in mainstream culture (Gillam, McFadden & van Kleeck, 1995). A study conducted by Reed and Spicer (2003), reported that adequate narrative skills were rated by teachers as the most important communication skill needed by students.

In order to become successful readers and writers, learners require knowledge of the conceptual organization involved with narrative structure (Gillam et al., 1995). At a fundamental level, Howard (1991; as cited by Fey, Windsor & Warren, 1995) suggests that we think by fitting story themes to personal experiences. Hudson and Shapiro (1991; as cited by Gillam et al., 1995) describe narrative structure as a story schema, a mental representation of story structure.

Anderson (1994; as cited by Westby, 2005) provides several functions of schemata. Cognitive schemata provide scaffolding in order for one to assimilate information. A schema facilitates the recognition of relevant and pertinent information, enables the process of inferencing, and allows an orderly search from memory in order to recall story elements and details. Additionally, a schema aids in the process of editing and summarizing, allows for the reconstruction of information from recall, and allows one to hypothesize about information that is missing. Lastly a schema facilitates comprehension monitoring in order to recognize anomalous information or to pay attention to information that either adds to existing schema knowledge or contradicts it.

In addition to cognitive schemata, the comprehension and production of narratives requires the integration of several other cognitive and linguistic processes. Losh and Capps (2003) suggest that becoming skilled in the use of narratives requires the ability to plot events in a causal-explanatory manner and requires the use of appropriate syntactic and morphological elements in order to formulate temporal and causal relationships (Berman & Slobin, 1994; Miranda, Camp, Hemphill, & Wolf, 1992; as cited by Losh & Capps, 2003). Pragmatically, research suggests that proficiency in producing narratives requires the knowledge of efficiently introducing narratives, providing necessary

information to the listener, and monitoring the listener's involvement (Bamberg, 1997; Goffman, 1959; Lobov & Waletzky, 1967; as cited by Losh and Capps, 2003).

Understanding the relationship of content ideas is critical to comprehending narrative text. More specifically, comprehending human motivations and goal-seeking behaviors is essential (Black, 1985; Bruce & Newman, 1978; Voss & Bisanz, 1985; as cited by Westby, 2005). "Landscape of action" and "landscape of consciousness" (Bruner, 1986; as cited by Westby, 2005) are two terms to explain narrative content. "Landscape of action" describes narratives that are largely action sequences told in the third person. Little insight into the character's emotional state is provided. On the other hand, "landscape of consciousness" describes narratives that are told from diverse characters' perspectives. These terms represent developmental progression, with narratives beyond grade three requiring increasing proficiency in understanding the psychological states of characters (Westby, 2005).

The production of narratives requires a significant degree of morphosyntactic and lexical resources (Halliday & Hasan, 1976 and others; as cited by Pearce, James, & McCormack, 2010). When examining morphosyntax, one is no longer examining the global or macrostructure of narratives, but rather the local or microstructure of narratives. The microstructure can be analyzed in regards to syntactic complexity, sentence length, and referential cohesion (Norbury & Bishop, 2003). Westby (2005) suggests four essential elements related to the sophistication of linguistic elements that are assessed in narratives. They include the following: conjunctions, elaborated noun phrases, mental and linguistic verbs, and adverbs. Deficits in the inclusion of any of these elements in the narrative production can be addressed through intervention.

Cohesive adequacy refers to the linguistic features that bind sentences together as a unit rather than as a series of unrelated utterances (Hughes et al., 1997). Haliday and Hasan (1976; as cited by Hughes et al., 1997) identified five categories of cohesive markers: reference (pronouns), conjunctive (connective words), lexical (vocabulary selection), and substitution and ellipsis (replace noun or verb phrases). Cohesive markers signal the listener to search outside of the sentence for meaning. Cohesive ties can be considered complete, incomplete, or erroneous. The development of cohesive ties begins between the ages of 2 to 3;6 years and is suggested to increase with age and mean length of MLU (Hughes et al., 1997). At the literate language end of the continuum, lexical richness may be referred to as the "sparkle" of the story (Peterson & McCabe, 1983; as cited by Greenhalgh & Strong, 2001).

Gummersall and Strong (1999) suggest that syntactic complexity develops at the level of the clause by the use of coordinating or subordinating conjunctions. Clauses are linked together because they are semantically related. It is also important to note that the use of cohesive devices requires adequate word retrieval skills, complex sentence production, and the correct syntactical use of pronouns and articles (Miranda et al., 1998; as cited by Pearce et al., 2010).

The "mainstream" structure of narratives, the macrostructure, is often referred to as "story grammar" (Paul, 2007; Westby, 2005). Hughes et al. (1997) reported that narratives continue to develop with respect to the complexity of the episodes and narrative macrostructure. The authors suggested that increasingly complex narratives contain multiple episodes, complex episodes, embedded episodes, and interactive episodes. The term "multiple episodes" refers to narratives containing more than one

complete episode. A complex episode includes an obstacle to the character carrying out the plan or resolving the problem in the story. An embedded episode occurs within another episode in the narrative. Interactive episodes involve the story being told from various points of view. The increased complexity in the structure of the narrative is related to the elaboration of the climax of the story. An elaborated climax, or resolution of a story, may result when one resolution leads to an additional conflict in the story. These elements of narrative complexity would be expected in typically developing children ages 11 to 13.

In the area of narrative comprehension, McCormick (2007) suggests instruction that emphasizes activities targeting the construction of meaning from the text. Tasks should explicitly address what comprehension is, and students should be involved in learning activities before, during, and after reading text. For example, explicit instruction may include extensive reading that builds background knowledge; however, this is not sufficient practice alone for developing strategies for comprehending deeper meaning. Additional examples include the use of scaffolding to target higher level skills and reflective instruction. Norris & Hoffman (1993; as cited by Paul, 2007) also report the importance of activating background knowledge. Staskowski and Creaghead (2001, as cited by Paul, 2007) further propose the following strategies for improving narrative comprehension: establishing a purpose; activating prior knowledge; making predictions; asking questions; and visualizing.

Graham and Harris (2005) describe various narrative writing strategies. To begin with, the use of a story grammar strategy provides a model for planning and writing a story. It targets generating ideas and developing story structure, and it facilitates

formulating a plan for each story part prior to the actual story writing. Story grammar helps to develop an elaborated plan as one writes. It also assists in developing a more complete story. In a study conducted by Sawyer, Graham, and Harris (1992), the authors found that the use of story grammar strategy led to 5-6th grade students producing stories containing most basic story elements, as well as qualitatively better stories in comparison to baseline measures.

A specific story grammar instructional tool is SGM (Moreau & Fidrych, 1994, 2002). This program was designed to assist children in the organization of narrative development and its link between speech and writing. Moreau & Fidrych (1994, 2002) report the reason behind the development of Story Grammar Marker was to create s a tool to meet the diverse educational needs of children. SGM is a practical tool that helps to strengthen the critical cognitive-linguistic link between oral communication and writing. Because many children struggle in their attempts to sort and integrate pertinent information that they read or hear, the SGM provides a mode for them to more readily accomplish the following tasks: identify important ideas; provide temporal sequences of story details; retain information by associating components of the story to parts of the manipulative; use the critical thinking triangle to respond to higher level "how" and "why" questions about characters' actions and interactions/motives; make inferences about information that is not explicitly stated; make predictions. In addition, SGM allows for a child's participation at his or her individualized level. As previously discussed, children must develop sufficient cognitive representations, or schemas, of narrative structures. SGM provides this organization to help children internalize

narrative structure through modeling and scaffolding. See Table 1.1 for descriptions of SGM elements.

In sum, narrative skills emerge in a developmental sequence. The integration of several cognitive and linguistic processes is necessary as narrative complexity evolves. In remediating oral and/or written narrative deficits, story grammar strategies, such as SGM (Moreau & Fidrych, 1994, 2002), provide models of the essential story elements and are suggested to facilitate narrative development (Graham & Harris, 2005).

Table 1.1: SGM Elements and Descriptions (Moreau & Fidrych, 1994, 2002)

Story Grammar Element	Description
Character	Who
Setting	Where
Initiating Event	The "kick off"; what happens (situation, problem) to the character that results in him making a plan
Internal Response	The characters feelings about "kick off"
Plan	The character's plan of action
Attempts/Actions	The character's attempts to solve the problem
Direct Consequence	The result of the attempts/plan
Resolution	Character's feelings about the consequence

Narrative Skill Performance in Children with RD

Research examining narrative skills in children with RD has revealed weaknesses in the areas of semantics and morphosyntactic skills (Roberts & Scott, 2006); however, the extent of such studies in the literature is sparse. In an earlier longitudinal study,

Feagans and Short (1984) examined the differences in the comprehension and production of narratives in young children, ages 6 or 7, with a newly identified RD across two school years (wave 1 and wave 2) and a control group of typically developing children.

As predicted, the RD group performed more poorly than the control group on the educational assessment battery. All children were also administered measures of baseline performance in reading recognition and reading comprehension skills. Findings indicated that the older children with RD presented with more significant deficits in comparison to younger children with RD; however, a significant difference by age was not evident within the control group (Feagans & Short, 1984). These findings support the suggested persistent and accumulating negative impact that a reading deficit can have on a child as they mature (Catts & Kamhi, 2005; Shaywitz, 2003).

Oral retellings were elicited with miniature grocery store props. After each child was able to name all of the items in the grocery store and was able to act out requested actions pertinent to the action sequences in the narratives, the narrative was read aloud. The child was then asked to act out the story with the props. The narrative was reread until the child successfully acted out all of the action sequences in the correct order. The child was then required to retell the story. This process provided a common baseline for the participants (Feagans & Short, 1984).

Findings indicated no evidence of group differences in comprehension; however, a significant effect for group was identified, with the RD group producing fewer action units in comparison to the control group, and this pattern continued across time points. Measures of linguistic complexity revealed that the control group and older children produced more words overall. In addition, the RD group produced a greater number of

nonreferential pronouns, although this feature reduced over the time, and fewer complex sentences in comparison to the typically developing group. Correlations for longitudinal results were computed and indicated a moderate relationship between oral retellings and the RD group's reading achievement and intelligence, but no relationship between reading achievement and intelligence. The opposite pattern was evidenced for the comparison group (Feagans & Short, 1984).

In a more recently reported longitudinal study, Westerveld, Gillon, and Moran (2008) investigated oral narrative performance in children with mixed reading disability (MRD). MRD refers to the classification of children with deficits in both word recognition and listening comprehension skills. The clinical group consisted of 14 children with MRD and 14 TD peers aged 6;4 to 7;8 and 6;8 to 8;2, respectively at the commencement of the study. All participants were required to produce a personal narrative and retell a story at three time points spanning across a two-year period. Microstructural analyses of grammatical competence and semantic diversity of the personal narratives were conducted. In addition, macrostructural analyses of the story retells were conducted.

Assessments indicated that the clinical group consistently performed more poorly in comparison to typical peers. The MRD group produced less complex sentence structures, as well as fewer grammatically correct sentences. The MRD group's expressive vocabulary, as measured by number of different words (NDW) produced, evidenced a significant main effect for group. Performance on the story retellings indicated that the MRD group produced stories of diminished quality in comparison to the TD group. It is of further interest to note that although the MRD group evidenced

progress across time points, it was not at a rate that enabled them to attain the same level of skills as their TD peers (Westerveld et al., 2008).

Westerveld and Gillon (2010) later recruited a sample of children from the previously discussed study in order to further compare children with MRD to typically developing peers. The comparison groups of 11 children with MRD (aged 7;11 to 9;3) and a control group of 11 age-matched children were examined in regards to their performance on three narrative contexts: story retelling, story generation, and personal narratives. Oral narratives were elicited and tape recorded for all three contexts. Microstructural analyses were calculated with the Systematic Analysis of Language Transcripts (SALT; Miller & Cahpman, 1984-2003; as cited by Westerveld & Gillon, 2010). Morphosyntactic skills were calculated for Mean Length of utterance in Morphemes (MLU-M), grammatical accuracy (GA), and percent of complex sentences (% Complex). Analysis of semantic diversity was calculated based on the NDW. Verbal productivity was calculated as the number of utterances produced (UTT). A cutoff after the first 50 intelligible utterances was applied for the purposes of analyses with the exception of narratives produced with fewer than 50 utterances. In the event of the latter, the entire narrative was analyzed.

The story retellings produced the longest MLU-M, followed by story generation, and personal narratives. Overall, the MRD group performed more poorly in comparison to the control group across the three narrative contexts. For both groups, a greater number of utterances were evidenced on the story retelling task, and a significantly greater NDW produced were evident in the story retelling context in comparison to the story generation task. No significant group differences were yielded for the story

generation context; however, the TD control group exhibited significantly greater grammatical proficiency (GA) than the RD group. In addition, these findings of fewer productions of complex sentences by the MRD group supported previous reports by Feagans and Short (1984) and Puranik et al. (2007). In the personal narrative context, group differences were evident in regards to NDW and MLU-M, with the control group demonstrating better performance than the MRD group (Westerveld & Gillon, 2010).

A study investigating oral narrative intervention with a sample of children with MRD (N=10) from the original longitudinal study conducted by Westerveld et al. (2008) was carried out by Westerveld and Gillon (2008). A sample of TD peers (N=10) were also recruited from the original study to serve as a comparison group. The children's performance on the final assessment in the original study was used as a baseline for the current intervention study. The same tasks, with different stimuli, were administered for post-intervention measures. The children with MRD were randomly selected into two intervention groups. The first group received intervention focusing on improving their knowledge of story grammar structure while the second group served as a control. Once the six-week intervention was completed for the first clinical group, the second clinical group received the same intervention Westerveld & Gillon, 2008).

Post-intervention analyses for group 1 revealed no significant treatment effects for number of different words NDW or grammatical knowledge. Direct treatment effects, as a result of the intervention, were also not evidenced in the quality of the story retells; however, post-intervention measures of story quality between MRD and TD groups were no longer statistically significant as they were at baseline measures. Comparisons of the MRD and TD groups at post-intervention also indicated some improvement in semantic

diversity (NDW) and grammatical accuracy; however, this progress was also not attributed to the intervention, but rather due to uncontrolled factors, such as classroom instruction (Westerveld & Gillon, 2008).

Thus, although the research examining narrative skills in children with RD is limited, a pattern of linguistic characteristics emerges for this clinical group. Performance was reported to vary depending on the type of narrative produced (retelling, story generation, or personal narrative); however, evidence suggests that children with RD present with persistent weaknesses in semantic diversity and linguistic complexity (Feagans & Short, 1984; Westerveld & Gillon, 2008, 2010; Westerveld et al., 2008). Furthermore, findings suggest a relationship between oral retelling abilities and reading achievement in young children with RD (Westerveld & Gillon, 2010). These results lend further support to a hypothesis proposing a connection between oral language and literacy.

Narrative Skill Performance in Children with LI

It has been well established that children with language impairments produce fewer words and sentences in their narratives (Hughes et al., 1997), fewer story grammar elements (Paul, Hernandez, Taylor, & Johnson, 1996), decreased sentence complexity (Gillam & Johnston, 1992), reduced frequency and accuracy levels of cohesive ties (Liles, 1985), greater percentages of grammatical errors (Gillam & Johnston, 1992; Liles, Duffy, Merritt, & Purcell, 1995; Norbury & Bishop, 2003), and inferior story quality (Gillam, McFadden, & van Kleeck, 1995; McFadden & Gillam, 1996; Paul et al, 1996) in comparison to their typically developing peers. Structural analysis of oral and written narratives is a common method for assessing quantifiable features of narratives.

However, applying a holistic scoring approach, a less commonly used system, takes into account both quantitative and qualitative elements of a narrative (McFadden & Gillam, 1996).

McFadden and Gillam (1996) examined the quality of spoken and written narratives with both structural and holistic scoring procedures. The participants included a group of children between the ages of 9;0 and 11;7 with LI (N=10) and three comparison groups of children (N=30) matched on either age, spoken language, or reading ability. Each participant produced two oral narratives and two written narratives based on picture stimuli. A rubric was developed and applied for holistic scoring purposes. The categories of narrative performance were rated as weak, adequate, good, or strong. Structurally, the linguistic form (e.g., grammatical accuracy) and content (e.g., semantics) of the narratives were scored at both sentence and text levels.

Analyses indicated that the age-match group outperformed all other groups in regards to story quality; whereas, the LI group performed similarly to the reading and language-matched groups. A large percentage of narratives produced by the latter three groups were judged as weak or adequate. On the other hand, a large percentage of the narratives produced by the age-matched group were judged as good or strong. Overall, findings suggest deficits in measures of form and content in the LI group. Their narratives were less complex on seven of eight measures in comparison to age-matched peers. Although weaknesses were evidenced at both the sentence and text level by the LI group, it was the overall quality at the text level that was correlated with the negative judgments. This finding was noteworthy in regards to intervention techniques. The

authors suggest treatment at the textual level (e.g., story elements and structure), as well as in qualitative features, such as charm and clarity (McFadden & Gillam, 1996).

Given that children with LI are a heterogeneous group, examination of the structural and literate language characteristics of narratives in this diverse group aids in further describing narrative development in this clinical group. Fey et al. (2004) measured the differences in oral and written narratives among four groups of children: typical language (TL); specific language impairment (SLI); nonspecific language impairment (NLI); and low nonverbal IQ (LNIQ). For the purposes of this review, differences based on group, oral versus written narratives, group differences in growth of story composition from second to fourth grade, and the impact of children's persistent spoken language impairments on story composition from kindergarten to second grade will be discussed.

Developmentally, large effects favored oral stories versus written stories at the second grade level especially on measures of story length. By grade four, these effects diminished significantly. Between second and fourth grade gains were noted within both modalities; however, gains in written stories were significantly greater on four out of six measures across all four groups. These findings suggest that despite their levels of language functioning, children begin to close the gap between oral and written narratives in length, complexity, and story quality between second and fourth grade (Fey et al., 2004).

These findings conflict with earlier findings by Gillam and Johnston (1992) in which the language impaired group produced a greater number of grammatical errors in written narratives versus oral ones. Fey et al. (2004) also noted that grammatical

accuracy remained constant or even regressed between second and fourth grade. This finding may be indicative of persistent written language weaknesses in children with histories of language impairment in later elementary years.

In regards to group, Fey et al. (2004) found grammatical accuracy followed by subjective measures of story quality (e.g., story content, organization, literate language) as the strongest indicators that differentiated between the TL and the NLI groups. The number of C-units was not found to be a sensitive measure for differentiating these groups at either second or fourth grade measures. For the SLI group, statistically significantly slower progress in semantic diversity (NDW) was evidenced from second to fourth grade in comparison to that of the TL group.

Fey et al. (2004) found that second grade children with indeterminate language impairment (ILI) differed only slightly in their narrative skills in comparison to the TL group, and the ILI group's performance was substantially better than that of the persistent language impairment (PLI) group. These findings of suspected patterns of normalization were further supported by evidence from norm-referenced language test scores. This pattern changed significantly by grade four with performance differences greater between the ILI group and the TL group, and fewer differences noted between the ILI and PLI groups. Thus the ILI group initially demonstrated signs of recovery, but by fourth grade they produced shorter narratives, increased grammatical errors, and weaker story quality in comparison to narratives produced by the TL group.

The expressive elaboration of narratives by children with SLI was further investigated by Ukrainetz and Gillam (2009). Expressive elaboration relates not only to information about what happens to the individuals in a story, but also what they know,

think, or feel (Bruner, 1986; as cited by Ukrainetz & Gillam, 2009). Elaboration is accomplished through the use of details, lexical choices, and specific linguistic patterns. The authors examined expressive elaboration in 48 children with SLI and 48 TD children at ages 6 and 8 years.

To determine the effect of context, two narrative tasks were administered. Narratives were first elicited from a set of sequenced pictures and then from a single picture stimulus. The narratives were scored based on three primary categories of expressive elaboration: appendages, orientations, and evaluations (see Ukrainetz, Justice, Kaderavek, Eisenberg, Gillam, & Harm, 2005). Appendages cue the listener that a narrative is being told. Orientations include information pertaining to the names, roles of characters, and setting. Evaluative language is represented by the use of modifiers, figurative language, and dialogue (Ukrainetz & Gillam, 2009).

The SLI group was found to produce narratives with fewer elements of expressive elaboration across ages in comparison to the TD group. The SLI group and younger TD children demonstrated more difficulty in formulating appendages in their narratives. Although orientations were the most commonly occurring element, the SLI and younger TD groups produced fewer of these elements in comparison to the older TD group. Additionally, the SLI group produced less evaluative language elements. The study further indicated that across the two time points, the SLI group did not catch up nor fall further behind, suggesting a pattern of persistent weakness in narrative development (Ukrainetz & Gillam, 2009).

Being that narrative skills are essential to adolescents' social and academic success (Nippold, 1998; McCabe & Bliss, 2003; as cited by Reed, Patchell, Coggins, &

Hand et al., 2007), the study conducted by Reed et al. (2007) was beneficial to further understanding such skills this age group of children with SLI and TL. The participants' oral narratives were transcribed and categorized into C-units representing one C-unit per page of the wordless picture book, Frog, Where are you? (Mayer, 1969). The responses were then categorized according to four response types: Informative, Vague, Irrelevant/Inaccurate, and No Response (Loban, 1976; Coggins, Friet, & Morgan, 1998; as cited by Reed et al., 2007).

Findings did not indicate significant differences between the percentage of occurrence of No Response versus any response (Informative, Vague, Irrelevant/Inaccurate) between the SLI and TL groups. However, results approached statistical significance when comparing the No Response category amongst groups. The SLI group failed to respond almost two times more often than the TL group. Analysis of the Informative, Vague, and Irrelevant/Inaccurate responses indicated a statistically significant difference in the percentage of responses across the categories based upon the groups. Both younger and older adolescents in the SLI group produced fewer Informative responses, approximately half, in comparison to the younger and older TL adolescents. The SLI adolescents were also found to produce more than three times the number of Irrelevant/Inaccurate response types and 1.5 times as many vague responses in comparison to the TL peers (Reed et al., 2007).

