THE LITERATE LEXICON IN NARRATIVE AND EXPOSITORY WRITING:

A DEVELOPMENTAL STUDY OF CHILDREN AND ADOLESCENTS

by

LEI SUN

A DISSERTATION

Presented to the Department of Special Education
and Clinical Sciences
and the Graduate School of the University of Oregon
in partial fulfillment of the requirements
for the degree of
Doctor of Philosophy

September 2008

University of Oregon Graduate School

Confirmation of Approval and Acceptance of Dissertation prepared by:

Lei Sun

Title:

"The Literate Lexicon in Narrative and Expository Writing: A Developmental Study of Children and Adolescents "

This dissertation has been accepted and approved in partial fulfillment of the requirements for the degree in the Department of Special Education and Clinical Sciences by:

Marilyn Nippold, Chairperson, Special Education and Clinical Sciences
Roland Good, Member, Special Education and Clinical Sciences
Deborah Olson, Member, Special Education and Clinical Sciences
Nathaniel Teich, Outside Member, English

and Richard Linton, Vice President for Research and Graduate Studies/Dean of the Graduate School for the University of Oregon.

September 6, 2008

Original approval signatures are on file with the Graduate School and the University of Oregon Libraries.

An Abstract of the Dissertation of

Lei Sun for the degree of Doctor of Philosophy

in the Department of Special Education and Clinical Sciences

to be taken September 2008

Title: THE LITERATE LEXICON IN NARRATIVE AND EXPOSITORY WRITING: A DEVELOPMENTAL STUDY OF CHILDREN AND ADOLESCENTS

Approved: Dr. Marilyn A. Nippold

Three types of literate words, including abstract nouns (freedom, challenge), mental state verbs (assume, explain), and derivatives (relationship, respectful), were examined in narrative and expository writing in typically developing children and adolescents. It was predicted that older students would use literate words more frequently than younger students, and that literate words would occur more frequently in expository writing than in narrative writing. One hundred and twenty typically developing children and adolescents including forty 5th graders, forty 8th graders, and forty 11th graders wrote one narrative and one expository essay at school. The results showed that genre had a substantial impact on the use of literate words in the writing of school-age children and adolescents, except metalinguistic verbs. Moreover, literate words were used significantly more often in expository than in narrative text, except derived adjectives. Additionally, metalinguistic

verbs occurred more often in narrative writing than expository writing; however, the difference was not statistically significant.

Age-related increases occurred in the use of abstract nouns, derived nominals, early/late developing metacognitive verbs and late developing metalinguistic verbs in narrative writing. Age-related increases also occurred in the use of derived adjectives, and late developing metacognitive and metalinguistic verbs in expository writing. The present study adds to the knowledge base concerning the development of literate word use in narrative and expository writing in typically developing children and adolescents.

CURRICULUM VITAE

NAME OF AUTHOR: Lei Sun

PLACE OF BIRTH: Taipei, Taiwan

GRADUATE AND UNDERGRADUATE SCHOOLS ATTENDED:

University of Oregon
Shih Hsin University, Taipei, Taiwan
National Taipei University, Taipei, Taiwan

DEGREES AWARDED:

Doctor of Philosophy in Communication Disorders and Sciences, 2008
University of Oregon.
Master of Science in Communication Disorders and Sciences, 2004
University of Oregon.
Master of Arts in Communication, 2001
Shih Hsin University
Bachelor of Arts in Public Administration and Politics, 1998
National Taipei University

AREAS OF SPECIAL INTEREST:

Child Language Development
School-Age Children Language Development
Literacy
Word Learning Process and Strategy
Literate Lexicon
Word Use in Writing
Morphology Development
Mental Imagery in Literacy

PROFESSIONAL EXPERIENCE:

Graduate Teaching Fellow, Communication Disorders and Sciences Program,
University of Oregon, Fall 2006

Teaching Assistant, Communication Disorders and Sciences Program,
University of Oregon, Fall 2004; 2005, Winter 2005
Research Assistant, Communication Disorders and Sciences Program,
University of Oregon, 2005-2006

PUBLICATIONS:

Nippold, M., & Sun, L. (in press). Knowledge of morphologically complex words: A developmental study of older children and young adolescents. *Language, Speech, and Hearing Services in School*.

ACKNOWLEDGMENTS

Extreme thanks to my advisor, Dr. Marilyn Nippold, for encouraging me, helping me overcome the challenges and providing assistance in the preparation of my dissertation. Thank you to my committee: Marilyn Nippold, Ph.D., Roland Good, Ph.D., Deborah Olson, Ph.D., and Nathaniel Teich, Ph.D. I appreciate their support and valuable input in assisting me in this process.

Sincere appreciation goes to my best friend/partner in my life, Pei-Fang Hung. Without her unconditional love, support and patience, I would not have been able to achieve this goal. I thank her for being there through thick and thin, joy and tears. In addition, I wish to express sincere appreciation to Tracy Mainsfield, Ph.D. for solving my millions of questions about coding and the SALT program and his neverending support for the past few years. I also would like to thank Shelley Watson and Shiree Nguyen. Being friends with them is a blessing. Thanks for their encouragement and always being there for me. The days in Eugene and Seattle are unforgettable.

Thanks to my parents for spiritually and financially supporting me for the past few years, to my little sister for always being on my side and making me laugh, and my grandma's continuous love. Finally, I thank the students and teachers who participated in this study who provided me with invaluable information.

TABLE OF CONTENTS

Chapter Page

LIST OF FIGURES

LIST OF TABLES

CHAPTER I

BACKGROUND AND INTRODUCTION

The lexicon is central in communication, providing a window of observation into language acquisition and processing (Clark, 1993). Moreover, the lexicon is an important element of both spoken and written language development and is a crucial component of higher cognitive activity (Ravid, 2004). Dockrell and Messer (2004) stated that the lexicon is important in both comprehension and production. Additionally, a well-developed receptive vocabulary is a prerequisite for fluent reading, a critical link between decoding and comprehension (Joshi, 2005). In general, children with a larger vocabulary tend to continue to expand their word sets faster and to understand texts more easily than children with a smaller vocabulary. Therefore, lexical development is important in communication, reading, and academic achievement across the school years and is a foundation for gaining world knowledge throughout life.

An individual's lexical knowledge refers to the person's knowledge of vocabulary. Aitchison (2003) referred to the lexicon as "the human word store." Ravid (2004) claimed that the lexicon is the repository of words that speakers and writers use for language comprehension and production. In other words, the lexicon is the knowledge

that a person has about a language including the sounds and use of words, meanings, and word categorizations (Brent & Cartwright, 2002; Clark, 1993). Therefore, the lexicon provides a bridge between sounds and meaning, linking phonological properties to semantic and syntactic information about the words (Marslen-Wilson, 2002). Because the lexicon is stored and organized in a specific way in memory, mature adults can recognize and retrieve words effortlessly and quickly. The lexicon is more complex than a mental dictionary, organizing the vocabulary of a language according to certain principles but also utilizing rules to generate the meanings of new words.

Based on Nagy and Anderson's (1984) report, children acquire 3000 words per year between third and ninth grades and an average high school graduate knows about 45,000 words. Bloom (2001) stated that an average 17-year-old English speaker knows more than 60,000 words and some literate adults even know more than 100,000 words. Although there is no consistent number defining how many words a typically developing adolescent knows, it is critical for researchers to understand how children learn so many words at such an amazing rate. A child's lexicon grows with age in different ways without direct instruction, such as: 1) quick incidental learning/fast mapping (Dockrell & Messer, 2004; Oetting, Rice, & Swank, 1995); 2) use of context clues (Cain, Oakhill, & Elbro, 2003; Cain, Oakhill, & Lemmon, 2004; Chaffin, Morris, & Seely, 2001); 3) syntactic bootstrapping (Oetting, 1999; O'Hara & Johnston,1997; Rice, Cleave, & Oetting, 2000); and 4) morphological generalization (Larsen & Nippold, 2007; Nippold, 2007). A child's vocabulary expands tremendously from the very first year, and continues to grow through

the school-age years, adolescence, and early adulthood. However, vocabulary acquired in early childhood is different from that learned in middle and high schools.

Literate Lexicon and Core Lexicon

There are several differences between the lexical items acquired in early childhood and those learned during the school-age years. Ravid (2004) defined the core lexicon as basic vocabulary acquired by preschoolers mainly from spoken language, and the literate lexicon as advanced vocabulary items that are more abstract, less familiar, and acquired mainly through schooling and education. Ravid (2004) further suggested that cognitive development and linguistic literacy contributed to advanced lexical development. Cognitive development allows older children to process, retrieve, and store lexical items in appropriate contexts, and linguistic literacy provides children plenty of exposure to complex syntactic structures and advanced lexical items in textbooks, lectures, and content area readings (Nippold, 1993). Thus, through schooling and exposure to print, children are able to expand their vocabulary greatly and boost their literate language development. Vocabulary items that school-age children encounter are more abstract, complex, longer, with multiple affixes, and are used to reflect internal states (Nippold, 2007; Ravid, 2004; Westby, 1990). Therefore, use of an advanced lexicon reflects later language development and cognitive development.

The literate lexicon was examined in spoken narratives of school-age children in Greenhalgh and Strong's study (2001), specifically conjunctions, adverbs, and mental state verbs. Nippold, Ward-Lonergan, and Fanning (2005) studied adverbial conjuncts,

abstract nouns, and metaverbs in the persuasive writing of school-age children, adolescents, and adults. Bar-Ilan and Berman (2007) investigated the use of Latinate portion of the English lexicon, a type of high linguistic register such as conflict and pressure, in spoken and written narrative and expository production (Bar-Ilan & Berman, 2007). Additionally, five literate language features (elaborated noun phrases, conjunctions, adverbs and mental and linguistic verbs) were examined in preschool spoken narrative in Curenton and Justice's study (2004).

Another study done by Ravid (2004) investigated correct production in Hebrew of derived nominals, passive constructions, and denominal adjectives in tasks completed by school-age children. Nouns were further analyzed on ten-point noun scale, concrete to abstract, in spoken and written narrative and expository produced by school-age children, adolescents and adults in Ravid's study (Ravid, 2006). The latest study done by Berman and Nir-Sagiv(2007) studied the use of nouns, Latinate words (high register linguistic), and polysyllabic words in written narrative and expository in school-age children, adolescents and adults. A very limited number of studies have looked at how school-age children use the literate lexicon, and previous studies focused on different aspects of literate language and the literate lexicon. Given that use of the literate lexicon reflects later language development, more research into the types and uses of literate lexicon is needed in order to provide a complete picture of the development of the literate lexicon.

According to previous studies, use of mental state verbs including metacognitive and metalinguistic verbs is important in literate language development (Greenhalgh & Strong, 2001; Nippold, 2007; Westby, 1990). Additionally, mental state verbs provide a

bridge to connect speakers/writers and their audience and a link between theory of mind and language development (Astington & Jenkins, 1999; Booth, Hall, Robinson, & Kim, 1997; Olson & Astington, 1993). In addition to mental state verbs, most of the complex and longer words that school-age children encountered were derivatives. Derivatives are words with affixes, and usually stem from the root words (e.g., "happiness" is derived from "happy"). Complex derived words become increasingly important throughout the school years in content area reading, writing, textbooks, and literature (Nippold, 2007). Children use morphological generation strategies to generate word meanings while reading, but use of derivatives is a more complex process and requires knowledge of spelling, syntax, and morphology. Therefore, use of derivatives is an important aspect of later language development that cannot be overlooked.

Another aspect of later language development that differs from early language development is abstract thought (Nippold, 2007). Concrete objects and thoughts dominate early childhood language development; however, the importance of abstract thinking and reasoning increases through cognitive and linguistic development. Abstract nouns are one of the representations of abstract thought. An abstract noun refers to states, events, concepts, feelings, and qualities that have no physical existence and anything that cannot be perceived through five physical senses: the opposite of a concrete noun. These three important types of literate words provide insight into later language and literacy development. Therefore, it is critical that research not only focuses on the literate lexicon and language development, but also examines different types of literate words.

Word Knowledge Tests

The literate lexicon is associated with word knowledge. How children's word knowledge is measured is critical to educators, clinicians, parents, and researchers. Dockrell and Messer (2004) claimed that word knowledge should be assessed with different measures and should consider the quality and quantity of children's vocabulary knowledge. Westby (1990) suggested using whole language theory to assess language development and to further evaluate children with language disabilities. In the whole language model, children are evaluated in different aspects of language such as semantics, pragmatics, and syntax in four modalities (i.e., reading, writing, speaking, and listening). This is based on the view that understanding some aspects of a word does not necessarily indicate understanding of the word's meaning in a more complex context. Thus, in order to provide a full picture of children's word knowledge, assessment in both comprehension and production of vocabulary is essential.

The standardized vocabulary tests such as Peabody Picture Vocabulary Test-Fourth Edition (PPVT-4) (Dunn & Dunn, 2007) and some standardized language tests containing vocabulary knowledge subtests such as Clinical Evaluation of Language Fundamentals 3 (CELF-3) (Semel, Wiig & Secord, 1995), and Test of Language Development-Primary, Third edition (TOLD-P:3) (Newcomer & Hammill, 1997) were commonly used to detect vocabulary knowledge of the examinee. However, the focuses of the lexical knowledge tests are often limited to the comprehension and production of the meaning, vocabulary use, and word association (Laufer, Elder, Hill & Congdon, 2004). Westby (1990) claimed that many language tests assess discrete aspects of

semantic abilities. Laufer, Elder, Hill, and Congdon (2004) pointed out that the best way to evaluate children's vocabulary size and strength was to measure different dimensions of word knowledge because word knowledge meant not only understanding the link between the meaning and the form but also use of the word correctly in free production. Vocabulary tests have been questioned by researchers (Curtis, 1987; Laufer et al., 2004), and most of the tests focused on word or sentence level comprehension and production. Therefore, it is important that researchers not only assess word knowledge under one aspect of language but also examine the quality of word knowledge. In addition to determining how many words a child knows through vocabulary tests, understanding how children use these words in daily life is essential to both language development and instruction design.

Writing as an Important Window

Language develops and expands continuously in life. Throughout the school-age years, writing play an important role in learning and academic success and is viewed as schooled language competence (Perfetti & McCutchen, 1987). Writing is the most complex aspect of language and is important during the school-age years while written language becomes crucial in academic success and knowledge acquisition (Morris & Crump, 1982). Writers do not simply write the words down, but rather also need to plan, organize, spell, and compose the content according to the potential audience and genre requirements. Perfetti and McCutchen (1987) suggested that three components comprising writing competence including discourse schema knowledge, lexical

knowledge, and syntactic knowledge, and that writers manipulate words and phrases to meet the discourse requirements by having sufficient lexical and syntactic knowledge. Therefore, using appropriate words in writing is a critical process for writers to correctly convey the meaning with confidence and effectiveness.

Written texts were often found to contain low-frequency lexical items and words referring to abstract entities (Bar-Ilan & Berman, 2007; Chafe & Danielewicz, 1987; Nippold, 2007; Nippold,Ward-Lonergan & Fanning, 2005). In addition, children used more complex syntax and diverse vocabulary in written text than spoken text (Bar-Ilan & Berman, 2007; Scott, 1988). Therefore, writing is a natural and practical way to examine how children use words in regular settings because children need to have full knowledge of the word in order to use it appropriately given the context, genre, and audience. Thus, examining word use in writing provides a window to explore the literate lexicon and school-age language development.

According to Flower and Hayes' writing model (1984), the writing process contains three steps (i.e., planning, translating, and reviewing), and is interactive with the writer's knowledge of the topic, audience, and writing plans. All of these steps must be coordinated within the limits of working memory (McCutchen, Covill, Hoyne, & Mildes, 1994); however, the translating step was less elaborated in Flower and Hayes' model. Berninger and Swanson (1994) and McCutchen and colleagues (1994) further explained what happened during the translating stage. In the translating stage, writers need to retrieve appropriate words and further generate sentences and paragraphs. If the translating process does not operate fluently, then the limited working memory available

for online planning and reviewing is hindered (McCutchen, Covill, Hoyne, & Mildes, 1994). Berninger and Swanson (1994) further divided the translating step into two components, namely text generation and transcription, where text generation contains the production of words, sentences, and paragraphs. Therefore, word use is in the process of text generation and translation and is an important representation of children's word knowledge and literate language development.

Writers need to consider audience and genre in the writing process; therefore, it is important to take genre into account to further explore whether writers use vocabulary differently. Genre is a map or plan for discourse and varies in its functions (Westby, 1994). Scott pointed out that genre is more powerful than modality on the effect of a text's form (1994), and the distinction between narrative and expository discourse provides most classification scheme differences (2005). Thus, it is advisable to compare language samples in these two distinct types of discourse while examining language use and development. Since the literate lexicon is used more often in formal writing than in speaking (Ravid, 2004) and by school-age children than by preschoolers, the focus of the present study was on written language in school-age children and adolescents.

Compared to spoken language development, fewer studies have been devoted to written language. Moreover, most of these studies focused on cohesion, organization, syntactic complexity, information density, and semantic density and diversity (e.g., Berman & Nir-Sagiv, 2007; Hidi & Hildyard, 1983; McCutchen, 1987; O'Donnell, 1974; Ravid & Berman, 2006; Ravid & Zilberbuch, 2003; Verhoeven et al., 2002). Although some of the studies explored the literate word use in writing, the focus of literate word

use in these studies was on Latinate lexicon (Berman & Bar-Ilan, 2007; Berman & Nir-Sagiv, 2007), abstract nouns (Berman & Nir-Sagiv, 2007; Nippold, Ward-Lonergan & Fanning, 2005; Ravid, 2006) and adverbial conjunctions and metaverbs (Nippold, Ward-Lonergan & Fanning, 2005). Very few studies looked into different types of literate words that school-age children and adolescents produced in different writing genres. However, as stated previously, it is critical to assess language development in multiple dimensions and across different age spans to fully understand continuous language development.

Later Language Development and Children with Language Difficulties

Traditionally, older children have received less attention in the study of language development because later attainments in language are subtle (Nippold, 1993; 1995). However, in studying the literate lexicon and writing, school-age children and adolescents must be included because the use of advanced and complex language develops relatively late. Differences in language use between the school-age years and early childhood show themselves in quality and quantity, resulting from schooling, exposure to print, and opportunities to write (Nippold, 2007). Older children not only use advanced vocabulary and compose sentences with more complex syntax but also consider their potential audience, context, and discourse more maturely. Although preschoolers use aspects of literate language such as conjunctions and mental state verbs in narratives (Curenton & Justice, 2004), the use of these types of words may not reflect their true understanding since linguistic literacy and cognitive maturity are still developing.

Therefore, studying school-age children's written language samples is the best way to explore how children use and understand the literate lexicon.

In particular, little attention has been paid to how school-age children and adolescents use the literate lexicon in writing. Writing provides a window to examine how children use words they have learned, and school-age children are perfect candidates for exploring later language development. For the present study, task of narrative and expository writing not only supplied research evidence to further understand word use in different genres of writing but also was embedded in the school curriculum. Therefore, this study offered valuable research evidence and a more complete picture of literate lexicon development during the school-age years.

Studying typically developing children and adolescents provides valuable information for educators and clinicians to determine when children are at risk. It is critical to first understand how typically developing children build up and utilize their language in order to use the information as a foundation to identify children with language difficulties. The American Speech-Language-Hearing Association (ASHA, 2001) stated that children with spoken language problems commonly have difficulty learning to read and write, since that challenge involves the same language components as listening and speaking, such as phonology, morphology, syntax, and semantics. Gillam and Johnston (1992) examined spoken and written narratives of typically developing children and children with language learning difficulties. They found out that children with language learning difficulties produced less complex sentences and made more grammatically unacceptable sentences, especially in writing. Morris and Crump (1982)

found that children with learning disabilities used less variety in their written vocabulary, although there was no difference in T-unit length between typically developing children and children with learning disabilities. Children with specific language impairment (SLI) were compared with chronological age matched (CA) and language age matched (LA) groups in writing in the Mackie and Dockrell study (2004). Children with SLI produced shorter stories, had more difficulties with generating text, and made more syntactical errors in writing compared to the CA and LA marched peers. They claimed that children with SLI have difficulties with translating the ideas into written language because of the limited linguistic and cognitive resources.

Windsor, Scott, and Street (2000) examined the use of verb morphology (such as regular past tense, and third person singular present tense) and noun morphology (such as articles, regular plural, and possessives) in spoken and written language production for children with language learning disabilities (LLD). They found that children with LLD had difficulties with marking verb morphology appropriately in their written and spoken language. Another study done by McFadden and Gillam (1996) used a holistic scoring system to evaluate spoken and written narratives generated by children with language disorders. Their findings indicated that children with language disorders produced narratives with less complex structure and lower quality compared to their peers. Similar results were obtained in Scott and Windsor (2000), where genre and modality effects were more prominent in school-age children with language learning disabilities. These children performed more poorly in writing and in expository discourse compared to their peers. Additionally, Lewis and colleagues (1998) claimed that children with speech

and/or language disorders were at risk for writing difficulties at school age, and the risk continued even after their spoken language improved.

According to ASHA (2001), Speech Language Pathologists are required to provide language assessment and intervention for young children at risk to prevent later written language problems. However, few studies address writing issues, and no study to date has focused on word use in writing in children with language difficulties. Lewis and the colleagues (1998) pointed out that since reading, writing, and spelling shared common linguistic processes, children with spoken language difficulties were at risk for writing difficulties. Given that, researchers advocate the importance of evaluating children's written language skill since development of writing and written language deficits were less studied and understood (Singer, 1995; Windsor, Scott & Street, 2000).Thus, the present study provided important evidence of how typically developing children use the literate lexicon in different genres of writing in order to supply developmental data for educators and clinicians to detect children at risk and further provide intervention in writing and literate lexicon learning.

Purpose of the Present Study

The purpose of the present study was to provide research evidence and developmental norms regarding how typically developing school-age children and adolescents use the literate lexicon in different genres of writing. Word knowledge refers not only to understanding meaning and form, but also having knowledge about how to use words appropriately in different contexts, genres, and for varying audiences.

Investigating word use in writing provides a window into language development and is a practical way to understand how literate language develops in typical school-age children and adolescents. The present study not only integrated the literate lexicon/language and later language development, but also provided a clear picture of how school-age children and adolescents continuously develop their literate use of language.

Examining how typically developing children process language offers useful information to identify children at risk. Since literate language plays an important role during the school-age years, it is critical to assess children's literate lexicon/language knowledge to detect any difficulties in word knowledge and language use. Therefore, developmental study is critical not only to understand language development, but also to use it as a reference to detect children at risk. Moreover, the present study integrated later language, literate lexicon development, and writing to serve as a foundation for clinicians and teachers to identify children with writing difficulties and prevent writing problems.

CHAPTER II

LITERATURE REVIEW

Literate Lexicon

The literate lexicon is more than just the set of words learned in early childhood. Based on Ravid's definition (2004), the core lexicon refers to the basic vocabulary gained during preschool and mainly derives from spoken language. In comparison, the advanced or literate lexicon reflects maturation in cognitive and language development and increases during the school years. The literate lexicon commonly shows itself in scholarly contexts in high school and college, such as in textbooks, lectures, or technical presentations (Nippold, 1993). Overall, literate words are longer, more abstract and complex, and less familiar than those in the core lexicon, often appearing with multiple affixes which make these words more difficult to learn and retain. Nippold, Ward-Lonergan, and Fanning (2005) asked 60 school-age children, 60 adolescents, and 60 adults to write an essay on a controversial topic to investigate syntactic, semantic, and pragmatic development in persuasive writing. They found that the use of three types of literate words -- adverbial conjuncts, abstract nouns, and metaverbs -- increased from

childhood to adulthood. However, although the literate lexicon develops gradually, the use of these words remains low even in adults.

Oral and literate language both develop (Paul, 2007), but they differ from one another. The school-age years are important for literate language development since children at these ages encounter more complex and less concrete advanced words through exposure to textbooks, lectures, and reference woks such as encyclopedias. Nippold (1993) claimed that two crucial components of semantic development during adolescence are the literate lexicon and figurative language. Adolescents not only acquire a larger vocabulary, but also are able to elaborate upon the meanings of known words and to understand the connections among words, such as derivatives and synonyms (Nippold, 2007; Paul, 2007). With cognitive and linguistic development, adolescents have the ability to acquire more advanced words and to expand their lexical inventory through categorizing words and utilizing word rules. School-age children and adolescents develop advanced, literate vocabularies through opportunities to read texts with complex syntactic structures and to write in professional ways.

Literate language development displays some distinct signs. Paul (2007) categorized six types of words that involve literate language forms, including: 1) advanced adverbial conjuncts (e.g., moreover, in contrast); 2) adverbs of likelihood and magnitude (e.g., possibly, extremely); 3) technical terms related to curricular content (e.g., bacteria, proton); 4) metalinguistic and metacognitive verbs (e.g., imply, hypothesis); 5) words with multiple meanings (e.g., strike, short); and 6) words with multiple grammatical functions (e.g., hard, sweet). In addition, use of words such as conjunctions,

elaborate nouns phrases, metacognitive and metalinguistic verbs, and adverbs, helps researchers and teachers estimate a child's literate language ability (Greenhalgh & Strong, 2001; Westby, 1999).

Development of an advanced lexicon interacts with syntactic complexity, genres (e.g., narrative, expository), and modality (e.g., speech, writing) (Ravid, 2004). Verhoeven and colleagues (2002) claimed that it is a critical process in later language development to distinguish the difference between modality and genre. Therefore, it is important to consider genres and modality as factors while comparing spoken and written language performance (Scott & Windsor, 2000).

Narrative and Expository Texts

The ability to talk and write with different genres is an important factor in development (Verhoeven, Aparici, Cahana-Amitary, van Hell, Kriz, Viguie-Simon, 2002). Different genres have a significant impact on how information is presented, varying with broad ranges of vocabulary, clauses, phrases, sentences, and organization. Therefore, while talking about language development, different genres need to be taken into account to represent language performance without bias.

