THE CONNECTIONS AMONG PROSODY, READING FLUENCY AND READING COMPREHENSION

SUCHETA T. KULKARNI, B.A.

A THESIS SUBMITTED TO THE GRADUATE FACULTY IN COMMUNICATION SCIENCES AND DISORDERS IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN SPEECH-LANGUAGE PATHOLOGY

SAINT XAVIER UNIVERSITY
Chicago, Illinois
May, 2008
ACKNOWLEDGEMENT

I would like to dedicate this thesis to my father and mother, Dr. Narayan Kulkarni and Sulochana Kulkarni, to my husband, Dr. Tammaji Kulkarni, and my children, Nivedita and Vivek.

To my parents, you have always believed in my abilities and have encouraged me to strive for excellence.

To my husband, you have motivated me to succeed in this endeavor and in my studies in this field.

To my children, thank you for always being my cheerleaders and giving me hope and joy.

I would also like to mention and thank my sisters and brother, Suneeta, Archana, and Vishu who have given me much long-distance support.

I would especially like to thank Dr. Carol Szymanski and Dr. Gail Harris-Schmidt for their guidance, their patience, and their dedication with this project. They have both been wonderful role models and it has been an honor to work with them both.

Finally, I would like to thank the faculty and staff in the Department of Communication Sciences and Disorders for giving me the opportunity to work on this project and for guiding my academic experience.
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ABSTRACT

PROSODY

By

Sucheta T. Kulkarni

This study consisted of a review of the current literature (1991 to 2007) in order to determine the connection and scope of prosody in extant literature to brain studies, language, bilingual populations, reading fluency, and reading comprehension. The information was gathered using books, journal articles, published theses, and a number of electronic databases. The literature revealed connections between prosody and language and reading as shown by neuroimaging brain studies. The literature also revealed connections of prosody with language and reading, in particular, fluent reading. Prosody is a component of fluent reading as defined by the National Reading Panel. Further studies need to be conducted to investigate how prosody can be used to develop reading fluency.
Introduction

Background

Prosody is the aspect of speech which is composed of all the supra-segmental parts of sound. There are many different definitions of prosody used by researchers and speech-language pathologists in the field of Communication Sciences and Disorders. Some define prosody in the same way as intonation. Others add extra features such as vocal effort and rhythm to the definition. For the purpose of this paper, the definition of prosody as outlined by Shriberg and Kent (2003) will be used: prosody is composed of the supra-segmental aspects of speech including frequency (pitch), intensity (loudness), duration (length), vocal effort, rhythm, tempo, and patterns of stress. Prosody applies to all aspects of oral language and gives expression and interest to speech. Each language has appropriate prosody which enables speakers to convey a multitude of overt meanings and hidden nuances. There are numerous studies which have been conducted in speech-language pathology that examine the relationship of prosody to the English language. Shriberg and Kent (2003) cited a study by Fernald and Mazzie (1991, as cited in Shriberg and Kent, 2003) in which the exaggerated intonation patterns of "motherese" were studied. The authors suggested that this type of prosodic structure may provide a framework to the infants for learning adult speech. The effects of prosody on the acquisition of language (Snow, 1998) and the acquisition of literacy have also been the topic of research (Dowhower, 1991). As children acquire literacy skills they learn to read with expression or appropriate prosody.

When appropriate prosody is used in oral reading, it conveys the meaning of the work easily and accurately. This type of reading has been referred to as prosodic
reading or expressive reading. Various studies have been conducted to show the relationship of prosodic reading to fluency in reading (Schwanenflugel, Hamilton, Kuhn, Wisenbaker and Stahl, 2004) and also to comprehension and language development (Peppe and McCann, 2003). There is no clear indication of whether appropriate prosody in oral language increases comprehension in reading or greater comprehension increases prosodic reading and oral language. As Dowhower (1991) stated, this is the eternal puzzle of which came first, the chicken or the egg. The likelihood that both skills develop as alternating steps along the pathway to language and reading development seems to be plausible. There are a number of programs in the United States schools which are used to foster the development of fluent and expressive reading with comprehension. The programs that have been approved by the United States Department of Education are listed on the What Works Clearinghouse (http://www.whatworks.ed.gov).

Another aspect of appropriate prosody involves the development of language and the effects in bilingual or multi-lingual populations. A number of studies have been conducted on bilingual populations. These studies have examined aspects such as English language development (Peregoy and Boyle, 2000), the effects of L2 on reading abilities (Leseaux and Siegel, 2003), and the effects of the home environment on reading and the comprehension of English (Fitzgerald and Noblit, 2000). There are a number of programs that are currently in use which deal with English language development and reading skills in the bilingual population in the United States. The United States Department of Education has assessed a number of these programs to determine their effectiveness in the school setting. The results and ratings of these
programs can be accessed at the What Works Clearinghouse website (http://www.whatworks.ed.gov). So, how does prosody influence reading abilities? How can we determine which aspects of prosody should be studied further?