Greenhalgh and Strong (2001) more closely examined the microstructure of oral narratives produced by children with LI and a TD group (ages 7 to 10 years). The authors compared the use of literate language features in these two groups. The measured aspects of literate language included: conjunctions, elaborated noun phrases

(ENP), mental and linguistic verbs, and adverbs. An ENP provides additional and explicit information about nouns and pronouns, such as two or more modifiers before a noun, qualifiers, appositives, and relative clauses (Westby, 1994; as cited by Greenhalgh & Strong, 2001).

Findings from Greenhalgh and Strong (2001) indicated trends for consistent differences among all literate language measures between the TL and LI groups. However, the only measures reaching statistical significance were the use of conjunctions and ENP per C-unit. Findings did not support previous evidence in which group means differed in NDW (Klee, 1992; Watkins et al., 1995).

For many children, written language can present with significant challenges due to the cognitive and linguistic demands of the task. Mackie and Dockrell (2004) conducted a study examining written language weaknesses in a group of 11 children (mean age 11 years) with SLI in comparison to TD children matched on chronological (N=11) or language (N=11) ages. The written narratives, elicited through a picture stimulus, were evaluated on three categories: productivity (total words written), syntax, and abstract-concrete.

A statistically significant group difference was evidenced with the SLI group producing fewer written words in comparison to the age-matched TD peers. In regards to measures of syntax, the SLI group produced a significantly greater number of grammatical errors in comparison to both age and language age-matched groups. The authors further purported that the SLI group demonstrated the ability to produce imaginative stories with abstract language that did not statistically differ from the two

comparison groups; however, measures of fluency suggested that the SLI group produced their stories at a slower rate (Mackie & Dockrell, 2004).

Narrative intervention in young children with delayed language has suggested a positive outcome in the use of story grammar elements (Davies, Shanks, Davies, 2004; Peterson, Gillam, Spencer, & Gillam, 2010). Given both the grammatical and structural weakness of narratives evidenced in children with LI (Fey et al., 2004), Swanson, Fey, Mills, and Hood (2005) examined, in a nonexperimental study design, an intervention method (narrative-based language intervention; NBLI), that addressed both of these domains in a group of 10 children with SLI (M=7;10).

The NBLI incorporated a combination of direct instruction and incidental teaching techniques. Following the NBLI, eight out of ten participants demonstrated significant improvement in overall story quality. However, improvements in NDW and grammatical complexity were not evidenced (Swanson et al., 2005).

In short, both young children and adolescents with LI present with narrative deficits at the micro- and macro-structural levels, with literature regarding the latter age group being rather sparse for both classification of skills and intervention strategies. Studies indicate weaknesses in grammatical accuracy, sentence complexity, and story quality in this clinical population (Fey et al., 2004; Greenhalgh & Strong, 2001; Reed et al., 2007). In addition to the previously reported persistent phonological processing deficits in children with resolved LI (Goulandris et al., 2000), this population may also continue to present with residual deficits in narrative development in later grades. Similarities in the narrative profiles of children with LI and RD are emerging, adding support for a continuum of skills related to language and literacy.

Overview of Expository Text Structures

Less is understood about the development of expository discourse in children in comparison to narrative skill development (Westby & Clauser, 2005). Expository text can be defined as informational, non-fiction text. Its purpose is to inform by conveying facts and ideas about a topic. Across all levels of education, content subjects may be taught with this type of text structure; however, in earlier grades content curriculum is primarily taught through narratives (McCormick, 2007; Moreau & Fidrych, 1998, 2007). In contrast, at the middle and high school levels, the majority of curriculum, either from lecture or textbooks, is presented in an expository style. Students at this level of education are expected to efficiently comprehend and produce expository text structures (Paul, 2007; Westby, 2005).

Although similar text structures can be found in narrative and expository texts (e.g., problem-solution), the macrostructure of the latter is considered more complex (McCormick, 2007; Moreau & Fidrych, 1998, 2007). Examples of expository text structures that differ from a typical narrative macrostructure include: description, cause and effect, sequence, and compare and contrast (Moreau & Fidrych, 1998, 2007). Expository text is also considered to be more challenging because it communicates novel information. Because of this, the strategy of applying background knowledge to improve comprehension may be less successful. Furthermore, expository texts contain specific vocabulary that is not typically part of a student's oral lexicon, thereby, adding to the cognitive demands of the task (McCormick, 2007).

Expository text structures contain more syntactically complex linguistic features in comparison to narrative discourse. Scott and Baltbazar (2010) propose three

categories of complex grammar that may impede comprehension of expository text: complex noun phrases, subordinate clauses, and the manner that information is grammatically structured throughout the text. An example of the latter feature would be found in a complex sentence sequence of dependent-independent clauses. The authors propose that this type of structure places the most pertinent information at the end of the sentence resulting in a more complex sentence processing task.

As previously discussed, narrative prose follows a predictable structure. Top-down processing can be used to comprehend such stereotypical patterns as these. Although expository texts contain a topic, series of statements, and a conclusion, they do not present with a predictable macrostructure (Westby, 2005; Westby & Clauser, 2005). Because the content schema and text grammar are not typically known prior to reading the text, processing such text structures requires more of a bottom-up process. This type of processing taxes one's memory load because it requires the reader or listener to hold onto, organize, and then select a text structure to fit the content schema (Westby, 2005). Moreau and Fidrych (1998, 2007) suggest that competence in this latter task, selecting an expository text structure, relies on one's ability to identify the author's purpose of the text.

ThemeMaker is a tool designed to aid children in organizing, reflecting, and commenting on non-fiction curriculum materials. ThemeMaker is an extension of the SGM tool previously discussed. Its purpose is to assist children in producing and comprehending expository material with the use of a hands-on manipulative and a variety of graphic organizers depicting expository text structures. As with the use of SGM,

instruction with ThemeMaker is conducted through the use of scaffolding and SGM's common language (Moreau & Fidrych, 1994, 2002; Moreau & Fidrych, 1998, 2007).

In summary, comprehension and production of expository text structures is a cognitively demanding task that students encounter across the curriculum. This level of literate language places children with RD or LI at a significant risk for failure. Proficiency in such tasks requires metacognitive and metalinguistic resources. Regardless of the type of text comprehension strategy selected, students should be instructed in how to apply strategies throughout the reading process (McCormick, 2007).

Expository Retelling in Children with RD and LI

Expanding examination of linguistic domains beyond that of phonological deficits to that of connected discourse is a significance of the study conducted by Puranik et al. (2007). The study examined written expository retellings of children with RD and LI. Analysis of written discourse is critical in more fully understanding the profiles and relationship of RD and LI. The authors found compelling evidence supporting the presence of nonphonological differences between the LI and RD groups, as posed by Bishop and Snowling (2004). The authors examined the behavioral similarities and differences in a written expository re-telling task in a total of 47 preadolescents and young adults, ranging in age from 11 to 21 years, with RD and LI in comparison to controls (Puranik et al., 2007).

Subjects were identified as dyslexic if they demonstrated deficits in phonological awareness, phonological memory, rapid naming, and decoding and spelling skills at the word level. This clinical group also presented with relative strengths in listening comprehension, reading comprehension, and spoken language. Subjects were diagnosed

with language impairment if they reported a history of speech and language therapy or early academic weaknesses. Additional diagnostic criteria included performance falling at least one standard deviation below the mean on reading comprehension, listening comprehension, and expressive vocabulary measures (Puranik et al., 2007).

Like Westerveld and Gillon (2010), Puranik et al. (2007) analyzed quantitative measures with the SALT computer software (Miller & Chapman, 2001; as cited by Puranik et al., 2007). The written language samples were transcribed into the computer database, and analyzed at four levels: discourse, T-unit (see Methods section for complete description of T-unit), sentence, and word. Measures of discourse included the total number of words (NTW) written and the number of details represented from the passage. At the T-unit level, measures of grammatical complexity included total T-units, mean length of T-unit, and clause density. At the sentence level, the percentage of grammatically correct sentences was determined. Lastly, analysis at the word level identified the NDW written and the spelling accuracy of words written (Puranik et al., 2007).

Although results indicated no significant differences among the three groups for measures of mean length of T-units and clause density, the LI group performed more poorly than the dyslexic and control groups on the total number and diversity of words written, the number of ideas, and the number of T-units; in contrast, the dyslexic and control groups performed similarly on these measures. Lastly, the LI and dyslexic groups performed similarly and more poorly than the control group on spelling and the percentage of grammatically correct sentences produced. The latter finding was expected for the LI group but was contrary to the authors' hypothesis for the dyslexic group

(Puranik et al., 2007). Findings further support the theory that phonological processing deficits are evident in both RD and SLI populations, as evidenced by their weaker spelling skills in comparison to the control group.

In summary, phonological and non-phonological processing deficits were evidenced in adolescents and young adults with RD and LI. Findings indicated more severe language-related deficits in the written narratives of the LI group; however, both clinical groups demonstrated weaknesses in the linguistic domain of grammatical accuracy. The exploratory study conducted by Puranik et al. (2007) begins to examine the complex relationships between phonological processing and language in children with RD and LI.

Discourse Skills in Children with Language and Learning Disabilities

In an early study conducted by Copmann and Griffith (1994), the authors investigated expository discourse in children (ages 8;33 to 13;92) with LI and LD in comparison to TD peers. Two passages of the same content, one written in a narrative structure and the other in an expository structure, were presented to each participant. Each participant was then required to retell each passage to a naïve listener, a classmate not participating in the study.

Results indicated that the LI group recalled events with less accuracy and recalled a fewer number of events in comparison to both the LD and TD groups. All groups were evidenced to recall a greater number of details from the narrative versus the expository genre. These findings support the hypothesis of a developmental progression in the comprehension and production of narrative and expository text structures (Copmann & Griffith, 1994).

Following the study of expository and narrative recall in children with LI and LD (Copmann & Griffith, 1994), Ward-Lonergan, Liles, and Anderson (1999) examined the effect of two expository discourse structures, comparison and causation, on recall abilities in adolescents (ages 12; 5 to 14;7) with comorbid language and learning disabilities (LLD) in comparison to a control group of normally achieving adolescents (NL). The participants were presented with video recordings of two social studies lectures about a fictitious country. Linguistically, each expository retelling was measured in regards to syntactic complexity (i.e., T-units, number of subordinate clauses) and number of lecture elements recalled. Additionally, efficiency measures of the expository retellings were conducted, but for the purposes of this review, are not further discussed.

The LLD group performed more poorly across linguistic measures in comparison to the control group suggesting greater difficulty in comprehending, processing and retrieving expository information. The clinical group produced fewer T-units and subordinating clauses across retellings; however, both groups produced a greater number of T-units and subordinate clauses in the retellings of the comparison structure versus the causation structure, suggesting a developmental sequence. On the other hand, both groups demonstrated greater recall in the number of factual elements from the causation lecture. In sum, the comparative expository structure is suggested to facilitate more syntactically complex and elaborated retellings, whereas the causation expository structure facilitates more efficient retrieval of information (Ward-Lonergan et al., 1999).

Scott and Windsor (2000) explored general language performance measures (GLPM) in the oral and written production of narrative and expository discourse structures in a group of LLD children (mean age = 11;5) and two control groups, a

chronological-age matched (CA) group and a language-age matched group (LA). For the purposes of this review, GLPM of productivity (i.e., total T-units, total words), lexical diversity (NDW), clausal density (number of clauses per T-unit), and grammatical accuracy (number of grammatical errors) will be discussed. As with the study conducted by Ward-Lonergan et al. (1999), the LLD group presented with comorbid learning and language deficits. The participants were presented with two videos, one depicting a narrative story structure and the other an expository discourse structure.

Analyses of the narrative and expository summaries indicated group differences on the length (total number of T-units) and complexity (mean length T-unit; MLT-unit), as well as the number of grammatical errors, with the LLD group performing more poorly in comparison to the CA group and the LA group; although, statistically significant differences were not reached for all comparisons to the LA group. The LLD group produced shorter summaries, shorter sentence structures, and a greater number of grammatical errors. Clausal density was not found to determine significant differences among groups. Furthermore, lexical diversity was found to account for only an isolated difference with the clinical group producing a significantly fewer NDW in the written narrative modality in comparison to the CA group (Scott & Windsor, 2000).

Further differences in oral versus written modalities were evidenced. The LLD group demonstrated a significantly greater number of grammatical errors in the written modality in comparison to both control groups. As hypothesized, all participants produced longer oral versus written summaries (Scott & Windsor, 2000).

Statistical differences for group and genre were not evidenced; although, overall, trends indicated increased difficulty with written expository summaries for the LLD and

LA groups. All participants produced longer narrative summaries in comparison to the expository summaries. In contrast, the MLT-unit was longer for expository versus narrative summaries. This pattern, longer T-units in expository discourse, was also evidenced in a later study of typically developing individuals in comparison to conversational output (Nippold, Hesketh, Duthie, & Mansfield, 2005). This finding supports the theory that genre begins to affect sentence structure in children ages 9 to 12 years (Scott & Windsor, 2000).

As part of a longitudinal study, Nippold, Mansfield, Billow, and Tomblin (2008) more closely examined syntax in the expository discourse in a large cohort of eighth grade adolescents with LI (mean age 13;11) and typically achieving peers. The participants were originally identified with SLI or nonspecific LI (NLI) as part of a previously referred to epidemiological study (Tomblin et al., 1997). Conversational and expository discourse samples were analyzed for MLT-unit, use of subordinate clauses (i.e., nominal, relative, adverbial), and clausal density.

For all groups, grammatical complexity was found to be greater in expository text discourse versus conversational discourse across all syntactical measures. Group differences were not evidenced on the conversational task. However, the SLI and NLI groups produced reduced MLT-unit in comparison to the TD group. Additionally, the TD group produced a greater number of relative clauses in comparison to the NLI group (Nippold et al., 2008).

In sum, these studies have provided evidence of the persistent difficulties children with LI and comorbid RD display in their development of expository text comprehension and production. These clinical groups have consistently demonstrated weaknesses in

syntactic development on expository tasks in comparison to TD peers. Therefore, these findings further support the importance of incorporating expository discourse tasks as measures of syntactic development in adolescents with LI and/or RD (Copmann & Griffith, 1994; Nippold et al., 2008; Scott & Windsor, 2000; Ward-Lonergan et al., 1999).

Summary

Overall, previous studies have demonstrated that children with LI and RD exhibit deficits in the area of phonological processing. Given the cognitive foundation of phonological development, this finding is not unexpected. In addition, the manifestation of non-phonological weaknesses in these two clinical groups is also becoming clearer; however, there is still much to be learned about these skills in older children. Children with LI and RD are not homogeneous groups. Evidence does however suggest an association supporting similar underlying phonological processes resulting in LI and RD across a continuum of severity. It is apparent from this literature review that studies carrying out in-depth analyses of phonological processing skills and narrative and expository skills in older children with LI and RD have only been minimally explored. Furthermore, intervention strategies to improve oral and written narrative and expository development, such as SGM (SGM; Moreau & Fidrych, 1994, 2002) and ThemeMaker (Moreau & Fidrych, 1998, 2007), in older children with LI and RD have yet to be investigated.

Statement of Problem

Research examining reading and reading related behaviors in children with reading and language impairments has far surpassed that of comparison studies of oral

and written discourse skills in these populations (Puranik et al., 2007). Additionally, previous research examining the relationship between RD and SLI has provided limited descriptive information in regards to linguistic error patterns evidenced in these two groups (Rispens & Been, 2007). More in depth analyses are necessary in order to provide further support for the proposed hypotheses that purport to explain the cognitive relationship of reading and language impairments (e.g., severity, dyslexia-plus). Studies implementing more comprehensive quantitative and qualitative measures regarding the behavioral profiles of oral and written language, such as expository retellings, oral and written narrative productions, and evidence-based narrative and expository text interventions for these populations are needed, particularly for older students. Single subject research examining intervention techniques to address deficits in the area of narrative and expository development are of significant importance to the field of education. The use of single subject research has been reported as a practical method for assessing behavioral interventions and experimental effects in the field of special education. Single subject research provides an experimental method of documenting causal relationships between independent and dependent variables (Horner, Carr, Halle, McGee, Odom, & Wolery, 2005).

According to Hughes et al. (1997), there are five major reasons for assessing narrative skills in children. To begin with, there are noted relationships between narrative language skills and various academic skills. Narrative skills naturally occur in a variety of environments, including home and school. Assessing narrative skills provides insight into the content (the meaning of language/semantics), form (vocabulary, word combinations, grammar), and use (pragmatic/social language) of language.

As previously noted, adolescents are expected to understand and construct expository text structures (Paul, 2007; Westby, 2005). However, studies investigating features of grammatical complexity and expository text structures in children with RD and LI are sparse. As evidenced in several studies (Copmann & Griffith, 1994; Nippold et al., 2008; Scott & Windsor, 2000; Ward-Lonergan et al., 1999), analyses of expository text development in older students are necessary in order to fully assess text structure and syntactical complexity. Assessment of narrative and expository productions provides a means of identifying strengths and weaknesses in these discourse genres in order to adjust the level of instructional materials and explicit teaching necessary for academic achievement.

SGM (SGM; Moreau & Fidrych, 1994, 2002) and ThemeMaker (Moreau & Fidrych, 1998, 2007) are tools that can easily be implemented within the regular or special education environment within a response to intervention (RTI) framework. Increases in student performance with the use of SGM instruction, as measured with authentic portfolio assessments, have been reported in the following areas: expression of ideas; increased sentence complexity; sequencing information; cause/effect; and expression of character's feelings and plan (Moreau & Fidrych, 1994, 2002); however, scientifically-based evidence of narrative development with the use of SGM instruction in children with communication and reading disorders is lacking in the literature. The following study will begin to examine the effectiveness of SGM (Moreau & Fidrych, 1994, 2002) and ThemeMaker (Moreau & Fidrych, 1998, 2007) tools for intervention targeting the production of narrative and expository text structures in children with communication and/or reading disorders.

Furthermore, the use of special education disability categories implemented in the current study provides a practical methodology for categorizing participants into the RD and LI groups. Information from this quasi-experimental single subject study will aid professionals, including SLPs, in efficiently and accurately executing assessment procedures and remediation techniques for each of these disorders or in the occurrence of comorbidity. Providing differentiated instruction to children is essential in order to meet the diverse learning needs within today's educational environment.

Purpose Statement and Research Questions

The purpose of this study was to first examine the similarities, differences, and error patterns in phonological processing, phonological working memory, oral and written narrative productions, and expository retellings in middle school-aged children diagnosed as either RD or LI. There were two phases. Phase I provided in-depth analyses of quantitative and qualitative findings to further characterize the complex similarities and differences, as proposed in the dyslexia-plus and severity hypotheses, between RD and LI in children who have a current special education identification of one of these disorders.

Phase II utilized a single-subject multiple baseline across subjects design study. Phase II, was conducted in order to determine the effectiveness of an intervention that focused on narrative and expository discourse with the use of Story Grammar Marker (Moreau & Fidrych, 1994, 2002) and Theme Maker (Moreau & Fidrych, 1998, 2007) tools and resources with children identified with RD and LI. These tools are suggested to target the improvement of oral retellings of expository texts and the production of oral

and written narrative text structures. Post-intervention assessments were conducted to further describe the impact of the intervention phase.

The following questions are posed in this study:

1. Are patterns evidenced in each clinical group (LI and RD) on measures of phonological processing and phonological working memory?
2. Are patterns evidenced in each clinical group (LI and RD) on measures of oral expository retelling?
3. Are patterns evidenced in each clinical group (LI and RD) on measures of oral narrative (story grammar elements, sentence complexity, semantics)?
4. Are patterns evidenced in each clinical group (LI and RD) on measures of written narrative (story grammar elements, sentence complexity, semantics)?
5. Are patterns based on modality (oral vs. written narrative) evidenced in each clinical group?
6. Is there a positive trend during intervention for all participants? I.e. did all participants benefit from intervention?
7. Are there changes between pre- and post-intervention measures of oral expository retelling (details recalled, length sentence complexity)?
8. Are there changes between pre- and post-intervention measures of oral narrative (story grammar stage, length, sentence complexity)?
9. Are there changes between pre- and post-intervention measures of written narrative (story grammar stage, length sentence complexity)?
10. What factors can be hypothesized to relate to any differences in outcomes that are found and therefore warrant further exploration in future studies?

CHAPTER 2

METHODS

Participants

A convenience sample was recruited from a single public middle school within a rural Connecticut school district. At the time of this study, all participants were enrolled in grades 6 to 8 and were receiving language services from this author or were receiving specialized multisensory reading instruction in the areas of decoding and encoding by this author or a special education teacher according to each child's individualized education plan (IEP). Connecticut State guidelines for eligibility of language services state that the child must demonstrate an impairment in one or more communication area and that this/these impairment(s) must have a demonstrable negative impact on the child's education. Additionally, the communication impairment must not be related to limited exposure to typical language developing experiences, nor can the communication impairment be related to the process of acquiring English as a second language.

The Connecticut state guidelines for a classification of LD (also referred to in this report as RD), follow those set forth under the Individuals with Disabilities Education Improvement Act of 2004 (IDEA 2004; as cited by Connecticut State Department of Education, 2010):

> "A disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations, including conditions such as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. Specific learning disability does not include learning problems that are primarily the result of visual, hearing, or motor disabilities, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage" (p. 5).

In regards to special education classification of LI, a child may be in need of speech and language services as a special education service if language is the primary

area of disability. A child may also be eligible for speech and language services as a related service if language is identified as a secondary area of disability. The Connecticut state guidelines for a classification of LI follow terminology set forth by ASHA (1993; as cited by Connecticut State Department of Education, 2008):

> "A language impairment is impaired comprehension and/or use of spoken, written, and/or other symbol systems. The disorder may involve (1) the form of language (phonology, morphology, syntax), (2) the content of language (semantics), and/or (3) the function of language in communication (pragmatics) in any combination" (p. 38).