In the Greenhalgh and Strong (2001) study, there was no age-level difference found when literate language use was examined in spoken narratives in typically developing children compared to children with language impairments in four different age groups (from 7 to 10 years old). One of the explanations of failure to find age-level differences was that only narratives were collected in this study, and literate language is

commonly shown in written language. Children use different kinds of vocabulary depending on contextual factors, the way they represent the content, and the requirements of different discourse genres. Thus, the frequency of different types of words used may vary with genre and modality.

A genre is a plan for discourse and text, and different genres may have different functions (Westby, 1994). Each genre has a predominant discourse form to be learned through numerous writing experiences and genres influence choices in lexical, phrase, sentence, and text levels (Scott, 1994). Only two genres were investigated in the present study, because there is a major distinction between narrative and expository genres (Ravid & Zilberbuch, 2003). Narratives are about people engaged in events with a sequential timeline, including personal experiences, fictional narratives/stories, and film/book/TV program summaries (Hadley, 1998; Scott, 1988). They are chronologically based and agent-focused (Scott & Windsor, 2000), as in retelling and generating stories. In contrast, expository texts usually contain factual or technical information such as cause-effect explanations and procedural directions (Hadley, 1998), having a non-temporal, logically-based, and argumentative structure (Ragnarsdottir, Aparici, Cahana-Amitay, van Hell, & Viguie, 2002). Ragnarsdottir and colleagues (2002) claimed that one major difference between narrative and expository texts is verbal paradigms. For example, past tense is typically used in narrative, but present tense is characteristic of expository text.

Narrative skills develop earlier than those used in writing expository text, where narrative is the earliest extended monologue text produced by children. Narratives receive

great interest because they are a universal genre and have a central place in human lives (Westby, 1994). Moreover, narrative text expresses people's thoughts and plays an important role in comprehension and production for academic success. In contrast, the acquisition of expository text structure requires exposure to lectures, textbooks, and writing and reading experiences in school. Berman and Katzenberger (2004) suggested that the well-formed expository texts are constructed beginning from high school.

By adolescence, children are able to organize the information hierarchically in an expository text, including a statement in the introduction followed by supporting arguments and a conclusion, with a main ideas and claims. Scott and Windsor (2000) stated that sentential grammatical complexity is affected by genre in children age 9 to 12. Although children use different linguistic markers and verbal expressions to show distinctive knowledge between narrative and expository texts around 4th grade (Berman, 2004; Berman & Katzenberger, 2004; Berman & Nir-Sagiv, 2004), a clear distinction, such as syntactic structures and lexical selection, is not formed until adolescence (Ravid & Zilberbuch, 2003).

San Jose (1973, cited in Morris & Crump, 1982) pointed out the effect of discourse genre on average T-unit length in writing as early as 4th grade, and T-unit length was longer in argumentative discourse than descriptive text. In Scott and Windsor (2000), they compared spoken and written narrative and expository discourse between typically developing children and children with learning disabilities. The results indicated that narrative summaries had longer T-units and a greater total number of words, and that productivity and fluency were greater in narrative than expository discourse. However,

average T-unit length, used to measure grammatical complexity, was longer in expository summaries than narrative ones. In addition, expository text is usually longer than narratives. Another study done by Hidi and Hildyard (1983) indicated that narrative text was produced more easily, and was found to be longer, better formed, and more coherent than expository text in both 3rd and 5th graders.

The differences between the two genres have been compared across several measures in several studies, namely: productivity, grammatical complexity, lexical diversity, and grammatical errors (Scott & Windsor, 2000); use of ten types of nouns (Ravid, 2006); text openings (Berman & Katzenberger, 2004); lexical and morphosyntactic constructions (Berman & Nir-Sagiv, 2004); noun and verb phrases (Berman, 2004); content and text organization (Langer, 1985; Berman & Nir-Sagiv, 2007); semantic well formedness and cohesion (Hidi & Hildyard, 1983); clause packaging (Verhoeven, Aparici, Cahana-Amitary, van Hell, Kriz, Viguie-Simon, 2002); Latinate and Germanic lexicon use (Bar-Ilan & Berman, 2007).

It is a gradual learning process to understand how to alter content organization, select appropriate words, use proper syntactic structures, and target the right audience according to the specific genre type. Therefore, one of the crucial components of later language development is to be familiar with the written language requirements of different discourse styles (Ravid & Tolchinsky, 2002). Berman and Nir-Sagiv (2004) confirmed that one of the late-developing language abilities is use of genre-appropriate context structure and consistent register distinction according to different discourse types. For example, logical connectors, present tense, and argument statements are used in

expository text; on the other hand, past tense, concrete description, and illustration are seen in narratives.

Berman and Katzenberger (2004) pointed out that expository and narrative texts reflect different cognitive processes. In addition, expository text develops later than narrative text because of sociocognitive factors and different types of experiences. Westby (1994) argued that narrative text requires children to integrate language skill into a literate language production without assistance; however, the acquisition of expository text needs exposure to formal schooling. In general, it is easier to describe an experienced event or to tell a story than it is to make a logical statement or argument about a controversial issue. Therefore, expository and narrative texts are different not only in content, lexical use, and syntactic structure, but also in developmental and cognitive processes.

Spoken and Written Modality

One turning point in child language development is the transition from oral to written language (Verhoeven et al, 2002). In order to study the lexicon, it is necessary to consider modality because lexical measures are sensitive to genre and modality (Stromqvist, Nordqvist & Wengelin, 2004). Thus, in addition to genres, modality needs to be taken into account in order to get a full picture of language development. Modality of language, describing how information is communicated and delivered, often refers to spoken and written language (Westby, 1985). Speech and writing are both language expressions, sharing some features, distinct in others. In general, spoken language tends

to be face-to-face (or voice-to-voice), concrete, contextually embedded, rapidly processed, more spontaneous (i.e., less planned), with less word variation; in contrast, written language tends to represent a monologue, and is abstract, contextually extracted, deliberately processed, planned (i.e., editable), structured, and uses a formal vocabulary register.

These two modalities are both expressive, closely interacting with each other in the language development process. Common variables used to compare these two modalities are syntactic structures (i.e., sentences, clauses, phrases), semantic use (e.g., lexical density and diversity), cohesion (e.g., organization), number of words, and connectors used (Scott, 1988). In addition to understanding the similarities and differences in oral and written language, it is worth examining the process wherein a child begins to write, and then reaches a level required to talk and write appropriately according to the context, audience, and purpose.

Kroll (1981) pointed out four phases describing the developmental process of speaking and writing. Younger children have well-developed oral language but very minimal written language. During this preparation phase, younger children use oral language to learn and to provide a basis for written language. Children's written language lags behind oral language when they begin to write, and they focus more on spelling and forming letters instead of on structures and formation. When children begin to write, they write as if they were talking. During this consolidation phase, writing and speaking begin to integrate.

Narrative serves as an important transition from oral language to literate language and is the first step that children learn to produce a monologue without interactive dialogue (Westby, 1985). Younger children produce less complex sentences in writing than in speaking, but the sentences in writing become more complex during the secondary school years (Scott & Windsor, 2000).Through schooling and experience, children learn the difference between speaking and writing, and their essays acquire a format that is different from speech. During adolescence and adulthood, writing and speaking are used interchangeably, maturely and appropriately according to audience, purposes, and context.

O'Donnell (1974) indicated that writing tended to be more complex in syntactic structure and had a greater degree of syntactic density. In addition, T-units, one main clause with all the subordinate clauses and nonclausal phrases attached to or embedded in it (Scott, 1988; Nippold, 2007), were longer in writing and more T-units contain dependent clauses in writing than in speech. Ravid and Berman (2006) studied spoken and written narrative texts in English and Hebrew in 4th, 7th, and 11th graders and graduate students. In their study, oral narratives were longer but less dense in information compared to written narratives; moreover, informational density was closely related to modality beginning in 4th grade.

McCutchen (1987) pointed out that spoken texts were longer and more elaborated than written texts, but writing was more coherent than speaking. Additionally, explicit ties such as conjunctions and dependent clauses were shown in writing but not in spoken texts. Similar results were confirmed in Hidi and Hildyard's study (1983). Spoken texts

were longer than written texts for both narrative and expository genres, and written texts tended to be more cohesive than spoken texts. Not surprisingly, a developmental trend was shown in both quality and quantity of written and oral production.

Chafe and Danielewicz (1987) compared four types of language samples: conversation, lecture, letters, and academic writing from twenty graduate students and professors. It is noteworthy that speakers tended to have a limited variety of vocabulary use and to use more new words and new meanings of old words compared to writers. In addition, more literate vocabulary was used in academic writing but more colloquial vocabulary was used in conversation. Therefore, because of the nature of writing, it leads to richer and more explicit uses of words.

Some researchers expanded the understanding of spoken and written language relationships from typically developing children to children with language and learning difficulties. Scott and Windsor (2000) compared productivity, lexical diversity and grammatical errors of school-age children with language learning disabilities and their language and age matched peers in different modalities and genres. The findings revealed that spoken texts were longer and produced faster than written texts. Moreover, the grammatical errors were more commonly seen in writing than that in speaking for all three groups. Combining with genres, written expository was difficult for children with language learning disabilities and language matched peers, and there was no grammatical complexity increase in written expository for these two groups.

Children with language and learning difficulties and typically developing children were also compared in spoken and written narratives in Gillam and Johnston's (1992)

study. Their results showed that spoken narrative was longer but not necessary more complex than written narrative. In addition, children with language and learning difficulties produced more ungrammatical sentences in writing; however, the relationship between spoken and written language was similar to that of matched peers. In the Morris and Crump (1982) study, four groups of school-age children with learning disabilities and their age-matched peers were studied on written texts. Although the T-units length increased with ages, it did not differentiate these two groups of children. However, when syntactic maturity was taken into account, typically developing children performed better than children with learning disabilities. In addition, typically developing children used a greater variety of vocabulary words in writing.

Overall, spoken and written languages are critical in language development, learning, and communication. These two modalities share similarities, but becoming a mature writer is not only putting words in print but requiring selection and organization of ideas and knowing how to produce content that is appropriate, along with discourse and modality. According to the literature review, spoken text uses less diverse vocabulary and more frequent words; however, more advanced literate lexicon and a wider variety of words are seen in written text (Stromqvist, Nordqvist & Wengelin, 2004). Therefore, Lexical use in spoken text tends to be less formal and less informative compared to written text (Ravid & Tolchinsky, 2002). Beyond lexical use differences written text often contains longer sentences, denser information, and more complex syntactic structure.

The literature related to the literate lexicon, genre, and modality has been reviewed to provide a solid foundation for the present study. Since the main focus of the

present study was to investigate three types of literate words used across two different genres in writing, a literature review of three types of literate words, including abstract nouns, mental state verbs, and derivatives was essential.

Abstract Nouns

Concrete words such as *flower* and *dinosaur* and abstract nouns such as *freedom* and *loneliness* not only have different functions in language but also are processed differently in the brain. According to Paivio's dual coding theory (1991), a verbal system which refers to verbal codes and a nonverbal system which implies mental imagery are processed differently. The two systems can be activated by each other in either parallel or integrated ways. In addition to the different processing methods between verbal and nonverbal, there is a discrepancy between abstract and concrete language processing. Concrete and abstract words are processed differently in the brain because of activation of different part of the brain. Moreover, concrete words have greater cognitive processing advantages over abstract words (West & Holcomb, 2000). Apparently, concrete words additionally activate regions in the right hemisphere and form nonverbal images, so concrete language is retained longer, recalled faster, and more easily comprehended due to the activation of both verbal and nonverbal systems. On the other hand, abstract language depends heavily on verbal associations for its meaning and is mainly processed by the verbal system.

Dual Coding Theory

It is assumed that concrete nouns are learned through sensory experience while the meanings of abstract nouns are derived mainly from networks that are mostly made up of abstract words (Sabsevitz, Meddler, Seidenberg & Binder, 2005). Dual coding theory proposes that abstract concepts are stored in the language dominate hemisphere, the left hemisphere, but that concrete concepts are processed in both hemisphere. However, if dual coding theory is applicable not only to words but also to sentences, then paragraphs and texts are worth investigating. Sadoski (1995) conducted a study to investigate whether concreteness effects could be extended beyond the word level such as text. The concreteness effect was found in paragraphs drawn from naturally occurring texts. In addition, concrete content was better recalled when concrete and abstract information was equally familiar to the readers, but when abstract content was more familiar to readers than concrete content, they were equally recalled. Therefore, in addition to the concreteness effect, content familiarity had influence on later recall. But, concrete content was twice as memorable as abstract content when the text was controlled in readability, comprehensibility, and other context differences. Thus, dual coding theory explained the concreteness effect to natural text, which is beyond the word and sentence levels.

In contrast to dual coding theory, the context availability theory views the concreteness effect from a different standpoint. Context availability theory (Schwanenflugrl, Akin & Luh, 1992) claims that concrete and abstract information is integrated into the learner's prior knowledge and is processed differently because of

distinct context support, not different brain systems. Schwanenflugrl and colleagues (1992) argued that when context availability was controlled, subjects recalled abstract and concrete word without any differences. In addition, when imageability and context availability were highly correlated, the independent effect of imagery was difficult to detect. According to context availability theory, concrete information is easier to comprehend and remember because it is easier to relate to prior knowledge. Context availability theory claims that it is easier to retrieve a context in which a concrete word appears such as *lamp* than to retrieve a context in which an abstract word appears such as *peace* (Altarriba, Bauer & Benvenuto, 1999). In other words, concrete words have stronger links to contextual information and a greater quantity of information available, in contrast to abstract words (Sabsevitz, Meddler, Seidenberg & Binder, 2005). However, abstract information is more vague and difficult to process due to the lack of built-in contextual support (Kounios & Holcomb, 1994).

Evidence for Dual Coding Theory

In order to test how concreteness effects work and if dual coding theory or context availability theory better explain word processing in the brain, several imaging studies were done to provide the experimental evidence. Jessen and colleagues (2000) attempted to provide evidence for dual coding theory through event-related functional fMRI and to explore which cortical regions are responsible for the additional concreteness effect. Fourteen German-speaking adults participated in this study. Two hundred and forty words including 120 concrete and 120 abstract words were used as stimuli. Subjects had to encode as many words as possible and the word recognition test

was administrated later. The test consisted of 80 experimental words and 80 distractor words, and the subjects were asked to identify previously presented words. The results of this study showed that higher concreteness resulted in better recognition, so the superior concreteness effect was achieved. The findings of this study supported dual coding theory, that concrete words activated in the right hemisphere during decoding. In addition, the parietal region, which was related to spatial imagery, was activated in some participants; thus, a spatial associative encoding strategy was used in some participants to memorize the concrete words.

Sabsevitz and colleagues (2005) conducted an fMRI study to determine if concreteness effects exist. Twenty-eight adults had to select the word that was most similar to the meaning of the sample noun. The stimuli, which were composed of concrete and abstract nouns, were visually presented. The results indicated that abstract nouns were mainly activated and processed in the left hemisphere while concrete nouns were processed bilaterally. Therefore, this study again supported dual coding theory with the evidence of bilateral activation during the processing of concrete nouns. Another fMRI study done by Noppeney and Price (2004) asked 15 adults to choose the word that had a similar meaning to the sample word. The words were visually represented within a triad and drawn from abstract concepts (*motive*, *intent*, *attempt*), color (*green*, *pink*, *red*), sounds (*tone*, *melody*, *noise*), and hand movements (*squeeze*, *comb*, *brush*). The results showed that abstract concepts activated a left-lateralized frontal temporal system that is usually involved in semantic processing. Additionally, abstract concepts and sensory-based semantics were processed in different neural systems. Noppeney and Price

suggested that since abstract concepts could not be represented by real objects, people might generate a semantic context to obtain meaning.

The imageability on word processing was also investigated through Event-Related potentials (ERPs). Swaab, Baynes, and Knight (2002) presented 320 word pairs auditorally to 12 adults. The stimuli were composed of concrete, imageable, and abstract, non-imageable words, and the word pairs were either related or unrelated in meaning. For example, bread-butter was highly-imageable and related, but pace-dispute was low-imageable and unrelated. Participants were asked to decide whether the words in pairs were related semantically. They pointed out that imageable, concrete words were stored differently from abstract, non-imageable words and activated both verbal and image-based store systems. Additionally, the image-based system can be activated during normal word processing without sentence or context support.

Kellogg, Olive and Piolat (2007) asked 60 college students to write definitions of 10 concrete or abstract nouns and to perform a verbal or visual working memory task at the same time. They found that the visual WM task showed interference only when participants wrote the definitions of the concrete nouns but not for the definitions of abstract nouns. They stated that participants did not need to generate the images while writing the definitions of abstract nouns; thus, the interference did not show up. In addition, participants responded more slowly in defining abstract nouns while performing the verbal WM task but not the visual WM task. Therefore, their findings were consistent with dual coding theory since the visual WM task only interfered while participants defined concrete nouns.

Another ERP study was done by Nittono, Suehiro and Hori (2002). Twelve college students were asked to rate the imageability of the words that were visually presented to them on a five-point scale and to recall as many words as they could later. The stimuli were composed of high imagery words, low imagery words, and non-words. The results indicated that high imagery words activated additional imagery-related networks that were located in the right hemisphere and were not activated by low imagery words. Thus, the results again supported dual coding theory.

Mellet, Tzourio, Denis and Mazoyer (1998) investigated the activation of cortical areas through PET when people listened to word definitions. Participants were in three conditions including generating mental imagery while listening to concrete word definitions, listening to abstract word definitions, and silence conditions. Eight college students listened to 15 words and their definitions and then recalled the words they had just heard. The findings indicated that participants recalled more concrete words than abstract words after listening to word definitions. They also found that listening to the abstract word definitions activated the language area more intensively than listening to the concrete ones.

Difference in Defining Concrete and Abstract Nouns

In addition to imaging evidence, some behavioral evidence revealed that people process concrete and abstract nouns differently. Sadoski and his colleagues (1997) asked 48 college students to write definitions of 5 concrete and 5 abstract nouns and to rate their thinking strategies while defining the words. The findings indicated that participants tended to use the imagery strategy while defining a concrete word, but used the

verbal-associate strategy for abstract words. In addition, the definitions of the concrete nouns were more detailed and informative compared to the abstract words.

McGhee-Bidlack (1991) recruited 120 subjects (ages 10, 14, and 18) to define eight concrete and eight abstract nouns. Results revealed that concrete and abstract nouns were defined differently and that concrete nouns were easier to define than abstract nouns. In addition, all groups defined concrete nouns mostly by class and characteristics; however, abstract nouns were not well defined by class and characteristics until 18 years-old. The quality of the definitions of both concrete and abstract nouns improved gradually with age but defining abstract nouns apparently develops later than concrete nouns. McGhee-Bidlack stated that concrete nouns are related to tangible objects; therefore, children have better built-in concepts for concrete nouns but not abstract ones and are able to learn concrete words prior to abstract words.

Another definition study done by Nippold and colleagues (1999) asked four age-groups (12, 15, 18, and 23) to define 16 abstract nouns. The findings indicated that the development of the ability to define abstract nouns improved with age into early adulthood but was still incomplete by late adolescence. Nippold et al (1999) claimed that the improvement might result from the development of abstract reasoning as a way of thinking; therefore, early adulthood was a time to refine word knowledge and metalinguistic ability. Nippold (1999) conducted another study and tested the same abstract nouns on 16 skilled readers and 16 poor readers, age 15. She pointed out that skilled readers provided more informative, accurate, and clear definitions than poor readers.

Use of Abstract Nouns in Written Language

According to the imaging evidence and behavioral evidence reviewed above, abstract and concrete nouns are processed differently. However, how people use abstract and concrete nouns in actual language production is less understood especially in written language. Although spoken and written compositions are different, these two modalities are both language production and may share similar cognitive mechanisms (Sadoski, Kealy, Goetz, & Raivio, 1997). Some studies (McGhee-Bidlack, 1991; Nippold, 1999; Nippold, Hegel, Sohlberg, & Schwarz, 1999) attempted to examine how people composed definitions for abstract and concrete nouns through written modality, but how children use abstract nouns in actual writing is unclear and has received less attention. Sadoski et al (1997) recommended that it is necessary to study longer written compositions in different genres with sufficient time limits.

Ravid (2006) used ten nouns, including concrete nouns (*ball*, *bike*), proper names (*Tiffany*, *Mike*), collection/location (*library*, *class*), role nouns (*cousin*, *neighbor*), generic nouns (*people*, *somebody*), temporal nouns (*week*, *months*), event nouns (*game*, *party*), imaginable abstract nouns (*yells*, *kicks*), abstract nouns (*control*, *purpose*), and derived abstract nominals (*discussion*, *pressure*) to examine how Hebrew school-age children utilized nouns while writing and telling expository texts and narrative stories. She found that all age-groups (4th, 7th, 11th graders and adults) used more abstract and high-level nouns in expository and written texts than narrative and spoken texts, and a gradual increase toward adolescence was shown in both category and abstractness. In the use of abstract nouns within both modalities across all age groups, 12% of the words used in

expository text were abstract nouns, but abstract nouns only accounted for 7% of the word use in narratives.

On of the sub-studies done by Berman and Nir-Sagiv (2007) categorized Ravid's (2006) noun scale into four levels based on the abstractness and imageability. The participants were asked to tell and write a story regarding "problems between people" (narrative) and discuss "problems between people" (expository) orally and in written format. The results revealed that participants tended to use more concrete/imageable nouns in narrative, but use more abstract and low frequency words in the expository writing.

Summary of Abstract Nouns

Use of abstract nouns is one of the features in later language development. Nippold (2007) stated four contrasts between early and later language development including sources of language learning, metalinguistic competence, abstract thought, and social perspective-taking; thus, the use of abstract nouns is evidence of thinking abstractly. Dual coding theory provides a foundation for how and why people process abstract and concrete nouns differently in the brain, and definition tasks additionally supply evidence of distinct quality and quantity while defining these two types of nouns.

In both spoken and written discourse, abstract nouns have received little attention from researchers. However, language development is a continuum and lexical learning is a gradual rather than all-or-none process. Therefore, in order to fully understand language development, it is important to study the lexical use from school-age to adulthood and to detect the differences from early to late language development. Although the changes in

quantity might be subtle, changes in quality of language use show differences (Nippold, 2007; Nippold, Mansfield & Billow, 2007; Scott, 1988). Nippold and colleagues (2005) claimed that the use of abstract nouns increased between childhood and adulthood, and that the word learning process heavily focused on abstract concepts in adolescents and adults. Since children's thoughts become increasingly abstract with age, measurement on how school-age children use abstract nouns is needed. The study of abstract nouns offers insight to researchers for understanding later language development. This information also serves as an index for clinicians to evaluate language processes in children with language difficulties.

Mental State Verbs

In addition to abstract nouns, the use of mental state verbs is sensitive to developmental growth. During the school years, words are used not only to label familiar experiences but also to reflect internal states, which are critical in reading comprehension and communication (Westby, 1990). In both spoken and written language, it is important to correctly convey people's beliefs and the truth of what is communicated (Fuste-Herrmann, Silliman, Bahr, Fasnacht, Federico, 2006). Therefore, mental state terms, including metacognitive and metalinguistic verbs, are worthy of study because they play important roles in social and conversational understanding and represent people's internal mental states.

Mental State Verbs and Theory of Mind

According to Olson and Astington (1993), metacognition is talking about cognition and metalinguistics is talking about language, and they are all metarepresentation. In addition, metacognitive and metalinguistic terms provide language for and about thinking. When people say, "I think an elephant is a mammal," it represents language for thinking to reflect on things in the world or to change one's opinions about things. Mental state terms also are used to reflect our own or other peoples' thoughts; thus, they are language about thinking (Olson & Astington, 1993). Astington and Olson (1990) claimed that metacognitive verbs, such as *assume*, *doubt*, *infer*, *and remember*, and metalinguistic verbs, such as *admit*, *conclude*, *confirm*, *and predict*, facilitate children's thinking and talking. In addition, use of these terms could help children to recognize different mental states and speech acts in order to make the meaning clear. Moreover, mental state verbs not only are used to monitor, interpret, and express internal mental states of people, but also to provide a possible window into how the mind develops.

Theory of mind, the ability to understand that people have beliefs, desires, and intentions, is important in the development of pragmatics. Most children produce at least one mental state verb around two years old (Olson & Astington, 1993; Shatz, Wellman & Silber, 1983). Basically, two common tasks have been used to examine the development of theory of mind and false belief. During the first task, one character hid an object in one place and then left and the second character moved the object while the first character was gone. The participant was asked where the first character would look for the object upon returning. The other task is an unexpected-content task where the experimenter used

a commonly seen and familiar container such as a candy box, but replaced the candies with other objects such as crayons. After the child learned that the box contained something unexpected, the experimenter closed the box and asked the child what a friend would think is in the box before he/she looked inside.

When theory of mind comes to language, mental state terms are a salient and explicit way to represent and detect one's thinking and internal states. In addition, use of metacognitive and metalinguistic terms provided the first evidence of children's development of theory of mind (Olson & Astington, 1993). Booth and colleagues (1997) stated that cognitive words are an important process to develop awareness of internal mind activities and a vehicle to explore one's thought. Therefore, mental state terms are critical in cognition and language development because these terms provide evidence of development of theory of mind and false belief. What is the relationship between language and theory of mind?

Three major views about the relationship between language and theory of mind were discussed by Astington and Jenkins (1999) and Miller (2004). One of the major views is that theory of mind develops first and then language builds on it. The second point of view is that development of theory of mind depends on language competence, including pragmatics, semantics (Astington & Jenkins, 1999), and syntax (de Villiers & de Villiers, 2000) (Slade & Ruffman, 2005). Another view claimed that theory of mind and language are intertwined in development, and depend on the third factor such as working memory or executive function. The research results did not reach consensus on

which factor strongly predicts the development of theory of mind; however, it is clear that there is a strong relationship between theory of mind and language competence.