There are a number of measures which could be used to assess prosody, reading, and comprehension. Some of the measures that are available are the Prosody-Voice Screening profile (PSVP) (Shriberg, Kwiatowski, and Rasmussen, 1990), the Qualitative Reading Inventory (QRI) (Leslie and Caldwell, 2001), the Comprehensive Reading Inventory (CRI) (Cooter, Flynt, & Cooter, 2007), and the Informal Reading Inventory (I.R.I.) (Roe, 1999) and the Gray Oral Reading Tests, Fourth Edition (GORT – 4) (Wiederholt, & Bryant, 2001). These tools could be used in further studies for advancing the development of both language and reading skills.

Research question and/or hypothesis

This study consists of a review of the current literature in order to determine the connection and scope of prosody in extant literature to brain studies, language, bilingual populations, comprehension and, in particular, to reading ability.

Methods

A number of materials were used for gathering information for this research. These materials included books, journal articles, published theses, and electronic databases. Searches were conducted within the databases which included: EBSCOhost/EBSCO Publishing, Eric, Com.Dis.Dome, psycINFO., PsycARTICLES Publications, Academic Search Premier, Expanded Academic ASAP, JSTOR, CINAHL Plus, Communication and Mass Media Complete, Science Direct College Edition and Science Direct Physical Sciences College Edition. These searches were conducted
using author names, journal titles, books, dissertations, reports, conferences, and keywords. The keywords included: prosody, prosody and comprehension, prosody and literacy, prosody and language, prosody and reading, prosody and syntax, prosody and ESL, suprasegmentals, intonation, language and speech, reading development, reading fluency, reading fluency and English language learning, fluent reading and reading programs, and ERP (Event-related potentials). The research used for the literature review was published between 1991 and 2007.
Review of Literature

Definitions of Prosody

According to Shriberg and Kent (2003) the suprasegmental aspects of speech are those characteristics of speech, such as voice quality and style, which are not broken down into segments. These suprasegmental aspects can be divided into two broad categories of paralinguistics and prosody. Paralinguistics include voice quality, which is affected by emotion and speaking style. Prosody can be broken down into many different components. The major parts of prosody, according to Shriberg and Kent (2003), are intonation (pitch variations), intensity (loudness), and tempo (length). This definition also includes tone, speaking rate, and the John-Lewis (1986, as cited in Shriberg and Kent, 2003) definition of intonation which encompasses patterns of rise and fall and stress.

Intonation is made up of: rhythm, pitch declination, new vs. given information, contrastive stress, lexical stress and tone. The rhythm of a language is how stress is placed over the span of an utterance. In English, stress is placed on syllables in words (Shriberg and Kent, 2003) in an alternating manner so that a strong syllable is followed by a weak syllable. In other languages, the stress may be placed on timing of certain utterances. Pitch declination occurs when the fundamental frequency of an utterance decreases, as is the case with the ends of clauses or sentences (Shriberg and Kent, 2003) in English. This declination in pitch tells the listener that the phrase or sentence has ended, and this is one of the hallmarks of the English language. In English, speakers tend to highlight new information by stressing those words in the sentence. Snow (2001) had previously described these connections by stating that by marking
boundaries and highlighting information the features of pitch and timing “produce the linguistic systems of stress/accent, intonation, and rhythm.” (p. 42). All of these types of changes in prosody can be denoted by diacritic marks.

Shriberg and Kent (2003) have outlined two systems of transcription which may be utilized in addition to the International Phonetic Alphabet (IPA). The first system they discussed is an extension of the IPA proposed by Duckworth (Duckworth, Allen, Hardcastle, & Ball, 1990, as cited in Shriberg and Kent, 2003) which includes symbols for pauses of various lengths, loudness of speech, and rate of speech. The symbols used are periods within parentheses for pauses, f (forte) and p (piano) for loudness, and allegro and lento for rate of speech. The second system discussed by Shriberg and Kent (2003) is for transcription of conversation and was outlined by French and Local (1986, as cited in Shriberg and Kent, 2003). This system utilizes a variety of symbols including (.) for pauses, (2.5) indicating lengths of pauses in seconds, .h or h, indicating an outbreath, <f>, <p>, <cr> for levels of increasing loudness, and *** for an unintelligible utterance.