For Phase I of the study, the RD/LD group consisted of ten students (8 boys; 2 girls) ranging in age from 11;10 to 14;9 (mean age of 13;0). Within the RD group, one student was also receiving speech-language services from this examiner, and two students had an earlier history of speech-language services but no longer qualified for language services. The recruited participants for the LI group consisted of five students (4 boys; 1 girl) ranging in age from 11;10 to 15;2 (mean age of 12;8). At the time of the study, all participants in the LI group received either pull-out or inclusionary language services from this examiner. Students were categorized into groups according to their primary disability; however, two of the students with a primary language disability also participated in the previously discussed specialized reading program (see Table 2.1). Exclusionary criteria for both groups eliminated children with IQ scores below 70. In addition, any child having been exposed to SGM instruction by this examiner was excluded.

Once potential participants' eligibility classifications were identified, the parents/guardians were contacted. Because the participants in this study were minors, a simplified written explanation of the study was provided to each participant and to each

potential participant's parent(s) or guardian(s). Written informed consent by each minor participant and his/her parent was obtained. This study was approved by the University of Massachusetts Institutional Review Board (IRB) and the Vernon Public School Board.

Table 2.1. Participant Characteristics

ID Code	Grade	CA	Sex	Primary Disability	Comorbid Disabilty
S-1	8	14;9	Male	RD	
S-2	6	12;3	Male	RD	
S-3	7	13;0	Male	RD	Resolved LI
S-4	6	12;7	Male	RD	
S-5	7	13;3	Male	RD	
S-6	7	13;5	Male	RD	
S-7	7	12;9	Male	RD	LI
S-8	8	13;11	Male	RD	
S-9	7	13;5	Female	RD	
S-10	6	11;10	Female	RD	Resolved LI
S-11	8	14;1	Male	LI	RD
S-12	8	15;2	Male	LI	
S-13	6	11;10	Male	LI	
S-14	6	12;6	Male	LI	RD
S-15	6	11;11	Female	LI	

Note. RD = Reading Disabled; LI = Language Impaired.

Gast (2010) suggests that selected participants for single subject research studies should have similar characteristics (e.g., age, cognition). Although the participants ranged in age and disability, the primary target population of this study was middle school-aged children with RD and LI. Of more importance to the study was to determine

similarities in participants based on assessments conducted from Phase I of the study, primarily measures of expository retelling and narrative development. This methodology was applied to assist in controlling for a wide range of variability in discourse skills prior to the start of intervention. Three children were necessary for the single subject design. However, a fourth child was recruited to prevent limitations of the study design in the event of attrition. Four boys, with a mean age of 13;2 (participants S-1, S-7, S-11, and S-13) were recruited for the intervention phase.

At the time of this study participant S-1, a white male, was an eighth grade student (CA = 14;9) receiving special education services under the LD/RD criteria. He participated in a specialized multisensory reading program based on a standard score of 52 on the Fundamental Literacy Ability Index of the Word Identification and Spelling Test (WIST; Wilson & Felton, 2004). This participant also has a medical diagnosis of Attention Deficit Hyperactivity Disorder (ADHD). Prior to grade seven, this participant attended a parochial school within the same school district. Due to concerns with reading development, his parents enrolled him in the public school system where he would have greater access to specialized reading instruction.

Participant S-7, an African American male, was enrolled in grade seven at the time of this study. This participant qualified for the school district's free and reduced lunch program. This participant was receiving special education services under the LD/RD criteria with a secondary identification of language impairment (LI). This participant qualified for the special education multisensory reading program based on a Fundamental Literacy Ability Index standard score of 68 from the WIST (Wilson & Felton, 2004). The student also had an early history of LI but was dismissed from

speech-language services prior to grade five. Also prior to grade five, this participant attended schools in Louisiana and Texas. When the participant was enrolled in the current school district, he was in grade five. At that time an additional assessment was conducted with the CELF-4 (Semel et al., 2003). A discrepancy between receptive (SS = 107) and expressive (SS = 80) language performance was identified, and he re-qualified for language services. At the time of this study, the participant was residing with his aunt and cousins while attending CT public schools.

Participant S-11 was an eighth grade student receiving services under the LI criteria based on a composite standard score of 78 on the Test of Language Competence-Expanded Edition (TLC-E; Wiig & Secord, 1998). This participant is a white male who began receiving speech and language services in an early intervention program due to delayed language acquisition. In addition, diagnostic testing conducted at age 13;3 indicated delayed word identification skills (SS = 76; composite Fundamental Literacy Ability Index = 82) as measured with the WIST (Wilson & Felton, 2004). As a result, the participant also received specialized multisensory reading instruction.

At the time of this study, participant S-13 was a grade six student. This participant, a Hispanic male, also qualified for the school district's free or reduced lunch program. He began receiving speech and language services in an early intervention program. Educational concerns for this student were, and continue to be in the area of expressive language development (SS = 68) as measured with the CELF-4 (Semel et al., 2003). Thus, his school diagnosis was LI.

Once the participants were selected for the intervention portion of the study, their parents were again contacted to confirm continued participation in the study and to

schedule intervention sessions. Due to the previously stated extenuating circumstances (extracurricular activities, transportation, etc.), random assignment of students within the intervention phase was waived, and the four participants were purposefully assigned by me. All participants fully completed the intervention condition of Phase II of the study.

Setting

Both the assessment and intervention conditions took place in my speech and language classroom within a rural Connecticut public middle school after regular school hours. The classroom setting provided access to all necessary instructional materials, such as a white board, overhead projector, and the necessary intervention tools described below. All instruction took place at a large table with each participant facing a large white board.

Assessment Overview

Phonological Processing Skills

Phonological processing skills were assessed with stimuli from two subtests, Elision and Nonword Repetition (NWR), of the Comprehensive Test of Phonological Processing (CTOPP; Wagner, Torgesen, & Rashotte, 1999). The CTOPP is a norm-referenced assessment tool that provides a valid measure for identifying deficits in phonological awareness, phonological memory, and rapid naming. The CTOPP is standardized for children age 7 to 24. Reliability coefficients for the CTOPP across the three sources of error types, internal consistency, test-re-test, and scorer are reported. Reliability measures of the Elision subtest for children ages 7 years and older are .89, .82, and .99, respectively and .84, .73, and .99, respectively, for the Blending subtest (Wagner et al., 1999).

The Elision subtest contains 20 items requiring the participant to repeat a word provided by the examiner, and then to repeat the word again without a specified syllable or sound. The NWR subtest contains 18 items (presented from a CD) requiring the participant to repeat nonwords that range in length from three to fifteen sounds (Wagner et al., 1999).

Sentence processing was measured with the Recalling Sentences subtest from the Clinical Evaluation of Language Fundamentals-Fourth Edition (CELF-4; Semel, Wiig, & Secord, 2003). This subtest is valid in content for assessing the recall and production of increasingly complex sentence structures. The subtest requires one to repeat sentences of increasing length and complexity verbatim. This subtest is standardized for children age 5 to 21;11 and has a reliability of .90 (test-re-test) and .91 (internal consistency). Because the Repeating Sentences subtest is scored objectively, inter-scorer reliability is not reported in the examiner's manual for this subtest (Semel et al., 2003).

Expository Retellings

As in Puranik et al. (2007), expository text stimuli in the areas of Social Studies (all participants) and Science (post-intervention) were presented from the Analytical Reading Inventory (ARI; Woods & Moe, 2007). The expository passages were randomly selected for the descriptive and post-intervention measures. The expository stimuli were pre-recorded with an Olympus Digital Voice Recorder VN-5000 by this examiner in order to maintain consistency in the delivery of the passages. The expository passages were presented two times to all participants.

Narrative Skills

As suggested by Peña, Gillam, Malek, Ruiz-Felter, Resendiz, Fiestas, and Sabel (2006), parallel wordless picture books were utilized in order to gather reliable pre- (all participants) and post-intervention (intervention subjects only) data for oral and written narrative text structures. Findings support the use of this dynamic assessment method as a less biased form of evaluation for children with various racial and ethnic backgrounds. The authors further suggest that such measures have greater sensitivity following intervention than more typical baseline measures; therefore, this author chose the wordless picture books, Flotsam and Free Fall by David Wiesner (2006, 1999, respectively) due to their shared author and similar story complexity and picture stimuli.

Phonological Processing and Discourse Assessment Procedures

In regards to group patterns for Phase I, phonological processing measures were analyzed with descriptive statistics (i.e., means, standard deviations). Descriptive statistics were used because the study lacked a sufficient population size for application of inferential statistics. Variability in scores is reported through standard deviations and visual representations (i.e., box plots). In regards to post-intervention assessments, comparative performance between pre- and post-intervention performance is provided in the areas of text structure (e.g., story grammar elements), length (e.g., CU, T-unit), and sentence complexity (e.g., morphosyntax). Calculations for descriptive statistics and visual representations of the data were carried out with SPSS (2007) computer software.

I conducted individual assessment measures for both the descriptive and post-intervention portions of the study at the participants' school after school hours. Initial baseline measures (all participants) required approximately a 1-hour session and

consisted of measures of phonological processing, phonological working memory, expository retelling, and oral and written narratives. Post-intervention measures required approximately a 45-minute session and consisted of the same measures as baseline, with the exception of the phonological processing and memory tasks. A tangible reinforcer (e.g., snack and gift card) was awarded to each child at the completion of each testing session.

For the descriptive portion of this study, assessments included measures of phonological processing, phonological working memory, expository retelling, and oral and written narrative production (all participants). Post-intervention assessments included measures of expository retelling and oral and written narrative production (intervention participants only). Post-intervention assessments were conducted with each participant within three days following their completion of the six intervention sessions. All expository retellings and oral narrative assessments across the study were digitally recorded with an Olympus Digital Voice Recorder VN-5000 to allow for later transcription and analyses.

For the purposes of qualitative analysis (e.g., error pattern analysis), the Elision and NWR subtests of the CTOPP (Wagner et al., 1999) and the Recalling Sentences subtest of the CELF-4 (Semel et al., 2003) were administered in their entirety. Besides the presentation of all stimuli, the directions for administration and standardized scoring were conducted according to procedures outlined in the test manuals. An additional analysis of the repeating sentences task was conducted. The number of complex sentence structures containing subordinating conjunctions within the subtest stimuli was identified

as 9 sentences. The percentage of accurately repeated complex sentence structures was then calculated for each participant.

The retelling task required the participants to retell an expository text following two presentations of the appropriate digitally pre-recorded stimulus from the ARI (Woods & Moe, 2007). Following the two presentations of the prerecorded expository text, this author stated, as suggested by Woods and Moe (2007), "Tell me everything you can remember from the passage, and I will record your story." The total possible number of details to be retold were predetermined and compiled into a scoring chart by this examiner (see Appendix A for sample). The oral retellings were then scored according to the percentage of details recalled. The open-ended probe, "Can you tell me more?" was the only allowable probe to determine whether the participant recalled more information but just had not verbalized it (Woods & Moe, 2007).

For elicitation of oral narratives, I stated, "We are going to look at the pictures in this book, and then you are going to tell me a story to go with the pictures." Prior to telling the story, the participant viewed each page of the book as this examiner turned each page after approximately five seconds of viewing. After reviewing all of the pages, this examiner opened the book to the first page and stated, as suggested by Hughes et al. (1997), "You may turn the pages yourself as you tell your story. Pretend that I cannot see the pictures, so make sure to tell the story so that I will understand it." No other prompts were provided.

Following completion of the oral narrative, this examiner stated, "Now you are going to write a story to go with the pictures in this book." Each participant was

provided with lined paper and a pencil. There were no time limits for completing either the oral or written language tasks.

Each oral and written narrative was analyzed based on a single complete episode (i.e., character, setting, initiating event, internal response, plan, attempts, direct consequence, and resolution) in order to: compare pre and post-intervention performance, quantify the percentage of story grammar elements (macrostructure) produced, and to identify, qualitatively, the child's narrative developmental stage as defined by Moreau & Fidrych (1994, 2002) in Table 2.2. An outline was compiled by this examiner as a guide for scoring the story grammar elements for the pre and post-intervention narrative tasks (See Appendix B).

The expository retells and narratives (oral and written) were analyzed in regards to measures of syntax, morphology, semantics, and length (see Table 2.3 for a summary of micro- and macrostructural analyses). The production of mazes (i.e., revisions, fillers, repetitions) was also measured for oral language tasks. As previously noted, analyses at post-intervention are reported for text structure, length, and sentence complexity (SI) only (see below). As suggested by Hughes et al. (1997), the participants' retells and narratives were transcribed and coded into the Systematic Analysis of Language computer program according to software protocols (SALT 2010 Student Version; Miller & Inglesias, 2010). The SALT program excluded any utterances that were coded as unintelligible (X) from the analyses. For a sample of SALT discourse transcriptions and codes, see Appendices C and D.

For grammatical analyses of the microstructure, each expository and oral narrative production was segmented into communication units (CUs). A CU is defined as

a main clause and its modifiers (Loban, 1976; as cited by Hughes et al., 1997). The total number of CUs, as well as measures of syntactical complexity (mean length of CUs in words; MLCU-W) and morphological complexity (mean length of CUs in morphemes; MLCU-M) were automatically calculated with the SALT program. Paul (2007) suggests using MLCU-W analyses versus MLCU-M when comparing adolescent productions to published norms; however, for Phase I of the study both analyses were conducted in order to observe any particular patterns between clinical groups. Grammatical accuracy, the percentage of grammatically correct sentences, was calculated manually by dividing the number of correct sentence structures by the total number of sentences produced.

Table 2.2. SGM Stages and Descriptions (Moreau & Fidrych, 1994, 2002)

Stage	Stage Description
Stage 1	Descriptive Sequence: description of the character and setting; labeling; causal and temporal links are absent; use of additive cohesives such as "and, and then"
Stage 2	Action Sequence: identification of character or theme; chronological or temporal order may be present; causal relationships absent; focuses on actions; use of temporal cohesive ties such as "then, first, next, when, before, after"
Stage 3	Reaction Sequence: emergence of cause-effect within initiating event; plan or goal is absent; use of cohesive ties such as "but, so, or"
Stage 4	Abbreviated Episode: emergence of emotional cause-effect; may provide an implied plan; provides a relationship/causality between the initiating event and the direct consequence; development of character emotions; use of causal ties such as "because, if"; emergence of perspective-taking
Stage 5	Complete Episode: recognizes need for plan and carries out plan; sequential events targeting the plan; emergence of critical thinking skills that answer why questions; emergence of resolution; perspective taking; use of cohesive ties such as "as a result, because"
Stage 6	Complex Episode: elaboration and critical thinking skills vital; emergence of embedded episodes; multiple sequential episodes with multiple plans, attempts, and direct consequences may be present; use of figurative language and trickery
Stage 7	Interactive Episode: perspective-taking in regards to the impact of one character's actions on another character's actions or behavior; story told from multiple perspectives

Clause density, a measure of grammatical complexity, was reported by SALT as the subordination index (SI). The SI can be calculated by dividing the total number of clauses, independent and subordinate, by the total number of CUs in the sample (Scott & Stokes, 1995). Previously reported studies have suggested that adolescents in sixth and seventh grades produce more complex sentence structures orally, but by eighth and ninth

grades, the two modalities are more commensurate. For example, on average adolescents in grade six produced a SI of 1.4 for spoken language samples and 1.3 for written language samples. In contrast, in grade eight adolescents were found to produce a SI of 1.4 for oral discourse and 1.5 for written discourse (Loban, 1976; as cited by Paul, 2007).

Table 2.3. Discourse Analyses

Macrostructure

*Number of SGM elements produced: character, setting, initiating event, internal response, plan, attempts/actions to carry out plan, resolution, and indirect consequence

*Stage of story grammar (according to SGM)

*Number of details recalled (expository retells)

*Length:
- Total words produced (TNW)
-Total CUs (oral discourse)
-Total T-units (written discourse)

Microstructure

*Syntax
-MLCU-W (oral discourse)
-MLT-unit in words (written discourse)
- Clause Density (SI)
-Cohesion (qualitative analysis of the use of conjunctive cohesive markers)

*Morphology
-MLCU-M (oral discourse)
-MLT-unit in morphemes (written discourse)

*Grammatical accuracy
-quantitative (% correct)
-qualitative (error types, patterns, etc.)

*Semantics
-NDW
-TTR

*Mazes (% of revisions, repetitions, fillers)

*Spelling Errors (% of errors and informal analyses of error types)

The written narratives were segmented as terminable units (T-units) and then coded and transcribed into the SALT program. As with the use of CUs, this measure of

grammatical complexity was used in order to avoid the complications of run-on sentences, and of sentences strung together with the conjunction "and". A T-unit is defined as a single independent clause and all attached subordinate clauses (Paul, 2007). By definition, CUs and T-units are similar, but the distinct terms are used to easily differentiate between oral and written samples (Hughes et al., 1997). As with CU analyses, a SI was calculated for the written narratives by dividing the total number of clauses by the total number of T-units produced in the written sample. Measures of MLT-units in words and morphemes were also conducted. Grammatical accuracy was manually calculated for written narratives as described for oral discourse measures. In addition, spelling accuracy was informally measured for written narratives. Qualitative examination of spelling errors in regards to syllable structure and word complexity was conducted.

Semantic performance for both oral and written discourse modalities (Phase I) was measured in regards to the total number of words (TNW), number of different words (NDW), and type-token ratio (TTR). The latter measure of lexical diversity can be calculated by dividing the NDW by the TNW produced (Hughes et al., 1997; Paul, 2007). TNW and NDW have been reported as more sensitive measures than TTR for differentiating between language impaired children and typically developing peers (Watkins, Kelly, Harbers, & Hollis, 1995); however, since the aim of this study is to assess similarities and differences between the RD and LI clinical groups, all three semantic measures were examined.

The discourse productions were further analyzed qualitatively to determine the types of grammatical errors produced within sentences (e.g., inflectional morphemes,

subject-verb agreement, fragments). Production of the conjunctive cohesive markers (Hughes et al., 1997) was also identified for descriptive measures of story grammar stage.

Intervention Stimuli

Direct instruction of Story Grammar Marker (Moreau & Fidrych, 1994, 2002) and ThemeMaker (Moreau & Fidrych, 1998, 2007) tools was provided. The SGM iconic manipulative indicating the character, setting, initiating event, internal response, plans of action, attempts, direct consequences, and resolution for narrative text structures was modeled and utilized throughout the intervention. Additionally, ThemeMaker graphic organizers pertinent to the following expository text structures and related materials (e.g., SGM stickers, SGM stamps, magnets) were also modeled and utilized throughout the intervention: descriptive, compare and contrast, problem/solution, cause/effect, and sequence. These visual supports were used in conjunction with six nonfiction short stories to model and scaffold strategies to assist participants in the comprehension and development of narrative and expository text structures. The sequence of stories and coinciding instructional tools from SGM (Moreau & Fidrych, 1994, 2002) and ThemeMaker (Moreau & Fidrych, 1998, 2007) are outlined above in Table 2.

The expository retell stimuli were taken from Visualizing and Verbalizing Stories, Books 1, 2, and 3 (Bell, 2003) and No-Glamour Reading (Hyde, 2001). These resources were utilized across the intervention phase. A total of 28 retells were elicited during the intervention phase. See Appendix E for a sample of an expository retell rubric.

Intervention Procedures

An experimental single subject multiple baseline across participants design was used for the second portion of the current study. The inclusion of multiple participants in

the single subject design provided improved external validity of the study. The study contained three conditions: baseline, intervention, and maintenance (A-baseline, B-intervention, C-maintenance). The intervention provided individual instruction (modeling and scaffolding) in the use of the Story Grammar Marker (Moreau & Fidrych, 1994, 2002) and ThemeMaker (Moreau & Fidrych, 1998, 2007) for six 1-hour sessions, with 1 to 2 sessions occurring per week. Like Phase I, Phase II of the study was conducted individually with me at the participants' school after school hours. As with the assessment sessions, each participant was rewarded with a tangible reinforcer (e.g., snack) at the beginning or end of each intervention session. Providing further external validity to the study was that each participant received the same instruction in the use of SGM (Moreau & Fidrych, 1994, 2002) and ThemeMaker (Moreau & Fidrych, 1998, 2007) tools by the same researcher.

Each intervention session began with me sitting across from the participant and reading aloud an expository short story (see Table 2.4 for story list). The story was placed on the table in front of the participant in order for him to follow along and view the pictures. The next portion of the session incorporated instruction in one or more of the graphic organizers depicting a specific expository structure. When applicable, the students were able to choose among the use of stamps, stickers, or transparencies with the white board to practice the targeted oral expository text structures during each lesson. With the use of these visual supports, the students were required to express their ideas orally and in writing during each lesson. The final portion of each session consisted of an expository retell measure discussed below.

On occasion, brief expository retelling probes were obtained during versus after school hours in order to accommodate student availability and transportation constraints. All expository retelling probes, regardless of the intervention stage, were administered to all participants either on the same day or within a three-day time frame. Due to unforeseen circumstances, there was a single exception to this timeline. The fourth intervention retell for the final participant was obtained between 5-8 days of the other participants' maintenance measures of the same retell stimulus. As previously reported, maintenance measures were not obtained for the final participant due to the end of the school year.

Table 2.4. Sequence of Expository Texts and Instructional Materials

Text	Instructional Materials
One Tiny Turtle (Davies, 2001)	*SGM manipulative *Descriptive web *Compare/Contrast map *Sequence map
A Picture Book of Martin Luther King, Jr. (Adler, 1989)	*Cause/Effect map *Sequence map *Problem/Solution map *SGM manipulative
Spiders (Gibbons, 1993)	*Descriptive web *Compare/Contrast map *Sequence map *Problem/Solution map *SGM manipulative
A Picture Book of Amelia Earhart (Adler, 1998)	*Sequence map *Problem/Solution map *SGM manipulative
Tarra & Bella (Buckley, 2009)	*Problem/Solution map *SGM manipulative *Compare/Contrast map
A Picture Book of Harriet Tubman (Adler, 1992)	*Problem/Solution map *SGM manipulative

Intervention was staggered across the four participants. This method provides experimental control by exhibiting observed changes in behavior across intervention conditions and across participants. A minimum of three baseline measures were established prior to the introduction of the intervention condition. Each consecutive participant began the intervention condition after the prior participant had completed the six one-hour intervention sessions. An independent observer, my supervisor, also scored the first 70% of the expository retellings, using the scoring procedures applied by this researcher. The independent observer was blind to which subject was participating

within the intervention phase across the scoring. Student retellings were transcribed by me and sent electronically to my supervisor. She then scored the retells and forwarded her scores to me electronically. I then compared our findings. As a result of this process, two face-to-face meetings were held to discuss discrepancies in scores. Following our discussions, inter-rater reliability was 100% (Gast, 2010).