Although the views on the relationship between theory of mind and language were divergent, several studies showed that mental state terms emerge around two to three years old (Bretherton & Beeghly, 1982; Shatz et al, 1983). At this time, children begin to be aware of other peoples' thoughts and minds, although how much children understand other peoples' thoughts remain in question (Olson & Astington, 1993). Preschoolers begin to use lower level mental state terms, for example, *know, remember*, and *guess*; however, they do not grasp the complete meanings of these mental state terms until the early school years (Astington & Olson, 1990). Research showed that children begin to distinguish different certainty levels of mental state terms from four or five years old (Johnson & Maratsos, 1977; Johnson & Wellman, 1980; Moore & Davidge, 1989) and understand that people have different beliefs, and that beliefs change depending on time, the environment, and circumstances (Olson & Astington, 1993).

Understanding continues to develop well into adolescence for high level mental state terms such as *infer* and *hypothesize* (Schwanenflugel, Henderson, & Fabricius, 1998); however, high school and college students might still have incomplete knowledge about some of the complex cognitive words, such as *conclude*, *assume*, *interpret*, *and infer* (Booth & Hall, 1994). The reason that children do not appropriately use and fully understand mental state terms until adolescence might be that many of the mental terms are polysemous, and the sentences that carry these terms are usually complicated and involved in false belief.

Booth and Hall (1994) pointed out that mental state terms develop in a gradual manner, but that the acquisition of meaning might be different depending on its conceptual difficulty, levels of uncertainty, and abstractness (Schwanenflugel, Fabricius, & Noyes, 1996). The examples proposed in Booth, Hall, Robinson and Kim's article (1997) explained how abstractness and conceptual difficulty could range among different levels. For example, "know" in "I know the plate is dirty" is the lowest perception level, but "know" in "I know he will win the award" involves making presuppositions about the truth and belongs to the highest evaluation level. Therefore, the same mental state words may represent different internal mental state levels, and it makes mental state terms even more complicated to understand and takes longer for children to fully grasp the meaning. However, knowledge of mental state terms increases with age until adulthood as people organize and categorize these metacognitive words.

Mental State Terms and Literacy

Literacy leads people to represent language in a new way and to provide a way to think about language in a written format (Olson, Antonietti, Liverta-Sempio, & Marchetti, 2006). In order to fully understand the text, it is critical to understand what is given in the text and what is the meaning under the surface. Mental state terms serve as a bridge for readers to correctly comprehend the text. Olson and Torrance (1986) conducted a two-year longitudinal study beginning when participants were 5 1/2 years-old. Four metacognitive and metalinguistic tasks were administered and reading and vocabulary test scores were collected. Results showed that performance on metalinguistic and metacognitive tasks was strongly correlated to the oral and literate competence,

especially reading ability. In addition, the measures on metacognitive and metalinguistic verbs were intercorrelated. Thus, mental state terms are related not only to pragmatic and social conversation but also to comprehension, literacy, and metacognitive strategy development.

The association between metacognition and reading comprehension is strong, and it is evident that metacognition is critical in reading comprehension training and in enhancing overall learning efficiency. Booth and Hall (1994) investigated the relationship between cognitive words, *think* and *know*, and the development of metacognition. Twenty-four short stories, each with one cognitive word, were presented to 5th graders, 7th graders, 10th graders, and college students. Subjects were asked to choose the best answer from four sentences; a replacement cognitive word was contained in each sentence. The findings revealed that cognitive words were significantly related to metacognitive strategies and might enhance metacognitive strategy acquisition. They further pointed out that children with more cognitive words might be more likely to process the metacognitive information efficiently and effectively and to maintain and generalize reading strategies.

Mental state terms also play an important role in literacy. Since most of the mental state terms exist in literature and textbooks, not dialogue, teachers need to assist children to comprehend the sentences correctly without building misleading concepts of knowledge. Olson and Astington (1993) suggested that teachers should ask questions to facilitate children's thinking such as "Is that an assumption or a hypothesis?" in all discourse genres from younger ages. In addition, teachers need to talk about thought by

using mental state terms and to encourage students to use such language often in class instead of directly teaching metacognitive and metalinguistic words. Moreover, teaching students to interpret text through thinking how a statement is to be taken is essential because texts do not always clearly state the inferential and metaphorical meanings.

Development of Mental State Terms in Preschoolers

Children begin to produce mental state terms around two years of age. In Shatz, Wellman and Silber's study (1983), they first transcribed a speech sample of one child collected from age 2:4 to 4:0 years, and then gathered language samples from another thirty children for six months beginning at age 2:0 to provide stronger evidence. They focused on the frequency and functional use of *know* and *think*. The results showed that most of the children produced at least one mental verb at 2 years old; however, these words were not used to refer to internal mental states. They pointed out that younger children did not use these terms to make reference to mental states, resulting from a lack of awareness of mental states instead of deficits in linguistic abilities. Therefore, younger children tended to use *think* and *know* for conversational purposes, not for mental reference.

Johnson and Maratsos (1977) recruited 32 preschoolers, between 3 and 4 years old, and used a story of a hidden-object trick with follow-up questions to examine the understanding of *know* and *think*. The results indicated that 4-year-olds could distinguish that *think* might be false and *know* must be true, but 3-year-olds showed confusion with mental state verbs with external events.

Another study done by Moore and Davidge (1989) used a similar hiding game performed by two toy bears with 60 preschoolers, ages 3 to 6 years-old. They examined three mental terms including, *think*, *know*, *and sure*. In this study, children had to find the candy from two boxes according to what the two bears said. The bears said the same sentence but used different mental terms, for example, "I think it is in the red box" or "I am sure it is in the blue box." The findings showed that children began to differentiate *know* and *think* around four-years-old, but failed to distinguish the difference between *know* and *sure* even by 6-years-old. Therefore, they claimed that younger children could differentiate the mental terms between high and low certainty, such as *know* and *think*, but failed to make a distinction between two high certainty ones, *sure* and *know*.

Forty-five children (ages 3, 4, and 7) and a group of 15 adults participated in Babu and Mishra's study (2000). Three tasks, including comprehension, verbal-choice, and pragmatic tasks, were given to examine the understanding of the semantic and pragmatic meaning of *think* and *know*. In the comprehension task, the introductory context was provided, so children could utilize the context as reference to answer presupposition and explanation questions. The verb-choice task required children to choose from one of the two cognitive words that best described the character's mental state based on the story content. Finally, the hiding game, which was similar to the previous research, was used in the pragmatic task, and children were asked to provide justification for their answers. The results revealed that there was a developmental trend in the understanding of *know* and *think*, and the pragmatic understanding was well developed while the semantic understanding was not completed by age 7.

Booth and his colleagues (1997) conducted a study to analyze the utterances with *know* of four children (ages between 2 to 5) and their parents. The utterances were analyzed by semantic or pragmatic properties and referring to self or others. This study revealed that the percentage of use of high-level cognitive words increased with age for both children and parents, and children reflected the distinction between metal states on having greater use of different cognitive words. In addition, children tended to use cognitive words to refer to themselves rather than to others. Apparently, children produced the cognitive words that they heard from their parents; thus, parental cognitive word input was important and related to children's production of these words.

Development of Mental State Terms in School-Age Children and Adolescents

Several studies were conducted to compare the understanding of mental state terms between preschoolers and young school-age children. In an early study done by Johnson and Wellman (1980), they used a series of hidden-object tasks with 4 and 5-year-olds and first and third graders to examine the development of the following mental verbs: *remember*, *know,* and *guess.* After each task, the experimenter asked three questions about each mental verb, such as "Do you know/remember/guess what is there?" The results revealed that the four-year-olds could distinguish internal mental state from external events, but were confused with *remembering*, *knowing* and *guessing*. In addition, the five-year-olds did show some distinctions of mental state terms, but the understanding was more advanced in school-age children.

Another study conducted by Moore, Brynt, and Furrow (1989) recruited 69 children (ages 3, 4, 5, 6, and 8), and used a similar hiding game with *think*, *know*, and

guess statements. The results indicated that children differentiated *think* and *know* by age 4, but that the distinction between *think* and *guess* was not complete even at 8-years-old. However, 4-year-olds showed some understanding of certainty levels in mental state terms. For example, 4-year-olds understood *know* as an indicator of certainty, and that *think* and *guess* were indicators of uncertainty.

In the Booth and Hall study (1995), they explored the six levels of cognitive meaning of *know* including perception, recognition, recall, understanding, metacognition, and evaluation. Four groups of children (ages 3, 6, 9, and 12) participated in this study. After each story was carried out, five basic questions related to the story content and six questions associated with the six levels of cognitive meaning of *know* were asked. The findings indicated that children developed the hierarchical meaning of *know* with age, and there was a significant increase in lower level meaning than higher-level meaning throughout the age range. In addition, they stated that there was a correlation between knowledge of mental state terms and standardized vocabulary measures for all ages except 3-year-olds. Furthermore, the distinction between mental state terms was correlated with the theory-of-mind task; thus, mental state terms are a good way to understand the development of theory of mind.

There are relatively few studies done with school-age children; however, this period is likely to show important changes in metacognition since children extend and elaborate their understanding of mental states from low to high cognitive levels (Schwanenflugel, Fabricius & Noyes, 1996). Thus, children during these years may have more advanced, clear, and distinct understanding of mental state terms and this might

result from the fact that most of these words exist in textbooks, literature, and poems (Peskin & Olson, 2004). Schwanenflugel, Henderson and Fabricius (1998) examined the changes in semantic organization of *knowing* on 9-, and 11-year-olds and adults. Participants were asked to read 34 scenarios and a list of 17 verbs related to *knowing* followed by each scenario. Subjects had to circle at least three verbs to describe how they would use their mind in each situation. Seventeen mental verbs included: input verbs, *examine* and *recognize*; memory verbs, *remember* and *understand*; and constructive processing verbs, *estimate* and *guess*. They found out that children were in the process of developing a constructive theory of mind, but were still less constructive than adults. In addition, adults put similar uncertain verbs together such as *guess*, *estimate*, and *question*, because these verbs were co-occurring in the same scenarios, but children did not view these mental processes in the same way as adults did.

Olson and his colleagues (2006) used five metacognitive verbs and four metalinguistic verbs to create three versions of stories containing knowledge of folk psychology, history, and mathematics for each verb and asked participants to choose the best mental verb for each story. The study included 3rd, 5th, 7th, and 9th graders and a group of undergraduates. A developmental trend was shown in the acquisition of metarepresentational verbs; however, even undergraduates did not reach 100% correct. In addition, metalinguistic verbs were mastered before metacognitive verbs in all groups of participants. Some of the verbs such as *assume*, *conclude*, and *doubt* were more difficult than others.

In another school-age study by Astington and Olson (1990), 6th, 8th, 10th, 12th graders and undergraduates participated. Twelve stories were used to test the understanding of higher-level metalinguistic verbs: *assert*, *predict*, *imply*, and metacognitive verbs: *hypothesize*, *assume*, and *conclude*. Subjects were asked to choose the most appropriate verbs to replace *say* and *think* in each story. The finding showed that the knowledge of these mental state terms increased over the high school years and the understanding of these terms was much improved by the end of high school. In addition, the scores of this task were correlated with reading vocabulary and critical thinking tests in 8th and 12th graders. Booth and Hall (1994) modified Astington and Olson's study (1990) to examine six levels of meaning in *think* and *know* with 5th, 7th, 10th graders and college students. Twenty-four short stories were used to examine the understanding of low and high frequency cognitive verbs. The finding indicated that cognitive word knowledge increased with age. Moreover, developmental differences were observed in all groups and cognitive levels except metacognition. Additionally, the largest increase was between 5th and 10th graders, and the possible reason might be that older children have more exposure to mental state terms in textbooks and literature.

Mental State Terms in Writing

Very few studies examined the use of mental state terms in writing; however, writing is an important piece in the language and learning system. Westby (1990) stated that children could not function independently in reading and writing if there is no awareness of internal mental states such as remembering, knowing, thinking, and guessing. It is important to analyze the presence of mental state terms because these

words reflect the awareness of mental states and metacognition development (Greenhalgh & Strong, 2001). Nippold, Ward-Lonergan, and Fanning (2005) investigated semantic, syntactic, and pragmatic development in persuasive writing. In semantic analysis, adverbial conjuncts, abstract nouns, and metacognitive/metalinguistic verbs were analyzed; however, early developing metaverbs, such as *know, think, feel,* and *ask*, were excluded in this study. The results indicated that use of mental state verbs in writing increased with age but the use of these verbs remained low even in adults.

There is no study to date comparing use of mental state terms between narrative and expository writing. Most of the research in mental state verbs focused on comprehension tasks instead of production. However, language is both expressive and comprehensive; therefore, examining only one aspect of language use cannot offer a complete picture of language development. Through examining the use of mental state verbs in writing, researchers could understand how children actually use these words when children compose two different types of writing. In addition, it is critical to know if the use of mental state terms increases with age and what kind of metal state terms they use while writing different content.

Summary of Mental State Verbs

Mental state verbs contain metalinguistic verbs, language for thinking, and metacogtitive verbs, language about thinking. Olson and Torrance (1986) stated that metalinguistic and metacognitive verbs are the heart of language and thought, and the thoughts of a child and adult are closely related to the sentences that they produce and comprehend. However, when children first use mental state verbs, such as *know* and

think, it does not necessarily mean that they fully grasp the meaning of mental state verbs (Johnson & Maratsos, 1977; Moore & Davidge,1989; Shatz, Wellman & Silber, 1983;). Certain mental state verbs are learned as early as five-years-old; however, more complex and advanced mental state verbs such as *conclude* and *assume* cannot be fully understood by adolescents (Olson, Antonietti, Liverta-Sempio, & Marchetti, 2006).

There is a developmental trend in using mental state verbs, and one explanation is that the information-processing load increases with age to allow people to manage several meanings at once (Wing & Scholnick, 1986). Mental state verb use is related to the development of theory of mind and language, and these words develop rather late compared to other verbs such as *get* and *have*. Thus, examining how school-age children and adolescents use mental state verbs provides insight into the relationship between language and thought. In addition to comprehension tasks, writing provides a natural method to understand the actual use of mental state verbs through development.

Derivational Morphology

In addition to abstract nouns and mental state verbs, acquiring derived words is another important concept in school-age and adolescent language development. Morphologically complex words used in the textbooks increase beginning at 3rd grade, and learning derivational morphology is a gradual and complex process (Nippold, 2007). In addition, children's knowledge of derivational morphology is related to word knowledge and reading comprehension (Larsen & Nippold, 2007; White, Power & White, 1989; Wysocki & Jenkins, 1987).

Derived words are complicated but sometimes learners can follow certain rules to figure out the meaning of the words during reading. For example, *happiness* and *loneliness* are both nouns and derive from the adjectives, *happy* and *lonely*. However, not all of the derived words are salient to learners or can be decomposed, and it makes learning of derivational morphology more difficult. What is derivational morphology? How do children acquire it? A brief literature review is provided in the following section.

What Is Derivational Morphology?

Morphological knowledge includes the acquisition of inflectional morphology, such as plural and past tense markers, and derivational morphology, such as prefixes and suffixes. Inflectional morphology is acquired earlier in a fixed manner and follows more systematic rules compared to derivational morphology (Mann, 2000). Children pick up derivational morphology later than inflectional morphology because of the greater complexity of derivatives. Deviational morphology does not always follow consistent rules and might not generalize the same meaning from the same base or root. In addition, derived forms might change phonology, orthography, and semantic and syntactic characteristics from the base form. These issues make derived words more difficult to learn.

Champion (1997) pointed out that children increase their vocabulary remarkably from 3rd grade through middle school, and knowing how to utilize rules of derivational morphology to learn novel words is an important factor. According to Biemiller and Slonim (2001), children acquire about 5200 root words by the end of 2nd grade and gain an average 3200 additional root words a year between 3rd and 5th grade. Since the

understanding of root words leads children to expand their vocabulary more efficiently, it is expected that children will learn about twice as many words as the root words, based on Anglin's estimates (1993). Children show gradual improvements in derivational morphology from 3rd or 4th grade through high school and college due to increased exposure to complex words in literature, textbooks, and lectures. Therefore, understanding how children acquire derivational morphology is critical because children encounter more and more complex words throughout the grades, and the ability to use and analyze complex words provides an important foundation for reading and writing.

The relationship between base form and derived form could be transparent or opaque. Opaque words are more difficult to learn than transparent ones because decomposing opaque words into meaningful constituents to generate correct meanings is not easy. Moreover, some derivatives change phonologic and orthographic characteristics from base forms, and this makes the derivatives even more difficult to learn. In addition to the relationship between base forms and derivatives, there are two classes of derivational suffixes including neutral and nonneutral suffixes. Tyler and Nagy (1989) indicated that neutral suffixes, such as *-ness*, *-er*, *-ment*, and *-ize* do not involve changing the vowel quality, stress or phonological characteristics; thus, most of the derived words formed from these neutral suffixes are transparent and acquired earlier. On the other hand, non-neutral suffixes, such as *-ive*, *-ous*, and *-ity* change in phonology, and these derivatives are often not transparent from the base forms.

In addition to the difference in acquisition, productivity is very distinct between inflectional morphology and derivational morphology. An inflectional morpheme, such as

-s (plural), *-s* (possessive), *-s* (3rd-person singular), and *-ed* (past tense), creates a change in the function of the word. For example, the *ed* in *walked* indicates past tense. Inflectional morphology is constrained by grammar; therefore, it shows limited variation in productivity. However, derivational morphology displays greater productivity but most of the derivatives are highly predictable if people use a decomposition strategy. Although it is assumed that people tend to use a decomposition method to understand complex words, there is still no consistent explanation as to how people read complex words by using a morphological decomposition strategy.

The Process of Derivational Morphology

Carlisle (1987) pointed out that derived words are difficult to learn because derived forms are not as common as inflected forms. In addition, these words do not follow the rules consistently, and the relationship between the base and derived form is sometimes opaque. For example, *application* is derived from *apply*. In addition, learners have to acquire some word-specific knowledge to correctly use a particular suffix to convey a derivational meaning. Since derived words are often complicated and difficult to learn, how do people process these words? Will people process derivational morphology based on certain rules or use different strategies to categorize, organize, and store derivationally complex words?

In the Alegre and Gordon (1999) study, they tried to use the "gang effect" which was found in inflectional morphology to explain how derivational morphology is processed in an associative memory structure. In inflectional morphology, the "gang effect" means that people would produce generalized words by using similar patterns that

are already stored in memory. For example, to produce the past tense, it would be easier to generate *stink-stank* if people know the pattern of *drink-drank* or *sink-sank*.

Alegre and Gordon (1999) investigated 6 non-neutral affixes including *-ion*,*-al(n)*,*-al(v)*, *-ity*, *-ous*, and *-ic* and 6 neutral affixes including *-ize*, *-en*, *-ness*, *-able*, *-ment*, and *-er* .Both neutral and non-neutral affixes displayed gang effects, but did not extend in the same way. In their second study, forty-four undergraduate students filled out a questionnaire containing 69 novel derived words including four gang affixes (*-ion, -al(v), -al(n),* and *-en*) and three non-gang affixes (*-er*, *-ness*, and *-able*) from the first study and their base forms. Participants first rated naturalness of the base form and then rated the likelihood of the base form carrying a particular affix on a 7-point scale. The results revealed that when the novel words did not contain any attested forms or violated the gang patterns, the acceptability of the novel words would be much lower. In addition, the existence of gang effects had a strong influence on judgments of the acceptability of the novel word. If an affixed form was similar to members of the gang cluster, it would be more acceptable.

In addition to using gang effects to explain the process of derivational morphology, Verhoeven and Perfetti (2003) indicated three models to explain morphological process in reading. The first model is the decomposition hypothesis. According to this hypothesis, people first have to analyze the constituent components and then find out the meaning of the base word. However, the full-listing hypothesis claims that complex words would represent in memory and the mental lexicon individually no matter how complex the word is. The third hypothesis combines the first two assumptions

and develops into an interactive model. It proposes that people could define the word based on the frequency of the word and its regularity in orthography. According to the hypothesized process of derivational morphology reviewed above, learners categorize and organize affixes based on their meanings and functions and further use that knowledge to decompose a derived word into meaningful components to gain meaning.

Development of Derivational Morphology in School-age Children

Children begin to analyze derivational words when they are in elementary school. Carlisle (1988) pointed out that there is a developmental trend in learning derivational morphology and that children increase their knowledge of derivational morphology dramatically between 4th and 8th grade. In order to understand how school-age children acquire derivational morphology, Windsor (1994) recruited 3rd to 8th graders and 40 adults as participants. Twenty-six nonsense picture pairs were used as stimuli in production and comprehension tasks. Six different derivational meanings were tested including diminutive X, to make X, without X, character of X, approximate X, and can be X-ed. In the production task, participants had to provide derived words to complete the sentences presented by the experimenters. In the comprehension task, children had to choose one correct answer from four words derived from the same root after the experimenters showed the picture and read the story to them.

The results showed that both school-age children and adults performed better on the comprehension task than on the production task, but that adults tended to utilize particular suffixes to express specific derivational meanings. For example, adults tended to use *-like* and *-ish* for "approximately X", *-ful* for "character of X", *-ize* to express "to

make X" and *-ette* to convey "diminutive X". In contrast to adults, children made more errors in the use of suffixes by producing compound words and creating nonsense words without suffixes. In addition, accuracy on the comprehension task for older children was close to the accuracy level of adults; however, children's accuracy of suffixation production was significantly lower than the adults'. Therefore, derivational morphology takes time to develop and suffixation production improves slower than comprehension.

In Lewis and Windsor's (1996) follow-up study, they investigated how children used morphological knowledge when they encounter unfamiliar real derivational words. The results demonstrated that in the production task, children tended to use productive suffixes more frequently than less productive ones. For example, in this study, children preferred to use *-let* to express "diminutive X", *-ize* for "to make X", *-ful* for "character of X", and *-ish* for "approximately X". Overall, the accuracy in comprehension was consistently better than that in production, which replicated the findings of Windsor's (1994) study. In addition, productivity had a great influence on choosing suffixes in both comprehension and production, and school-age children were aware of derivational components.

Freyd and Baron (1982) examined the acquisition of derivational morphology on 8th graders and superior 5th graders. A vocabulary test that included words such as *ethics* and *limber* and derived words such as *movement* and *imagination* were given. In their study, superior 5th graders did better on derived words than simple words because children analyzed words based on the base forms and suffixes. In the meaning learning test, superior 5th graders did better when the pseudowords were derivationally related, for

example, skaf = steal, skafist = thief, but 8th graders did not show a difference. However, in order to succeed in learning derivational morphology, the ability to recognize the relationship between base and derived forms is not enough.

Tyler and Nagy (1989) proposed that a full understanding of derivational morphology requires three steps. First, learners must have the ability to recognize the relationship between base and derived forms. Second, learners need to understand that suffixes also represent syntactic categories. For example, *-ize* is a verb marker and *-ion* is a noun marker. The last step is to develop distributional knowledge; thus, learners know some constraints in the use of suffixes. For example, *-ness* could be attached to adjectives but not to verbs. In Tyler and Nagy's study (1989), the findings revealed that 4th graders had a basic ability to recognize the base form from an unknown derived word, but that knowledge of syntactic categories developed later than the ability to recognize the relationship between base and derived forms. Moreover, 6th graders were in the process of acquiring distributional knowledge of suffixes, but the major progress in this knowledge occurred even after 8th grade.

Leong (2000) used a different method, a computerized priming procedure, to determine the accuracy and reaction time of processing morphological relationships in 4th, 5th, and 6th graders. The experimenter used four conditions including no change, orthographical change, phonological change, and both orthographical and phonological change for the test materials. Ten words embedded in short sentences in each condition would appear on the computer screen. The results showed that the reaction time was getting shorter and the accuracy was getting higher from 4th to 6th graders, and the

results from this computerized morphology task were consistent with the scores on standardized spelling tests.

The second experiment utilized the same stimulus materials and procedures on the same participants to determine if students could accurately and rapidly generate the derived words from the base forms provided on the computer screen. The results revealed that there was a developing trend from 4th graders to 6th graders in both base and derived form tasks. Students showed higher accuracy and shorter reaction times when producing the base form from a less complex derived words such as deriving *happy* from *happiness* and deriving a less complex derived words from the base form such as generating *knowledgeable* from *knowledge*.

Nippold and Sun (in press) administered the word knowledge task including 15 derived adjectives and derived nominals on typically developing 5th and 8th graders. Each question provided one sentence as contextual support for the missing target word and a choice of four derived words. The results revealed that 8th graders outperformed 5th graders on the task and the derived nominals were more difficult than the derived adjectives for both groups. In addition, word frequency, root word opacity, familiarity of the root word, and the multi-derivative nature of certain words (such as *dictatorship*) seemed to contribute to the complexity of learning the meaning of derivatives.

According to the literature reviewed above, children develop derivational morphology mainly during the school age years, and knowledge of derivational morphology increases with age (Nippold, 2007). Why is it important to study derivational morphology in school age children? Green and the colleagues (2003) pointed out that

morphologically complex words account for approximately 60 % of new word learning in school-age children and students encounter affixed words while age increases (White, Power & White, 1989). Additionally, a child's vocabulary size increases dramatically from 3rd to 8th grade and morphological generalization contributes to the large vocabulary growth (Larsen & Nippold, 2007; White, Power & White, 1989; Wysocki & Jenkins, 1987).

Derivational Morphology in Vocabulary Learning and Spelling

Bertram, Laine, and Virkkala (2000) investigated Finnish children's knowledge of derivational morphology and if frequency and affix productivity played an important role in learning vocabulary. Thirty-two 3rd graders participated in the first experiment and 70 target words including 35 high-frequency and 35 low-frequency words were used as materials. The experimenters pronounced each word and showed a stimulus card with the target word to children simultaneously. The children had to provide a definition for each target word orally. The results showed that high frequency words were defined better than low frequency words and that words with high productivity suffixes were better identified than those with low productivity suffixes. In addition, morphological structure had a positive impact on defining words, since children showed better identification in words with low productivity suffixes than low-frequency monomorphemic words. Therefore, when sufficient morphological information is provided by the word, readers can derive meaning even though it is a complex word.