Similar procedures as from Phase I were applied for expository retells during Phase II of the study and for post-intervention measures; however, during Phase II, the participants were provided access to visual supports. A blank sample of each graphic organizer that had been taught up to the point of each retell was placed in a random order on the table in front of the participant while he listened to the recorded expository text and during his retell of the text. At this time point, the oral prompt was changed to, "Can you tell me more using the graphic organizers?" Maintenance probes of expository retells were conducted every 2 to 3 weeks following each participant's completion of the intervention, with the exception of the final participant, as previously discussed.

Comparable methods from Phase I were also implemented for the oral and written narrative productions at post-intervention. However, at that time point, the participants were provided access to the SGM manipulative (Moreau & Fidrych, 1994, 2002). The participants were also provided with the additional oral instruction, "You can use the SGM manipulative to help you tell/write your story."

A tool for examining the fidelity of the intervention process was not provided. However, the intervention process and materials were held constant across participants. Manuals for both SGM (Moreau & Fidrych, 1994, 2002) and ThemeMaker (Moreau & Fidrych, 1998, 2007) were referred to in order to maintain the integrity of the program.

Measures for Multiple Baselines Across Participants Design

During the intervention condition, each participant served as his own control by means of multiple baselines and repeated measures as described by Gast (2010). During the intervention condition, the participants were measured on an expository retelling task, as described above, as a method of experimental control. A visual analysis of the data for each participant across conditions was developed in order to evaluate the effectiveness of the intervention condition (See Figure 3.4). This method of analysis is a traditional approach for interpreting results from a single-subject design study (Gast, 2010; Horner et al., 2005). SPSS software (2007) was used for plotting visual analyses.

Analyses of both within-conditions and between adjacent conditions of the plotted data were conducted and included the following measures (see discussion of each measure below.): level stability, changes in level within and between adjacent conditions, trend direction, changes in trend within and between adjacent conditions, and the percentage of non-overlapping data [(PND) Gast & Spriggs, 2010)].

Two important factors in regards to the level, or magnitude of data, are stability and change. Stability refers to the variability observed in a series of data. When the variability of data is low, the data are considered stable. As previously noted, a minimum of three data points are required within a condition in order determine stability, trend, or directionality. Due to the time constraints of the academic school year, the first participant began the intervention phase after three baseline measures. Because the baseline measures were not entirely stable, a split-middle method was applied to estimate the trend of the pre-intervention condition. This method, as suggested by White and Haring (1980; as cited by Gast & Spriggs, 2010), is an understandable alternative in

determining level stability when practicality does not allow for extended conditions or measures are variable. This method was also applied for the remaining participants due to the latter factor of variability across multiple baseline measures. Although tolerated, the split-middle method is reported to diminish experimental control. On the other hand, this methodology does allow for the analysis of experimental effect (Gast & Spriggs, 2010). An experimental effect, as described by Horner et al. (2005), suggests that the observation of predicted change in the dependent variable (measures of expository retellings) is a direct effect of the presentation of the independent variable (narrative and expository discourse instruction).

Four steps were required for estimating trend with the split-middle method. This process was conducted separately for both the baseline and intervention conditions across participants and for maintenance measures for the first participant (S-7). First, data for a specified condition were split in half. Next, the mid-point for each half of the data was identified. A line was then drawn through both of these noted intersections. Lastly, the line drawn was moved up or down so that an even number of data points were above and below the estimated trend line. Directionality, accelerating/improving or decelerating/deteriorating, of the trend line was then determined (White & Haring, 1980; as cited by Gast & Spriggs, 2010).

The second factor of level, the degree of change within the baseline condition, was calculated as an absolute level change. To do so, the values of the first and last data points were identified. From these points, the change in level based on direction was determined. Noted changes in level could then also be judged as improving or deteriorating (Gast & Spriggs, 2010).

For between adjacent condition analyses (A-B, B-C), changes in level, trend, and PND were conducted. In regards to level, the absolute level change was computed as previously described; however, the two data points compared were now the last data point from one condition (e.g., baseline, intervention) and the first data point from an adjacent condition (e.g., intervention, maintenance). Change in trend between conditions was described in terms of directionality, as previously discussed.

The magnitude or significance of the observed treatment effects was established by calculating the percentage of non-overlapping data point (PND) values. The greater the PND calculated, the greater the observed effect of the intervention on the target behavior. This percentage was computed by first identifying the highest data points from the baseline condition. Next, the number of data points from the intervention condition was counted (6). Then the number of data points from the intervention condition that fell above the highest value of the baseline condition was determined. Lastly, the number of data points falling above the data points for the baseline condition was divided by the number of intervention data points (6) and then multiplied by 100 (Gast & Spriggs, 2010). The PND was also calculated for comparison between the intervention and maintenance conditions. Table 3.25 was formulated to provide a summary of performance for within-conditions and between adjacent conditions across participants.

It is important to note that maintenance measures were not obtained for the final participant (S-1) in the study due to time constraints. Additionally, the minimal number of data points recommended for measuring stability and data trends within a condition is three (Gast & Spriggs, 2010). Therefore, an adequate number of data points were available for formal maintenance measures for the initial participant only.

CHAPTER 3

RESULTS

Phase I

Phonological Processing Measures

Group standard score means for three measures of phonological processing and phonological working memory (deletion, NWR, and repeating sentences) were calculated and reported according to average range of performance in comparison to same aged peers, with the average range falling between the 16th and 84th percentiles. The RD group demonstrated borderline below average performance on the deletion task (M = 17, SD = 21.437) and average performance on the NWR (M = 31.60, SD = 18.733) and Recalling Sentences tasks (M = 36.3, SD = 24.0742). The LI group also demonstrated borderline below average performance on the deletion task (M = 16.40, SD = 15.11). In addition, the LI group demonstrated below average performance on the NWR task (M = 14.20, SD = 7.662), but average performance on the Recalling Sentences task (M = 23.360, SD = 30.7322). Across tasks, the means of the RD group were higher than the means of the LI group.

Figures 3.1 – 3.3 summarize the distribution of the phonological processing data for each group. These figures depict the variability within each group across the phonological processing tasks. On the deletion task, the distribution is positively skewed with a wide range of scores for the RD group falling above the median score. Extreme high and low scores ranged from the 1st to the 63rd percentiles. The distribution for the LI group is more symmetrical with less variability among scores. In contrast, the distribution on the NWR task is symmetrical for the RD group but extreme scores ranged

from the 9th to the 63rd percentile. Distribution of the LI group's performance again suggests less variability but with data negatively skewed.

The distribution of scores on the repeating sentences task suggests the same range of performance (<1st to 75th percentile) for both groups. However, the extreme score falling at the 75th percentile for the LI group (Participant S-13) is displayed as an outlier. This data point was depicted as an outlier because the majority of scores for the LI group fell between the 0.4 and 25th percentiles.

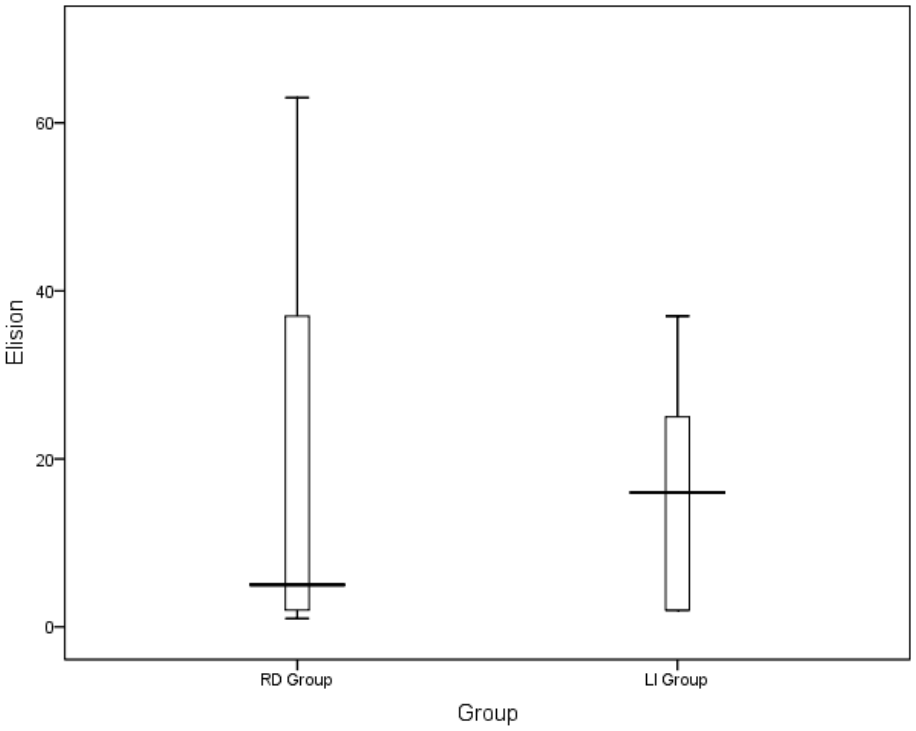

Figure 3.1. Box plots depicting the distribution of Elision (deletion; CTOPP; Wagner et al., 1999) performance for RD and LI groups. Solid horizontal lines through rectangles = median; vertical lines extending from boxes (whiskers) = extreme minimum and maximum values; quartiles above and below horizontal median line = range of data values above or below the median.

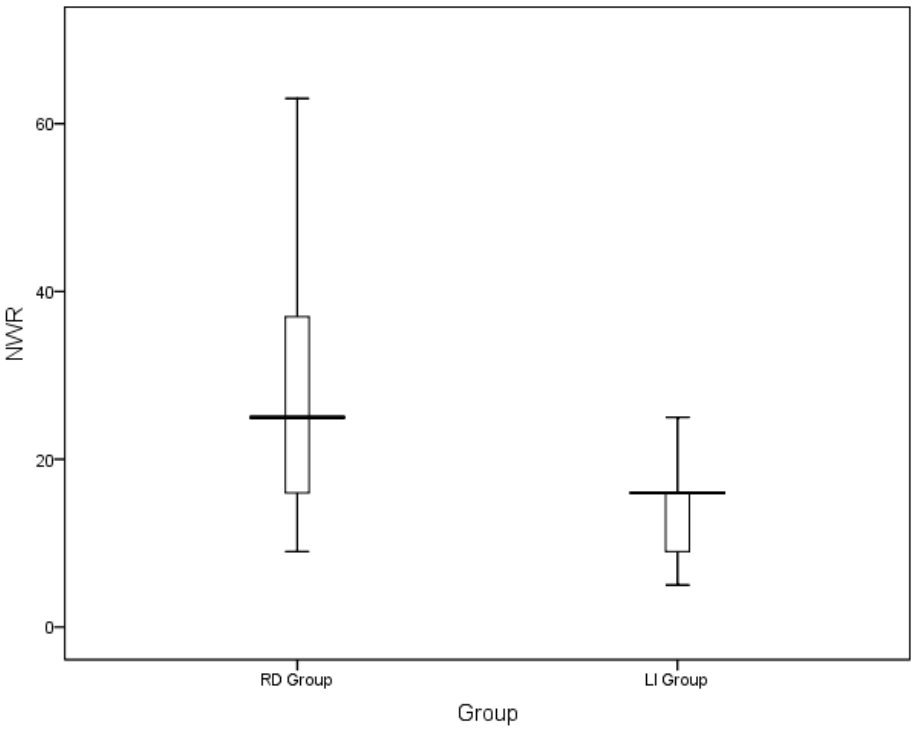

Figure 3.2. Box plots depicting the distribution of NWR (nonword repetition; CTOPP; Wagner et al., 1999) performance for RD and LI groups. Solid horizontal lines through rectangles = median; vertical lines extending from boxes (whiskers) = extreme minimum and maximum values; quartiles above and below horizontal median line = range of data values above or below the median.

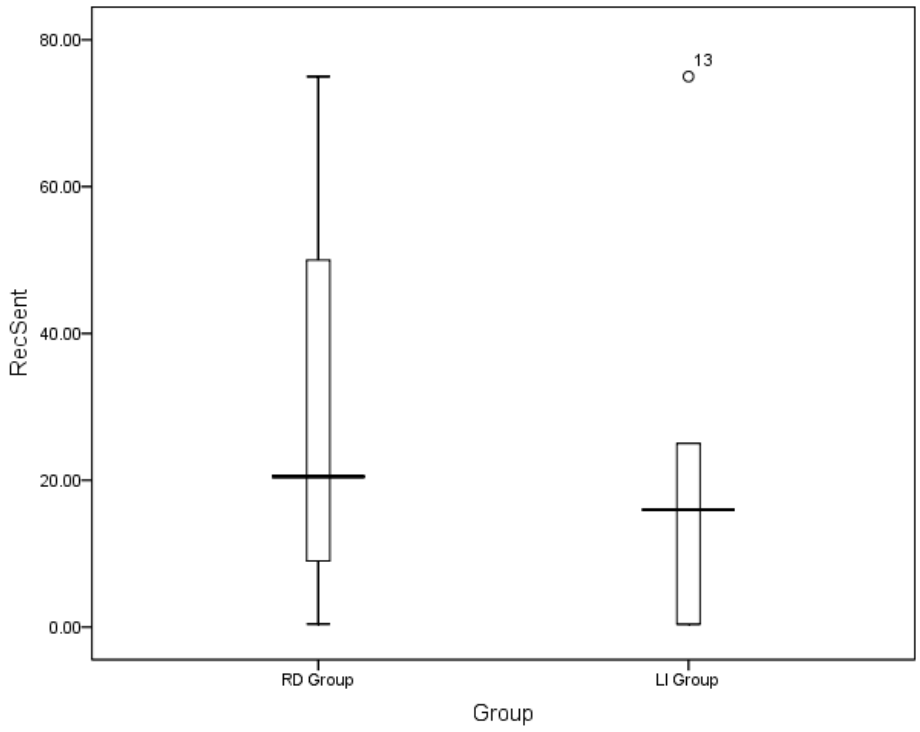

Figure 3.3. Box plots depicting the distribution of Recalling Sentences. RecSent = recalling sentences (CELF-4; Semel et al., 2003) performance for RD and LI groups. Solid horizontal lines through rectangles = median; vertical lines extending from boxes (whiskers) = extreme minimum and maximum values; quartiles above and below horizontal median line = range of data values above or below the median; score with a circle outside of whiskers = outlier value for participant S-13.

Further examination of variability in phonological performance indicated that all 5 participants in the LI group demonstrated below average performance ($\leq 16^{th}$%ile) on at least one measure of phonological processing, with 3 of the LI participants demonstrating below average performance on 2 measures, and one participant demonstrating below average performance on all 3 measures. Observed within-group differences for the RD group revealed that 8 of the 10 participants demonstrated below average performance on at least one measure of phonological processing, with 6 participants demonstrating below average performance on 2 measures, 2 participants on 1 measure, and 2 participants

demonstrating average performance across tasks. Group performances on the phonological processing tasks are summarized in Tables 3.1 and 3.2.

Table 3.1. Phonological Processing - Group Performance

Task	N	Mean	Standard Deviation
		RD Group	
Elision	10	17	21.437
NWR	10	31.60	18.733
RecallSent	10	36.30	24.074
		LI Group	
Elision	5	16.40	15.110
NWR	5	14.20	7.662
RecallSent	5	23.36	30.732

Note. RD = Reading Disabled; LI = Language Impaired; Elision = deletion (CTOPP; Wagner et al., 1999); NWR = nonword repetition (CTOPP; Wagner et al., 1999); RecallSent = Recalling Sentences (CELF-4; Semel et al., 2003).

Table 3.2. Below Average Phonological Processing Skills by Group

Group	Elision	NWR	Recalling Sentences
RD Group	70%	30%	40%
LI Group	60%	80%	60%

Note. Reading Disabled; LI = Language Impaired; Elision = deletion (CTOPP; Wagner et al., 1999); NWR = Nonword Repetition (CTOPP; Wagner et al., 1999); Recalling Sentences (CELF-4; Semel et al., 2003).

Qualitative analyses were conducted on the phonological processing tasks in order to further identify any similarities and/or differences in the patterns of the RD and LI groups. Examination of responses on the deletion task revealed that the RD group produced errors at the syllable and phoneme levels, whereas the LI group produced errors at the phoneme level only. All participants from both groups demonstrated errors when required to delete a consonant from a simple consonant blend (e.g., st). The next primary level of difficulty for both groups was the deletion of a medial consonant.

Examination of error patterns on the NWR task indicated that 80% (4/5 participants) of the LI group produced errors beginning at the one or two syllable levels. In contrast to the LI group, 30% of the RD group (3 participants) produced errors beginning at the two syllable word level. The remaining RD participants demonstrated errors beginning at the three (4 participants) and four (3 participants) syllable word levels.

Lastly, the repeating sentences task was analyzed in regards to the percentage of complex sentence structures accurately repeated verbatim. This analysis clearly showed diverse patterns in the two clinical groups with a much higher mean percent correct for the RD group (M = 32.22%) than for the LI group (M = 15.56%).

Expository Retellings

The principal reasons for administering the retelling task were to examine performance by the RD and LI groups on the recall of text details and on pertinent areas of language development based on an expository text stimulus. Analyses were conducted on both global and local structural levels. Group patterns as well as variability within

groups were examined to assist in describing observable linguistic behaviors in adolescents with RD and LI.

Macrostructure Analyses

On average, the RD group recalled 30.8% of the possible details on the expository retelling task. The LI group recalled an average 26.4% of the details. Both groups demonstrated an equal range of 24 points between high and low scores: 20 to 44 points for the RD group and 12 to 36 points for the LI group. In regards to length, the RD group produced an average of 6.6 CUs, whereas, the LI group produced an average of 4.8 CUs. In regards to the TNW produced on the retelling task, the RD group again demonstrated a higher mean (M = 57.3) than the LI group (M = 41.2). The mean NTW score for the RD group was 16 points higher than for the LI group. See Tables 3.3 – 3.4 for group performance summaries of macro- and microstructure analyses.

Table 3.3. Expository Retelling Performance for RD Group

Task	Range	Mean	Standard Deviation
CU	7.0	6.60	2.171
MLUW	4.82	8.845	1.954
MLUM	6.18	10.436	2.242
SI	.50	1.234	0.149
NTW	61	57.20	18.576
NDW	36	38.7	10.605
TTR	.23	0.692	0.075
GA	36.36	90.706	13.682
MAZES	13.0	4.70	3.592
DETAILSREC	24.0	30.80	7.554

Note. CU = communication unit; MLUW = mean length of communication units in words; MLUM = mean length of communication units in morphemes; SI = subordination index; NTW = number total words; NDW = number different words; TTR = type-token ratio; GA = grammatical accuracy; %Mazes = percentage of revisions, repetitions, and fillers; %DETAIL = percentage of details recalled.

Table 3.4. Expository Retelling Performance for LI Group

Task	Range	Mean	Standard Deviation
CU	5.0	4.80	1.924
MLUW	5.80	8.436	2.245
MLUM	7.27	9.712	3.022
SI	0.29	1.158	0.145
NTW	48.0	41.20	18.566
NDW	30.0	29.0	11.446
TTR	0.13	0.726	0.0559
GA	37.50	66.90	17.082
MAZES	9.0	5.20	3.493
DETAILSREC	24.0	26.40	9.209

Note. CU = communication unit; MLUW = mean length of communication units in words; MLUM = mean length of communication units in morphemes; SI = subordination index; NTW = number total words; NDW = number different words; TTR = type-token ratio; GA = grammatical accuracy; %Mazes = percentage of revisions, repetitions, and fillers; %DETAIL = percentage of details recalled.

Microstructure Analyses

Analyses at the level of the microstructure were conducted to determine linguistic patterns for expository retelling skills in the two disability groups. Measures of morphology and syntax showed similar patterns in each of the two groups. Measures of morphology indicated that the RD group demonstrated slightly longer sentences (MLU-M = 10.436) in comparison to the length of sentences produced by the LI group (MLU-M = 9.712). In regards to syntax, both groups demonstrated similar performance on

measures of MLU-W (RD M = 8.845; LI M = 8.436) and subordination (SI: RD M = 1.2335; LI M = 1.158).

Grammatical accuracy, as measured by the percentage of grammatically correct sentences produced, was found to be a sensitive measure for determining patterns of performance for the RD and LI groups. The LI group demonstrated difficulty in consistently formulating grammatically correct sentences (M = 66.9% correct). The RD group demonstrated minimal difficulty on this task (M = 90.706% correct). The code "utterance level error" was used to categorize awkward sentence structures that may have contained multiple errors. Although the number of CUs produced on the retelling task across participants was limited, it was noted that 60 percent of the LI group produced either utterance level errors (e.g., "And Abraham Lincoln did something didn't settled yet.") or morphological errors (e.g., omission of past tense "ed"). In contrast, utterance level errors were not observed at all in the RD group. Furthermore, only a single grammatical error in subject-verb agreement and a single morphological error (i.e., plural "s") were noted from one participant in the RD group during the expository retelling task. See Table 3.5 for a summary of individual performance at discourse and sentence levels.

Table 3.5. Individual Retelling Performance at Discourse & Sentence Levels

ID	CU	MLU-W	MLU-M	SI	%GA	%Details
			RD Group			
S-1	4.0	9.75	11.0	1.25	100	28
S-2	8.0	8.5	9.88	1.375	100	32
S-3	7.0	6.71	8.29	1.14	71.43	36
S-4	11.0	6.18	6.82	1.13	63.64	32
S-5	5.0	6.6	8.2	1.0	100	20
S-6	6.0	11.0	13.0	1.17	83	40
S-7	5.0	7.6	9.4	1.2	100	24
S-8	9.0	10.44	13.0	1.5	88.99	44
S-9	6.0	10.67	12.17	1.17	100	28
S-10	5.0	11.0	12.6	1.4	100	24
			LI Group			
S-11	4.0	8.5	9.5	1.25	50	24
S-12	3.0	5.0	5.33	1.0	67	12
S-13	8.0	7.88	8.63	1.29	87.50	28
S-14	5.0	10.8	12.6	1.25	80	36
S-15	4.0	10.0	12.5	1.0	50	32

Note. RD = Reading Disabled; LI = Language Impaired; CU = communication unit; MLUW = mean length of communication units in words; MLUM = mean length of communication units in morphemes; SI = subordination index; GA = grammatical accuracy; %Mazes = percentage of revisions, repetitions, and fillers; %DETAIL = percentage of details recalled.

Results from the semantic analyses were mixed (See Table 3.6). The RD group produced a greater NDW (M = 38.70) in comparison to the LI group (M =29.0). The

opposite pattern was evidenced with TTR, with the LI group (M = .7260) demonstrating a slightly higher TTR in comparison to the RD group (M = .692). This result should be interpreted with caution since the length of the retells was dependent on the number of details and concepts recalled by each participant.

Table 3.6. Individual Expository Retelling Performance at Lexical Level

ID	NTW	NDW	TTR
	RD Group		
S-1	39.0	30.0	0.77
S-2	68.0	40.0	0.59
S-3	47.0	30.0	0.64
S-4	68.0	44.0	0.65
S-5	33.0	23.0	0.70
S-6	66.0	49.0	0.74
S-7	38.0	31.0	0.82
S-8	94.0	59.0	0.63
S-9	64.0	40.0	0.63
S-10	55.0	41.0	0.75
	LI Group		
S-11	34.0	25.0	0.74
S-12	15.0	12.0	0.80
S-13	63.0	42.0	0.67
S-14	54.0	36.0	0.67
S-15	40.0	30.0	0.75

Note. Reading Disabled; LI = Language Impaired; NTW = number total words; NDW = number different words; TTR = type-token ratio.

In regards to the average number of mazes produced in the expository retelling samples, patterns were similar for the LI group and the RD group. A qualitative analysis of the types of mazes produced revealed that both groups produced a greater number of

fillers. Revisions were the next most common type of maze to be produced by both groups followed lastly by repetitions (See Table 3.7).

Table 3.7. Average Maze Types Produced by Groups – Expository Retelling

Group	Repetitions	Fillers	Revisions
RD Group	11.76	56.86	31.37
LI Group	23.08	42.31	34.62

Note. RD = Reading disabled; LI = Language impaired.

Oral Narrative Measures

Measures of oral narrative production were conducted in order to provide quantitative and qualitative data regarding narrative and linguistic abilities in adolescents with RD and LI. Examination of the oral narrative samples was conducted at the macro and microstructure levels. Observable patterns for between and within group performances are reported.

Macrostructure Analyses

As previously outlined, the results of macrostructural analyses are presented in regards to length and SGM measures in order to observe the patterns of oral narrative productions in adolescents with RD and LI. Table 3.8 summarizes individual story grammar performance by group for oral narrative productions. In regards to length, the LI group was found to produce an average of 25 more CUs and 151 more words in their oral narratives than the RD group. Additionally, at the macrostructure level, analysis of the percentage of SGM elements produced by each group revealed that, on average, the LI group produced one more story element than the RD group.

Qualitatively, all participants in the LI group provided a character and initiating event, but only a single participant explicitly provided a setting. For the RD group, 80% of participants provided a character in their story, 90% provided an initiating event, but only 60% provided a setting. A single participant in the RD group provided an internal response to the initiating event. Character plans were produced by 30% of the LI group but no participants in the RD group provided this element. The story rubric included a total of nine possible attempts to carry out a plan. On average, both the LI (8.2 attempts) and RD (7.7 attempts) groups produced approximately eight attempts. All participants provided a direct consequence; however, a resolution at the end of the story was not evidenced in any of the oral narrative samples.

The narrative stage of SGM was determined based on the previously described categories of story complexity in Table 2.2. Two participants in the RD group produced narratives at the most basic stage of narrative development, the descriptive sequence. Ideas within these narratives were connected, for the most part, with "and" or "and then". Two participants, one from each clinical group, produced descriptive narratives that were judged to bridge into action sequences due to the emerging use of temporal ties. Three participants in the LI group and four participants in the RD group produced solid action sequences. These oral narratives consisted of a list of chronological actions connected with additive and temporal cohesive ties. The next narrative stage, a reaction sequence, was produced by one participant from each of the groups. In addition, an emerging action-reaction narrative was produced by a participant in the RD group. Narratives at the reaction stage began to include causal cohesive ties (e.g., so, but, or) to connect ideas. Lastly, the most complex narrative sample depicting a reaction sequence and emerging

abbreviated episode was produced by a participant from the RD group. This story contained the greatest number of SGM elements but lacked the use of causal cohesive ties (e.g., because, if) to explicitly express a cause-effect relationship among ideas within the narrative.

In regards to observed patterns in the RD and LI groups, a proposed general observation is that both groups produced more narratives at the action sequence stage than any other stage. This narrative quality was previously referred to as "landscape of action". The majority of narratives were produced as a series of actions that lacked insight into the character's emotional state (Westby, 2005). Overall, the oral narratives produced by both the RD and LI groups are below age-expected levels of story grammar complexity, indicating delayed oral narrative development in both clinical groups.

Table 3.8. Individual Story Grammar Performance - Oral Narrative

ID/Group	%SGM Elements	SGM Stage
	RD Group	
S-1	62.50	Descriptive
S-2	75.0	Descriptive
S-3	68.75	Action
S-4	68.75	Reaction
S-5	75.0	Action
S-6	81.25	Action-Reaction
S-7	43.75	Action
S-8	81.25	Descriptive-Action
S-9	56.25	Action
S-10	87.50	Reaction-Abbreviated
	LI Group	
S-11	68.75	Action
S-12	81.25	Action
S-13	68.75	Descriptive-Action
S-14	81.25	Action
S-15	81.25	Reaction

Note. SGM (Moreau & Fidrych, 1994, 2002) = story grammar marker.

Microstructure Analyses

Microstructural analyses were carried out to provide observations in regards to the posited questions of linguistic abilities in adolescents with LI and RD. Similar to results reported for the expository retelling, the RD group demonstrated a slightly larger MLU-

M (M = 12.764) on the oral narrative over the LI group (M = 10.678). Although the LI group produced a greater number of CUs on the oral narrative task, the RD group produced longer sentences as measured by MLU-W (M = 11.1430 vs. M = 9.28). On average, clause density was similar in the RD (M = 1.1470) and LI (M = .968) groups. The majority of sentence structures produced within the oral narratives across participants again contained primarily a single main clause.

Measures of grammatical accuracy indicated similar findings as with the expository retelling task. This measure again identified diverse patterns of performance for the RD and LI groups. The RD group demonstrated a higher percentage of grammatically correct sentences (M = 94.164) than the LI group (M = 75.922). See Tables 3.9 - 3.12 for individual and group performance across measures of oral narrative performance.

Table 3.9. Individual Oral Narrative Performance at Discourse & Sentence Levels

ID	CU	MLU-W	MLU-M	SI	%GA
			RD Group		
S-1	18.0	10.94	13.06	1.17	94.0
S-2	68.0	10.68	11.71	1.15	94.12
S-3	42.0	8.24	9.76	1.07	97.62
S-4	60.0	10.17	11.68	1.13	88.33
S-5	27.0	13.26	15.11	1.19	88.99
S-6	32.0	12.88	15.0	1.13	90.63
S-7	25.0	12.2	13.32	1.32	100
S-8	46.0	10.96	13.0	1.11	97.83
S-9	33.0	12.36	14.27	1.03	100
S-10	82.0	9.74	10.73	1.17	90.12
			LI Group		
S-11	45.0	10.76	12.22	0.69	55.66
S-12	49.0	8.29	9.88	0.76	67.35
S-13	110.0	7.79	9.06	1.06	82.73
S-14	65.0	9.38	10.82	1.08	90.77
S-15	71.0	10.18	11.41	1.25	83.10

Note. Reading Disabled; LI = Language Impaired; CU = communication unit; MLUW = mean length of communication units in words; MLUM = mean length of communication units in morphemes; SI = subordination index; GA = grammatical accuracy.

Table 3.10. Oral Narrative Performance for RD Group

Task	Range	Mean	Standard Deviation
CU	64	43.30	20.737
MLUW	5.02	11.143	1.554
MLUM	5.35	12.764	1.785
TTR	0.27	0.348	0.0761
NTW	602	466.50	191.860
NDW	114	152.60	42.586
GA	11.67	94.164	4.511
Mazes	24	19.60	8.329
SI	0.29	1.147	0.0778
SGM	43.75	70.0	13.110

Note. CU = communication unit; MLUW = mean length of communication units in words; MLUM = mean length of communication units in morphemes; TTR = type-token ratio; NTW = number total words; NDW = number different words; GA = grammatical accuracy; Mazes = revisions, repetitions, and fillers; SI = subordination index; SGM (Moreau & Fidrych, 1994, 2002) = percentage of story elements produced.

Table 3.11. Oral Narrative Performance for LI Group

Task	Range	Mean	Standard Deviation
CU	65.0	68.0	25.846
MLUW	2.97	9.280	1.246
MLUM	3.16	10.678	1.244
TTR	0.15	0.296	0.568
NTW	451.0	617.40	182.09
NDW	70.0	130.0	28.420
GA	35.11	75.922	14.163
Mazes	29.0	32.80	14.061
SI	0.56	0.968	0.235
SGM	12.50	76.25	6.847

Note. CU = communication unit; MLUW = mean length of communication units in words; MLUM = mean length of communication units in morphemes; TTR = type-token ratio; NTW = number total words; NDW = number different words; GA = grammatical accuracy; Mazes = revisions, repetitions, and fillers; SI = subordination index; SGM (Moreau & Fidrych, 1994, 2002) = percentage of story elements produced.

Table 3.12. Individual Oral Narrative Performance at Lexical Level

Group	NTW	NDW	TTR
		RD Group	
S-1	197.0	106.0	0.54
S-2	726.0	201.0	0.28
S-3	346.0	116.0	0.34
S-4	610.0	201.0	0.33
S-5	358.0	133.0	0.37
S-6	412.0	157.0	0.38
S-7	305.0	104.0	0.34
S-8	504.0	167.0	0.33
S-9	408.0	123.0	0.30
S-10	799.0	218.0	0.27
		LI Group	
S-11	484.0	183.0	0.38
S-12	406.0	130.0	0.32
S-13	857.0	200.0	0.23
S-14	610.0	169.0	0.28
S-15	730.0	197.0	0.27

Note. Reading Disabled; LI = Language Impaired; NTW = number total words; NDW = number different words; TTR = type-token ratio.

As a variable of discourse length, the number of mazes produced during the oral narrative task was significantly larger in contrast to the expository task. Examination of the maze productions revealed that the LI group produced a greater proportion of mazes than the RD group (See Table 3.13). Further analysis of error types by group indicated

that the RD group produced similar numbers of revisions (62) and fillers (60) followed by repetitions (40). The LI group also was observed to produce many revisions (71) but repetitions (65) outnumbered fillers (14).

Table 3.13. Average Maze Types Produced by Groups – Oral Narrative

Group	Repetitions	Fillers	Revisions
RD Group	24.69	37.04	38.27
LI Group	43.33	9.33	47.33

Note. RD = Reading disabled; LI = Language impaired.

Qualitatively, the patterns of the two groups differed in that the LI group produced a greater number of verb tense errors, almost three times more than the RD group. The LI group also produced a greater number of utterance level errors (e.g., "…and the lady at the counter picked it up and took it and see if it was the same one from another ones on the rack.") as was also evidenced on the oral retelling task. Both groups demonstrated errors in the use of articles (e.g., a/an). Although the number of bound morphemes omitted (e.g., -ed, -'s, -s) was double for the LI group (4 errors), morphology was observed to be a less sensitive measure in distinguishing patterns of performance for the two adolescent groups in comparison to measures of syntax. Additionally, word level errors (e.g., seastar/starfish, fume/film, magniflash/magnifying glass, sceletope/microscope) were noted for both groups with a greater number of errors produced by the LI group (LI: 9 errors; RD: 5 errors). Furthermore, in regards to semantics, the LI group produced a higher average of NDW (M = 175.8) than the RD

group (M = 152.6); however, on average, the RD group demonstrated a higher TTR (M = .348) than the LI group (M = .296).

Written Narrative Measures

The aim of the written narrative task was to examine performance in the RD and LI groups on story structure, length, language abilities, and spelling. Secondly, performance on oral versus written narrative productions was evaluated in a later section. The latter measures were conducted in order to determine group characteristics by modality.

Macrostructure Analyses

Global analyses of the written narrative structures revealed group patterns of performance. The mean for the LI group was higher than the mean for the RD group on number of T-units produced (LI M = 27.20; RD M= 14.20). Group patterns were further observed on the NTW measure with the LI group producing an average of more than two times as many words (M = 289.40) as the RD group (M = 138.00).

The LI group also demonstrated a higher average than the RD group with respect to the number of story grammar elements included in their written samples (LI M = 58.75; RD M = 48.75). This breaks down to the LI group producing an average of 9.4 story elements versus an average of 7.8 elements produced by the RD group. In terms of specific story grammar elements, all of the participants provided a character and initiating event, and 40% of the LI group and 60% of the RD group explicitly included a setting. Only one participant from each clinical group expressed the character's internal response to the initiating event, and only one participant from the LI group included a plan. Out of the nine possible attempts, the LI group produced an average of 5.8 attempts and the RD

group produced an average of 5.1 attempts. A direct consequence was provided by 80% of the LI group and 60% of the RD group. No written samples included a resolution.

Examination of the written narrative samples suggests that the majority of the LI group performed at a higher stage of narrative complexity in contrast to the RD group. Sixty percent of the LI group produced written narratives at the reaction stage. These participants produced causally connected actions with the use of cohesive ties (e.g., but, or, so) whereas the majority of the RD group (80%) produced action sequences with the use of temporal cohesive ties. One participant from the RD group produced a narrative with causally related actions. The content of the majority of written narrative samples were again described in terms of "landscape of action" (Westby, 2005). One participant produced a narrative content that was described as emerging into "landscape of consciousness" by introducing the internal state of the character combined with the use of cohesive ties to express causally related actions. See Table 3.14 for individual story grammar performance for written narratives.

Table 3.14. Individual Story Grammar Performance - Written Narratives

ID	%SGM Elements	SGM Stage
	RD Group	
S-1	50.00	Reaction
S-2	50.00	Action
S-3	31.25	Action
S-4	56.25	Action
S-5	43.75	Action
S-6	43.75	Action
S-7	37.50	Action
S-8	50.00	Action
S-9	40.00	Action
S-10	75.00	Reaction
	LI Group	
S-11	68.75	Action
S-12	43.75	Reaction
S-13	62.50	Reaction
S-14	68.75	Reaction
S-15	81.25	Reaction

Note. SGM (Moreau & Fidrych, 1994, 2002) = story grammar marker.

Microstructure Analyses

Morphsyntactic analyses, i.e., MLTU-M and MLTU-W, showed that the LI group produced longer and more complex written sentences than the RD group. Clausal

density, on the other hand, was fairly commensurate between groups (RD M = 1.019; LI M = 1.144) with both groups producing primarily independent clauses rather than the age-expected combination of independent and subordinate clauses. Both groups demonstrated similar difficulty in constructing grammatically correct written sentences (RD M = 61.019% correct; LI M = 60.945% correct).

Qualitative analyses of grammatical error types indicated that the majority of errors were due to omissions of morphological endings (e.g., -ed, -ing, -s). This pattern was evidenced for both groups with a greater number of these error types observed in the LI group. In contrast to morphemic errors, additional verb errors (e.g., incorrect irregular verbs, omissions of linking verbs) were predominantly evidenced in the LI group.

Lexical diversity (TTR) was again observed to be greater in the written narratives of the RD group. The LI group produced a greater NDW than the RD group. Additionally, the LI group produced longer narratives, on average, than the RD group.

Analyses of spelling performance revealed that the LI group demonstrated a higher average number of spelling errors than the RD group. Qualitatively, the types of errors were more severe in the RD group. At times, the spelling was impaired to such a significant degree that transcription by this examiner was dependent on the context of the utterance. For example: "He ma it to se marpse." This utterance was interpreted to mean, "He magnified it to see Martians." This level of error was rarely the case for the LI group. Both clinical groups demonstrated difficulty in accurately spelling words containing one, two, and three syllables. Furthermore, words containing four and five syllables were notably troublesome for both groups. The proportion of words produced

at this level of complexity was also significantly lower than that of shorter words.

Individual and group performances are summarized in Tables 3.15 – 3.18.

Table 3.15. Written Narrative Performance for RD Group

Task	Range	Mean	Standard Deviation
TU	36.0	14.20	10.283
MLTUW	8.14	9.552	2.739
MLTUM	10.34	10.310	3.291
TTR	0.40	0.550	0.127
NTW	389.0	138.0	110.656
NDW	118.0	65.20	31.829
GA	100.0	61.019	35.855
SI	0.58	1.019	0.151
SPERRORS	105.0	27.40	31.952
SGM	43.75	48.75	11.711

Note. TU = terminable unit; MLTUW = mean length of terminable units in words; MLTUM = mean length of terminable units in morphemes; TTR = type-token ratio; NTW = number total words; NDW = number different words; GA = grammatical accuracy; SI = subordination index; SPERRORS = spelling errors; SGM (Moreau & Fidrych, 1994, 2002) = percentage of story elements produced.

Table 3.16. Written Narrative Performance for LI Group

Task	Range	Mean	Standard Deviation
TU	34.0	27.20	13.646
MLTUW	5.78	10.560	2.654
MLTUM	6.41	11.394	2.658
TTR	0.13	0.456	0.493
NTW	441.0	289.40	186.581
NDW	144.0	125.0	61.237
GA	37.0	60.954	14.385
SI	0.30	1.144	0.139
SPERRORS	106.0	39.60	40.759
SGM	25.0	58.75	11.354

Note. TU = terminable unit; MLTUW = mean length of terminable units in words; MLTUM = mean length of terminable units in morphemes; TTR = type-token ratio; NTW = number total words; NDW = number different words; GA = grammatical accuracy; SI = subordination index; SPERRORS = spelling errors; SGM (Moreau & Fidrych, 1994, 2002) = percentage of story elements produced.

Table 3.17. Individual Written Narrative Performance at Lexical Level

ID	NTW	NDW	TTR
	RD Group		
S-1	91.0	56.0	0.62
S-2	149.0	70.0	0.47
S-3	36.0	26.0	0.72
S-4	61.0	45.0	0.74
S-5	85.0	52.0	0.61
S-6	96.0	56.0	0.58
S-7	107.0	51.0	0.48
S-8	198.0	85.0	0.43
S-9	132.0	67.0	0.51
S-10	425.0	144.0	0.34
	LI Group		
S-11	239.0	115.0	0.48
S-12	180.0	91.0	0.51
S-13	149.0	70.0	0.47
S-14	207.0	97.0	0.47
S-15	621.0	233.0	0.38

Note. Reading Disabled; LI = Language Impaired; NTW = number total words; NDW = number different words; TTR = type-token ratio.

Table 3.18. Individual Written Narratives – Discourse & Sentence Levels

ID	TU	MLTUW	MLTUM	GA	SI	SPELLING
			RD Group			
S-1	7.0	13.0	14.86	42.86	1.33	12.0
S-2	14	11.36	10.64	78.57	1.0	41.0
S-3	6.0	6.0	6.16	0.0	0.75	8.0
S-4	10.0	6.1	6.4	0.13	0.91	344.0
S-5	9.0	9.44	9.89	77.88	1.0	12.0
S-6	13.0	7.38	8.23	100.0	1.06	35.0
S-7	11.0	9.73	10.09	81.82	1.0	5.0
S-8	14.0	14.14	16.5	71.43	1.08	6.0
S-9	16.0	8.25	9.38	62.5	0.94	11.0
S-10	42.0	10.12	10.95	95.0	1.12	110.0
			LI Group			
S-11	17.0	14.06	15.65	58.82	1.17	30.0
S-12	20.0	9.0	10.55	85.0	1.25	3.0
S-13	23.0	8.7	9.35	52.17	1.0	36.0
S-14	25.0	8.28	9.24	48.0	1.0	20.0
S-15	51.0	12.76	12.18	60.78	1.3	109.0

Note. TU= terminable unit; MLTUW = mean length of terminable units in words; MLTUM = mean length of terminable units in morphemes; GA = grammatical accuracy; SI = subordination index; SPELL = number of spelling errors.

Oral vs. Written Narrative Performance

Macrostructure

Examination of oral and written narrative macrostructures indicated that the RD group demonstrated shorter average narrative lengths as well as less complex levels of story structure than the LI group in both oral and written modalities. Although both groups produced inadequate levels of story structure, closer examination revealed that 40% of the LI group and 30% of the RD group produced a more complex narrative stage in the written modality. In contrast, 40% of participants in the RD group and 20% of the LI group were found to produce less mature narrative structures in the written modality. See Tables 3.19 and 3.20 for group performance summaries.

Table 3.19. Oral vs. Written Narrative Macrostructure for RD Group

Task	Mean	Standard Deviation
CUORAL	43.30	20.737
TUWRIT	14.20	10.283
NTWORAL	466.50	191.860
NTWWRIT	138.0	110.656
SGMORAL	70.0	13.110
SGMWR	48.750	11.711

Note. CUORAL = communication unit oral; TUWRIT = terminable unit written; NTWORAL = number total words oral; NTWWRIT = number total words written; SGMORAL (Moreau & Fidrych, 1994, 2002) = percentage of story elements oral; SGMWR (Moreau & Fidrych, 1994, 2002) = percentage of story elements written.