Larsen and Nippold (2007) asked 50 typically developing 6th graders to explain 15 low-frequency morphological complex words using a dynamic assessment procedure

in which different levels of scaffolding were provided by the researchers. Additionally, scores on standardized vocabulary test (PPVT-III) and reading comprehension (Oregon Statewide Assessment) were obtained. They pointed out that children's performance on the task was positively correlated to their literacy skills. Moreover, although children used the strategy to analyze the morphologically complex words, some degrees of the scaffolding were needed. Since scaffolding is needed in learning morphologically complex words, White, Sowell and Yanagihara (1989) advocated the importance of teaching some most common prefixes and suffixes to promote students' ability to analyze these words.

In addition to vocabulary acquisition, derivational morphology plays an important role in spelling. In the Carlisle (1988) study, four tests including the Wide Range Achievement Test-Spelling subtest, the morphology test, the spelling test, and the suffix test were administered to 4th, 6th, and 8th graders. The morphology test contained two subtests that were Derived forms and Base forms subtests; the stimulus words were divided into four types (no change, orthographic change, phonological change, and both change) to indicate the transformation between the base form and the derived form. In the spelling test, participants had to spell the base and derived forms from the derived forms subtest of the Morphology test. In the suffix test, the participants had to add a suffix to 30 nonsense words using the doubling final consonant rule, the final *–y* rule, and the final *–e* rule. The results showed that there was a developmental trend in learning derivational morphology and that children were able to use the relationship between the base and derived forms to spell derivatives even though children still had not mastered suffix rules.

In the Carlisle (1987) study, typically developing children, 4th, 6th, and 8th graders, and 9th graders with learning disabilities were recruited. Four tests including the Wide Range Achievement Test (WRAT), the Test of Morphological Structure (TMS), the Spelling Test (ST), and the Test of Suffix Addition (TSA) were delivered to compare the performance of typically developing students and students with learning disabilities.

The finding showed that spelling base and derived words was difficult because spelling required knowledge of phonological awareness, syntactic, orthographical rules, and morphology. In addition, students made more errors in producing words with phonological change and both phonological and orthographic change. More difficulties were found with 9th graders with LD since they tended to learn derived words as whole words and did not know how to use morphological rules in spelling derived words.

Derivational Morphology in Writing

Most of the research was done to examine the acquisition of derivational morphology through comprehension tasks in which children had to generate the meaning, recognize the base and derived forms, and categorize the suffixes. However, how children practically use the derived words has not received enough attention. Rubin, Patterson, and Kantor (1991) stated that implicit morphological knowledge is one of the underlying factors for writing since both oral and written language production require the same linguistic structure and implicit knowledge. Therefore, children who do well on oral morphological tasks would also do well on writing and morphological analysis since implicit knowledge would reflect the explicit levels. One of the findings in their study showed that morpheme use, both inflectional and derivational morphology, in writing

showed very similar patterns to the use of morphological knowledge in spoken language. In addition, children who demonstrated strong implicit and explicit morphological knowledge made fewer errors in spelling and morphemic errors in writing.

Limited studies were done to examine the use of derived words in children's writing. Green and colleagues (2003) investigated morphological development in narrative writing in 3rd and 4th graders. Participants were showed two pictures in different time periods and then asked to write stories about the pictures. The findings showed that children used fewer derived words than inflections, and that the accurate use of inflections was higher than the use of derivatives. In addition, 4th graders used derivational forms more accurately than 3rd graders, and they have mastered most of the inflectional forms used in their writing but not for derivational morphology. Green and colleagues indicated that morphological development in writing was similar to development in oral language, and a majority of the 4th graders did not use derivational morphology in writing. Additionally, most of the derived words used in writing fell into six derivational categories: *-ly, -ed, -y, -ing, -ful , -er,* and only phonologically transparent derived words were used in 3rd and 4th graders' writing. Therefore, opaque derived forms are more difficult to learn and use in both oral and written language.

Reading and writing are important to morphological learning. Children expand their morphological knowledge from exposure to print starting in 2nd or 3rd grade. They master inflectional morphology first and begin to learn derivational morphology during these early school years. Carlisle (1996) investigated how commonly and accurately 2nd and 3rd graders with and without learning disabilities used inflections, derivations, and

compound words in spontaneous writing. In addition to the writing task, children were asked to complete sentences with the correct forms while the base forms were provided; they then spelled out the word. The results showed that 2nd graders used fewer words and were less accurate in using morphologically complex words such as derived forms and compound words. In addition, the use of morphological markers increased from 2nd to 3rd grade, but 2nd graders with LD were less accurate than their peers. Also, there was a strong correlation between the sentence completion task and the accuracy of using morphological forms in spontaneous writing. The results suggested that there might be a transitional period between 2nd to 3rd grade, and that children consolidated their knowledge of inflectional morphology and began to use derived forms in their spontaneous writing during this period.

A recent study by Ravid (2006) examined two genres, narrative and expository, and two modalities, speech and writing, to detect the use of different nouns. Nouns were divided into ten levels based on abstractness and semantic-pragmatic content. The ten levels were concrete nouns (*ball, bike*), proper names (*Tiffany, Mike*), collection/location (*library, class*), role nouns (*cousin, neighbor*), generic nouns (*people, somebody*), temporal nouns (*week, months*), event nouns (*game, party*), imaginable abstract nouns (*yells, kicks*), abstract nouns (*control, purpose*), and derived abstract nominals (*discussion, pressure*). Twenty native Hebrew speakers from each age group (4th, 7th, 11th graders and adults age between 25 to 35) participated in this study (N= 80). Participants were asked to write and talk about their personal experience of problems between people

(narrative) and to discuss the same topic in both spoken and written modalities (expository discussion).

The results indicated that nominal density (the mean number of lexical nouns per clause) increased with age especially in adolescents and adults. In addition, use of nouns was denser, more linguistically complex and rich in expository than narrative genres across all age groups. Overall, participants used more abstract and high-level nouns in expository and in written texts than narrative and spoken texts. In addition, role, collective/location, imaginable abstract, and generic nouns were the four mostly used nouns in narrative texts; on the other hand, generic, imaginable abstract, derived abstract, and abstract nouns were mostly shown in expository texts.

Plag, Dalton-Puffer, and Bayyen (1999) studied three types of corpus including written, spoken-formal and spoken-daily conversation from British National Corpus. They focused on the productivity of fifteen suffixes including abstract nouns, *-ity*, *-ness*, *-ion*, participant nouns, *-er*, *-ist*, measure partitive nouns *-ful*, derived verbs, *-ize*, and derived adjectives, *-able*, *-free*, *-ful*, *-ish*, *-less*, *-like*, *-type*, *-wise* in the corpus. The findings showed that the suffixes yielded more types in the written than in the spoken corpus and derived nouns made a larger contribution to the vocabulary size. However, because the sample size of each corpus was uneven, the productivity of suffixes varied depending on the corpus.

Summary of Derivational Morphology

Derivatives are acquired later because derived words are more abstract, and these words are commonly seen in written and formal language, not daily conversation (Nagy,

Diakidoy, Anderson, 1993). In addition, the abstractness of the derivatives, available knowledge of word structure, and metalinguistic competence explain the late acquisition of morphologically complex words (Nippold, 2007; Nippold & Sun, in press). According to research, children develop knowledge of derivational morphology between 4th grade and high school, and they make major gains between 4th and 7th grades (Nippold, 2007; Nagy, Diakidoy, Anderson, 1993; Wysocki & Jenkins, 1987). Because of exposure to print and learning in content areas, children have an enormous opportunity to encounter derivatives and to use either context abstraction or morphological generalization to learn new words. However, even high school students and adults were not completely accurate on derivational morphology tasks, especially for production tasks (Nippold, 2007).

Production of derivatives is more difficult than comprehension. However, according to the literature, development of derivational morphology shows a similar pattern in oral and written language. When children have sufficient implicit knowledge, that knowledge is reflected in explicit production. Thus, instead of testing comprehension of derivatives, understanding how people use derived words gives researchers, teachers, and clinicians a full picture of development of derivational morphology, which is an important element in later language development. Writing is planned and formal and is essential for school-age children to succeed in school. Thus, writing provides valuable and different insights into the use of language. How do school-age children use derivatives in their writing? The literature reviewed above showed that inflections are easier and acquired earlier than derivatives, and that children use infections more often and accurately in writing. However, how children use derivatives in writing was rarely

studied. Based on Ravid's study (2006), when genres were taken into account, children used more concrete nouns in narratives, but more abstract and morphologically complex words in expository. Therefore, genre needs to be considered when investigating derived words in writing.

Research Rationale and Hypotheses of the Current Study

Three types of literate words – abstract nouns, mental state verbs, and derivatives – were examined in students' essays in the present study. These three types of words were indicators of later language development and are more common in written language than in oral language. The literate lexicon differs from the core lexicon. Use of the literate lexicon is a sign of advanced cognitive and language development (Ravid, 2004). Many research studies focused on how words are learned, such as incidental learning (Oetting, Rice & Swank, 1995), context abstraction (Cain, Oakhill & Lemmon, 2004; Chaffin, Morris & Seely, 2001), and morphological generalization (Larsen & Nippold, 2007; White, Power & White, 1989; Wysocki & Jenkins, 1987), but how children actually use the words in production was rarely discussed. Word use in writing provides a natural way of examining how children use words other than in speaking. Since content, syntactic structure, and word use varies depending on modalities, writing provided a distinct view to examine language development. Although modality may have an impact on language production, only written discourse was included since everyday conversation may not represent what children have mastered (Ravid & Zilberbuch, 2003),

and the literate lexicon is more often shown in written language (Nippold, 2007; Ravid, 2004).

Based on the research reviewed above, it was important to take genre into account while comparing children's language performance. Writers alter the organization of content, syntactic structure, and vocabulary based on different genres. Prater and Padia (1983) stated that writing skill changed among different genres, and the practice in school had an impact on student's writing performance. Moreover, writing in different genres enhanced the relationship between language and cognition and the development of complex syntactic structures (Blair & Crump, 1984; Scott, 2005). Since a major difference in genres exists between narrative and expository, use of the literate lexicon compared across these two types of discourse was selected.

Language development in school-age children and adolescents often receives much less attention than development in young children. However, language continues to develop and adds new meaning to old words throughout life. Later language is different from early language development in speed, salience, and substance (Nippold, 2007) and is worthy of study. Thus, comparing young children, school-age children, and adolescents supplied evidence that was needed in understanding the subtle and gradual language development beyond early childhood. In addition to later language development, writing was another key variable examined in the present study. Writing plays a critical role in later language development and academic success. Writing is a type of language production, but it is less studied compared to speaking. Additionally, research on children's writing has often focused on cohesion, syntactic structures, and content

organization. However, the lexicon, an important and basic component in language use, was often missing from the research. Therefore, the current study provided research evidence needed in both later language development and lexical use in writing.

Later language development is a gradual process; thus, widely separated age group comparisons are needed to detect the subtle differences (Nippold, 1995; Nippold, 1993). In addition, a higher grades comparison is required because children begin to display their distinctive knowledge between narrative and expository around 4th grade and by that time, their writing shows more written-like structures and mature word use that is different from spoken language. Therefore, a comparison among 5th, 8th and 11th graders' writing allows researchers to determine if there are quantitative and qualitative differences in the use of literate words between the three grade levels. Additionally, the present study investigated if literate lexicon use showed a developmental trend and was different based on genre selected.

The purpose of the present study was to provide evidence of literate language development in school-age children and adolescents for clinicians and educators. Different modalities provide distinct and valuable information in language processes, and examining writing offered a more complete understanding of language use. In order to acquire writing and the literate lexicon, students need direct instruction and practice to master these advanced and complex language skills (Blair & Crump, 1984). Thus, the present study provided a foundation for future instruction planning and raised attention to literate lexicon development in writing.

Although the present study examined the literate lexicon in writing in typically developing children, it provided a norm for children with language difficulties. Children with spoken language problems often have difficulties in reading and writing, given the reciprocal relationship between spoken and written language (ASHA, 2001). In addition to the difficulties in writing, the literate lexicon was rarely used by children with language impairments compared to the matched peers (Greenhalgh & Strong, 2001). Thus, the present study can be used as guidance in assessment and intervention in literate language use in writing for school-age children and adolescents who might be at risk of language difficulties and those who have language impairments.

In sum, the major research question of this study was to examine how literate words -- abstract nouns, mental state verbs, and derivatives – were used in narrative and expository writing in three age groups including 5th, 8th, and 11th grade. The hypotheses of this developmental study are as follows:

1. Older children will use more abstract nouns, mental state verbs, and derivatives than younger children in both narrative and expository writing.

2. Children and adolescents will use more abstract nouns, mental state verbs, and derivatives in expository than narrative writing across all age groups.

3. Older children will use more advanced abstract nouns such as *circumstance* and *consequence*, more later-developing mental state verbs, such as *assert, intend*, and *claim*, and more complex derivatives, such as *confrontation*, *intervention,* and *negativity*, and, than younger ones.

4. Children will use more advanced abstract nouns, more later-developing mental state verbs, and more complex derivatives, and in expository writing than in narrative writing.

CHAPTER III

METHOD

Participants

Recruiting and Sampling

One elementary school, one middle school, and one high school in the same school district from a suburban area in Western Oregon agreed to participate in the present study. Only those students who signed a student assent form participated in the study. The present study was a developmental investigation of typically developing school-age children and adolescents; therefore, participants who received special education services, had an individualized education plan (IEP), or whose first language was not English were excluded. Based on the teachers' reports, all participants in the present study attended regular classes and demonstrated normal language, cognitive, behavioral, and social-emotional development. Thus, they were defined as typically developing children and adolescents.

There were 45 students in 5th grade, 44 students in 8th grade, and 62 students in 11th grade during the recruitment period. However, participants whose chronological age was not in the typical age range (10-11 years for 5th grade, 13-14 years for 8th grade, and

16-17 years for 11th grade) were excluded from the study. Thus, one 5th grade, two 8th grade, and four 11th grade students were excluded. The researcher randomly selected 40 children for each age group from the rest of the pool, examining each participant's written language samples in the two genres. Therefore, the present study included eighty language samples (40 narrative and 40 expository) for each of 5th, 8th and 11th grades, for a total of 240 samples.

Demographics

The participants (N = 120) included forty 5th grade (mean age = 11;1 [years; months], range = 10;5-11;8), forty 8th grade (mean age = 14;2, range = 13;4-14;10), and forty 11th grade (mean age = 17;5, range = 16;8-17;10) students. There were 23 males and 17 females in 5th grade, 20 males and 20 females in 8th grade, and 15 males and 25 females in 11th grade. The ethnicity proportion in the school district was 91% Caucasian, 5% Hispanic, 2% Native American, 1% Asian, and 1% African American. The gender ratio in the school district was 52% male and 48% female, and 54% of the students in the school district were economically disadvantaged. All participants reported they were native English speakers.

Materials

Experimental Materials in Writing

Students completed two essays, a narrative piece and an expository piece. They were allowed 20 minutes per essay. Prior to beginning each essay, they were given an instruction sheet along with a booklet that contained four pages of lined paper to

complete their writing. The order of the writing tasks was counterbalanced to avoid possible order effects. If the students in the first class wrote the narrative first and the expository second, the students in the second class wrote the expository first and the narrative second. The order of the tasks rotated in this way throughout the study.

Instructions for the Narrative Essay

The title of the narrative essay was "What happened one day." The title was set to be general and participants were asked to write from their personal experiences or to imagine a story. At the beginning of the instruction sheet, the participants were asked to write a story that was either true or imaginary about something funny, sad, or scary that happened to themselves or to people around them. An outline was provided on the instruction sheet to help the participants generate a narrative. The outline, which was similar to a story grammar, included the settings, characters, plot, problems, attempts, outcome, and thoughts. On the instruction sheet, participants were informed of the twenty-minute time limit and were asked to use complete sentences and correct grammar, spelling, and punctuation to complete the essay. The instruction sheet for the narrative essay is provided in Appendix A.

Instructions for the Expository Essay

The title of the expository essay was "The Nature of Friendship." The title was set to be familiar to participants because domain knowledge has an impact on writing performance and ability. McCutchen (1986) pointed out that children generated more coherent and longer texts if they knew the topics well. "Friendship" is important to people and is a familiar and common topic for students to write about. Moreover, this

topic allowed participants to inform, explain, describe, or define their subject to potential readers. The format was similar to the instructions for the narrative. An outline was presented that contained seven questions designed to prompt participants to think about friendship. Each point consisted of a wh- question such as "why is friendship important to people." The outline provided prompts to help participants write an expository essay. The instruction sheet for the expository narrative essay is provided in Appendix B.

Teacher Questionnaire

In addition to examining students' essays, the type of teacher instruction they had received was important to examine (Duin & Graves, 1987; Laflamme, 1997; Zarry, 1999). Therefore, four teachers, two from 5th grade, one from 8th grade, and one from 11th grade, agreed to fill out a 6-page questionnaire during or after the writing task. The teachers of 8th and 11th grades were instructors in language arts and the 5th grade teachers were general teachers. Each teacher received $5 for filling out the questionnaire. There were no time limits in completing the questionnaire.

The questionnaire was non-standardized and was designed by the primary investigator. The questionnaire contained two questions about writing frequency in each genre, five questions related to writing instruction, three questions related to the feedback provided to the students, and ten rating questions to address their students' word knowledge and genre familiarity in writing.

The writing instruction questions were based on Hayes and Flower's writing model (1984) and previously reviewed studies about the literate lexicon in speaking and writing (Curenton & Justice, 2004; Greenhalgh & Strong, 2001; Nippold, Ward-Lonergan

& Fanning, 2005). The feedback questions were based on Hayes and colleagues' text evaluation model and possible problem detection in writing (Hayes, Flower, Schriver, Stratman & Carey, 1987). The teacher questionnaire was designed to provide exploratory information about the kinds of feedback teachers provided on students' writing and teachers' writing instruction in general. The teacher questionnaire is provided in Appendix C.

Procedures

The two investigators visited the three schools during the academic year. The task was administrated in several regular writing classes while the teachers were in the classrooms. One investigator first explained the study to the students and addressed the importance of their participation. Each student was asked to complete a written narrative and a written expository essay within one regular class time. Participants were provided with a one-page instruction sheet and a booklet of four pages of lined paper for each essay. After participants received the instruction sheet, one of the investigators read the instructions aloud to the students and answered any questions regarding the study. The order of the writing tasks was counterbalanced. If the students in the first class wrote the narrative first followed by the expository essay, the students in the second class wrote the expository first followed by the narrative essay, to avoid any possible order effects.

At the end of twenty minutes, participants were asked to complete the sentence they were currently writing. Then, the two investigators collected the instruction sheets and booklets. The instruction sheets and booklets for the other essay were distributed to

the class after all of the first essays were collected. Then the investigators repeated the same procedures as the first essay. Participants were asked to remain in their seats until all students had finished the writing tasks. After all participants had completed the writing tasks, the investigators offered a gift certificate to an ice cream shop for participating in the study.

Coding and SALT Program

Transcription and SALT Program

A total of 240 essays (120 narrative and 120 expository) were keyboarded verbatim into the Systematic Analysis of Language Transcripts program (SALT) (Miller & Chapman, 2002), following SALT conventions. This work was completed by the primary investigator and two graduate research assistants who were familiar with SALT procedures. The SALT program is designed to analyze morphemic, syntactic, pragmatic, and semantic aspects of language in spoken and written language samples (Weston, Shriberg & Miller, 1989). It is the most widely used tool to process language samples (Hill, 2001). In order to analyze the data, the transcription was further segmented into T-units, a common procedure used in the analysis of written and spoken discourse. A T-unit is defined as an independent (main) clause and any dependent (subordinate) clauses that are attached to it (Hunt 1965). When an utterance did not qualify as a T-unit, fragment codes or parentheses were placed. All T-units and fragments were included in the analysis set in which the total body words were used to analyze literate word use in the present study.

Each T-unit or fragment was further coded for three types of literate words and different types of clauses such as nominal clause, relative clauses, and adverbial clauses for the present and future analyses. The primary investigator and two graduate research assistants followed the coding system of clauses (Mansfield, 2007) and literate words, and solved any inconsistencies among the coders and investigators. The written language samples were coded by one coder and double-checked by another coder to detect any coding errors. Each code was tagged right after each target word and clause and followed the SALT conventions.

The spelling and spacing errors were corrected in transcription for the SALT analysis; however, the original spelling and spacing errors were unchanged on the students' test booklets for possible future analysis. No participant or school names were used in coding. Each participant was assigned a number, and only chronological age, gender, and grade were coded for the analysis purpose of the present study. In addition, any identifying information such as names and school names in the essays were replaced by codes to protect participants' confidentiality.

Inclusion Criteria for the Literate Lexicon

Three types of literate words were the main focus of the present study; thus, the inclusion criteria were needed to code the target words accurately and consistently.

Abstract Nouns

Abstract nouns indicate intangible objects unlike concrete nouns, which have distinct boundaries and stable relations among the components (McGhee-Bidlack, 1991). An abstract noun often refers to states, events, concepts, feelings, qualities, and things

that have no physical existence. Additionally, anything that cannot be perceived through the five physical senses (as with concrete nouns) is defined as an abstract noun. Examples of abstract nouns are listed in Table 3.1.

Table 3.1 Coding System for Three Types of Literate Words

Codes of literate lexicon	Examples
ABN- abstract nouns	freedom, authority, challenge, dignity
DRN-derived nominals	happiness (ness), magician (ian), payment (ment), relationship (ship), creation (tion), maintenance (ance/ence), personality (ity), director (or/er)
DRA-derived adjectives	enjoyable (able), critical (al), beautiful (ful), facial (ial), childish (ish), creative (ive), careless (less), curly (ly), bigger (er), biggest (est)
EMCV Early-developing MCV	know, think, guess
EMLV Early-developing MLV	say, tell, ask
LMCV Later-developing MCV	understand, discover, realize, reflect, intend, deserve, experience, figure out (figure), wonder, pretend, assume, remember, doubt, infer, hypothesize, perceive, recall, comprehend, analyze, observe, predict
LMLV Later-developing MLV	explain, assert, concede, conclude, imply, predict, interpret, confirm, argue, persuade, agree, deny, claim, admit, confess, define, describe, criticize, suggest

Derivatives

According to Nippold and Sun (in press), there was a significant difference in understanding the meaning of derived nominals and derived adjectives while school-age children were asked to do a forced-choice derivational morphology task. Therefore, in order to further understand if there is a difference in understanding and producing different types of derived words, the current study divided derivatives into derived nominals and derived adjectives.

The inclusion criteria were based on the types of suffixes listed in Nippold's book (2007, pp. 51-52). In addition, the decomposition strategy was used to analyze possible derivatives, and the coders followed the rule that the root words must be able to stand alone without the suffixes. Derived nominals included suffixes that formed from a verb or an adjective to a noun and gerunds, which is a verbal that ends in *-ing* and functions as a noun. For example, there were two derived nominals in the T-unit from a 11th grader's narrative essay: " along with *finishing [DRN]* this *accomplishment [DRN]* we would be looked upon as a hero[ABN]". Derived adjectives included not only the words with suffixes to form adjectives but also adjectives of emotion/feeling that are formed from the -ed / -ing forms of verbs. For example, there were two derived adjectives formed from the verbs, *love* and *want*, in the T-unit from a 11th grader's expository essay:
" Friendship[DRN] is important to people because it makes them feel *wanted/0[DRA]* and *loved/0[DRA]* in this world[ABN]". Another example of a T-unit from an 11th grade expository essay contained two derived adjectives including one formed from the –ing form of the verb and one with a suffix to create an adjective: "There are always people to talk to and have an *entertaining [DRA]* and *enjoyable [DRA]* conversation [DRN] with in the presence[DRN] of friendship[DRN]".

Prefixes, derived verbs, and derived adverbs were excluded from the present study because prefixes were comparatively easier than suffixes, and derived verbs and derived adverbs were less frequent than derived nominals and derived adjectives. Some suffixes used as inclusion criteria in the present study are listed in Table 3.2.

Mental State Verbs

Mental state verbs included metacognitive and metalinguistic verbs. According to the previous literature review, early developing mental state verbs such as *think* and *say* emerge around 4 years old. However, when children advance in linguistic complexity and cognitive development and expand their vocabulary through schooling and exposure to print, they have more mental state verbs to describe their thinking and mental state.

Table 3.2 Samples of Suffixes Used to Create Nouns and Adjectives

Suffixes	Noun Examples	Suffixes	Adjective Examples
-age	marriage, leakage	-able	enjoyable, eatable
-ance/ence	difference, importance	-al	identical, critical
-er/or	editor, speaker	-ent	excellent, dependent
-ess	actress, waitress	-ful	beautiful, thankful
-hood	childhood, neighborhood	-ible	reversible, edible
-ian	magician, musician	-ial	facial, racial
-ism	criticism, racism	-ish	selfish, reddish
-ist	artist, activist	-ive	active, creative
-ness	happiness, sadness	-less	homeless, hopeless
-ment	payment, investment	-like	childlike,
-ship	friendship, relationship	-ous	nervous, obvious
-tion	attraction, creation	-some	troublesome, burdensome
-th	truth, death	-y	fluffy, scary

(Source: Nippold, M. (2007). *Later language development: School-age children, adolescents, and young adults* 3rd ed. Austin: Pro-Ed.)

The metacognitive and metalinguistic verbs listed in Table 3.2 were drawn from the previous studies (Astington & Olson, 1990; Nippold, Ward-Lonergan & Fanning,

2005; Olson, Antonietti, Liverta-Sempio & Marchetti, 2006; Wilson, 1999). In order to detect qualitative differences in mental state verb use, the present study separated metacognitive verbs from metalinguistic verbs and further distinguished the early and later developing metalinguistic and metacognitive verbs. According to the studies previously reviewed, *know*, *think*, *guess*, *say*, *ask*, and *tell* developed during preschool (Babu & Mishra, 2000; Booth, Hall, Robinson & Kim, 1997; Johnson & Maratsos, 1977; Shatz, Wellman & Silber, 1983). Therefore, the present study categorized these mental state verbs as early developing metacognitive and metalinguistic verbs. Mental state verbs other than the early developing ones were coded as later developing metacognitive and metalinguistic verbs. Examples of metacognitive and metalinguistic verbs are listed in Table 3.2.