Table 3.20. Oral vs. Written Narrative Macrostructure for LI Group

Task	Mean	Standard Deviation
CUORAL	68.00	25.846
TUWRIT	27.20	13.646
NTWORAL	617.40	182.090
NTWWRIT	289.40	186.581
SGMORAL	76.250	6.847
SGMWR	58.750	11.354

Note. CUORAL = communication unit oral; TUWRIT = terminable unit written; NTWORAL = number total words oral; NTWWRIT = number total words written; SGMORAL (Moreau & Fidrych, 1994, 2002) = percentage of story elements oral; SGMWR (Moreau & Fidrych, 1994, 2002) = percentage of story elements written.

Morphosyntax

Patterns based on modality were clearly evidenced. The means of the RD group were higher than the means of the LI group on oral narrative measures of morphology and syntax. Conversely, the means of the LI group were higher than the means of the RD group across the same measures for the written narratives with the exception of clause density. Performance on this measure was fairly commensurate between groups. Furthermore, averages of GA were higher for oral versus written narratives in both the RD and LI groups. See Tables 3.21 and 3.22 for summaries of morphosyntax performance.

Table 3.21. Oral vs. Written Morphosyntax for RD Group

Task	Mean	Standard Deviation
MLUWORAL	11.143	1.554
MLUWWRIT	9.552	2.739
MLUMORAL	12.764	1.785
MLUMWRIT	10.310	3.291
GAORAL	94.164	4.511
GAWRIT	61.019	35.855
SIORAL	1.1470	0.0778
SIWRIT	1.019	0.151

Note. MLUWORAL = mean length of communication units in words oral; MLUWWRIT = mean length of terminable units in words written; MLUMORAL = mean length of communication units in morphemes oral; MLUMWRIT = mean length of terminable units in morphemes oral; GAORAL = grammatical accuracy oral; GAWRIT = grammatical accuracy written; SIORAL = subordination index oral; SIWRIT = subordination index written.

Table 3.22. Oral vs. Written Morphosyntax for LI Group

Task	Mean	Standard Deviation
MLUWORAL	9.280	1.246
MLUWWRIT	10.560	2.654
MLUMORAL	10.678	1.244
MLUMWRIT	11.394	2.658
GAORAL	75.922	14.163
GAWRIT	60.954	14.385
SIORAL	0.968	0.235
SIWRIT	1.144	0.139

Note. MLUWORAL = mean length of communication units in words oral; MLUWWRIT = mean length of terminable units in words written; MLUMORAL = mean length of communication units in morphemes oral; MLUMWRIT = mean length of terminable units in morphemes oral; GAORAL = grammatical accuracy oral; GAWRIT = grammatical accuracy written; SIORAL = subordination index oral; SIWRIT = subordination index written.

Semantics

Diverse patterns in the area of semantics were observed on the narrative tasks; however, differences as a result of modality were not evidenced. The RD group, as previously reported, demonstrated higher TTR levels across oral and written narratives whereas the LI group produced a greater NDW across modalities. In general, the LI group produced more language; however, the "quality" of the language output, as measured by lexical diversity, was greater in the RD group. See Tables 3.23 and 3.24 for summaries of semantic performance by group.

Table 3.23. Oral vs. Written Semantics for RD Group

Task	Mean	Standard Deviation
TTRORAL	0.348	0.0761
TTRWRIT	0.550	0.127
NDWORAL	152.60	42.586
NDWWRIT	65.20	31.829

Note. TTRORAL = type-token ratio oral; TTRWRIT = type-token ratio written; NDWORAL = number of different words oral; NDWWRIT = number of different words written.

Table 3.24. Oral vs. Written Semantics for LI Group

Task	Mean	Standard Deviation
TTRORAL	0.296	0.0568
TTRWRIT	0.456	0.0493
NDWORAL	175.80	28.420
NDWWRIT	125.0	61.237

Note. TTRORAL = type-token ratio oral; TTRWRIT = type-token ratio written; NDWORAL = number of different words oral; NDWWRIT = number of different words written.

Phase II: Intervention

Single Subject Multiple Baseline Design Study

The aim of Phase II in the current study was to examine the effectiveness of discourse instruction in expository and narrative genres in children with RD and LI. In order to facilitate visual analysis, performance measures in this single subject multiple baseline study are depicted visually for each participant across conditions (see Figure 3.4). For an additional summary of performance across participants and conditions, see Table 3.25. The performance of each participant is discussed in the order of the applied intervention. The split-middle method (see Methods) was used as a measure of trend stability during each phase of the A-B-C design; it yielded estimated trend lines as referred to in Table 3.25.

Additionally, it is important to note that, because of the impact and unpredictability of background knowledge for each of the expository retelling topics, variability in baseline performance was expected. However, because the baseline-estimated trends (to be discussed below) were identified as stable (participant S-1) or decelerating (remaining participants), the intervention phase was started for each participant at the designated time points.

Participant S-7

The estimated trend line at baseline for the first participant in the study (S-7) demonstrated a decelerated slope. A decelerated slope indicates a decline in ordinate value over time and can be considered contratherapeutic (Gast & Spriggs, 2010). That is, at baseline, an improvement in expository retelling was not evidenced as a result of an outside variable. Additionally, analysis of absolute level change (i.e., difference between

first and last data points) for the baseline condition showed a pattern of decline, further supporting a decelerating trend.

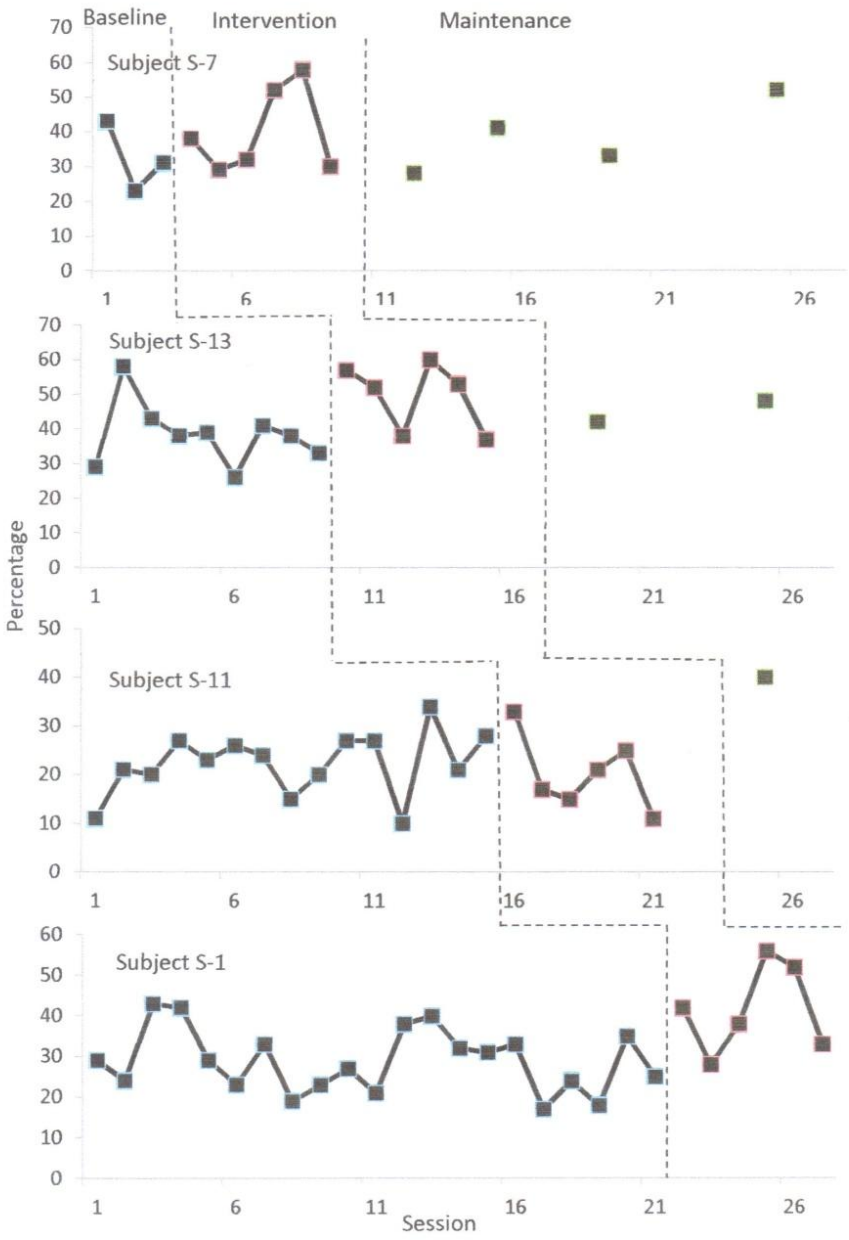

Figure 3.4. Single subject multiple baseline results across conditions. Data are displayed for each subject across conditions (baseline, intervention, maintenance), as applicable. The dashed lines separate the conditions (baseline, intervention, maintenance) across participants, as applicable.

As previously noted, the estimated trend line for the intervention condition was also treated with the split-middle method. An accelerated slope was observed for participant S-7. This estimated trend suggests an improvement in performance based on the applied intervention. This is in contrast to the decelerating slope observed at baseline.

For comparison between the A-B conditions (i.e., between baselines and intervention phases), absolute levels were calculated as previously discussed (difference between last data point from baseline and fist data point from intervention). As evidenced by this measure, participant S-7 demonstrated an increase of 7 points indicating an immediate improvement as a result of the intervention phase. In order to determine the magnitude of the observed treatment effects across the intervention phase, the PND was calculated (see Methods). For the current participant, 33.33% of the compiled data points were identified as non-overlapping. Calculating the PND was important in order to determine the efficacy of the applied intervention. Because the percentage of change across conditions was small versus compelling, findings refute a functional relationship between the applied intervention and expository retelling performance (Horner et al., 2005).

As previously noted, formal maintenance measures were conducted for participant S-7 only. The estimated trend for the maintenance condition indicated a positive slope; however, absolute levels and PND were also calculated for comparison of the B-C conditions in order to determine the significance of the participant's performance during the maintenance condition. The absolute level indicated a decline in performance. In addition, non-overlapping data points between the intervention and maintenance conditions were not evidenced. In other words, data points conducted during the

maintenance phase did not continue to increase above the range of data points within the baseline or intervention conditions.

Participant S-13

The estimated trend line at baseline for the second participant (S-13), as calculated with the split-middle method, also revealed a decelerated slope indicating a lack of improvement in expository retelling performance from an extraneous variable. However, the absolute level change for the baseline condition showed a slight increase of four points (29-33 points). Variability in performance was also observed for this participant across stimuli.

For comparison between conditions, the absolute level indicated an increase in performance between the A-B conditions of 24 points for participant S-13; however, the estimated trend line for the intervention condition demonstrated a zero celerating slope. A single point increase was identified across the trend line. The PND of 16.67% indicated a minimal change, again refuting a functional relationship between the applied discourse intervention and expository retelling performance. Because only two data points were measured during the maintenance phase for the second participant, versus the required three data points, calculations were not carried out for this condition.

Participant S-11

The estimated baseline trend, calculated with the split-middle method, indicated a decelerating trend for the third participant (S-11). As previously noted, a decelerating trend indicates lack of improvement of the dependent variable as the result of an uncontrolled factor. However, a large absolute level change of 17 points was determined within the baseline condition. Variability across the intervention condition was also

observed for this participant. Comparison between baseline and intervention phases indicated an accelerating slope with an absolute level change of 5 points. Despite this, the magnitude of the observed treatment effects, determined by calculating the PND, was 0%, indicating that this participant did not demonstrate improvement as an outcome of the applied intervention program. As for the second participant, calculations for the maintenance condition were also not conducted for the third participant because this condition lacked the required three data points for carrying out such measures.

Participant S-1

Performance for the final participant (S-1) revealed a stable estimated trend line which indicates fairly consistent performance across the condition. Furthermore, improvement was not evidenced during the baseline condition as a result of an uncontrolled variable. A decline in absolute level change (4 points) was also observed within the baseline condition.

The estimated trend for the intervention condition revealed a positive slope based on the split-middle method. An absolute level change of 17 points was noted for between baseline and intervention conditions; however, no data points from the intervention condition were observed outside of those from the baseline condition. Similar to the first participant, the PND was found to be only 33.33%. As with participant S-7, the intervention failed to demonstrate a significant change in S-1's expository retelling skills as a direct consequence of the intervention condition.

Table 3.25. Summary of Trends & Magnitude of Change Across Conditions

ID	Trend-Baseline	Trend-Intervention	PND-Intervention	Trend-Main
S-7	DC	AC	33.33	AC
S-13	DC	ZC	16.67	n/a
S-11	DC	AC	0	n/a
S-1	ZC	AC	33.33	n/a

Note. AC = accelerating DC = decelerating; ZC = zero celerating; PND = percentage of non-overlapping data points; n/a = not applicable.

Post-Intervention Performance

The purpose of the post-intervention assessments was to further examine the effects of the applied intervention on expository recall and oral and written narrative structures in comparison to measures administered during Phase I. Post-intervention assessments provided an opportunity for participants to independently apply targeted text structure strategies from the intervention phase. Patterns of both individual and group performance are discussed for post-intervention measures.

Expository Retellings

Macrostructure Analyses

The applied intervention did not specifically target increased length; however, it did so indirectly by providing the schema (e.g., graphic organizers) of various expository text structures to assist participants in recalling a greater number of details. Findings indicated that 75 percent of the participants (S-1, S-11, S-13) recalled more details, ranging from 1-5 more details, at post-intervention. The production of a greater number of details resulted in a greater number of CUs produced at post-intervention for the same 75 percent of participants. The participant (S-13) not evidencing consistent improvement

across measures of output (i.e., CU and details) was from the LI group. It was further indicated that the RD group demonstrated higher averages than the LI group on output measures of the numbers of CUs (RD: M = 9; LI: M = 6) and details produced (RD: M = 30; LI: M = 23.5). It was also observed that all of the participants looked at the displayed graphic organizers for assistance during the post-intervention expository retelling task.

Microstructure Analyses

An increase in the production of temporal and causal cohesive ties was not evidenced at post-intervention for expository discourse productions as measured by sentence complexity (SI). Participants in both groups continued to produce sentence structures containing primarily independent clauses. See Table 3.26 for a summary of the participants' expository retelling performance.

Table 3.26. Pre- vs. Post-Intervention: Length & SI - Expository Retellings

ID	CU-Pre	CU-Post	Details-Pre	Details-Post	SI-Pre	SI-Post
S-1	4	7	28	29	1.25	1.14
S-7	5	11	24	31	1.20	1.00
S-11	4	9	24	29	1.25	1.11
S-13	8	3	28	18	1.29	1.00

Note. CU-Pre = communication units at pre-intervention; communication units at Post = communication units at post-intervention; Details-Pre = percentage of details recalled at pre-intervention; Details-Post = percentage of details recalled at post-intervention; SI-Pre = subordination index at pre-intervention; SI-Post = subordination index at post-intervention.

Oral Narratives

Macrostructure Analyses

Analyses of oral narrative structures at post-intervention indicated an increase in the length, as measured by CUs, by the RD group and a reverse pattern observed in the LI group. Findings further indicated a greater number of story elements (2 to 5 more) in the oral narratives of all participants at post-intervention. However, the production of essential story elements, the character's internal state, plan of action, and resolution, were still not observed at post-intervention. The reported increase in the percentage of possible story elements produced was primarily an increase in the number of character attempts to carry out the plan. It should be noted that the participants were not observed physically using or referring to the SGM (Moreau & Fidrych, 1994, 2002) manipulative during post-intervention assessments of either oral or written narratives.

Examination of oral narrative productions in regards to stages of SGM (Moreau & Fidrych, 1994, 2002) development indicated that a single participant (S-7) demonstrated an increase in narrative complexity. This participant, from the RD group, produced causal cohesive ties to connect actions resulting in a reaction sequence at post-intervention measures. No additional changes in the types of cohesive ties produced were evidenced for the remaining participants at post-intervention. See Tables 3.27 - 3.29 for summaries of post-intervention oral narrative performance.

Table 3.27. Pre- vs. Post-Intervention: Story Elements & Stage - Oral Narratives

ID	SG-Pre	SG-Post	SGM Stage-Pre	SGM Stage-Post
S-1	62.50	70.59	Descriptive	Descriptive
S-7	43.75	70.59	Action	Reaction
S-11	68.75	70.59	Action	Action
S-13	68.75	70.59	Descriptive-Action	Descriptive-Action

Note. SG-Pre = percent of story grammar details produced at pre-intervention; SG-Post = percent of story grammar details produced at post-intervention; SGM = story grammar marker (Moreau & Fidrych, 1994, 2002).

Table 3.28. Pre- vs. Post-Intervention: Cohesion - Oral Narratives

ID	Types of Cohesive Markers-Pre	Types of Cohesive Markers-Post
S-1	Additive	Additive
S-7	Additive-Temporal	Additive-Temporal-Causal
S-11	Additive-Temporal	Additive-Temporal
S-13	Additive	Additive

Note. SGM = story grammar marker (Moreau & Fidrych, 1994, 2002).

Table 3.29. Pre- vs. Post-Intervention: CU & SI - Oral Narratives

ID	CU-Pre	CU-Post	SI-Pre	SI-Post
S-1	18	24	1.17	1.08
S-7	25	35	1.32	1.40
S-11	45	27	0.69	1.19
S-13	110	37	1.06	1.05

Note. CU-Pre = communication units at pre-intervention; CU-Post = communication units at post-intervention; SI-Pre = subordination index at pre-intervention; SI-Post = subordination index at post-intervention.

Microstructure Analyses

Microstructural analysis of clause density in the oral narratives at post-intervention indicated an increase in SI measures for half of the participants (S-7, S-11) with participant S-7 reaching expected grade level SI performance. Both the RD (M = 1.24) and LI (M = 1.12) groups demonstrated similar performance on this latter measure. Participant (S-7) produced the most complex type of cohesive ties (i.e., causal) in comparison to other participants at post-intervention. This participant produced 32% of CUs as complex sentence structures prior to intervention and 28.57% of CUs as complex sentences at post-intervention; however, a reverse pattern was noted in clausal density. This latter finding was the result of the production of an increased number of embedded clauses (e.g., sentences containing 3 clauses) at post-intervention, which increased his SI score (e.g., "Then he saw these pages and stuff floating by him like the book that he was looking at before he fell asleep.").

Written Narratives

Macrostructure Analyses

Improvement was noted for 75% of the participants (S-1, S-7, S-13) in regards to the number of story elements produced (1-4 more elements). Findings varied within the RD and LI groups. One participant from the LI group (S-11) demonstrated a decline in percentage of story elements. As was noted for the oral narrative productions, the increases in story elements were primarily the result of the remaining participants producing a greater number of attempts to carry out the plan. However, one participant from the RD group (S-1) did include a resolution in his written narrative. In comparison to pre-intervention analyses, this same participant (S-1) demonstrated a decline in his narrative structure based on the types of cohesive ties he produced. A participant from the LI group (S-13) demonstrated an improvement in narrative complexity, going from a descriptive sequence to an action sequence. The remaining two participants maintained similar levels of complexity in comparison to pre-intervention measures.

A more fine grained analysis of narrative stage based on cohesion indicated varied performance with two participants, one from each group (S-1, S-11), producing fewer types of cohesive ties in their narratives and the other two participants (S-7, S-13) showing an increase in the types of cohesive ties produced. In reference to the length of written narratives, all participants produced a greater number of T-units at post-intervention. See Tables 3.30 - 3.32 for summaries of post-intervention written narrative performance.

Table 3.30. Pre- vs. Post-Intervention: Story Elements – Written Narratives

ID	SG-Pre	SG-Post	SGM Stage-Pre	SGM Stage-Post
S-1	50.00	52.94	Reaction	Descriptive
S-7	37.50	47.06	Action	Action
S-11	68.75	64.71	Action	Action
S-13	50.00	70.59	Descriptive	Action

Note. SG-Pre = percent of story grammar details produced at pre-intervention; SG-Post = percent of story grammar details produced at post-intervention; SGM = story grammar marker (Moreau & Fidrych, 1994, 2002).

Table 3.31. Pre- vs. Post-Intervention: Cohesion - Written Narratives

ID	Types of Cohesive Markers-Pre	Types of Cohesive Markers-Post
S-1	Additive-Temporal-Causal	Additive-Temporal
S-7	Additive-Temporal	Additive-Temporal-Causal
S-11	Additive-Temporal	Additive-Temporal-Causal emerging
S-13	Additive-Temporal	Additive

Note. SGM = story grammar marker (Moreau & Fidrych, 1994, 2002).

Table 3.32. Pre- vs. Post-Intervention: T-Units & SI - Written Narratives

ID	TU-Pre	TU-Post	SI-Pre	SI-Post
S-1	7	12	1.33	1.08
S-7	11	17	1.00	1.06
S-11	17	19	1.17	1.00
S-13	23	27	1.00	0.96

Note. TU-Pre = terminable units at pre-intervention; TU-Post = terminable units at post-intervention; SI-Pre = subordination index at pre-intervention; SI-Post = subordination index at post-intervention.

Microstructure Analyses

At post-intervention, measures of sentence complexity were found to slightly decrease across subjects with the exception of one participant from the RD group (S-7). This was the same participant who demonstrated the greatest improvement in clause density on the oral narrative at post-intervention. Although the overall length of the written narrative increased across participants, the same pattern was not observed for sentence complexity. Furthermore, informal comparisons continued to reveal depressed measures of SI compared to that of typical peers for all participants at post-intervention (see Scott, 1989; as cited by Paul, 2007).

In sum, post-intervention assessments suggest positive effects of the SGM (Moreau & Fidrych, 1994, 2002) and ThemeMaker (Moreau & Fidrych, 1998, 2007) intervention across participants and genres in regards to output. This pattern was revealed in the oral modality across subjects but in only 75 percent of the subjects in the written modality, with the participant who did not improve coming from the LI group. All participants recalled more details for the expository genre and produced more story

grammar elements on oral narratives at post-intervention. However, oral narrative productions continued to be longer in comparison to oral expository structures. Post-intervention assessments also suggest some positive effects of the intervention on narrative and sentence complexity across modalities.

CHAPTER 4

DISCUSSION

Phase I: Phonological Processing & Linguistic Performance

The primary purpose of Phase I of the current study was to examine the phonological processing and linguistic skills in adolescents with RD and LI. A non-experimental design was applied in order to assess quantitative and qualitative patterns in these two groups, which were defined using special education qualification criteria. This methodology provided a means of assessing adolescents with RD and LI based on the practicality of a typical school-based speech-language pathologist's caseload. Although considerable heterogeneity was observed within the RD and LI groups in this study, several patterns emerged in the areas of phonological processing and linguistic performance.

Patterns in Phonological Processing and Working Memory

As reported, a number of studies have evidenced a common core deficit in phonological processing in children with RD and LI (e.g., Catts et al., 2001; Goulandris et al., 2000; Larkin & Snowling, 2008; Rispen & Been, 2007; See Catts et al., 2005 for opposing viewpoints). In the current study, two areas of phonological processing were examined, phonological awareness (i.e., deletion) and phonological working memory (i.e., NWR, repeating sentences). A common deficit in phonological processing was observed in the two clinical groups; however, the patterns of phonological processing difficulties were variable both within and between the groups.

Findings indicated that the RD and LI groups demonstrated similar and delayed performance in the area of phonological awareness, which was manifested on the deletion

task. In contrast, the RD group demonstrated average performance on both measures of phonological working memory. The LI group demonstrated below average performance on the NWR task in comparison to reported norms, but average performance on the other phonological working memory task, repeating sentences. To further explain this unexpected finding of mean performance falling within levels similar to nondisabled peers on the repeating sentences task, the dispersion of scores was examined. Significant variability was observed on this task for the LI group, as depicted in Figure 3.3, with an outlier score skewing the overall mean for the LI group. Additionally, since the comprehension and production of complex sentence structures is critical to learning at the middle school level, the repeating sentences task was further analyzed in regards to the percentage of complex sentence structures accurately repeated verbatim. The findings on this measure showed an expected and greater difficulty on average in processing and retrieving complex language structures in the LI group than the RD group. Given prior research on the constraints of phonological working memory in children with LI, these findings were expected (Gathercole & Baddely, 1990; Goulandris et al., 2000; Larking & Snowling, 2008; Rispen & Been, 2007).

Error analyses of phonological tasks indicated that the majority of errors on the deletion task were at what would be considered complex levels of phoneme deletion (e.g., single consonant deletion from a simple consonant blend, medial consonant deletion). This finding was expected given the age of the participants. Further analysis revealed that, as a group, the RD participants demonstrated difficulty on the deletion task beginning at the syllable level in contrast to the LI group demonstrating difficulty beginning at the phoneme level. This finding supports a common deficit in phonological

processing with the RD group demonstrating difficulty at earlier developmental levels of phonological awareness in comparison to the LI group. Given the strong association of phonological awareness with reading development, this latter finding was not surprising (Anthony & Lonigan, 2004; Torgesen, Morgan, & Davis, 1992; Wagner & Torgesen, 1987; Wagner, Torgesen, Laughon, Simmons, & Rashotte, 1993).

In regards to patterns of phonological working memory, analysis of error patterns on the NWR task indicated that the majority of the LI group demonstrated a breakdown starting at words containing one or two syllables and the majority of the RD group demonstrating errors beginning in more complex word structures (i.e., three or four syllable words). Additionally, as noted, overall average performance on the repeating sentences task for the LI group was unexpected and can be best explained in terms of the variability of impaired linguistic domains within the LI group (e.g., receptive versus expressive impairments). As previously noted, children with LI are a heterogeneous group that more than likely rely on areas of strength (e.g., receptive language) to compensate for specific areas of weakness (e.g., expressive language).

The findings from the present study support previous findings in the area of phonological processing in children with RD and LI. Specifically, similar performance of younger children with RD and LI on deletion tasks was reported in a prior study conducted by Rispen and Been (2007). Moreover, Larkin and Snowling (2008) reported delayed phonological working memory in children with LI in comparison to children with RD. These findings differ from the findings by Catts et al. (2005) in that their RD group demonstrated greater deficits in NWR as well as on a deletion task in contrast to

the LI group. Again, within-group variability in conjunction with the age differences of the participants in the various studies may have contributed to these diverse findings.

Thus, in answer to the first proposed research question, the current study supports the hypothesis that phonological processing is a common core deficit in both RD and LI populations (Carroll & Snowling, 2004; Catts et al., 2001; Gathercole & Baddely, 1990; Goulandris et al., 2000; Larkin & Snowling, 2008; Rispen & Been, 2007). Thus, this finding supports the phonological processing deficit proposed by both the severity and the dyslexia-plus hypotheses. The current findings further suggest varying degrees and patterns of difficulty between these two clinical groups. Overall, the RD group evidenced greater difficulty on tasks targeting phonological and phonemic awareness. In addition to a similar level of difficulty in phonological processing, the LI group also demonstrated notably weaker phonological working memory performance in contrast to the RD group.

Patterns in Expository Discourse

Similarities and differences were evidenced between the two clinical groups on expository retelling performance. The LI group demonstrated smaller mean scores on measures of output (e.g., details produced, NTW), semantic diversity (NDW), and grammatical accuracy than the RD group. Given the observed deficit in phonological working memory in the LI group, and the increased cognitive demands of processing expository text structures, this clinical group would be expected to demonstrate a greater level of difficulty on such tasks in comparison to the RD group. Additionally, the finding that the RD group demonstrated a higher average than the LI group on the recall of diverse vocabulary and concepts on the expository retelling task substantiates suspected

delays in vocabulary development for the LI group. As previously noted, expository text structures often contain specific content vocabulary that is not typically present in a child's oral lexicon (McCormick, 2007), further putting the LI group at an academic disadvantage.

Grammatical competence was a consistent area of difficulty for the LI group. Given that expressive grammar deficits are a key characteristic of SLI and not of RD, this finding was reasonable. Performance in regards to sentence complexity (SI), on the other hand, was similar in both the RD and LI groups. This latter feature is discussed further below as a more stable pattern of performance emerged in regards to the development of complex sentence structures for both RD and LI groups.

The production of mazes during the expository retelling task indicated similar patterns across all participants, with each group producing a majority of fillers, followed by revisions, and lastly repetitions. This characteristic can be explained, in part, by the bottom-up cognitive processing required to retain, organize, and recall expository text structures (Westby, 2005). This additional demand on cognition may have resulted in participants requiring additional time to retrieve information, thereby causing them to produce fillers and repetitions and to then reorganize recalled information through the use of revisions.

The overall findings from the expository retelling task suggest that the phonological working memory constraints evidenced by the LI group further impede their performance when they are required to process and retrieve expository information. A posited relationship between working memory and oral language performance as observed in the LI group lends support to the severity hypothesis. That is, phonological

processing deficits were observed in both clinical groups; however, as noted, the LI group demonstrated more pervasive deficits in the area of phonological working memory in conjunction with deficits on the phonological awareness task whereas the RD group demonstrated deficits in phonological awareness only. Therefore, the number of phonological processing domains affected is suggested to be related to whether or not, or to what extent, oral language difficulties (e.g., GA) will be evidenced. This proved true when comparisons were carried out on the two groups studied here.

Patterns in Oral Narrative Discourse

The current study proposed to examine linguistic patterns in oral narrative development in adolescents with RD and LI at both micro- and macrostructural levels. In contrast to the expository retelling task, the LI group demonstrated higher mean performance in regards to narrative quantity (e.g., length) than the RD group but not in the quality of their oral narratives (e.g., TTR). In other words, although the LI group produced longer narratives (as measured in e.g., CUs, NTW) than the RD group, the overall quality of the narratives in regards to semantic development (e.g., TTR) and length of sentence structures (MLU-W) was further developed in the RD group. It is important to consider that the oral narrative task relied on the retrieval of spontaneous expressive vocabulary in contrast to the recall of specific content vocabulary on the expository retelling task. Taken together, these findings suggest that the LI group presents with consistent difficulty in the area of semantic development.

Similar to the participants' performance on the expository retelling task, the RD group was observed to demonstrate higher scores on average than the LI group on measures of GA. This measure of syntax was found to be more sensitive in identifying

group patterns than measures of morphology (e.g., MLU-M) and supports a developmental pattern as described by Scott (1988). She suggests that syntactic development slows during older childhood and adolescence, making MLU-M a less sensitive measure in distinguishing performance between groups.

The finding of suspected delayed performance in grammatical complexity (SI) in both the RD and LI groups supports results from prior studies. For example, decreased sentence complexity in children with LI has been well documented (e.g., Gillam & Johnston, 1992). Additionally, reduced sentence complexity has been evidenced in children with RD in comparison to typically developing peers (Feagans & Short, 1984; Westerveld et al., 2008; Westerveld & Gillon, 2010). This pattern was also observed in the current study in regards to the types of cohesive ties (e.g., additive, temporal) produced to connect story elements. The limited production of subordinating conjunctions, used to measure SI, was also associated with the limited number of causal cohesive ties (e.g., because, if) produced by both groups.

To further examine the potential of delayed syntactic development in children with RD and LI, typically developing patterns of performance were reviewed. Two caveats to be considered when interpreting the current findings are that complex sentence structures are produced at a relatively low frequency even in typically developing children. Furthermore, these sentence structures occur more commonly in formal situations (Eckert, 1990; as cited by Paul, 2007). Scott and Stokes (1995) reported that sentence complexity increases at a slow pace during the secondary years of education; therefore, the following discussion of the current findings should be interpreted with caution. Given these noted warnings in examining grammatical complexity, substantially

reduced SI scores in comparison to typically developing peers would be necessary to draw clear conclusions from oral and written samples. Because discourse elicitation procedures were not held constant in this exploratory study with those reporting norms on SI, only informal comparisons of the current results were conducted. These comparisons were still considered worthy of exploration. Reported norms suggest that at grade six and eight, close to half (1.4) of sentences produced during a narrative sample would be expected to be complex sentence structures. As previously reported, participants from both groups in the current study produced a majority of simple sentence structures on the oral narrative task, supporting a hypothesized delay in complex sentence structures in adolescents with either RD or LI (or both).

Of further interest in regards to sentence complexity, behavioral observations revealed fairly commensurate mean scores across both the RD and LI groups for SI on the expository retelling and oral narrative tasks. The finding of higher SI scores for expository retells versus narrative discourse was expected for both groups. Expository discourse is a more formal and complex genre in contrast to narrative discourse and, therefore, would be expected to yield greater SI performance (Nippold et al., 2008).

Findings further suggest that both clinical groups produced oral narrative structures suggestive of earlier developmental stages (e.g., action sequence) than would be expected for middle school-aged children (e.g., complex episode). Cognitive causes of this pattern are beyond the scope of this study. However, relative to this current study, it is hypothesized that delayed narrative development is partially the result of diverse causes for each group but manifesting in a similar outcome. For example, impaired language development would understandably impede oral narrative performance for the

LI group in that the constraints of semantic and syntactic development may interfere with resources necessary for attention to and development of cognitive schema. "The Matthew effect" is a term previously discussed that may explain the delayed oral narrative performance in the RD group (Catts & Kamhi, 2005; Shaywitz, 2003). Limited practice in reading over time may result in delayed development of the narrative structure that is found in children's literature and early academic curricula.

Fluency, as measured by production of mazes, was a factor for both groups on the oral narrative task. The average number of mazes produced by both groups increased dramatically on this task in contrast to the expository retell task. This difference in genres is judged to be partially the result of the significant differences in the length of the children's expository retells as measured by CUs. More importantly, it is suggested that the efficient retrieval of vocabulary was hindered by impaired phonological representations for both groups with a proposed added factor of delayed semantic development for the LI group. As previously discussed, a breakdown within the phonological loop can impede efficient and accurate retrieval of information from one's lexicon.

In general, similar and delayed patterns of narrative development were revealed for both RD and LI groups. Although middle school curriculum focuses on expository text structures, persistent deficits in narrative structures were ubiquitous across participants in both groups. In terms of the previously discussed hypotheses (e.g., severity, dyslexia-plus), the results from the oral narrative task suggest a continuum of severity. The degree of previously reported phonological impairment is posited to influence the severity of linguistic processes impacting both macro- and microstructural

levels of performance. The LI group, having evidenced more pervasive difficulties in phonological processing and working memory, were found to demonstrate more significant linguistic deficits both quantitatively and qualitatively (e.g., GA, semantics, error patterns) in comparison to the RD group. In contrast, the RD group presented with a single area of weakness in phonological processing related to literacy development. This phonological weakness may have a lesser impact on language development, nonetheless resulting in the observed difficulties with higher-level syntactic development and with efficient access to lexical storage.

Patterns in Written Narrative Discourse

Distinct group patterns were revealed on the written narrative task indicating a notable effect of modality. Similar to previous research (Scott & Windsor, 2000), both groups produced substantially longer oral versus written narratives. On average, the RD group was observed to demonstrate more difficulty on written narrative measures with respect to both macro- and microstructure than the LI group. Similar to the oral narrative productions, the LI group produced longer narratives (e.g., TNW, T-units) that contained more story elements than the RD group. Although both groups demonstrated delayed story structure, the majority of the LI group produced written narratives at a more advanced stage of narrative development than the participants in the RD group. Measures of semantic development (i.e., TTR) continued to reveal higher performance, based on group averages, for the RD group versus the LI group. Sentence complexity failed to indicate an effect of modality or genre in either group, again demonstrating fairly commensurate and suspected delayed performance. This finding was consistent

with Scott and Windsor (2000) in that they too failed to find clausal density as a sensitive measure for differentiating patterns in clinical groups.

As previously reported, children in grade six would be expected to produce a reasonable number of complex sentences in their oral discourse (SI = 1.4) and fewer in the written modality (SI = 1.3). However, at grade eight this pattern is expected to change. Children at this latter age would be expected to produce a fair number of complex structures in both oral (SI = 1.4) and written (SI = 1.5) discourse (Scott, 1989; Loban, 1976; as cited by Paul, 2007). Overall, SI scores for equally mixed clinical groups (i.e., 3 LI and 3 RD participants for grade 6; 2 LI and 2 RD participants for grade 8) based on grade were observed to be below expected levels of performance across genres and modalities. The SI performance for both oral and written narratives was judged to be substantially deficient in comparison to published norms of SI performance across modalities at grade six (SI oral = 1.14; SI written = 1.055) and even more so at grade eight (SI oral = 0.9325; SI written = 1.1875). Unsurprisingly, the RD group demonstrated the lowest SI performance in the written modality.

An altered pattern than was previously observed on the oral discourse measures was evidenced in regards to written morphosyntax (e.g., GA, MLTU-M), with the RD group producing a similar percentage of errors on syntax and morphology as the LI group in the written modality. This finding lends support for the hypothesis that children with RD, as well as children with LI, present with morphological weaknesses due to impaired or poorly developed phonological representations. As previously discussed, critical phonological, semantic, and syntactic information is stored within these mental lexical representations. Inadequate phonological representations may support less refined word

representations and result in difficulty in retrieving the distinct phonemic features of morphological markers for accurate orthographic associations (Perfetti, 1985; as cited by Altmann et al., 2000).

Similarities in spelling performance in children with LI and RD were reported by Puranik et al. (2006). Examination of spelling performance in the current study also revealed spelling difficulties in both clinical groups. Overall, the LI group produced a greater proportion of spelling errors in comparison to the RD group, but the types of encoding errors were notably more severe in the RD group. The finding of a literacy-related deficit in both clinical groups further corroborates a common core phonological processing deficit. This finding was important to the current study since formal measures of decoding were not conducted.

Overall, written narrative performance provided evidence to support patterns of difficulty for both the RD and LI groups. The anticipated difficulty with the print-related task for the RD group was evidenced across written narrative measures. As noted, the observed difficulties in spelling performance for both clinical groups provided further evidence to support a suspected common core deficit in literacy-related phonological processing.

Phase I Summary

The overall findings from Phase I of this study show greater support for the severity hypothesis than the dyslexia-plus hypothesis. The former hypothesis is suggested by this author as a plausible explanation for the observed phonological processing and linguistic patterns reported in the current study. It is theorized that the identified varying deficits in linguistic and literacy-related performance in the adolescent

groups were the result of the severity and number of impaired phonological processing domains. In other words, the more severe the observed phonological processing deficit, the more significant the consequential oral language impairment was. Similar to the explanation of cognitive profiles of children with RD and LI described by Rispen and Been (2007), it is also suggested by this author that phonological processing and oral language deficits result from a common processing system versus from separate and independent processes.

As previously discussed, narrative development relies on both linguistic and cognitive factors that are beyond the scope of this study; however, the noted pervasive delays in linguistic features associated with slowed narrative development (e.g., SI, cohesion) suggest a similar delay in complex language performance. If measures of sentence complexity were solely delayed in the written modality for the RD group, credibility for this view would be diminished. However, given the posited delayed grammatical development across genres and modalities for both groups, this finding lends support to the severity hypothesis with the LI group impaired in more language domains (e.g., GA, semantics), and the RD group delayed in literacy-related domains and more complex language development at adolescence. Additionally, inefficient and inaccurate retrieval of information from phonological storage was evidenced in both groups.

Furthermore, analysis at the word, sentence, and discourse levels across genres and modalities was found to be a systematic method for identifying the linguistic profiles of adolescents with RD and LI. This finding has educational relevance in that linguistic assessments should not be automatically overlooked in the RD population. Furthermore, the impact of phonological processing on both language and literacy development in

children with RD and LI is important for speech-language pathologists and special education teachers to consider when developing both assessment and treatment procedures. Furthermore, given the evidenced persistence of such deficits, implications for the importance of early intervention and continued progress monitoring in older children is supported.

Phase II: Expository and Narrative Intervention

Because the expectations of academic performance in middle school-aged adolescents rely heavily on the comprehension and production of expository discourse in oral and written modalities, the primary purpose of Phase II of the current study was to examine the effectiveness of an expository and narrative discourse intervention program that incorporated SGM (Moreau & Fidrych, 1994, 2002) and ThemeMaker (Moreau & Fidrych, 1998 , 2007) concepts and materials with four children identified with reading and language impairments from Phase I of this study. The four adolescents, two identified with RD (grades 7 and 8) and two with LI (grades 6 and 8), performed similarly on the expository retelling task and narrative productions on assessments conducted during Phase I of this study. Performance was judged to be depressed across tasks and participants.

The intervention specifically provided direct instruction, with modeling and scaffolding, in the use of graphic organizers and a manipulative tool for producing expository and narrative text structures. In conjunction with text schema instruction, the use of cohesion was addressed during the intervention sessions. The modeling and scaffolding of cohesive ties is a component of the applied intervention and serves to connect ideas within each text structure. During the intervention stage, expository

literature that was judged to be of interest to middle school-aged adolescents was used as stimuli in conjunction with the text structure tools. A single subject multiple baseline design was applied. Individual and group (RD, LI) performances were examined.

Intervention Outcomes

In order to answer the research question addressing the benefits of the applied intervention program, performance across participants in the experimental single subject design study is discussed. The staggered introduction of the intervention condition, as discussed by Horner et al. (2005), provided a method for observing any causal change in targeted behavior within four different series (participants) at three different time points (as applicable). Compelling change across all participants would be necessary in order to document a cause-effect relationship between the applied intervention and expository retelling performance. This pattern was not evidenced in the current study. The systematic replication of the intervention across participants indicated only minimal changes during the intervention condition for half of the participants.

It is important to note that only a limited number of intervention sessions (six) were available for teaching what would be considered by most as rather complex linguistic and literacy-based tasks. The short duration of intervention was also judged to impede the carryover of learned skills. I would further suggest that the impact of previously reported weaknesses in phonological working memory for participants with an identification of LI cannot be ruled out as a contributing factor on the experimental measures of expository retellings. Specifically, participant S-11 presented with marked difficulty in working memory as measured on the repeating sentences task. Additionally, participant S-13 demonstrated a significant deficit in phonological working memory as

measured by the NWR task. The current findings are consistent with earlier findings reported by Copmann and Griffith (1994) in that the LI group in their study also recalled fewer details from expository text than children with reading-related learning disabilities.

Furthermore, variable performance was noted across participants. This factor was apparent on the visual analyses. The element of variability was further judged to be, in part, the result of each participant's degree of background knowledge about certain expository stimulus topics. The use of fictional expository text, as applied by Ward-Lonergan et al. (1999), would have controlled for this issue.

It is suggested that the method of assessing an experimental effect in this study was problematic in effectively assessing the impact of the applied intervention. The applied manner of assessment was difficult for all of the participants, but was most especially trying for those participants previously identified in Phase I with deficits in phonological working memory. The observed patterns of performance are also important for planning therapeutic programs in that providing alternate methods of assessing knowledge and progress in children with RD and LI may be necessary. Teaching new skills (e.g., expository text) using learning modalities noted to be areas of weakness (e.g., oral expression) for a particular child should be avoided, allowing for instruction and assessment in modalities and genres that will tap areas of strength in order for them to best demonstrate their growth.

In sum, the findings do not support the validity of the explicit instruction of text schema with SGM (Moreau & Fidrych, 1994, 2002) and ThemeMaker (Moreau & Fidrych, 1998, 2007) tools for adolescents with RD and LI as measured in the current study. Because of the linguistic profiles and the lack of significant experimental effects

for both groups, it is suggested that an alternate method for measuring progress in conjunction with a longer period of intervention be considered when planning related intervention programs for these populations. It is important to report that all participants were judged to be motivated throughout the intervention sessions, suggesting an indirect and positive effect of the applied intervention program on learning. A further discussion of individual performance and observations is provided below.