Coding for the Literate Lexicon

The investigators set up a system for coding the three types of literate words in SALT. The coding system is shown in Table 3.2. Each code was attached after the target word and followed the SALT program coding system. One word was counted in only one category. For example, *relationship* is a derived nominal and an abstract noun, but it was labeled only as a derived nominal in the present study. Counting one word in one category avoided the possibility of inflating the numbers of abstract nouns and derived nominals since most of the derived nominals are abstract nouns such as *happiness*, *relationship* and *decision*.

Interrater Reliability in Coding

A separate investigator, who was familiar with the SALT program but did not code the transcripts the first time, reviewed the coding of literate words. Ten percent of the total transcripts were randomly selected for the reliability check. A total of 24 transcripts, 4 transcripts in each grade/genre cell, were reviewed. The level of disagreement between two investigators was 2% for abstract noun, 3% for derivatives, and 9% for mental state verbs. The disagreements were discussed and a second round of interrater reliability was conducted. Another 24 transcripts which differed from the 1st round interrater reliability check, including 4 transcripts in each grade/genre cell, were randomly selected for the second round of interrater reliability check. The level of disagreement between the investigators was 1% for abstract noun, less than 1% for derivatives, and 2% for mental state verbs. All disagreements in coding were resolved through discussion, yielding 100% agreement.

Data Analysis

The present study aimed to provide both quantitative and qualitative data regarding how school-age children and adolescents use literate words in two genres of writing. Additionally, teacher questionnaires were analyzed to provide supplemental information about teachers' views and the instruction they provide in genre writing and in the use of literate words in writing.

Quantitative Analysis

The SALT program (Miller & Chapman, 2003) was used to generate the total number of words (TW), total number of utterances (TTU), mean length of utterance in words (MLTU), and the frequency counts for each type of literate word. TW was used as the foundation to compare the use of literate words since participants produced essays of different lengths. TTU and MLTU were used to detect the quantitative differences that participants produced in different genres of writing. All T-units and fragments (incomplete sentences disconnecting from the main clauses) were included in the data analysis. Thus, each participant had 10 scores including TW, TTU, MLTU, ABN (abstract nouns), DRN (derived nominals), DRA (derived adjectives), EMCV (early developing metacognitive verbs), EMLV (early developing metalinguistic verbs), LMCV (later developing metacognitive verbs), and LMLV (later developing metalinguistic verbs).

Percentages instead of frequency counts were used for each literate word type to control for differences in the number of utterances that the writers produced (Nippold et al, 2005). Seven raw scores including ABN, DRN, DRA, EMCV, EMLV, LMCV, and LMLV, were entered into the SPSS system (SPSS, 2005) and were transformed to percentages such that each raw score was divided by the total words (TW) that each participant produced for each genre. For example, one participant used ABN five times in narrative writing and the total words he/she produced in narrative writing was 100 words. Therefore, his/her ABN score in narrative writing was 0.05.

Content Analysis

In order to have a full understanding of the subtle changes in the use of literate words in school age children and adolescents, content analysis was essential. The differences in word use in writing can be subtle and not represented in statistical analyses. In the present study, the use of different literate words was listed, categorized, and organized to further compare word use. All literate words that were used in writing in this study were recorded.

In content analysis, each abstract noun was recorded only once without repeating in other age groups or the other genre to discover the difference in abstract noun use. For example, the word *accident* was also used in 8th and 11th graders' writings, but it was only recorded in the column of abstract nouns used in 5th grade narrative since the use of abstract nouns was substantial and the space for recording was limited. Derivatives were additionally analyzed by suffixes categorizing in derived nominal and derived adjective in order to represent the actual word use under each suffix. The recording of derivatives was based on the types of suffixes listed in Nippold's book (2007, pp. 51-52). Mental state verbs were categorized based on the coding system of the present study, which contained four categories EMCV, EMLV, LMCV, and LMLV. All derivatives and mental state verbs used in writings were listed to show the actual differences of word use in writings. Content analysis provides valuable information about the actual word use difference in addition to the statistical analysis. Therefore, utilizing both quantitative and content analysis offer a more complete picture of how school-age children and adolescents use literate words in different genres of writing.

Teacher Questionnaire Report

The purpose of the teacher questionnaire was to provide supplemental information about school-age children's writing. Since teacher instruction is related to children's writing performance and ability (Duin & Graves, 1987; Laflamme, 1997; Zarry, 1999), it was necessary to understand how teachers provided instruction in writing, including the frequency, genre difference, word instruction, and type of feedback they provided to students. Four questionnaires were collected in the present study. A summary of the teachers' responses (two 5th grade, one 8th grade, and one 11th grade) is reported in the results section.

CHAPTER IV

RESULTS

Quantitative Results

A two-way (2x3) mixed analysis of variance (ANOVA) was conducted to analyze the effects of age and genre on the use of literate words in writing. The independent variables included one between-subjects variable, age group, with three levels (5th grade, 8th grade, and 11th grade) and one within-subjects variable, genre, with two levels (narrative and expository). Eta Square (η^2), which is used to report effect sizes, was also calculated. The significance level was set at $p < .05$.

General Comparison between Age Groups and Genres

Total Number of Words (TW)

In the 5th graders, the mean of the total number of words was 170.68 (*SD* = 80.26) in narrative (*n* = 40) and 139.58 (*SD* = 60.31) in expository (*n* = 40). In the 8th graders, the mean of the total number of words was 245.4 (*SD* = 83.94) in narrative (*n* = 40) and 208.4 (*SD* = 66.08) in expository (*n* = 40). In the 11th graders, the mean of the total number of words was 336.73 (*SD* = 71.71) in narrative (*n* = 40) and 285.5 (*SD* = 75.88) in expository (*n* = 40).

There was a significant main effects for genre, $F(1, 117) = 32.15, p < .00, \eta^2 = .04$, but no interaction between age group and genre was found, $F(2, 117) = .073, p = 0.49$. Participants produced more words in narrative than in expository writing. There was a significant main effects for age group, $F(2, 117) = 62.17, p < .00, \eta^2 = .42$. Follow-up tests were conducted to evaluate pairwise differences among the means using a Tukey HSD test (at $p < .05$). There were significant differences obtained among the three groups' comparisons. Eleventh graders produced significantly more words overall in both narrative and expository writing than did 8th graders, and 8th graders produced significantly more words in both narrative and expository writing than did 5th graders. Measures of the total number of words in each age group and in the two genres are reported in Table 4.1.

Table 4.1 Two-Way, Mixed-Effects Analysis of Variance on TW

Source	*df*	*F*	η^2	*p*
Between Subjects				
Age	2	62.17**	0.42	<.00
Error Between	117			
Within Subjects				
Genre	1	32.15**	0.04	<.00
Genre * Age	2	0.73	0.00	.49
Error Within	117			
Total	239			

*$p < .05$. ** $p < .01$.

Total Number of Utterances (TTU)

For the 5th graders, the mean of the total number of utterances was 19.10 (*SD* = 8.86) in narrative (*n* = 40) and 11.53 (*SD* = 5.02) in expository (*n* = 40). For the 8th graders, the mean of the total number of utterances was 23.80 (*SD* = 9.93) in narrative (*n* = 40) and 15.18 (*SD* = 6.50) in expository (*n* = 40). For the 11th graders, the mean of the total number of utterances was 30.70 (*SD* = 7.99) in narrative (*n* = 40) and 22.43 (*SD* = 7.30) in expository (*n* = 40).

There was a significant main effects for genre, $F(1, 117) = 100.62$, $p < .00$, $\eta^2 = .17$, but no interaction between age group and genre was found, $F(2, 117) = 0.14$, $p = 0.87$. Participants produced more utterances in narrative than in expository writing. A significant main effect was found for age group, $F(2, 117) = 31.97$, $p < .00$, $\eta^2 = .22$. The follow-up Tukey HSD test (at $p < .05$) indicated that significant differences were obtained among the three groups' comparisons. Eleventh graders produced significantly more utterances overall in both narrative and expository writing than did 8th graders, and 8th graders produced significantly more utterances in both narrative and expository writing than did 5th graders. Measures of the total number of utterances in age groups and genres are reported in Table 4.2.

Mean Length of Utterance in Words (MLTU)

For the 5th graders, the mean of MLTU was 9.14 (*SD* = 2.22) in narrative (*n* = 40) and 12.33 (*SD* = 3.00) in expository (*n* = 40). For the 8th graders, the mean of MLTU was 11.19 (*SD* = 3.93) in narrative (*n* = 40) and 14.53 (*SD* = 3.13) in expository (*n* = 40). For

the 11th graders, the mean of MLTU was 11.27 (SD = 2.07) in narrative (n = 40) and 13.26 (SD = 2.54) in expository (n = 40).

Table 4.2 Two-Way, Mixed-Effects Analysis of Variance on TTU

Source	*df*	*F*	η^2	*p*
Between Subjects				
Age	2	31.97**	0.22	<.00
Error Between	117			
Within Subjects				
Genre	1	100.62**	0.17	<.00
Genre * Age	2	0.14	0.00	.87
Error Within	117			
Total	239			

*p < .05. ** p < .01.

A significant main effect was obtained for genre, $F(1, 117) = 75.46$, $p < .00$, $\eta^2 = .18$; however, there was no interaction between age group and genre, $F(2, 117) = 1.69$, $p = 0.19$. Participants produced longer utterances in expository than in narrative writing. A significant main effect was found for age group, $F(2, 117) = 9.41$, $p < .00$, $\eta^2 = .07$. The follow-up Tukey HSD test (at $p < .05$) showed that there were significant differences among the three age groups' comparisons. The results revealed that 11th graders produced longer utterance in narrative writing than did 8th graders but produced slightly

shorter utterances in expository writing than did 8th graders. 8th graders produced longer utterances in two genres of writing than did 5th graders. Measures of the mean length of utterance in words in age groups and in the two genres are reported in Table 4.3.

Table 4.3 Two-Way, Mixed-Effects Analysis of Variance on MLTU

Source	*Df*	*F*	η^2	*p*
Between Subjects				
Age	2	9.41**	0.07	<.00
Error Between	117			
Within Subjects				
Genre	1	75.46**	0.18	<.00
Genre * Age	2	1.69	0.01	.19
Error Within	117			
Total	239			

*$p < .05$. ** $p < .01$.

Literate Words Use across Age Groups and Genres

Abstract Nouns (ABN)

For the 5th graders, the mean of the use of ABN was 3.89 ($SD = 2.10$) in narrative ($n = 40$) and 9.15 ($SD = 2.87$) in expository ($n = 40$). For the 8th graders, the mean of the use of ABN was 4.17 ($SD = 1.74$) in narrative ($n = 40$) and 8.26 ($SD = 2.54$) in expository

($n = 40$). For the 11th graders, the mean of the use of ABN was 4.95 ($SD = 1.59$) in narrative ($n = 40$) and 9.85 ($SD = 1.99$) in expository ($n = 40$).

A significant main effect was found for genre, $F(1, 117) = 319.50$, $p < .00$, $\eta^2 = .53$; however, there was no interaction between age group and genre, $F(2, 117) = 1.72$, $p = 0.18$. Participants used more abstract nouns in expository than in narrative writing. There was a significant main effect for age group, $F(2, 117) = 5.72$, $p = .004$, $\eta^2 = .02$.

The follow-up Tukey HSD test (at $p < .05$) revealed that there were significant differences in the use of abstract nouns between the 8th graders and 11th graders and between 5th graders and 11th graders, which means that 11th graders used more abstract nouns than 8th graders and 5th graders in both narrative and expository writing. However, the comparison of the use of the abstract nouns between 5th graders and 8th graders was not significant. Measures of the use of ABN in age groups and genres are reported in Table 4.4.

Derived Nominals (DRN)

For the 5th graders, the mean of the use of DRN was 0.68 ($SD = 1.15$) in narrative ($n = 40$) and 5.40 ($SD = 3.86$) in expository ($n = 40$). For the 8th graders, the mean of the use of DRN was 1.13 ($SD = 0.83$) in narrative ($n = 40$) and 6.50 ($SD = 3.14$) in expository ($n = 40$). For the 11th graders, the mean of the use of DRN was 1.62 ($SD = 0.95$) in narrative ($n = 40$) and 6.14 ($SD = 2.24$) in expository ($n = 40$).

A significant main effect was obtained for genre, $F(1, 117) = 246.53$, $p < .00$, $\eta^2 = .52$, but no interaction between age group and genre was found, $F(2, 117) = .70$, $p = 0.501$. Participants used more derived nominals in expository than in narrative writing.

Table 4.4 Two-Way, Mixed-Effects Analysis of Variance on ABN

Source	*Df*	*F*	η^2	*p*
Between Subjects				
Age	2	5.72**	0.02	<.01
Error Between	117			
Within Subjects				
Genre	1	319.50**	0.53	<.01
Genre * Age	2	1.72	0.01	.18
Error Within	117			
Total	239			

*$p < .05$. ** $p < .01$.

There was a significant main effect for age group, $F(2, 117) = 3.41$, $p = .04$, $\eta^2 = .01$. The follow-up Tukey HSD test (at $p < .05$) revealed that there was no significant difference obtained from the comparisons between the three age groups in the use of derived nominals. Measures of the use of DRN in age groups and genres are reported on Table 4.5.

Derived Adjectives (DRA)

For the 5th graders, the mean of the use of DRA was 1.81 ($SD = 1.35$) in narrative ($n = 40$) and 1.18 ($SD = 0.86$) in expository ($n = 40$). For the 8th graders, the mean of the use of DRA was 1.97 ($SD = 1.32$) in narrative ($n = 40$) and 1.42 ($SD = 0.61$) in expository

($n = 40$). For the 11th graders, the mean of the use of DRA was 1.88 ($SD = 0.96$) in narrative ($n = 40$) and 1.71 ($SD = 0.89$) in expository ($n = 40$).

Table 4.5 Two-Way, Mixed-Effects Analysis of Variance on DRN

Source	*df*	*F*	η^2	*p*
Between Subjects				
Age	2	3.41	0.01	.04
Error Between	117			
Within Subjects				
Genre	1	246.53**	0.52	<.01
Genre * Age	2	0.70	0.00	.50
Error Within	117			
Total	239			

*$p < .05$. ** $p < .01$.

A significant main effect was found for genre, $F(1, 117) = 11.77, p < .00, \eta^2 = .05$, but there was no interaction between age group and genre, $F(2, 117) = 1.11, p = 0.33$. Participants used more derived adjectives in narrative than in expository writing. There was no significant main effect for age group, $F(2, 117) = 1.69, p = .19$, which means there was no difference obtained from the comparisons between the three age groups in the use of derived adjectives. Measures of the use of DRA in age groups and genres are reported in Table 4.6.

Table 4.6 Two-Way, Mixed-Effects Analysis of Variance on DRA

Source	*df*	*F*	η^2	*p*
Between Subjects				
Age	2	1.69	0.01	.19
Error Between	117			
Within Subjects				
Genre	1	11.77**	0.05	<.01
Genre * Age	2	1.11	0.01	.33
Error Within	117			
Total	239			

*$p < .05$. ** $p < .01$.

Early Developing Metacognitive Verbs (EMCV)

For the 5th graders, the mean of the use of EMCV was 0.69 (*SD* = 0.78) in narrative (*n* = 40) and 1.96 (*SD* = 1.44) in expository (*n* = 40). For the 8th graders, the mean of the use of EMCV was 0.81 (*SD* = 0.78) in narrative (*n* = 40) and 1.90 (*SD* = 1.02) in expository (*n* = 40). For the 11th graders, the mean of the use of EMCV was 0.83 (*SD* =0.55) in narrative (*n* = 40) and 2.18 (*SD* = 1.06) in expository (*n* = 40).

A significant main effect was found for genre, $F(1, 117) = 94.27$, $p < .00$, $\eta^2 = .29$, but there was no interaction between age group and genre, $F(2, 117) = 0.37$, $p = 0.69$. Participants used more early developing metacognitive verbs in expository than in narrative writing. There was no significant main effect for age group, $F(2, 117) = 0.76$, *p*

= .47, which means there was no difference obtained from the comparisons between the three age groups in the use of EMCV. Measures of the use of EMCV in age groups and genres are reported on Table 4.7.

Table 4.7 Two-Way, Mixed-Effects Analysis of Variance on EMCV

Source	*df*	*F*	η^2	*p*
Between Subjects				
Age	2	0.76	0.00	.47
Error Between	117			
Within Subjects				
Genre	1	94.27**	0.29	<.01
Genre * Age	2	0.37	0.00	.69
Error Within	117			
Total	239			

*$p < .05$. ** $p < .01$.

Early Developing Metalinguistic Verbs (EMLV)

For the 5th graders, the mean of the use of EMLV was 1.67 (*SD* = 2.06) in narrative (*n* = 40) and 1.30 (*SD* = 1.75) in expository (*n* = 40). For the 8th graders, the mean of the use of EMLV was 1.41 (*SD* = 1.67) in narrative (*n* = 40) and 1.08 (*SD* = 0.87) in expository (*n* = 40). For the 11th graders, the mean of the use of EMLV was 0.85 (*SD* =0.82) in narrative (*n* = 40) and 0.88 (*SD* = 0.80) in expository (*n* = 40).

There was no significant main effect found for genre, $F(1, 117) = 1.49, p = .23$, and the interaction between age group and genre was not significant, $F(2, 117) = 0.50, p = 0.61$. There was no significant difference in the use of EMLV between narrative and expository writing. There was a significant main effect for age group, $F(2, 117) = 3.71, p = .027, \eta^2 = .03$. The follow-up Tukey HSD test (at $p < .05$) revealed that there was a significant difference in the use of EMLV between 5th graders and 11th graders, which means that 5th graders used more EMLV than 11th graders in both narrative and expository writing. However, the comparisons of the use of EMLV between 5th and 8th graders and between 8th and 11th graders were not significant. Measures of the use of EMLV in age groups and genres are reported on Table 4.8.

Table 4.8 Two-Way, Mixed-Effects Analysis of Variance on EMLV

Source	*df*	*F*	η^2	*p*
Between Subjects				
Age	2	3.71*	0.03	.03
Error Between	117			
Within Subjects				
Genre	1	1.49	0.01	.23
Genre * Age	2	0.50	0.00	.61
Error Within	117			
Total	239			

*$p < .05$. ** $p < .01$.

Later Developing Metacognitive Verbs (LMCV)

For the 5th graders, the mean of the use of LMCV was 0.25 (SD = 0.46) in narrative (n = 40) and 0.94 (SD = 1.01) in expository (n = 40). For the 8th graders, the mean of the use of LMCV was 0.56 (SD = 0.71) in narrative (n = 40) and .81 (SD = 0.88) in expository (n = 40). For the 11th graders, the mean of the use of LMCV was 0.85 (SD =0.59) in narrative (n = 40) and 1.06 (SD = 0.76) in expository (n = 40).

A significant main effect was found for genre, $F(1, 117) = 17.30$, $p < .00$, $\eta^2 = .06$, but there was no interaction between age group and genre, $F(2, 117) = 2.84$, $p = 0.06$. Participants used more later developing metacognitive verbs in expository than in narrative writing. There was a significant main effect for age group, $F(2, 117) = 4.47$, $p = .013$, $\eta^2 = .04$. The follow-up Tukey HSD test (at $p < .05$) revealed that there was a significant difference in the use of LMCV between 5th graders and 11th graders, which means that 11th graders used more LMCV than 5th graders in both narrative and expository writing. However, the comparisons of the use of LMCV between 5th and 8th graders and between 8th and 11th graders were not significant. Measures of the use of LMCV in age groups and genres are reported in Table 4.9.

Later Developing Metalinguistic Verbs (LMLV)

For the 5th graders, the mean of the use of LMLV was 0.10 (SD = 0.31) in narrative (n = 40) and 0.09 (SD = 0.28) in expository (n = 40). For the 8th graders, the mean of the use of LMLV was 0.13 (SD = 0.26) in narrative (n = 40) and 0.12 (SD = 0.30) in expository (n = 40). For the 11th graders, the mean of the use of LMLV was 0.19 (SD =0.27) in narrative (n = 40) and 0.15 (SD = 0.25) in expository (n = 40).

Table 4.9 Two-Way, Mixed-Effects Analysis of Variance on LMCV

Source	*df*	*F*	η^2	*p*
Between Subjects				
Age	2	4.47*	0.04	.01
Error Between	117			
Within Subjects				
Genre	1	17.30**	0.06	<.01
Genre * Age	2	2.84	0.02	.06
Error Within	117			
Total	239			

*$p < .05$. ** $p < .01$.

There was no significant main effect for genre, $F(1, 117) = 0.39$, $p = .53$; the interaction between age group and genre was not significant, $F(2, 117) = 0.07$, $p = 0.93$. There was no significant difference in the use of LMLV between narrative and expository writing. There was no significant main effect for age group, $F(2, 117) = 1.53$, $p = .22$, which means there was no difference obtained from the comparisons between three age groups in the use of LMLV. Measures of the use of LMLV in age groups and genres are reported in Table 4.10.

Summary of Quantitative Results of Literate Word Use

A table of descriptive statistics of TW, TTU, MLTU, ABN, DRN, DRA, EMCV, EMLV, LMCV, and LMLV is reported in Appendix D.

Table 4.10 Two-Way, Mixed-Effects Analysis of Variance on LMLV

Source	*df*	*F*	η^2	*p*
Between Subjects				
Age	2	1.53	0.01	.22
Error Between	117			
Within Subjects				
Genre	1	0.39	0.00	.53
Genre * Age	2	0.07	0.00	.93
Error Within	117			
Total	239			

*$p < .05$. ** $p < .01$.

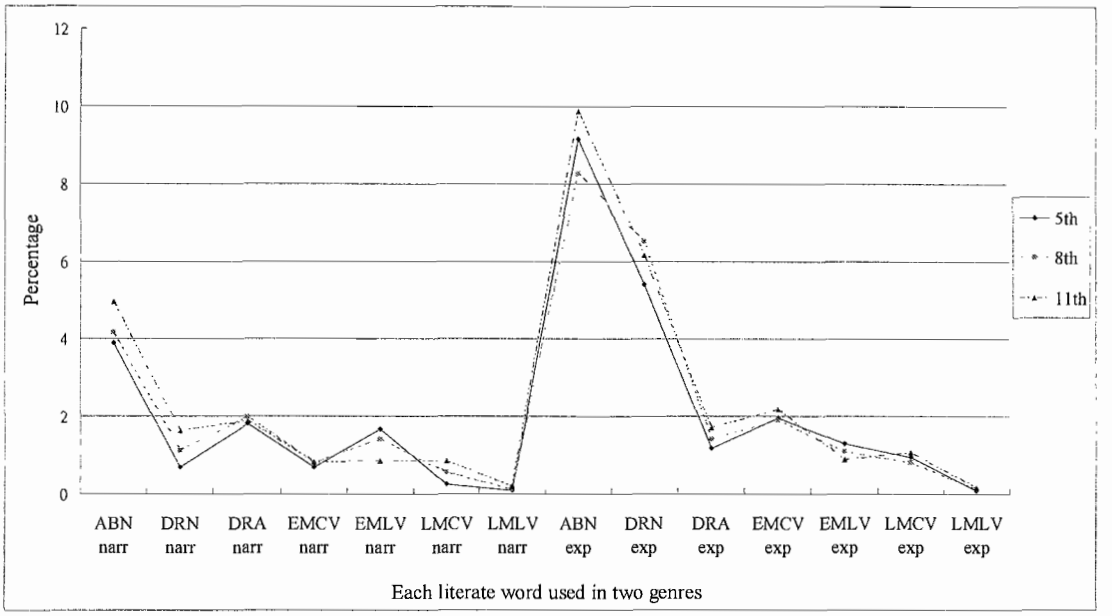
In addition, in order to provide a clear comparison between the use of literate words in narrative and expository writing across 5th, 8th, and 11th graders, a summary of the use of each literate word in the two genres across the three age groups is reported in Figure 4.1. Three lines represent each grade, the X axis represents the percentages of use and the Y axis represents each literate word in both genres.

Content Analysis Results

Word Lists from Two Genres across Three Age Groups

In addition to the quantitative data, the content analysis data provided valuable information and different insights into the results.

Figure 4.1 Percentages of Each Literate Word Use in Two Genres across Three Groups



Abstract Nouns

Some examples of abstract nouns used in narrative and expository writing at the three grade levels are listed in Table 4.1. Older students tended to use more complex and advanced abstract nouns in narrative and expository writing compared to younger ones. In addition, the use of abstract nouns was topic related and genre relevant. The abstract nouns used in expository writing were less varied than in narrative writing, and the younger students used less diverse abstract nouns in both narrative and expository writing compared to the older ones. The examples of abstract nouns used in the two genres of writing across the three grade levels are listed in Table 4.11.

Table 4.11 Examples of Abstract Nouns Used in Writings across Three Age Groups

Grade 5 narrative	Grade 5 expository
accident, carnival, chill, contact, dream, fight, friend, fun, mistake, prank, problem section, sense, shock, story, subject, sudden, time, trick, trouble, try, way, word	advice, answer, apology, category, cause, choice, culture, drama, enemy, gift goal, gossip, heritage, history, interest, lie lifestyle, moment, nature, paragraph, problem, reason, recess, religion, rule, science, secret, suicide, trick, trouble, turn vibe
Grade 8 narrative	Grade 8 expository
abuse, anniversary, attack, balance, basics, blast, bond, community, control, distance, effort, errand, lesson, nature, offense, outcome, peace, point, practice, reply, slope, support, surprise, suspense, torture, view, wit	adventure, aspect, attitude, basis, belief, breakdown, company, downfall, effect, encounter, gossip, insult, interlude, memory, mind, moment, mood, pride, quality, thought, trait, trust, weight
Grade 11 narrative	Grade 11 expository
anatomy, antic, attempt, chaos, character, curfew, disaster, disuse, divorce, force, issue, journey, mercy, moral, motive, multitude, mystique, neglect, objective, occasion, ordinary, practice, prank, process, promise, proof, relief, result, revenge, spectrum, tissue, traction, triumph, twist, unison, venture, wreck	acquaintance, adventure, apology, aspect, attempt, aura, burden, challenge, character, choice, circumstance, comment, compassion, crisis, culture, desire, impact, insult, knowledge, leisure, moral, obstacle, outcome, remark, remedy, research, respect, struggle, unity, value

Derived Nominals

Older students used more varied suffixes in both narrative and expository writing than younger ones. In addition, older students used more advanced and complex derived nominals in their writings. For example, 11th graders used *accomplishment*, *acknowledgement*, *encouragement*, and *resentment* as derived words with the suffix *–ment*, but 8th graders only used *excitement* as the *–ment* suffix derived nominal. In other words, although the three age groups used the same suffix in their writing, older students used more complex and diverse derived words than younger ones.

Based on the types of suffixes used in the two essays, participants used different types of suffixes in the two genres; however, there was no specific trend in using certain suffixes in specific genres. Similar to the abstract nouns, the use of derived nominals was topic dependent and genre related. Examples of derived nominals used in the two genres of writing across the three grade levels are listed in Table 4.12.

Table 4.12 Examples of Derived Nominals Used in Writing across Three Age Groups

Grade 5 narrative	Grade 5 expository
al: festival ***ence***: silence ***er***: runner, stroller, skater ***ing***: camping, shopping, setting ***ness***: darkness ***th***: death ***tion/ion***: vacation, admission	***er***: teacher, partner ***ing***: feeling, liking, cheating, socializing ***ship***: relationship, friendship, hardship ***tion/ion***: action ***th***: truth
Grade 8 narrative	Grade 8 expository
al: arrival ***ance***: entrance ***can***: mexican **cy**: emergency, pregnancy ***ee***: employee ***er/or***: manager, instructor, investigator, ***ing***: beginning, disputing, screaming ***ist***: guitarist, terrorist ***istic:*** characteristic ***ite***: favorite ***ity***: opportunity ***ment***: excitement ***ship***: friendship ***th***: youth ***tion/ion***: inspection, companion ***ure***: creature	***al***: betrayal ***ance/ence***: difference, confidence, experience, influence, acceptance ***er/or***: scooter, killer, counselor ***ing***: saying, feeling, understanding ***ist***: racist ***ite***: opposite ***ity***: personality, profanity, popularity ***ness***: loneliness ***ship***: friendship, relationship ***ty***: honesty, property, (dis)loyalty ***th***: truth, death ***tion/ion***: tension, opinion,, confrontation, imagination, connection, communication
Grade 11 narrative	Grade 11 expository
age: leverage ***al***: arrival, festival ***ance/ence***: experience, importance ***ant***: occupant	***age***: marriage ***al***: material, betrayal ***ance/ence***: acceptance, (re)assurance, perseverance, acquaintance, variance

dom: boredom ***er/or***: murderer, thrower, scavenger, laughter, director, creator ***hood***: childhood, neighborhood ***ing***: feeling, surrounding ***ity***: reality, opportunity, curiosity, responsibility ***ment***: acknowledgement, accomplishment, equipment, tournament ***ness***: loneliness, listlessness, staleness ***ry***: rivalry ***th***: youth, strength, death ***tion/ion***: abrasion, generation, competition, decoration, anticipation, destination, protection, connection ***ure***: creature ***y***: recovery	***ency***: sufficiency ***er/or***: laughter, applauder, factor, crusher ***hood***: neighborhood ***ian***: guardian ***ible***: variable ***ing***: (mis)understanding, belonging ***ity/ty***: unity, difficulty, opportunity, flexibility, popularity, variety ***ment***: accomplishment, commitment, encouragement, excitement, resentment ***ness***: willingness, bitterness, faithfulness ***ship***: hardship, friendship, relationship, companionship ***th***: strength, death ***tion/ion:*** dedication, definition, interaction, introduction, obligation, ***y***: jealousy

Derived Adjectives

Similar to the use of derived nominals, older students used more complex and varied derived adjectives compared to younger ones. In addition, 8th graders and 11th graders tended to use more different types of suffixes in narrative than in expository essays. It was noteworthy that 11th graders used multi-derivative words that had undergone two or more derivations from their roots in their expository essays, such as *unbreakable*, *impenetrable*, and *inseparable*.

In general, participants utilized certain suffixes more frequently across the three age groups, including comparative *er,* superlative *est*, *-ful*, *-y*, *-ly*, and *-al*. The examples of derived adjectives used in the two genres across the three age groups are listed in Table 4.13.

Table 4.13 Examples of Derived Adjectives Used in Writings across Three Age Groups

Grade 5 narrative	Grade 5 expository
al: fictional, nocturnal, tropical ***ful***: beautiful ***ible***: terrible ***ing:*** wrapping, fishing, freezing ***ly***: friendly ***ous***: nervous ***y***: dirty, freaky, scary, bouncy ***comparative er***: later ***superlative est***: biggest, funniest, loudest	***able*****:** enjoyable**,** valuable ***al***: personal, delusional ***ful***: respectful, thoughtful ***ish***: selfish ***ly***: lonely ***some***: lonesome ***y***: bloody, rainy, dirty ***comparative er***: easier, funnier, closer ***superlative est***: greatest
Grade 8 narrative	Grade 8 expository
able: unbelievable, unthinkable ***al***: emotional, burial ***ant***: hesitant ***ary:*** elementary ***ed***: stunned, dazed, designated, annoyed ***ful***: wonderful, thankful ***ible***: responsible ***ing***: upsetting, rewarding, tempting ***ish***: blackish, girlish ***ive***: sensitive ***less***: speechless, harmless ***ous***: cautious ***some***: troublesome ***y***: freaky, muddy, squeaky, handy, trusty ***comparative er***: closer, happier, slower ***superlative est***: biggest, largest, bravest	***able***: miserable**,** valuable, (un)comfortable ***al***: serial, personal ***ed***: bored, depressed, strained ***ent***: different ***ful***: respectful, trustful, hurtful ***ing***: boring, lasting, standing ***ite***: favorite ***ive***: active, positive ***ly***: lonely**,** daily**,** (un)friendly ***ous***: previous ***y***: lucky, funny ***comparative er***: quieter ***superlative est***: wildest, greatest, smartest
Grade 11 narrative	Grade 11 expository
able: valuable, comfortable ***al***: hysterical, skeptical ***ar***: particular ***ed***: scared, occupied ***ful***: successful, fateful, powerful ***ible***: responsible, terrible ***ic***: athletic ***ing***: amusing, clipping, freezing ***ish***: skittish ***ive***: intensive, consecutive, creative ***less***: fruitless, breathless, harmless ***ly*****:** sickly ***ous***: glorious, humorous, monstrous ***some***: irksome	***able***: unbreakable, enjoyable, bearable, sociable, impenetrable, inseparable ***al***: social, emotional, ethical, essential ***ful***: respectful, stressful, truthful, doubtful ***ive***: supportive ***less***: harmless, endless, selfless, careless ***ly***: friendly, lonely ***y***: goofy, healthy ***comparative er***: happier ***superlative est***: dullest

y: sneaky, spooky, cheesy, yellowy, creepy, blurry ***comparative er***: dirtier ***superlative est***: scariest	

Mental State Verbs

Across all three age groups and both genres, participants used a wide variety of early developing metalinguistic verbs (EMLV) such as *say*, *talk*, *tell*, *yell*, *ask*, *call*, *scream*, *whisper*, *lie* and *answer* and similar early developing metacognitive verbs (EMCV) such as *want*, *hope*, *love*, *feel*, *think*, *know*, *guess*, *need*, *hate*, *care*, *wish*, and *give up*. In the use of later developing metalinguistic verbs (LMLV), older students used a slightly greater variety of LMLV in both narrative and expository writing such as *confide*, *recite*, *encourage*, *describe*, *discuss*, and *define*. Overall, the later developing metalinguistic verbs used by the three groups appeared homogeneous and were similar in the two genres.

The three age groups used more varied later developing metacognitive verbs (LMCV) in the two genres compared to the use of later developing metalinguistic verbs. Additionally, the three age groups used similar LMCV in the two genres; however, older students used a slightly greater variety of LMCV in both genres such as *disown*, *shape*, *digest*, *attempt*, *determine*, and *cherish*. Although older students used a slightly greater variety of later developing mental state verbs, the mental state verbs used in the three age groups were similar and less varied. In general, *understand*, *realize*, *remember*, *figure (out)*, and *believe* were commonly used later developing metacognitive verbs and *agree* and *explain* were frequently used later developing metalinguistic verbs in the two genres

across the three age groups. The later developing metacognitive and metalinguistic verbs used in participants' writings are listed in Table 4.14.

Table 4.14 Later Developing Metacognitive and Metalinguistic Verbs Used in Writings across Three Age Groups

Grade 5 narrative	Grade 5 expository
LMLV: mention, blurt, swear, agree, admit LMCV: realize, understand, doubt, dare, believe, ignore, find out, forget, learn, expect, wonder, decide, picture	LMLV: agree, disagree, explain, express, greet. mention LMCV: understand, trust, respect, count on, learn, enjoy, share, depend on, appreciate, believe, cheer up, rely on, comfort, remind, decide, hope support, find out, ignore, betray
Grade 8 narrative	Grade 8 expository
LMLV: explain, agree. confess, deny, reply, question, blame, introduce, refer LMCV: figure, realize, figure out, remember, decide, dare, believe, trust, enjoy, determine, discover, notice, expect, ignore, plan, forget, share, hope, count on, learn, find out	LMLV: agree, admit, confide, express, argue, blame, gossip, discuss LMCV: understand, remember, figure out doubt, cheer up, trust, share, enjoy, ignore, respect, figure out, believe, support, forget, judge, mistake, consider, cherish, wonder, count on, rely on
Grade 11 narrative	Grade 11 expository
LMLV: explain, suggest, question, reply, mention, rumor, praise, inform, confide, recite, discuss, apologize, discourage LMCV: realize, figure out, notice, assume remember, understand, attempt, learn, imagine, pretend, decide, suppress, forget, plan, hope, believe, discover, ignore, find out, expect, shape, wonder, digest, refuse, reflect	LMLV: explain, argue, describe, express, define, apologize, confide, state, mention, encourage, reply LMCV: understand, remember, figure out, realize, share, betray, enjoy, trust, imagine, judge, believe, learn, commit, respect, rely on, defy, consider, ignore, appreciate, depend on, count on, cheer up, support, forget, remind, shape, find out, overlook, disown, treasure

Questionnaire Results

Teachers of each grade whose students participated in the present study, including two from fifth grade, one from eighth grade, and one from eleventh grade, agreed to fill out a 6-page questionnaire during or after the writing task. The teachers of 8th and 11th

grade students were instructors in language arts. The 5th grade teachers were general education teachers. All teachers were instructors of each grade's writing class. The questionnaire results are reported in the following subcategories.

Frequency

Fifth grade participants were asked to write a narrative essay once every two weeks, and an expository essay once every two weeks to once a month. The 8th grade teacher reported a similar frequency with once every two weeks for students to write a narrative and an expository essay. However, the 11th grade participants were asked to write a narrative and an expository essay once per term (every three months).

Instruction

There were five questions in the instruction section. All teachers reported that the most common type of instruction they provided for students' writing was planning, including idea generation, organization, and goal setting. In addition, they gave students vocabulary instruction, especially the vocabulary related to the topic and conjunctions such as *while, because,* and *however*, before writing according to four teachers' reports.

One 5th grade teacher and the 8th grade teacher indicated that vocabulary related to the topic and conjunctions was important for students to know before they wrote their essays. The other 5th grade teacher believed that conjunctions and adverbs such as *extremely* and *suddenly* were critical in students' writing, and the 11th grade teacher pointed out that vocabulary related to the topic and metacognitive and metalinguistic verbs were essential for students to know before writing.

The last question concerned the method that was used to teach students to distinguish the difference between genres. One 5th grade teacher and the 11th grade teacher reported that they provided lectures on differences between genres. Class activities were reported by the other 5th grade teacher, and writing samples were the most commonly used method to teach students the genre differences for the 8th grade teacher.

Types of Feedback

There were three questions related to the feedback that the teachers provided to students about their writing. All four teachers reported that spelling, grammar, and organization were the comments that were often provided to students. Three out of four teachers indicated that their students experienced difficulties in spelling, grammar, and organization when writing a narrative and expository essay, and the 8th grade teacher pointed out that spelling, faulty text structure, and organization were difficulties in 8th graders' narrative and expository writing.

Word Knowledge and Genre Ratings

Ten rating questions related to students' genre and word knowledge while composing narrative and expository essays were answered by teachers based on a five-point Likert scale including strongly disagree, moderately disagree, neutral, moderately agree, and strongly agree. Three out of four teachers moderately agreed that word use is essential for students to compose a narrative or expository essay, but one teacher strongly disagreed. Three out of four teachers moderately agreed that their students have adequate word knowledge to write good narrative or expository essays; however, one teacher strongly disagreed.

In the rating questions of vocabulary instruction in writing, one teacher strongly agreed, two teachers moderately agreed, and one teacher was neutral that their students need vocabulary instruction to complete a good narrative or expository essay. Two teachers strongly agreed, one teacher moderately agreed, and one teacher was neutral about providing sufficient vocabulary instruction to their students to complete an essay.

In the rating questions of students' genre knowledge and writing ability, two teachers strongly agreed and two teachers moderately agreed that their students understand the difference between writing a narrative and an expository essay. Two teachers strongly agreed, one teacher moderately agreed and one teacher was neutral about providing sufficient practice for students in writing two genres of essays.

In the rating questions of difficulties in composing two genres of essays, one teacher strongly disagreed, two teachers moderately disagreed, but one teacher moderately agreed that their students had difficulties composing a narrative essay. However, two teachers moderately agreed, one teacher moderately disagreed, and one teacher was neutral about their students having difficulties composing an expository essay. In the rating questions of using words in composing two genres, three teachers moderately disagreed and one teacher strongly disagreed that their students had difficulties in using appropriate words to write a narrative essay. On the other hand, two teachers moderately disagreed, one teacher moderately agreed, and one teacher was neutral about their students having difficulties using appropriate words to write an expository essay. The report of teacher questionnaire was summarized in Table 4.15.

Table 4.15 Summaries of Teacher Questionnaire Report

Frequency	*Narrative*: Once every two weeks (3) – Once a month (1) *Expository*: Once every two weeks (3) – Once a month (1)
Instruction	*Writing*: planning (idea generation, organization and goal setting) (4). *Vocabulary instruction commonly provided*: vocabulary reacted to the topic and conjunction (4). *Vocabulary important to know*: vocabulary related to topic (3), conjunctions (3), Adverbs (1), mental state verbs (1). *Teaching method used to distinguish genre differences*: writing samples (1), class activities (1), lectures (2).
Feedback	*Commonly provided to students*: spelling, grammar, disorganization *Students' difficulties in narrative writing*: spelling (4), grammar (3), disorganization (4), faulty text structure (1). *Students' difficulties in expository writing*: spelling (4), grammar (3), disorganization (4), faulty logic and inconsistencies (1).
Rating (Only focused on narrative and expository essays)	1. Word use is essential in writing: Strongly agree (1), Moderately agree (2), Strongly disagree (1). 2. My Students have adequate word knowledge to write a good essay: Moderately agree (3), Strongly disagree (1). 3. My students need vocabulary instruction to write a good essay: Strongly agree (1), Moderately agree (2), Neutral (1). 4. Provide sufficient vocabulary instruction for students to write a good essay: Strongly agree (2), Moderately agree (1), Neutral (1). 5. My students understand the difference between two genres: Strongly agree (2), Moderately agree (2). 6. Provide sufficient practice for students to write these two types of essay: Strongly agree (2), Moderately agree (1), Neutral (1). 7. My students have difficulties composing a narrative essay: Moderately agree (1), Moderately disagree (2), Strongly disagree (1). 8. My students have difficulties composing an expository essay: Moderately agree (2), Neutral (1), Moderately disagree (1). 9. My students have difficulties using appropriate words while writing a narrative essay: Moderately disagree (3), Strongly disagree (1). 10. My students have difficulties using appropriate words while writing an expository essay: Moderately agree (1), Neutral (1), Moderately disagree (2).

CHAPTER V

DISCUSSION

The purpose of the present study was to examine how children used literate words including abstract nouns, mental state verbs, and derivatives in two different writing genres, narrative and expository. The first aim was to evaluate the use of three types of literate words across the three groups. Second, the use of three types of literate words was compared between narrative and expository writing. Third, content analysis was used to represent the literate word use; in this way, subtle differences in literate word use in two genres and three age groups were detected in addition to quantitative analyses. It was predicted that older children would use more abstract nouns, mental state verbs, and derivatives than younger children. In addition, it was predicted that all three age groups would use more abstract nouns, mental state verbs, and derivatives in expository writing than in narrative writing. Lastly, it was predicted that older children would use more advanced abstract nouns, later developing mental state verbs, and complex derivatives, and than younger children, and more so in expository writing than in narrative writing.

Analysis of Writing Productivity in Age Groups and Genres

Writing productivity was analyzed in terms of total number of words (TW), total number of utterances (TTU), and mean length of utterance in words (MLTU). Past research had indicated that older children produced more and longer utterances in writing than younger ones (Nippold, 2007; Nippold, Ward-Lonergan & Fanning, 2005). Given cognitive and linguistic development, it was expected that older children in the present study would write more and generate longer sentences in their writings. Not surprisingly, the results of the present study indicated that older children wrote more and generated longer utterance than younger children, except that 8th graders (M = 14.53, SD = 3.13) produced slightly longer utterances in expository writing than did 11th graders (M =13.26, SD = 2.54).

The explanation of this unexpected result in MLTU might be that development in writing is not a straight line with the increase of age. Since the present study only focused on the literate word use in writing, syntactic structure was not examined in this study. Eighth graders and 11th graders produced similar length of utterance in words, but longer utterances did not necessarily equal to more complex syntactic structures. Therefore, more studies are needed to examine the complexity of syntactic structure between 8th and 11th grader's writings. Additionally, it is critical to rule out that the production of similar length of utterance between 8th and 11th grades in the present study was a single case or there was a pattern of drop off in writing productivity in high school.

Literate Word Use across Three Age Groups

Abstract Nouns

Abstract nouns were used more by older children in narrative writing but not necessarily in expository writing. In addition, the significant differences in the use of abstract nouns were found in the comparison between 8th graders and 11th graders and between 5th and 11th graders. According to Nippold's statement (2007), abstract thought is one of the differences between early and later language development. Since the use of abstract nouns reflects abstract thinking, it is expected that the use of abstract nouns will increase between childhood and adulthood (Nippold et al, 2005). Because the word learning process heavily focuses on abstract concepts in adolescents and adults, older children have a larger repertoire of abstract nouns. Therefore, the finding that the use of abstract nouns increased from 5th grade to 11th grade supported the development of abstract thinking although not all of the results reached significant levels. It was surprising to find that 5th graders used slightly more abstract nouns in expository writing than did 8th graders.

Although the changes in quantity might be subtle, changes in quality of language use show differences (Nippold, 2007; Nippold, Mansfield & Billow, 2007; Scott, 1988). Older students tended to use slightly more complex and advanced abstract nouns in narrative and expository writing compared to younger ones. For example, 5th graders used *accident*, *mistake*, *problem*, *trouble*, *advice*, *heritage*, *history*, *interest*; 8th graders used *offense*, *outcome*, *suspense*, *torture*, *wit*, *adventure*, *breakdown*, *downfall;* and 11th graders used *chaos*, *multitude*, *mystique*, *ordinary*, *spectrum*, *triumph*, *acquaintance*,

circumstance, *obstacle*. Although the use of abstract nouns was heavily topic dependent, it was clear that older children used more complex abstract nouns compared to younger ones. Moreover, the development in linguistic and cognitive ability and exposure to more schooling contribute a larger repertoire of abstract nouns in older children.

Derivatives - Derived Nominals and Derived Adjectives

According to research, children develop knowledge of derivational morphology between 4th grade and high school, and they make major gains between 4th and 8th grades (Nippold, 2007; Nagy, Diakidoy, Anderson, 1993; Wysocki & Jenkins, 1987). Therefore, it was expected that older children would use more derivatives in their writing. Older children used slightly more derived nominals in both genres of writing except 8th graders used slightly more derived nominals than 11th graders in expository writing. In the use of derived adjectives, older children used more derived adjectives than younger ones, except 8th graders used slightly more derived adjectives than 11th graders in narrative writing. Children increase in the use of derived nominals and derived adjectives with age and schooling (Nippold, 2007); however, none of the group comparisons reached significant levels in the present study. The present study partially supported the finding in the Ravid study (2006) that the use of derived nominals increased with age and schooling without demonstrating a significant difference between age groups in the present study.

Because of the abstractness of the derivatives, available knowledge of word structure and metalinguistic competence, children learn derivatives relatively late (Nippold, 2007; Nippold & Sun, in press). Although children gain most of the derived

word knowledge during the school-age years, it is not necessarily shown in their writing. In addition, the low use of derivatives in writing might not be able to detect the age-related differences. Avoiding of spelling errors, general literacy skills, and overall vocabulary knowledge might contribute to the low use of derivatives in the present study.

When children have sufficient implicit knowledge, that knowledge is reflected in explicit production (Rubin, Patterson & Kantor, 1991). The implicit knowledge of derivational morphology of participants was not obtained in the present study; therefore, the relationship between comprehension and production of derivatives could not be confirmed. Therefore, present study could not answer questions concerning whether participants had adequate derivational knowledge to produce a large number of derived words in writing, if they used alternative words to replace derivatives to avoid spelling errors, or if their teachers did not emphasize the use of derivatives. However, these concerns all possibly contribute to the low use of derivatives.

Although the significant difference in age groups was only found in derived nominals, 5th graders did use less varied and limited suffixes for derived nominals and adjectives in both written genres. However, 8th graders and 11th graders used similar and widely varied suffixes for derived nominals and adjectives in both written genres, which supported the view that children increase their knowledge of derivational morphology dramatically between 4th and 8th grade (Carlisle, 1988). According to White and colleagues (1989), the suffixes that 5th graders used as derived nominals and adjectives were mostly high frequency suffixes in printed school English for grades 3-9 including *-er*, *-ion/tion*, *ness*, *ing*, *-al*, *-ible/able*, *-ing*, *-ly*, and *–y*. In contrast, 8th and 11th graders

used a wider range of suffixes including high and low frequency suffixes in both derived nominals and derived adjectives.

It is noteworthy that 5th graders tended to use neutral suffixes such as *-ness*, *-er*, *-able*, *-ly*, *-ing*, which do not involve changing the vowel quality, stress, or phonological characteristics and are transparent and acquired earlier (Tyler & Nagy, 1989). On the other hand, 8th and 11th graders used both neutral and non-neutral suffixes and made use of more complex and advanced derivatives in both genres. It is not surprising to observe a wide range of suffix use in 8th and 11th graders, since children show gradual improvements in derivational morphology from 3rd or 4th grade through high school and college due to increased exposure to complex words in literature, textbooks, and lectures. Furthermore, the use of morphologically complex words in textbooks increases greatly beginning in 3rd grade (Nippold, 2007). This also contributes to the learning of derivatives. Some 8th and 11th graders used multi-derivatives where the derivative has undergone two or more derivations from its root such as *reassurance*, *misunderstanding*, *companionship*, *unbelievable*, *uncomfortable*, *unfriendly*, *impenetrable* and *inseparable*. The content analysis provided strong evidence that older children have more knowledge of derivational morphology and are able to use morphologically complex words explicitly and appropriately in writing.

Mental State Verbs - Metacognitive and Metalinguistic Verbs

Statistically significant age-group differences were found in the use of early metalinguistic (EMLV) and later metacognitive verbs (LMCV) in the present study. Although children showed an increase in their use of early developing metacognitive

verbs (EMCV), later developing metacognitive verbs (LMCV), and later developing metalinguistic verbs (LMLV) with age, only the comparison between 5th and 11th graders in the use of LMCV reached a significant level. It was interesting to find that older children used fewer early developing metalinguistic verbs (EMLV) in both written genres and that 5th graders used significantly more EMLV in both genres than did 11th graders. Given the low production of all mental state verbs, children in the present study did not use this type of literate word often in their writing. Moreover, LMCV and LMLV were rarely used in all three age groups. Therefore, the findings indicated that the use of mental state verbs in writing increased with age but that the use of these verbs remained low even in older students, consistent with what Nippold et al, 2005) reported.

The increased use of EMCV, LMCV, and LMLV indicated that knowledge of metalinguistic and metacognitive verbs increased with age, improved greatly between 5th and 10th grade and continued to develop into adolescence and adulthood (Astington & Olson, 1990; Booth & Hall, 1994). Wing and Scholnick (1986) claimed that gains in information processing load allow people to manage several meanings at once. Therefore, with development in linguistics and cognition, children are able to process multiple meanings, to reason, and to think critically to fulfill their communication purposes.

Across all three age groups and both genres, participants used similar early developing metalinguistic verbs (EMLV) such as *say*, *talk*, *tell*, *yell*, *ask*, *call*, *scream*, *whisper*, *lie* and *answer* and early developing metacognitive verbs (EMCV) such as *want*, *hope*, *love*, *feel*, *think*, *know*, *guess*, *need*, *hate*, *care*, *wish*, and *give up*. The declining use of EMLV indicated that younger children used more early metalinguistic verbs in writing

than did older children. It was not surprising to find that the use of EMLV declined from 5th graders to 11th graders, because older children were expected to use more later developing mental state verbs in writing. Substantial use of conversational dialogue and quotations were commonly observed in younger children's writings and possibly contributed to the use of EMLV in their writings. In contrast, older children used more EMCV than younger children and the possible explanation may be that there was a different mechanism underlying the use of EMCV and EMLV, since these two types of mental state verbs served different language functions (Olson & Astington, 1993).