Participant S-7

Participant S-7 was observed to enjoy the one-to-one sessions and hands-on tasks. He was eager and motivated to listen to the selected stories during each intervention session. It was judged that his increased performance on the expository retelling task during the fourth and fifth intervention sessions (52%, 58%, respectively) was not due to background knowledge of the topics (e.g., kangaroos) because the details of the passage were not considered "common" details (e.g., origin of the name "kangaroo"). Rather, reference to the graphic organizers was judged to aid in his recall of details during the retelling task. Specifically, it was observed that the descriptive text schema in the form of a graphic organizer assisted this participant in his recall of a number of details from these passages. However, during the final intervention session, the participant was observed to demonstrate difficulty in shifting cognitive sets. For example, the final passage was about "ostriches". The participant mentioned a detail from the passage about the smallest bird, the hummingbird but then demonstrated difficulty switching back to the topic of "ostriches."

Participant S-13

In comparison to participant S-7, participant S-13 was a bit more reluctant at the start of each after-school session. However, he quickly transitioned to the tasks and appeared to enjoy the use of stickers and stamps for summarizing text structures more than any of the other participants. During baseline performance, the second data point (58%) was quite a bit higher than the rest of the baseline measures. The topic of this retell was "bats." The details for this topic were considered to be common facts and were judged to be a factor for this participant's ability to recall such a high percentage of details. During the intervention condition, performance was variable with only two data points falling near the highest data point in the baseline condition. The topics for these retells were "Alaska" and "The Isle of Logs." This participant was observed referring to the graphic organizers during the intervention retells. For instance, when provided with the prompt, "Can you tell me more using the Story Grammar Marker tools ?" he provided 2 additional details about "Alaska" and one additional detail about the latter topic. Neither of the two retells during the maintenance condition fell above the baseline or intervention conditions.

Participant S-11

Participant S-11 appeared to be the most anxious and reluctant in regards to the retelling tasks during the baseline condition. This is not surprising given that his baseline condition included a total of 15 retells. This participant was much more motivated during the actual intervention sessions. He particularly enjoyed using the overhead transparencies depicting the various text structures. He put forth great effort in completing the projected images of the graphic organizers on the whiteboard. It was

observed that this student's written work could be quite difficult to read; however, this was not the case when using the whiteboard markers. Although this participant was observed looking at the graphic organizers while listening to the expository passages, it is of importance to note that of all of the participants in the intervention phase, this particular student produced some of the lowest retelling scores. This student also presented with the most difficulty on the repeating sentences task conducted in Phase I. The impact of this processing deficit cannot be ruled out as a factor that interfered with his performance.

Participant S-1

Of all of the participants, participant S-1 was observed to enjoy and be amused by the varied topics of the expository texts to a greater extent than was observed with the other participants. Despite the fact that he was the final participant to receive the intervention, he was never observed as being frustrated with having to complete a total of 27 retells. This participant also demonstrated enjoyment of the nonfiction stories during the intervention phase. As with participant S-11, this participant's favorite task was completing the graphic organizers on the white board. He did not demonstrate difficulties with attention. His previously reported diagnosis of ADHD was managed through medication. During the intervention condition, scores on the fourth and fifth expository retells were identified as falling above any of the baseline data points. The topics were "sea otters" and "electricity." Prior knowledge cannot be ruled out as a positive impact on these scores. As with the other participants, this participant was observed looking at the graphic organizers while listening to the expository passage. Before the examiner provided the additional prompt following the "electricity" passage,

the participant stated, "Yes, I have used what I can of this." Maintenance measures were not conducted due to the end of the school year.

Post-Intervention Performance

To answer research questions addressing comparison of pre- and post-intervention performance of the participants in Phase II of this study, similar assessment procedures to Phase I, but with different stimuli and the use of taught visual strategies (e.g., graphic organizers), were conducted for expository and narrative discourse tasks at post-intervention. Swanson et al. (2005) reported a lack of improvement in areas of microstructural analyses that were not explicitly targeted through story grammar intervention. Therefore, various features of microstructure analyses (e.g., NDW) were not examined in the current study at post-intervention. Rather, features that would be expected to change as a direct result of the applied intervention were analyzed.

As previously reported, the intervention did not purposely target length, but improvements in output were predicted as a direct consequence of the intervention that provided explicit instruction in text structure. This pattern of longer retells and narratives, as a whole, was consistently evidenced by the participants with RD, with positive consequences for the number of details or story elements produced and the number of CUs or T-units produced, across genres and modalities. In contrast, the LI participants demonstrated varied improvement on measures of length across tasks at post-intervention. Clear patterns of improvement were not revealed for these latter participants.

Reported findings are mixed in regards to improvement in narrative quality in younger children with RD and LI (Westerveld & Gillon, 2008; Swanson et al., 2005).

Westerveld and Gillon (2008) failed to find significant improvement on story quality as a result of direct narrative intervention in children with MRD. In contrast, a study conducted by Swanson et al. (2005) indicated improvement in story quality in 80% of the LI participants. The current study also found mixed results in the improvement of narrative productions in adolescents. A single participant (S-7) was observed to demonstrate an improvement in narrative quality for the oral narrative, and another participant (S-13) evidenced improvement in narrative complexity for the written narrative at post-intervention.

The use of cohesive ties within connected discourse is an element of SGM instruction (Moreau & Fidrych, 1994, 2002) and is represented within the various graphic organizers. Therefore, grammatical complexity was predicted to improve as a result of the direct instruction in the use of cohesive ties within the targeted text structures. The methodology of instruction for targeting complex sentence structures followed a general principle described by Scott and Baltbazar (2010) in that the grammatical instruction was modeled within the context of expository discourse. However, the expected finding of improved clause density was not revealed on the expository retelling task at post-intervention. Furthermore, notable improvement in the latter measure and the use of increasingly complex cohesive ties (e.g., causal ties) on the oral and written narratives was variable with one participant (S-7) demonstrating the most consistent progress at post-intervention.

In sum, the present investigation confirms that adolescents with RD and LI continue to demonstrate persistent and similar deficits in narrative and expository text structures across oral and written modalities. Participants with RD and LI were also

found to perform similarly and below expected levels on measures of linguistic complexity. This finding is consistent with and extends prior reports of delayed development in complex sentence production in children with RD and LI (Altmann et al., 2008; Fey et al., 2004; Puranik et al., 2007). The participants that received intervention did not demonstrate measurable progress on the particular variables that were the primary focus of the post-testing. However, the positive findings from the use of SGM (Moreau & Fidrych, 1194, 2002) and ThemeMaker (Moreau & Fidrych, 1998, 2007) intervention on various post-intervention measures of macrostructure for expository and narrative text structures in children with RD and LI is promising. Furthermore, given the limited intensity and span of the intervention reported here, it is posited that further and more consistent improvements in narrative quality and grammatical complexity would be observed if the number of sessions per week was increased or if the intervention program was carried out across a longer time period of at least a few months.

Limitations

There were a number of limitations in the current exploratory study that provide opportunities for further investigation. The most obvious limitation to the study was the participant selection criteria. The sample size for the descriptive portion of the study (Phase I) was small and the participants were not randomly selected from the two clinical populations. As a result, statistical comparisons between the RD and LI groups could not be conducted. Furthermore, the current study used broad disability criteria for participant selection. Although the use of LD (in the area of reading) and LI special education classifications is practical and valid, it does pose the possibility of a diverse range of deficits within each of the two clinical populations.

A limitation of the intervention phase was the limited intensity of the applied intervention, which was due in part, to the time constraints of the school year. Given the degree of persistently delayed linguistic performance observed on narrative and expository discourse measures, a more intensive intervention would be reasonable to consider. Additionally, although the applied intervention program was systematic and presented in a consistent manner, no formal documentation of fidelity was incorporated into the study. Thus, reliability cannot be verified.

In regards to the methods applied for measuring experimental effects, the potential for "burn out" due to the number of retells required by participants may have impacted results. This was especially true for the number of retells required by the last two participants in the study. This measure was also problematic in that it tapped phonological working memory to such an extent that evidence of a positive effect of the intervention may have been hindered.

Implications

In Phase I, the present study investigated the similarities and differences in adolescents with RD and LI. Studies examining assessment and intervention in older children with language and reading impairments at levels of micro-and macrostructure are scarce **(**Scott & Baltbazar, 2010). This study provided evidence of persistent phonological and linguistic delays based on both quantitative and qualitative analyses at the word, sentence, and discourse levels. The findings are pertinent to educational professionals in regards to assessment techniques and intervention planning for middle school-aged children.

Phase II of the current study began to explore the efficacy of a discourse level intervention program in children with RD and LI through an experimental single subject design. Although preliminary results did not yield positive findings, the current study emphasizes the importance of assessing and providing instruction in narrative and expository discourse for children with RD and LI at the secondary level of education. It is suggested that these preliminary findings justify further investigation into the use of the SGM (Moreau & Fidrych, 1994, 2002) and ThemeMaker (Moreau & Fidrych, 1998, 2007) concepts in adolescents with RD and LI.

Future Research

Future studies recruiting a larger cohort of adolescents with RD and LI and with a control group matched on age would allow for further investigation of narrative skill development in adolescents in comparison to same-age peers. Larger studies would also allow for generalization of both descriptive and intervention findings. Furthermore, matching clinical groups on measures of phonological processing would be of interest to further determine the impact of phonological processing deficits on expository retelling performance.

Potential descriptive studies incorporating real-word and pseudo-word reading tasks for adolescents with LI in comparison to adolescents with RD and age-matched typically developing peers would assist in determining the presence of persistent decoding deficits and the severity of such deficits between clinical groups. Also of importance to investigate in these adolescent populations is word spelling skills. Examining the relationship between word decoding and encoding skills and phonological

processing skills, including both working memory and phonological awareness, would also be of further value in describing patterns of performance.

Investigating performance on phonological processing tasks as a predictive measure for classifying pre-established groups (i.e., RD, LI, and comorbid RD and LI) would also be of empirical value. Applying this statistical method of discriminant analysis would allow researchers to further explore patterns of phonological processing among these clinical groups. In contrast, using cluster analysis to group participants based on their performance in different modalities and different genres as a method of classifying adolescents regardless of their pre-existing diagnoses may also be of importance in developing symptom-based intervention approaches.

Prospective single subject experimental studies using additional or alternate methods of measuring progress resulting from the proposed intervention would be useful in further determining its effectiveness with this clinical population. For example, having the participants respond to comprehension questions prior to producing a summary retell might lessen the constraints of working memory. Furthermore, the use of novel expository texts would assist in controlling for variance resulting from diverse levels of background knowledge (Ward-Lonergan et al., 1999).

Potential studies providing a greater number of sessions across a longer period of time would be reasonable considering the complexity of discourse development. Given the persistence of these children's difficulties into the middle school years, it would be logical to suggest that the observed persistent deficits in narrative and expository text development would require more intensive remediation in order for children to internalize strategies for independent application.

Lastly, a more targeted intervention focusing on instruction and assessment of a single text structure at a time is another option for the applied intervention program. This method would provide more comprehensive instruction of each text schema which would provide greater opportunities for internalizing targeted text structures. Further research examining literacy and language profiles in adolescents is warranted in order to provide the most effective strategies for academic success.

APPENDIX A

ORAL RETELL SAMPLE

Title: The Civil War	**Score 1**
During the early and mid-1800's,	
there was much talk in the United States	
about slavery.	
Most of the northern states had	
outlawed slavery.	
However, in the South,	
slaves were considered important to the plantation owners	
who grew cotton and tobacco.	
The slavery issue was not settled until Abraham Lincoln was elected president	
in 1860.	
Until 1861	
all the states had worked together as the United States.	
However, in 1861,	
leaders in the southern states believed that states had the right to leave, or secede from, the United States.	
The leaders in the northern and western states	
believed that no state had the right to secede.	
This difference in beliefs was one cause of the Civil War.	
The states that seceded from the Union were states that used slaves.	
Those states formed a group called the Confederate States of America, or simply, the Confederacy.	
When the Civil War began in 1861,	
there were eleven southern states in the confederacy.	
The Civil War was very difficult because Americans were fighting Americans.	
In some cases brothers fought on opposing sides.	
After four long years of fighting,	
The South surrendered in April of 1865.	
Total Points:	**/25**

APPENDIX B

NARRATIVE OUTLINE

Character: boy

Setting: beach, summer

Initiating Event: wave comes crashing to shore; the wave washes an old underwater camera to shore

Internal Response: curious, wondered about the camera/film

Plan: wanted/planned to find out more about the camera

Action Sequence:

*shows parents & lifeguard

*opens the camera and finds film

*takes film to one-hour photo shop to develop film; buys film

*takes photos back to beach to view them

*examines pictures with his naked eye

*uses magnifying glass to examine photos

*examines pictures with the microscope at increasing magnification

*sets up his camera & takes his own picture

*tosses the camera back out to sea for the various sea animals to carry the camera to new lands

Direct Consequence: The boy learned of an underwater world and a long history of photos taken with the underwater camera.

Resolution: The boy was amazed to learn about the underwater sea world and children from the past. He was satisfied to carry on the tradition and hopeful that someone else will find the camera with his picture in it.

APPENDIX C

SALT SAMPLE

ID: 1-6

C (the it it's a sea um it's a snail that) it/'s a snail that (some) a big eye/'s look/ing at [SI-2].
C The boy/'s look/ing at his snail with the magnifying glass [SI-1].
C And he and (his father hi his) his mom and father is[EW:are] read/ing a book [SI-1].
C He let the snail (go) go [SI-1].
C (He's looking) he/'s walk/ing with a bucket [SI-1].
C (He found) he found (a s*) a crab [SI-1].
C He/'s lay/ing on the ground and look/ing at the crab with his head's[EW:head] on the sand [SI-1].
C He caught the crab [SI-1].
C Then the big wave splash/ed him [SI-1].
C and the shovel and the bucket came all up [SI-1].
C He/'s sit/ing with (um) seaweed (on his feet up to his) on his feet and his leg/s [SI-1].
C A photo thing came up [SI-1].
C And the crab is (right next) right next to it [SI-1].
C The boy pick/ed the thing up before the wave came back [SI-1].
C The boy is think/ing [SI-1].
C He/'s run/ing to his mom and dad [SI-1].
C (He's oh yeah) he show/ed his mom and dad [SI-1].
C (He showed) and then he show/ed the life guard [SI-1].
C He took it out of its box [SI-1].
C And then he look/ed in the battery pack [SI-1].
C And then he took one of them and took it [SI-1].
C And then holded[EW:held] it [SI-1].
C He ran (to the post to I don't know) to somewhere [SI-1].
C And he show/ed the lady at the counter (where) what it was [SI-1].
C And the lady at the counter (um) pick/ed it up (sh) and took it and[EW:to] see if it was the (same one from the same one from the o) same one from aonther ones on the rack [EU] [SI-2].
C (The she she gave hi) she gave him a new pack [SI-1].
C He/'s sit/ing on the bench [SI-1].
C (He's) then he/'s lay/ing [SI-1].
C Then (the) the box is all alone without the boy [SI-1].
C And now he/'s with it again sit/ing [SI-1].
C And he/'s sit/ing again [SI-1].
C and then he/'s sit/ing look/ing for the window [SI-1].
C And now he/'s walk/ing out the door [SI-1].
C He ran back to the beach [SI-1].
C He/'s look/ing at paper/s with like blue, yellow, and red stuff [SI-1].
C now he[EW:he/'s] look/ing at it again [SI-1].
C and then (there's big) his eye/'s look/ing at it [SI-1].

C (There’s a) there/'s fish [SI-1].
C there/’s a picture with all these (fish) fish swim/ing [SI-1].
C And one fish is like a robot fish or like a swim/ing fish (that) that turn/3s around [SI-1].
C The picture was the photo [SI-1].
C and there/’s another photo of ((I forgot what their name was)) (uh) (octopus) octopus/s [SI-1].
C And there/’s a large one in (the like) the other fish one [SI-1].
C Fish are s* (uh) balloon/ing off of a spike fish [SI-1].
C And then a fish is try/ing to get up on it [SI-1].
C but (it) it/’s bye bye [SI-1].
C It stay/3s out in the water without them [SI-1].
C And the turtle/s I think they have a home on (their) their shell/s because (there’s pe* there’s pe*) there/'s[EW:there/'re] alien/s with (green sa*) green X ((I think)) [SI-3].
C There/'s[EW:there're] (three three) three of them that have them [SI-1].
C (There’s aliens) there/'s[EW:there/'re] alien/s that are by big sea horse/s with a[EW:an] alien ship [SI-1].
C One alien/’s ride/ing a fish [SI-1].
C One alien is poke/ing one with a stick [SI-1].
C One alien/’s try/ing to make the other alien stop ((okay)) [SI-1].
C The starfish are walk/ing like a dinosaur [SI-1].
C And it has (like like[FP]) tree/s on them and (like[FP]) palm tree/s and all that [SI-1].
C And whale/s are swim/ing beneath them one mom one baby and two dad/s (I) or brother/s or just cousin/s [SI-1].
C There/’s a girl that *is looking at these two picture/s [SI-1].
C That thing she found [SI-1].
C that thing that (h*) the boy has [SI-1].
C the boy/'s look/ing at the thing (like[FP]) that he/’s in shock [EU] [SI-2].
C He put down the magniflash[EW:magnifier] ((and wait)) [SI-1].
C He was look/ing at the picture [SI-1].
C And now he/’s still look/ing at it (the magniflash) the magniflash[EW:magnifier] picture[SI-1].
C He pick/ed up the magniflash[EW] picture to just see the picture that/’s little of it [SI-2].
C Now he/’s look/ing [SI-1].
C now another kid is look/ing at (two) two other picture/s with (two) another small picture [SI-1].
C and now (the) the boy/’s still look/ing at (the picture) the picture with the magnifly/*ing[EW:magnifying] glass [SI-1].
C now he took (the) ((I don't know what it’s called)) (but another) (a soup) like a scientist magnifly/ing[EW:magnifying] glass and look/ing in it [EU] and then look/ing still [SI-1].
C And there/’s picture/s of people that (found) found>
C There/’s a picture that the boy that it was to [EU] [SI-1].
C And then there/’s a picture boy that found it [EU] [SI-1].
C And then there/’s a picture (the) that the girl that found it [EU] [SI-1].
C And there/’s a picture *of the boy that found it [SI-1].
C And then (there’s a picture) there/’s a picture of the boy that found it [SI-1].

C And then now there/’s a ((you know)) black and white picture of the boy And black and white And then black_and_white picture of (a girl) two girl/s And black and white of X [SI-1].
C X All of them are like they>
C this boy/'s the ones[EW] that start/ed it [SI-1].
C and then the girl put her picture in it [SI-1].
C and the boy put his picture in it [SI-1].
C and this boy probably will put his picture in it [SI-1].
C That boy/’s still look/ing at the picture by the box [SI-1].
C Now his mom is yell/ing at him [SI-1].
C And (now) now he/’s still look/ing at the picture [SI-1].
C He/s still look/ing at it [SI-1].
C And then he left somewhere [SI-1].
C And now (he gonna) he/’s still look/ing at the picture [SI-1].
C And then there/’s now [SI-1].
C (he) now he/’s look/ing at the picture [SI-1].
C He threw all the picture/s [SI-1].
C The picture/s are all the way out in the ocean [SI-1].
C He/’s look/ing at it [SI-1].
C He/’s swing/ing it [SI-1].
C And then he threw it [SI-1].
C Went in the ocean [SI-0].
C ((Ok)) now it/’s float/ing [SI-1].
C It/’s still float/ing up [SI-1].
C (ah) one octopus got it [SI-1].
C A fish got it swallow/ed in its mouth [EU] [SI-1].
C Now it show/3s a big picture of a whale ((I think)) [SI-1].
C And the seahorse/s are carry/ing it [SI-1].
C And now it/'s by itself with some leave/s [SI-1].
C Now it’s ((I don't know where it is))>
C Now it/’s by octopus/s and one fish that that’s his spot/s [EU] [SI-2].
C and now it/’s still float/ing [SI-1].
C It look/3s like an underground fish world [SI-1].
C And now it/'s still float/ing [SI-1].
C A bird got it [SI-1].
C And then now a dolphins[EW:dolphin] got it [EU] [SI-1].
C And now it/’s just fly/ing in the air [SI-1].
C ((Oh)) the wind made it jump in the air [SI-1].
C And now the penquin/s got it [SI-1].
C And then there/’s[EW:there're] island/s [SI-1].
C And it just got to the shore [SI-1].
C And there/’s a little girl in the back where the beach is [SI-2].
C And (the little) the little girl in the green shirt got it [SI-1].

APPENDIX D

SALT CODES

SALT CODES:

C = communication unit (CU)

( ) = mazes

(( )) = parenthetical Remarks

/ = bound morphemes

EW = word error

EU = utterance error

WO = word order

[SI] = number of clauses

/3s = third person singular

* = omission

. = end of utterance

X = unintelligible segment

< = abandoned utterance

APPENDIX E

INTERVENTION RETELL

Chewing Gum	
Who invented chewing gum? No one really knows.	
We do know that ancient Greeks chewed tree resin.	
The resin was from the sap of trees.	
Chewing the resin was thought to help clean teeth.	
Santa Anna was a general from Mexico.	
He is best remembered for the Battle of the Alamo.	
There is another reason to remember him.	
Later in his life, he came to America to live.	
He brought some chicle with him.	
Chicle is a gummy sap that comes from trees in Mexico.	
Thomas Adams got some of the chicle.	
He worked with it, trying to make use of it.	
He tried to make rubber, but he failed.	
He tried to use it as glue for false teeth, but he failed.	
Finally, he made it into chewing gum. It was a success.	
People loved the chewing gum.	
Adams built a machine that made long strips of gum.	
He took the strips of gum to store owners.	
They broke off pieces when someone wanted to buy gum.	
Later on, gum was made into smaller sticks.	
In those days, gum only came in one flavor, licorice.	
This gum was called Black Jack.	
It was the first flavored gum.	
Later, different flavors were made.	
The most popular flavor was tutti-frutti. It was sweet.	
In 1906, bubble gum was invented by a man named Frank Fleer.	
He didn't think his bubble gum was a success because it was too sticky.	
Twenty years later, bubble gum was developed that wasn't too sticky.	
People could blow bubbles.	
Color was added to the gum.	
Since that day, most bubble gum has been pink.	
Total:	**/31**

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