Regarding later developing metalinguistic verbs (LMLV), older students used a slightly greater variety of LMLV such as *confide*, *recite*, *encourage*, *describe*, *discuss* and *define*, *discourage*, and *confess* and a greater variety of LMCV such as *assume*, *attempt*, *suppress*, *reflect*, *overlook*, *disown*, and *treasure*. Fifth graders used less varied and fewer later developing mental state verbs compared to 8th and 11th graders; however, 8th and 11th graders used similar later developing mental state verbs. Schwanenflugel and colleagues (1996) claimed that the acquisition of mental state verbs might be different depending on their conceptual difficulty, level of uncertainty, and abstractness. The similar use of later developing mental state verbs in 8th and 11th graders suggested that the participants in the present study might have similar knowledge of later developing mental state verbs although 11th graders used a slightly greater variety of later developing mental state verbs in writing. According to Booth and Hall (1994), some of the later developing mental state verbs are more difficult and acquired later than others, and even college students might have incomplete knowledge about some complex mental

state verbs. Therefore, the present study provided evidence that later developing mental state verbs continue to develop into adulthood and that growth is a gradual process.

Literate Word Use between Narrative and Expository Writing

Abstract Nouns

Not surprisingly, children used more abstract nouns in expository than narrative writing in all three age groups. The results supported the findings of Ravid (2006, 2004) and Berman and Nir-Sagiv (2007) in showing that writers used more concrete/imageable nouns in narrative writing, but used more abstract and low frequency nouns in expository writing. Expository texts usually contain factual or technical information such as cause-effect explanations and procedural directions (Hadley, 1998), having a non-temporal, logically-based, and argumentative structure (Ragnarsdottir, Aparici, Cahana-Amitay, van Hell, & Viguie, 2002). Therefore, the use of abstract nouns reflects the writer's abstract thinking while composing an expository essay.

According to Paivio's dual coding theory (1991), concrete information activates both verbal and mental image systems in the brain. Since narrative is personal and empirical, a mental image can be activated during writing. In this study, the topic of narrative writing was "What happened one day"; therefore, participants wrote a personal or imaginary story with a possible vivid image, such as a trip, an accident, or a party. In order to describe the images, writers used concrete and imageable words to convey the story. In contrast, it is difficult to generate an image during expository writing since it involves abstract thought, reasoning, and logical thinking. From the neuro-imaging studies to the word definition tasks (Jessen et al, 2000; McGhee-Bidlack, 1991; Nippold,

1999; Nippold, Hegel, Sohlberg, & Schwarz, 1999; Noppeney & Price, 2004; Sabsevitz et al, 2005; Swaab et al, 2002), it is evident that abstract words are difficult and take a longer time to process and acquire, which results from the non-activating mental-imaging system. Therefore, dual coding theory provided a fundamental explanation for the different use of abstract nouns between narrative and expository writing.

Children in the present study used slightly less varied abstract nouns in expository than in narrative writing and the use of abstract nouns were topic and genre related. Because the title of the expository essay was "Friendship" in the present study, children tended to use homogeneous abstract nouns such as *friend*, *moment*, *company*, *belief*, and *memory*. Since the title of the narrative writing varied depending on each writer's story, abstract noun use varied greatly from topic to topic such as *abuse*, *anatomy*, *anniversary*, *tissue*, and *accident*.

Derivatives - Derived Nominals and Derived Adjectives

In the present study, children used significantly more derived nominals in expository than in narrative writing, but used significantly more derived adjectives in narrative than in expository writing. It was noteworthy that children used fewer derived adjectives in both written genres and fewer derived nominals in narrative writing compared to the use of abstract nouns; however, the use of derived nominals in expository writing was numerous. This supported the finding in the Ravid study (2006) that derived nominals were used greatly in written expository text. One of the explanations is that the nature of expository discourse leads to the frequent use of derived nominals. Derivatives are more abstract and are commonly seen in written and formal

language (Nagy, Diakidoy, Anderson, 1993; Plag, Dalton-Puffer, & Bayyen, 1999). Similar to the use of abstract nouns, expository discourse stimulates abstract thinking and advanced cognitive and linguistic skills that are essential to express the writer's views.

In contrast, narratives are about people engaged in events, including personal experiences, fictional narratives/stories, and film/book/TV program summaries (Hadley, 1998; Scott, 1988). Derived adjectives act like adjectives to describe or modify a noun or pronoun, giving more information about what the noun or pronoun refers to. Therefore, writers tended to use derived adjectives to describe the settings, characters, and plots in order to provide the audience a complete and vivid picture while reading the story. Although the comparison in the use of derived nominals and adjectives between two genres reached significance, there was no specific trend in using certain suffixes in specific genres based on the content analysis. Moreover, children used less varied suffixes in expository text than in narrative text. One possible explanation of slightly less variety of suffixes in derived nominals and adjectives is that the title of the expository writing, "The Nature of Friendship," narrowed the variety of suffix use and led to similar and homogeneous use of derivatives in expository writing. In general, similar to the abstract nouns, the use of derived nominals was topic dependent and genre related, and no specific trend of using certain suffixes in certain genres was observed.

Mental State Verbs - Metacognitive and Metalinguistic Verbs

It was unexpected that significant differences between two genres were only found in the use of early and later developing metacognitive verbs, but no difference was found in the use of early and later developing metalinguistic verbs. According to the

results, children used more EMCV and LMCV in expository than in narrative writing. While writing an expository essay, a writer needs to use appropriate reasoning and logical thinking to justify his/her standpoint and argument. Since metacognitive verbs are talking about cognition (Olson & Astington, 1993) and are related to the development of theory of mind (Astington & Jenkins, 1999; Booth et al, 1997; Miller, 2004), increasing use of early and later developing metacognitive verbs strongly reflects a writer's thought processes, opinions, and ways of thinking about the world.

Given the extremely low use of LMLV, this type of mental state verb was difficult and not commonly used in writing in the present study. However, the possibility of limited knowledge of LMLV or other interfering factors resulting in the extreme low use of LMLV could not be answered in the present study. The use of EMLV in two genres was similar, which means that children did not use this type of literate word specifically in certain written genres.

There was no pattern observed in the use of certain mental state verbs in specific written genres except 5th graders used less varied LMCV and LMLV in narrative text. Similar to the abstract nouns and derivatives, the use of mental state verbs was topic dependent and genre related and no specific trend of using certain suffixes in certain genres was observed.

Vocabulary Instruction in Writing

Studies examining the relationship between vocabulary instruction and students' writing performance mainly focused on teaching content and topic related words instead

of the later acquired and complex literate words (Duin & Graves, 1987; Laflamme, 1997; Zarry, 1999). It is critical to expand the breadth and depth of students' vocabulary because it has a great influence on the descriptiveness, accuracy, and quality of their writing. However, in addition to the content words, literate words are critical in composing a text, especially for school-age children and adolescents to be able to express their thoughts, ideas, feelings, and opinions. Vocabulary items that school-age children encounter are more abstract, complex, longer, contain multiple affixes, and are used to reflect internal states (Nippold, 2007; Ravid, 2004; Westby, 1990). Therefore, use of an advanced lexicon reflects later language and cognitive development.

Although a child's lexicon grows with age in different ways without direct instruction (Cain, Oakhill, & Elbro, 2003; Cain, Oakhill, & Lemmon, 2004; Chaffin, Morris, & Seely, 2001; Dockrell & Messer, 2004; Larsen & Nippold, 2007; Nippold, 2007; Oetting, 1999;Oetting, Rice, & Swank, 1995; O'Hara & Johnston,1997; Rice, Cleave, & Oetting, 2000), effective instruction in vocabulary is necessary. In addition to reading, writing plays an important role in learning and academic success and is viewed as schooled language competence (Perfetti & McCutchen, 1987). Thus, how children use advanced vocabulary and literate words to boost their writing quality and express their thoughts and feelings appropriately is an important issue in teachers' instruction design.

According to the teacher questionnaires, the most common type of instruction they provided for students' writing was planning, including idea generation, organization, and goal setting. In addition, they gave students vocabulary instruction, especially the vocabulary related to the topic and conjunctions such as *while, because,* and *however*,

before writing. Therefore, vocabulary instruction in advanced vocabulary and literate words was weak compared to content and topic related vocabulary in the present study.

Most of the teachers agreed that word use is essential for students to compose a narrative or expository essay and indicated that vocabulary related to the topic, conjunctions, and adverbs are important for students to know before writing. It was interesting to find that only the 11th grade teacher recognized the importance of metacognitive and metalinguistic verbs.

Conclusions

The present study provided groundwork in examining the use of three types of literate words in narrative and expository writing and strong evidence that genre has a substantial influence on the use of three types of literate words in school-age children and adolescents' writing, except metalinguistic verbs. Although children increased the use of these literate words in both genres, only abstract nouns, derived nominals, and early metacognitive verbs were found to reach the significant level in the age group comparisons. It was interesting to find that there was no interaction effect of age and genre for any of the literate word use in writings.

This study reported quantitative and content analysis results to offer a full picture of how school-age children and adolescents use three types of literate words in two genres of writing. The findings detected subtle changes of literate word use in writing across three age groups, and supported previous studies in order to provide integrated evidence of later language development and literate lexicon use in writing. In addition,

teacher questionnaires in the present study provided exploratory and supplemental information about teachers' instructions in writing and their views about students' vocabulary and genre knowledge.

Although this study examined the use of only three types of literate words in typically developing school-age children and adolescents, it provided valuable information for educators and clinicians to determine when children are at risk. It is critical to first understand how typically developing children build up and utilize their language in order to use the information as a foundation to identify children with language difficulties. Since writing is viewed as school competence and is important to academic success, it should be viewed as just as important as reading and other school competencies. Most of the studies examining writing in children with language impairments focused on syntactic errors, length of utterance, and the use of morphology (Gillam & Johnston, 1992; Mackie & Dockrell, 2004; Windsor, Scott, & Street, 2000). Although Morris and Crump (1982) examined the vocabulary used in writing in children with learning disabilities, they did not look at the use of literate words. No studies to date have focused on how children with language impairments use literate words in writing. Researchers have been advocating for the importance of evaluating children's written language skills for many years (Singer, 1995; Windsor, Scott & Street, 2000). Thus, the present study offered a basis for clinicians and educators to detect possible language difficulties while examining their students' writings.

The present study not only provided valuable information about how typically developing school-age children and adolescents use literate words in narrative and

expository writing but also raised the question about providing vocabulary instruction in advanced literate words for children's writing. In addition, this study offered a foundation for clinicians and educators to emphasize the importance of literate word use in writing and possible ways to detect children at risk through their writings.

Limitations and Future Research

Limitations

Several limitations of this study should be noted. First of all, the definitions of inclusion criteria were partially supported by literature; therefore, it was possible that some literate words may have been left out from the present study. Although a solid literature review had been conducted prior to the present study, there was a possibility that not all literate words were included in the data analysis. The second limitation of the study is that the topic of expository writing, "Friendship." In the present study, this topic might constrain and narrow the use of certain literate words and may have resulted in a homogeneous use of literate words. Although participants were familiar with and had domain knowledge about the topic, children produced very similar and consistent literate words for this topic. It was possible that children had larger repertoires of abstract nouns, derivatives, and mental state verbs, but that they only chose to use certain words that fit best for the topic and genre. Thirdly, more interrater reliability checking was needed for this study to enhance the internal validity since the inclusion criteria provided only a general idea of each type of literate word. Increasing the number of raters would enhance internal validity and strengthen the ability to draw conclusions and results. Moreover,

both raters were not blind to this study; therefore, possible bias may have occurred during the coding.

The present study only focused on the use of literate words in narrative and expository writing. However, no other tests scores were obtained for further correlation tests. Although the present study provided a close look and deep analysis in the production of literate words in writing, knowing the correlation between comprehension and production of these literate words provides a strong foundation for understanding how school-age children and adolescents use these later developing words. Given the low use of derivative and mental state verbs, other tests, such as measures of vocabulary knowledge, reading ability, and literacy skill, might be able to provide adequate explanations and control for potentially interfering factors.

Future Research

Future studies should examine different types of literate words and advanced vocabulary such as words with multiple meanings (e.g., strike, short), words with multiple grammatical functions (e.g., hard, sweet), adverbs of likelihood and magnitude (e.g., possibly, extremely), and Latinate vocabulary of English (e.g. transfer, responsible) (Bar-Ilan & Berman 2007; Nippold, 2007; Paul, 2007) to further understand how children use later developing literate words in writing. In addition, the participants in the present study were school-age children and adolescents. Given that literate words continue to develop into adulthood, it is necessary to include young and older adults in future research to detect differences in the use of literate words in writing. Nippold and

colleagues (2005) investigated adverbial conjuncts, abstract nouns, and metaverbs in the persuasive writing of school-age children, adolescents, and adults. Therefore, it is important to examine how school-age children, adolescents, and adults use different kinds of literate words in different type of discourse such as narrative and expository writing.

Moreover, the relationship between the use of metacognitive and metalinguistic verbs in narrative and expository writing needs to be studied further. Although metacognitive and metalinguistic verbs are correlated (Olson & Torrance, 1986), it is not known how these two mental state verbs are correlated in writing. This requires more studies. In addition to mental state verbs, more research needs to be conducted to explore the relationship between the use of derived nominals and derived adjectives in different written genres, such as persuasive and descriptive writing. While conducting future research, it is suggested that investigators measure participants' implicit knowledge of literate words such as vocabulary knowledge, literacy skill, and reading comprehension to provide a full understanding of the use of literate words in writing.

The teacher questionnaire used in this study is only preliminary and supplemental, in order to provide a general idea of how teachers view their writing instruction and their students' vocabulary use in writing. Since only four teacher questionnaires were obtained in this study, more teachers' input is needed. Moreover, expanding the questionnaire to deepen the understanding of vocabulary instruction in literate words is essential to know how school-age children and adolescents acquire and use these later developing literate words. In addition to the teacher questionnaire, observation of teaching and teacher

interviews would provide detailed and valuable information and reflect teachers' actual opinions and attitudes regarding the instruction in students' writings. Understanding teachers' vocabulary instruction in writing not only provides useful information about effective instruction in writing but also verifies the relationship between vocabulary instruction in writing and students' production of literate words. Future studies should include not only students' writing samples in different genres and their test scores related to literacy and word knowledge, but also teachers' instruction in writing in order to have a full picture of children's writing development and performance.

APPENDIX A

INSTRUCTION SHEET -- NARRATIVE ESSAY

At this time, I would like you to write a story. Please write a story about something funny, sad, or scary that happened to you and a friend. You get to decide what to write about. It can be anything that was funny, sad, or scary. If you can't think of something that really happened, you can make it up. It doesn't have to be a true story. You can use your imagination, if you want. It's up to you.

The outline below will help you organize your thoughts and write a good story. In your story, be sure to do the following:

Tell where the events took place (the setting).
Tell who the main people are (characters).
Tell everything that happened in the story (plot).
Tell about the problems that came up (problems).
Explain what the characters tried to do (attempts).
Explain how things turned out (outcome).
Tell how everyone felt during the events (thoughts).

Keep this list of points in front of you as you write your story. As you address each point, try to write a full paragraph of your own ideas. You will have 20 minutes to complete your work. I have given you a booklet of lined paper to use in writing your story. Please put your name, age, and grade level on the booklet.

As you do this work, please use your best writing style with complete sentences, and correct grammar, spelling, and punctuation. If you aren't sure how to spell a word, make your best guess. Try to write neatly, using a pen or pencil. If you make a mistake, just cross it out or use an eraser. Keep going until I ask you to stop writing.

Do you have any questions?

The title of your story is: "What Happened One Day"

APPENDIX B

INSTRUCTION SHEET -- EXPOSITORY ESSAY

At this time, I would like you to write an essay. Please write an essay on the topic of friendship. Friendship is very important to people of all ages – children, adolescents, and adults. Most people say they enjoy spending time with their friends. They like to talk with their friends in person or on the phone and spend time together.

The outline below will help you organize your thoughts and write a strong essay. In your essay, be sure to explain the following:

What is friendship?
Why is it important to people?
How can friendship make life more enjoyable?
What kinds of things do friends like to do together?
How can people become good friends?
What kinds of actions can damage friendships?
How can people remain good friends over time?

Keep this list of questions in front of you as you write your essay. As you answer each question, try to write a full paragraph of your own ideas. You will have 20 minutes to complete your work. I have given you a booklet of lined paper to use in writing your essay. Please put your name, age, and grade level on the booklet.

As you do this work, use your best writing style with complete sentences, and correct grammar, spelling, and punctuation. If you aren't sure how to spell a word, make your best guess. Try to write neatly, using a pen or pencil. If you make a mistake, just cross it out or use an eraser. Keep going until I ask you to stop writing.

Do you have any questions?

The title of your essay is: "The Nature of Friendship"

APPENDIX C

TEACHER QUESTIONNAIRE

I am a doctoral student in the Communication Disorders and Sciences Program at the University of Oregon. My adviser, Dr. Marilyn Nippold, and I are conducting a study to learn how school-age children and adolescents spontaneously use different types of words in their narrative and expository writing. In addition to collecting students' essays, it would be valuable if we could ask teachers some questions about how writing is taught at school. Your participation is important for understanding the relationship between classroom instruction and students' writing. Responses will be kept anonymous. We appreciate your help. Thank you very much!

Best Wishes,
Lei Sun, CDS doctoral student
Dr. Marilyn Nippold, CDS Professor

Your name: _____

School name: _____

Grade level you are teaching: _____

Frequency

1. How often do you ask your students to write a narrative essay?

☐ More than 3 times a week ☐ 2-3 times a week ☐ Once a week

☐ Once every two weeks ☐ Once a month

☐ Other _____

2. How often do you ask your students to write an expository essay?

☐ More than 3 times a week ☐ 2-3 times a week ☐ Once a week

☐ Once every two weeks ☐ Once a month

☐ Other _____

Instruction

1. What kind of instruction on writing do you most often provide to your students? **(check ONE that applies best)**

☐ Planning (idea generation, organizing, goal setting)

☐ Translating (sentence generation, word choice)
☐ Reviewing/Editing (review written texts or plans)
☐ Others_____

2. Do you provide vocabulary instruction for students before writing?

☐ Yes (**If YES, please continue to question 3**)
☐ No (**If NO, please skip question 3 and continue to question 4**)

3. What kind of vocabulary do you teach before students write their essays? **(check TWO that apply best)**

☐ Vocabulary related to the topic (terminology)
☐ Metacognitive verbs (assume, hypothesis) and metalinguistic verbs (imply, predict)
☐ Conjunctions (while, because, however, on the other hand)
☐ Adverbs (extremely, suddenly)
☐ Complex derivatives (discussion, confrontation, frustration)
☐ Others_____

4. What kind of vocabulary is important to know before students write their essays based on your experience? **(check TWO that apply best)**

☐ Vocabulary related to the topic (terminology)
☐ Metacognitive verbs (assume, hypothesis) and metalinguistic verbs (imply, predict)
☐ Conjunctions (while, because, however, on the other hand)
☐ Adverbs (extremely, suddenly)
☐ Complex derivatives (discussion, confrontation, frustration)
☐ Others_____

5. Which method do you mostly use to help your students understand the distinction between different genres such as narrative and expository? **(check ONE that applies best)**

☐ Writing samples
☐ Reading
☐ Provide lectures on differences between genres
☐ Class activities
☐ Others_____

Feedback

1. What kind of feedback do you usually provide to your students? **(check THREE that apply best)**

☐ Spelling
☐ Grammar
☐ Ambiguities of word use
☐ Faulty logic and inconsistencies
☐ Errors of fact and schema violations
☐ Faulty text structure (genre conventions)
☐ Incoherence
☐ Disorganization
☐ Did not consider audience needs
☐ Others_____

2. What kind of difficulties do you usually see in your students' narrative writing? **(check THREE that apply best)**

☐ Spelling
☐ Grammar
☐ Ambiguities of word use
☐ Faulty logic and inconsistencies
☐ Errors of fact and schema violations
☐ Faulty text structure (genre conventions)
☐ Incoherence
☐ Disorganization
☐ Did not consider audience needs
☐ Others_____

3. What kind of difficulties do you usually see in your students' expository writing? **(check THREE that apply best)**

- ☐ Spelling
- ☐ Grammar
- ☐ Ambiguities of word use
- ☐ Faulty logic and inconsistencies
- ☐ Errors of fact and schema violations
- ☐ Faulty text structure (genre conventions)
- ☐ Incoherence
- ☐ Disorganization
- ☐ Did not consider audience needs
- ☐ Others_____

Rating

1. Word use is essential for students to compose a narrative or expository essay.

☐ Strongly disagree
☐ Moderately disagree
☐ Neutral
☐ Moderately agree
☐ Strongly agree

2. My students have adequate word knowledge to write a good narrative or expository essay.

☐ Strongly disagree
☐ Moderately disagree
☐ Neutral
☐ Moderately agree
☐ Strongly agree

3. My students need vocabulary instruction to complete a good narrative or expository essay.

☐ Strongly disagree
☐ Moderately disagree
☐ Neutral
☐ Moderately agree
☐ Strongly agree

4. I provide sufficient vocabulary instruction for my students to complete a good narrative or expository essay.

☐ Strongly disagree
☐ Moderately disagree
☐ Neutral
☐ Moderately agree

☐ Strongly agree

5. My students understand the difference between writing a narrative and writing an expository essay.

☐ Strongly disagree
☐ Moderately disagree
☐ Neutral
☐ Moderately agree
☐ Strongly agree

6. I provide sufficient practice for my students to write a narrative or expository essay.

☐ Strongly disagree
☐ Moderately disagree
☐ Neutral
☐ Moderately agree
☐ Strongly agree

7. My students have difficulties composing a narrative essay.

☐ Strongly disagree
☐ Moderately disagree
☐ Neutral
☐ Moderately agree
☐ Strongly agree

8. My students have difficulties composing an expository essay.

☐ Strongly disagree
☐ Moderately disagree
☐ Neutral
☐ Moderately agree
☐ Strongly agree

9. Generally, my students have difficulties in using appropriate words while writing a narrative essay.

☐ Strongly disagree
☐ Moderately disagree
☐ Neutral
☐ Moderately agree
☐ Strongly agree

10. Generally, my students have difficulties in using appropriate words while writing an expository essay.

☐ Strongly disagree
☐ Moderately disagree
☐ Neutral

☐ Moderately agree
☐ Strongly agree

Thanks for your participation!
Your answers will be kept confidential and secure!

APPENDIX D

DESCRIPTIVE STATISTIC TABLE OF 10 DEPENDENT VARIABLES – MEAN, STANDARD DEVIATION AND RANGE

Age group	10 DV / Genre	TW	TTU	MLTU	ABN	DRN	DRA	EMCV	EMLV	LMCV	LMLV
5th Grade	Narrative	170.68	19.10	9.14	3.89	0.68	1.81	0.69	1.67	0.25	0.10
		(80.26)	(8.86)	(2.22)	(2.10)	(1.15)	(1.35)	(0.78)	(2.06)	(0.46)	(0.31)
		[64-392]	[8-46]	[6-17]	[1.09-10.79]	[0-5.04]	[0-5.71]	[0-3.90]	[0-8.67]	[0-1.54]	[0-1.62]
	Expository	139.58	11.53	12.33	9.15	5.40	1.18	1.96	1.30	0.94	0.09
		(60.31)	(5.02)	(3.00)	(2.87)	(3.86)	(0.86)	(1.44)	(1.75)	(1.01)	(0.28)
		[29-346]	[5-31]	[6-18]	[3.19-15.18]	[0-20.43]	[0-3.45]	[0-5.38]	[0-9.26]	[0-3.61]	[0-1.12]
8th Grade	Narrative	245.40	23.80	11.19	4.17	1.13	1.97	0.81	1.41	0.56	0.13
		(83.94)	(9.93)	(3.93)	(1.74)	(0.83)	(1.32)	(0.78)	(1.67)	(0.71)	(0.26)
		[70-433]	[4-44]	[6-31]	[1.76-9.48]	[0-3.43]	[0-7.32]	[0-3.11]	[0-8.64]	[0-3.73]	[0-0.94]
	Expository	208.40	15.18	14.53	8.26	6.50	1.42	1.90	1.08	0.81	0.12
		(66.09)	(6.50)	(3.13)	(2.54)	(3.15)	(0.61)	(1.02)	(0.87)	(0.88)	(0.30)
		[48-242]	[3-33]	[7-25]	[3.76-13.17]	[1.32-15.34]	[0.53-3.45]	[0-4.51]	[0-3.51]	[0-3.45]	[0-1.19]
11th Grade	Narrative	336.73	30.70	11.27	4.95	1.62	1.88	0.83	0.85	0.85	0.19
		(71.71)	(7.99	(2.07)	(1.59)	(0.95)	(0.96)	(0.55)	(0.82)	(0.59)	(0.27)
		[182-452]	[15-46]	[8-17]	[1.43-8.63]	[0-4.18]	[0.3-3.87]	[0-2.14]	[0-3.79]	[0-2.13]	[0-0.97]
	Expository	285.50	22.43	13.26	9.85	6.14	1.71	2.18	0.88	1.06	0.15
		(89.96)	(7.30)	(2.54)	(1.99)	(2.24)	(0.89)	(1.06)	(0.80)	(0.76)	(0.25)
		[121-433]	[7-34]	[9-22]	[6.19-14.63]	[0-10.00]	[0-4.05]	[0.33-4.84]	[0-3.31]	[0-2.80]	[0-0.73]

( ): Standard Deviation

[ ]: Range from Low to High

BIBLIOGRAPHY

Aitchison, J. (2003). *Words in the mind: An introduction to the mental lexicon-third edition.* Oxford: Blackwell.

Alegre, M., & Gordon, P. (1999). Rule-based versus associative processes in derivational morphology. *Brain and Language*, *68*, 347-354.

Altarriba, J., Bauer, L., & Benvenuto, C. (1999). Concreteness, context availability, and imageability ratings and word associations for abstract, concrete and emotion words. *Behavior Research Methods, Instruments, & Computers*, *31*(4), 578-602.

American Speech-Language-Hearing Association. (2001). *Roles and responsibilities of Speech-Language Pathologists with respect to reading and writing in children and adolescents [Position Statement]*. Available from www.asha.org/policy.

Anglin, J. (1993). Vocabulary development: A morphological analysis. *Monographs of the Society for Research in Child Development*, *58*(10, Serial No. 238).

Astington, J., & Jenkins, J. (1999). A longitudinal study of the relation between language and theory-of -mind development. *Developmental Psychology*, *35*(5), 1311-1320.

Astington, J., & Olson, D. (1990). Metacognitive and metalinguistic language: Learning to talk about thought. *Applied Psychology: An International Review*, *39*(1), 77-87.

Babu, N., & Mishra, S. (2000). Development of mental state verbs among Oriya speaking children: Pragmatics or semantics. *Psychological Studies*, *45*, 24-29.

Bar-Ilan, L., & Berman, R. (2007). Developing register differentiation: The Latinate-Germanic divide in English. *Linguistic*, *45*(1), 1-35.

Berman, R. (2004). Genre and modality in developing discourse abilities. In C. Moder & A. Martinovic-Ziv (Eds.), *Discourse across languages and cultures*. (pp. 229-356). Amsterdam: John Benjamins.

Berman, R., & Katzenberger, I. (2004). Form and function in introducing narrative and expository texts: A developmental perspective. *Discourse Processes*, *38*(1), 57-94.

Berman, R., & Nir-Sagiv, B. (2007). Comparing narrative and expository test construction across adolescence: A developmental paradox. *Discourse Processes*, *43*(2), 79-120.

Berman, R., & Nir-Sagiv, B. (2004). Linguistic indicators of inter-genre differentiation in later language development. *Journal of Child Language*, *31*, 339-380.

Berninger, V., & Swanson, H.L. (1994). Modifying Hayes and Flower's model of skilled writing to explain beginning and developing writing. *Advances in Cognition and Educational Practice*, *2*, 57-81.

Bertram, R., Laine, M., & Virkkala, M. M. (2000). The role of derivational morphology in vocabulary acquisition: Get by with a little help from my morpheme friends. *Scandinavian Journal of Psychology*, *41*, 287-296.

Biemiller, A., & Slonim, N. (2001). Estimating root word vocabulary growth in normative and advanced populations: Evidence for a common sequence of vocabulary acquisition. *Journal of Educational Psychology*, *93*(3), 498-520.

Blair, T., & Crump, C. (1984). Effects of discourse mode of the syntactic complexity of learning disabled students' written expression. *Learning Disability Quarterly*, *7*, 19-29.

Bloom, P. (2001). How children learn the meanings of words. *Behavioral and Brain Sciences*, *24*, 1095-1103.

Booth, J., & Hall, W. (1994). Role of the cognitive internal state lexicon in reading comprehension. *Journal of Educational Psychology*, *86*(3), 413-422.

Booth, J., & Hall, W. (1994). *Metacognitive development and the cognitive internal state lexicon* (Reading Research Rep. No. 18). College Park, MD: University of Georgia and Maryland, National Reading Research Center.

Booth, J., & Hall, W. (1995). Development of the understanding of the polysemous meanings of the mental-state verb know. *Cognitive Development*, *10*, 529-549.

Booth, J., Hall, W., Robinson, G., & Kim, S. (1997). Acquisition of the mental state verb know by 2- to 5-year-old children. *Journal of Psycholinguistic Research*, *26*, 581-603.

Brent, M., & Cartwright, T. (2002). Distribution regularity and phonotactic constrains are useful for segmentation. In G. Altmann (Ed.), *Psycholinguistics: Critical concepts in psychology*. New York: Routledge.

Bretherton, I., & Beeghly, M. (1982). Talking about internal states: The acquisition of an explicit theory of mind. *Development Psychology*, *18*, 906-921.

Cain, K., Oakhill, J., & Elbro, C. (2003). The ability to learn new word meanings from context by school-age children with and without language comprehension difficulties. *Journal of Child Language*, *30*, 681-694.

Cain, K., Oakhill, J., & Lemmon, K. (2004). Individual differences in the inference of word meanings from context: The influence of reading comprehension, vocabulary knowledge, and memory capacity. *Journal of Educational Psychology*, *96*(4), 671-681.

Carlisle, J. (1987). The use of morphological knowledge in spelling derived forms by learning-disabled and normal students, *Annals of Dyslexia*, *37*, 90-108.

Carlisle, J. (1988). Knowledge of derivational morphology and spelling ability in forth, sixth, and eight graders. *Applied Psycholinguistic*, *9*, 247-266.

Carlisle, J. (1996). An exploratory study of morphological errors in children's written stories. *Reading and Writing: An Interdisciplinary Journal*, *8*, 61-72.

Chafe, W., & Danielewicz, J. (1987). Properties of spoken and written language. In R. Horowitz & S. J. Samuels (Eds.), *Comprehending oral and written language* (pp. 83-113). San Diego: Academic Press.

Chaffin, R., Morris, R., & Seely, R. (2001). Learning new word meanings from context: A study of eye movements. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *27*(1), 225-235.

Champion, A. (1997). Knowledge of suffixed words: A comparison of reading disabled and nondisabled readers. *Annals of Dyslexia*, *47*, 29-55.

Clark, E. (1993). *The lexicon in acquisition*. London: Cambridge University Press.

Curenton, S., & Justice, L. (2004). African American and Caucasian preschoolers' use of decontextualized language: Literate language features in oral narratives. *Language, Speech, and Hearing Services in School*, *35*, 240-253.

Curtis, M. (1987). Vocabulary testing and vocabulary instruction. In M. G. McKeown & M. E. Curtis (Eds.), *The nature of vocabulary acquisition* (pp. 37-52). Hillsdale, NJ: Lawrence Erlbaum Associates.

de Villiers, J., & de Villiers, P. (2000). Linguistic determinism and the understanding of false beliefs. In P. Mitchell & K. Riggs (Eds.), *Children's reasoning and the mind* (pp. 191-228). Hove, UK: Psychology Press.

Dockrell, J., & Messer, D. (2004). Lexical acquisition in the early school years. In R. Berman (Ed.), *Language development across childhood and adolescence* (pp. 53-82). Amsterdam: John Benjamins.

Duin, A., & Graves, M. (1987). Intensive Vocabulary Instruction as a Prewriting Technique. *Reading Research Quarterly*, *22*(3), 311-330.

Dunn, L., & Dunn, D. (2007). *The Peabody picture vocabulary test, fourth Edition.* Bloomington, MN: NCS Pearson, Inc.

Flower, L., & Hayes, J. (1984). Images, plans, and prose: The representation of meaning in writing. *Written Communication*, *1*(1), 120-160.

Freyd, P., & Baron, J. (1982). Individual differences in acquisition of derivational morphology. *Journal of Verbal Learning and Verbal Behavior*, *21*, 282-295.

Fuste-Herrmann, B., Silliman, E., Bahr, R., Fasnacht, K., & Federico, J. (2006). Mental State verb production in the oral narratives of English- and Spanish-speaking preadolescents: An exploratory study of lexical diversity and depth. *Learning Disabilities Research & Practices*, *21* (1), 44-60.

Gillam, R., & Johnston, J. (1992). Spoken and written language relationships in language/learning-impaired and normally achieving school-age children. *Journal of Speech and Hearing Research*, *35*, 1303-1315.

Green, L., McCutchen, D., Schwiebert, C., Quinlan, T., Eva-Wood, A., & Juelis, J. (2003). Morphological development in children's writing. *Journal of Educational Psychology*, *95*(4), 752-761.

Greenhalgh, K., & Strong, C. (2001). Literate language features in spoken narratives of children with typical language and children with language impairments. *Language, Speech, and Hearing Services in School*, *32*, 114-125.

Hadley, P. (1998). Language sampling protocols for eliciting text-level discourse. *Language, Speech, and Hearing Services in School*, *29*, 132-147.

Hayes, J. (1996). A new framework for understanding cognition and affect in writing. In C. Levy & S. Ransdell (Eds.), *The science of writing: Theories, methods, individual differences, and applications* (pp. 1-27). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Hayes, J., Flower, L., Schriver, K., Stratman, J., & Carey, L. (1987). Cognitive processes in revision. In S. Rosenberg (Ed.), *Advances in applied psycholinguistics. Vol. 2: Reading, writing, and language processing* (pp. 176-240). Cambridge: Cambridge University Press.

Hidi, S., & Hildyard, A. (1983). The comparison of oral and written productions in two discourse types. *Discourse Processes*, *6*, 91-105.

Hill, K. (2001). The development of a model for automated performance measurement and the establishment of performance indices for augmented communicators under two sampling conditions. Unpublished doctoral Dissertation, University of Pittsburgh.

Hunt, K. (1965). Grammatical structures written at three grade levels. *NCTE Research Report No. 3.* Champaign, IL: National Council of Teachers of English.

Jessen, F., Heun, R., Erb, M., Granath, D., Klose, U., Papassotiropoulos, A., & Grodd, W. (2000). The concreteness effect: Evidence for dual coding and context availability. *Brain and Language*, *74*, 103-112.

Johnson, C., & Maratsos, M. (1977). Early comprehension of mental verbs: Think and know. *Child Development*, *48*, 1743-1747.

Johnson, C., & Wellman, H. (1980). Children's development understanding of mental verbs: Remember, know, and guess. *Child Development*, *51*, 1095-1102.

Joshi, R. (2005). Vocabulary: A critical component of comprehension. *Reading and Writing Quarterly*, *21*, 209-219.

Kellogg, R., Olive, T., & Piolat, A. (2007). Verbal, visual, and spatial working memory in written language production. *Acta Psychologica*, *124*, 382-397.

Kounios, J., & Holcomb, P. (1994). Concreteness effects in semantic processing: ERP evidence supporting dual-coding theory. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *20*(4), 804-823.

Kroll, B. (1981). Developmental relationships between speaking and writing. In B. M. Kroll & R. J. Vann (Eds.), *Exploring speaking-writing relationships* (pp. 32-54). Urbana, IL: National Council of Teachers of English.

Laflamme, J. (1997). The Effect of Multiple Exposure Vocabulary Method and the Target Reading/Writing Strategy on Test Scores. *Journal of Adolescent & Adult Literacy*, *40*(5), 372-384.

Langer, J. (1985). Children's sense of genre: A study of performance on parallel reading and writing tasks. *Written Communication*, *2*(2), 157-187.

Larsen, J., & Nippold, M. (2007). Morphological analysis in school-age children: Dynamic assessment of a word leaning strategy. *Language, Speech, and Hearing Services in Schools*, *38*, 1-12.

Laufer, B., Elder, C., Hill, K., & Congdon, P. (2004). Size and strength: Do we need both to measure vocabulary knowledge? *Language Testing*, *21*(2), 202-226.

Leong, C-K. (2000). Rapid processing of base and derived forms of words and grades 4, 5 and 6 children's spelling. *Reading and Writing: An Interdisciplinary Journal*, *12*, 277-302.

Lewis, B., O'Donnell. B., Freebairn, L., & Taylor, H. (1998). Spoken language and written expression- Interplay of delays. *American Journal of Speech-Language Pathology*, *7*, 77-84.

Lewis, D., & Windsor, J. (1996). Children's analysis of derivational suffix meanings. *Journal of Speech and Hearing Research*, *39*, 209-216.

Mackie, C., & Dockrell, J. (2004). The nature of written language deficits in children with SLI. *Journal of Speech, Language, and Hearing Research*, *47*, 1469-1483.

Mann, V. (2000). Introduction to special issue on morphology and the acquisition of alphabetic writing systems. *Reading and Writing: An Interdisciplinary Journal*, *12*, 143-147.

Mansfield, T. (2007). Anatomy of a code. Unpublished manuscript.

Marslen-Wilson, W. (2002). Functional parallelism in spoken word-recognition. In G. Altmann (Ed.) *Psycholinguistics: Critical concepts in psychology*. New York: Routledge.

McCutchen, D. (1987).Children's discourse skill: Form and modality requirements of schooled writing. *Discourse Processes*, *10*, 267-286.

McCutchen, D. (1986). Domain knowledge and linguistic knowledge in the development of writing ability. *Journal of Memory and Language*, *25*, 431-444.

McCutchen, D., Covill, A., Hoyne, S., & Mildes, K. (1994). Individual differences in writing: Implications of translating fluency. *Journal of Educational Psychology*, *86*(2), 256-266.

McFadden, T., & Gilllam, R. (1996). An examination of the quality of narratives produced by children with language disorders. *Language, Speech, and Hearing Services in Schools*, *27*, 48-56.

McGhee-Bidlack, B. (1991). The development of noun definitions: A metalinguistic analysis. *Journal of child Language*, *18*, 417-434.

Mellet, E., Tzourio, N., Denis, M., & Mazoyer, B. (1998). Cortical anatomy of mental imagery of concrete nouns based on their dictionary definition. *NeuroReport*, *9*, 803-808.

Miller, C. (2004). False belief and sentence complement performance in children with specific language impairment. *International Journal of Language and Communication Disorders*, *39*(2), 191-213.

Miller, J., & Chapman, R. (2003). SALT: A computer program for the systematic analysis of language transcripts [computer software]. Madison, WI: Language Analysis Laboratory, Waisman Center, University of Wisconsin.

Moore, C., Brynt, D., & Furrow, D. (1989). Mental terms and the development of certainty. *Child Development*, *60*, 167-171.

Moore, C., & Davidge, J. (1989). The development of mental terms: Pragmatics or semeatics? *Journal of Child Language*, *16*, 633-641.

Morris, N., & Crump, W. (1982). Syntactic and vocabulary development in the written language of learning disabled and non-learning disabled students at four age levels. *Learning disability quarterly*, *5*, 163-172.

Nagy, W., & Anderson, R. (1984). How many words are there in printed school English? *Reading Research Quarterly*, *19*, 304-330.

Nagy, W., Diakidoy, I, & Anderson, R. (1993). The acquisition of morphology: Learning the contribution of suffixes to the meanings of derivatives. *Journal of Reading Behavior*, *25*(2), 155-170.

Newcomer, P., & Hammill, D. (1997). *The test of language development-3*. Austin, TX : Pro-ed.

Nippold, M. (2007). *Later language development: School-age children, adolescents, and young adults (3rd ed.)*. Austin, TX: Pro-Ed.

Nippold, M. (1999). Word definition in adolescents as a function of reading proficiency: A research note. *Child Language Teaching and Therapy*, *15*(2), 171-176.

Nippold, M. (1995). Language norms in school-age children and adolescents: An introduction. *Language, speech, and Hearing Services in Schools*, *26*, 307-308.

Nippold, M. (1993). Adolescent language developmental makers in adolescent language: Syntax, semantics, and pragmatics. *Language, speech, and Hearing Services in Schools*, *24*, 21-28.

Nippold, M., Hegel, S., Sohlberg, M., & Schwarz, L. (1999). Defining abstract entities: Development in pre-adolescent, adolescent, and young adults. *Journal of Speech, Language and Hearing Research*, *42*, 473-481.

Nippold, M., & Sun, L. (in press). Knowledge of morphologically complex words: A developmental study of older children and young adolescents. *Language, Speech, and Hearing Services in School.*

Nippold, M., Mansfield, T., & Billow, J. (2007). Peer conflict explanations in children, adolescents, and adults: Examining the development of complex syntax. *American Journal of Speech-Language Pathology*, *16*, 1-10.

Nippold, M., Ward-Lonergan, J., & Fanning, J. (2005). Persuasive writing in children, adolescents, and adults: A study of syntactic, semantic, and pragmatic development. *Language, Speech, and Hearing Services in School*, *36*, 125-138.

Nittono, H., Suehiro, M., & Hori, T. (2002). Word imageability and N400 in an incidental memory paradigm. *International Journal of Psychophysiology*, *44*, 219-229.

Noppeney, U., & Price, C. (2004). Retrieval of abstract semantics. *NeuroImage*, *22*, 164-170.

O'Donnell, R. (1974). Syntactic differences between speech and writing. *American Speech*, *49*, 102-110.

Oetting, J. (1999). Children with SLI use argument structure cues to learn verbs. *Journal of Speech, Language, and Hearing Research*, *42*, 1261-1274.

Oetting, J., Rice, M., & Swank, L. (1995). Quick incidental learning (QUIL) of words by school-age children with and without SLI. *Journal of Speech and Hearing Research*, *38*, 434-445.

O'Hara, M., & Johnston, J. (1997). Syntactic bootstrapping in children with specific language impairment. *European Journal of Disorders pf Communication*, *32*, 189-205.

Olson, D., & Astington, J. (1993). Thinking about thinking: Learning how to take statements and hold beliefs. *Educational Psychologist*, *28*(1), 7-23.

Olson, D., Antonietti, A., Liverta-Sempio, O., & Marchetti, A. (2006). The mental verbs in different conceptual domains and in different cultures. In A. Antonietti, O. Liverta-Sempio, & A. Marchetti (Eds.), *Theory of mind and language in developmental contexts* (pp. 31-65). New York, NY: Springer Science Business Media, Inc.

Olson, D., & Torrance, N. (1986). Some relations between children's knowledge of metalinguistic and metacognitive verbs and their linguistic competencies. In I. Gopnik & M. Gopnik (Eds.), *Models to modules: Studies in cognitive science from the McGill workshops* (pp. 66-81). Norwood, NJ: Ablex Publishing Corp.

Paul, R. (2007). *Language disorders from infancy through adolescence: Assessment and intervention (3rd ed.).* St.Louis: Mosby Elsevier.

Pavio, A. (1991). Dual coding theory: Retrospect and current status. *Canadian Journal of Psychology*, *45,* 225-287.

Perfetti, C., & McCutchen, D. (1987). Schooled language competence: Linguistic abilities in reading and writing. In S. Rosenberg (Ed.), Advances in applied psycholinguistics, reading, writing and language learning, Vol. 2 (pp. 105-141). New York: Cambridge University Press.

Peskin, J., & Olson, D. (2004). On reading poetry: Expert and novice knowledge. In R. A.. Berman (Ed.), Language development across children and adolescence (pp. 211-232). Amsterdam: John Benjamins Publishing Company.

Plag,I., Dalton-Puffer, C., & Bayyen, H. (1999). Morphological productivity across speech and writing. *English Language and Linguistics*, *3*(2), 209-228.

Prater, D., & Padia, W. (1983). Effects of modes of discourse on writing performance in grades four and six. *Research in the Teaching of English*, *17*(2), 127-134.

Ragnarsdottir, H., Aparici, M., Cahana-Amitay, D., van Hell, J., & Viguie, A. (2002). Verbal structure and content in written discourse: Expository and narrative texts. *Written Language & Literacy*, *5*(1), 95-125.

Ravid, D. (2006). Semantic development in textual contexts during the school years: Noun scale analysis. *Journal of Child Language*, *33*, 791-821.

Ravid, D. (2004). Derivational morphology revised: Later lexical development in Hebrew. In R. Berman (Ed.), *Language development across childhood and adolescence* (pp. 53-82). Amsterdam: John Benjamins Publishing Company.

Ravid, D., & Berman, R. (2006). Information density in the development of spoken and written narratives in English and Hebrew. *Discourse Processes*, *41*(2), 117-149.

Ravid, D., & Tolchinsky, L. (2002). Developing linguistic literacy: A comprehensive model. *Journal of Child Language*, *29*, 417-447.

Ravid, D., & Zilberbuch, S. (2003). Morphosyntactic constructs in the development of spoken and written Hebrew text production. *Journal of Child Language*, *30*, 395-418.

Rice, M., Cleave, P., & Oetting, J. (2000). The use of syntactic cues in lexical acquisition by children with SLI. *Journal of Speech, Language, and Hearing Research*, *43*, 582-594.

Rubin, H., Patterson, P., & Kantor, M. (1991). Morphological development and writing ability in children and adults. *Language, Speech, and Hearing Services in School*, *22*, 228-235.

Sabsevitz, D., Meddler, D., Seidenberg, M., & Binder, J. (2005). Modulation of the semantic system by word imageability. *NeuroImage*, *27*, 188-200.

Sadoski, M. (1995). Concreteness Effects in Text Recall: Dual Coding or Context Availability? *Reading Research Quarterly*, *30*(2), 278-288.

Sadoski, M., Kealy, W., Goetz, E., & Raivio, A. (1997). Concreteness and imagery effects in the written composition of definitions. *Journal of Educational Psychology*, *89*(3), 518-526.

Schwanenflugel, P., Akin, C., & Luh, W. (1992). Context availability and the recall of abstract and concrete words. *Memory & Cognition*, *20*(1), 96-104.

Schwanenflugel, P., Henderson, R., & Fabricius, W. (1998). Developing organization of mental verbs and theory of mind in middle childhood: Evidence from extensions. *Developmental Psychology*, *34*(3), 512-524.

Schwanenflugel, P., Fabricius, W., & Noyes, C. (1996). Developing organization of mental verbs: Evidence for the development of a constructivist theory of mind in middle childhood. Cognitive Development, *11*, 265-294.

Scott, C. (2005). Learning to write. In H. W. Catts & A. G. Kamhi (Eds.), *Language and reading disabilities*, *2* (pp. 224-258). Boston, MA: Pearson.

Scott, C. (1994). A discourse continuum for school-age students: Impact of modality and genre. In G. P. Wallach & K. G. Butler (Eds.), *Language learning disabilities in school-age children and adolescents: Some principles and applications* (pp.180-218). New York: Macmillan College.

Scott, C. (1988). A perspective on the evaluation of school children's narratives. *Language, Speech, and Hearing Services in Schools*, *19*, 67-82.

Scott, C. (1988). Spoken and written syntax. In M.A. Nippold (Ed.), *Later language development: Age 9 through 19* (pp. 49-95). Boston, MA: Little, Brown and Company.

Scott, C., & Windsor, J. (2000). General language performance measures in spoken and written narrative and expository discourse of school-age children with language learning disabilities. *Journal of Speech, Language, and Hearing Research*, *43*, 324-339.

Semel, E., Wiig, E., & Secord W. (1995). *Clinical evaluation of language fundamentals - 3*. San Antonio, TX: The Psychological Corporation.

Shatz, M., Wellman, H., & Silber, S. (1983). The acquisition of mental verbs: A systematic investigation of the first reference to mental status. *Cognition*, *14*, 301-321.

Slade, L., & Ruffman, T. (2005). How language does (and does not) relate to theory of mind: A longitudinal study of syntax, semantics, working memory and false belief. *British Journal of Developmental Psychology*, *23*, 117-141.

SPSS Inc. (2005). SPSS 13.0 for Windows. [Computer software]. Chicago, IL: SPSS Inc.

Stromqvist, S., Nordqvist, A., & Wengelin, A. (2004). Writing the frog story: Developmental and cross-modal perspectives. In S. Stromqvist & L. Verhoeven (Eds.), *Relating events in narrative, Volume 2: Typological and contextual perspectives.* (pp.359-394). Hallsdale, NJ: Lawrence Erlbaum Associates.

Swaab, T., Baynes, K., & Knight, R. (2002). Separable effects of priming and imageability on word processing: An ERP study. *Cognitive Brain Research*, *15*, 99-103.

Tyler, A., & Nagy, W. (1989). The acquisition of English derivational morphology. *Journal of Memory and Language*, *28*, 649-667.

Verhoeven, L., Aparici, M., Cahana-Amitay, D., van Hell, J., Kriz, S., & Viguie-Simon., A. (2002). Clause packing in writing and speech. *Written Language & Literacy* , *5*(2), 135-162.

Verhoeven, L., & Perfetti, C. (2003). Introduction to this special issue: The role of morphology in learning to read. *Scientific Studies of Reading*, *7*(3), 209-217.

West, C., & Holcomb, P. (2000). Imaginal, semantic and surface-level processing of concrete and abstract words: An electrophysiological investigation. *Journal of Cognitive Neuroscience*, *12*,1024-1037.

Westby, C. (1999). Assessing and facilitating text comprehension problem. In H. W. Catts & A. G. Kamhi (Eds.), *Language and reading disabilities* (pp. 154-221). Boston: Allyn & Bacon.

Westby, C. (1994). The effects of culture in genre, structure, and style of oral and written texts. In G. P. Wallach & K. G. Butler (Eds.), *Language learning disabilities in school-age children and adolescents: Some principles and applications* (pp. 180-218). New York: Macmillan College.

Westby, C. (1990). The role of the speech-language pathologist in whole language. *Language, Speech, and Hearing Services in School*, *21*, 228-237.

Westby, C. (1985). Learning to talk-talking to learn: Oral-literate language differences. In C.S. Simon (Ed.), *Communication skills and classroom success* (pp. 181-213). San Diego: College-Hill Press.

Weston, A., Shriberg, L., & Miller, J. (1989). Analysis of language-speech samples with SALT and PEPPER. Journal of Speech and Hearing Research, *32*, 755-766.

White, T., Power, M., & White, S. (1989). Morphological analysis: Implications for teaching and understanding vocabulary growth. *Reading Research Quarterly*, *24*(3), 283-304.

White, T., Sowell. J., & Yanagihara, A. (1989). Teaching elementary students to use word-part clues. *The Reading Teacher*, *42*, 302-307.

Wilson, J. (1999). Using words about thinking: Content analyses of chemistry teacher's classroom talk. *International Journal of Science Education*, *21*(10), 1067-1084.

Windsor, J. (1994). Children's comprehension and production of derivational suffixes. *Journal of Speech and Hearing Research, 37*, 408-417.

Windsor, J., Scott., C., & Street, C. (2000). Verb and noun morphology in the spoken and written language of children with language learning disabilities. *Journal of Speech and Hearing Research, 43*, 1322-1336.

Wing, C., & Scholnick, E. (1986) Understanding the language of reasoning: Cognitive, linguistic, and developmental influences. *Journal of Psycholinguistic Research, 15*(5), 383-401.

Wysocki, K., & Jenkins, J. (1987). Deriving word meanings through morphological generalization. *Reading Research Quarterly*, *22*(1), 66-81.

Zarry, L. (1999). Vocabulary enrichment in composition: A grade six study. *Education, 120*(2),267-272.