**Prosody and Brain Studies**

A number of studies have been conducted to examine how speech relates to brain functioning. However, there is a paucity of recent literature which connects brain functioning to both prosody and expressive or fluent reading. In one recent article Pugh, Sandak, Frost, Moore, and Mencel (2005) examined the literature for functional neuroimaging studies in reading development and reading disability in the English language. Another article outlined an experimental study by Steinhauer and Freiderici
(2001) which examined whether commas and prosodic boundaries cause shifts in brain wave activities.

Pugh, Sandak, Frost, Moore, and Mencel (2005) addressed the following two questions in their article: Can techniques in neuroimaging be used to identify reading problems that may be caused by congenital problems? Can neuroimaging techniques be used to determine which approaches to use in teaching reading to English Language Learners (ELL) children? The authors discussed three main areas of research which were: 1) spoken and written language circuits in different languages 2) posterior and anterior reading circuitry in typical development and reading disability (RD), and 3) identifying RD in ELL populations. In the first section, the authors noted studies (Indefrey & Levelt, 2004, as cited in Pugh, Sandak, Frost, Moore, and Mencel, 2005) which demonstrated that both the temporal and frontal (perisylvian) language zones in the left hemisphere (LH) are activated for oral language processes. They noted other studies which showed that Chinese speakers had more involvement of the right hemisphere (RH) during speaking tasks. The authors surmised that this may be the case due to the tonal nature of the Chinese language. They noted that the manner in which L2 brain circuits for speech develop might have an impact on how reading circuits develop in the course of literacy acquisition. In the second section of the article, the authors mentioned a study (Pugh, Mencel, Jenner et al., 2000, as cited in Pugh, Sandak, Frost, Moore, and Mencel, 2005) which shows that reading involves the LH posterior cortical area, the inferior parietal lobule in the dorsal system and, also, the temporal gyrus (Wernicke's area). Studies by Black and Behrmann, 1994; Geschwind, 1965, and Price, 2000 (as cited in Pugh, Sandak, Frost, Moore, & Mencel, 2005) showed that this
area is involved in visual mapping of printed matter in languages. There is a ventral system which develops later and which supports fluent reading performance (Booth et al., 2001; Shaywitz et al., 2002, as cited in Pugh, Sandak, Frost, Moore, & Mencl, 2005). The authors pointed out that this ventral system is disrupted in children who are RD. In the third section of the article, the authors discussed a study which showed that there may be a disruption of the temporoparietal regions of the LH in RD (Sarkari et al., 2002, Shaywitz et al., 2002, Simos et al., 2000, as cited in Pugh, Sandak, Frost, Moore, & Mencl, 2005). The authors concluded by stating that several possible neurobiological markers have been identified which can be used to differentiate between congenital RD and other factors in ELL populations. They also concluded that speech and reading development in ELL follows a similar path to that in monolingual children even though the rate of development may be different. Therefore, neuroimaging techniques could be used to determine which types of reading tasks might be most beneficial to RD populations.

Steinhauer and Friederici (2001) conducted an experimental study with three experiments which showed that commas are perceived in a similar way to auditory speech boundaries by the brain and that this depends upon punctuation habits developed by the individual reader. The authors mentioned that the question of whether punctuation rules should be decided by prosody or by syntax has been debated for many years (Baldwin & Coady, 1978; Bergien, 1994; Bohme, 1995; Chafe, 1988; Van Petten & Bloom, 1999, as cited in Steinhauer & Friederici, 2001). Also unresolved is whether prosody (even subvocal) brings about appropriate punctuation. Based on the
study, the authors concluded that a reader's analysis of a sentence is definitely affected by the punctuation of the sentence.

The authors conducted three experiments on right-handed university students who spoke German. Two different types of brain wave activity were recorded while the subjects both read and listened to a variety of sentences with correct or incorrect punctuation. Event-related potentials (ERP) and Closure Positive Shift (CPS) waveforms were analyzed.

The results of the first experiment showed that the ways of parsing sentences can be determined by, and reversed by, commas and prosodic cues. Deleting an incorrect sentence and reversing the garden path (or direction followed) was more difficult to do than adding a comma where none existed. The second experiment showed that a closure-positive shift (CPS) in brainwave activity took place in two different types of sentences and was linked to comma processing. The third experiment showed that prosody was related to the CPS even when sentence melodies (without words) were used. The CPS also occurred during silent reading, indicating that subvocal parsing was taking place. Finally, the readers who were used to strict punctuation rules reacted appropriately to the commas. The authors concluded that the processing of prosodic boundaries in speech is similar to the processing of commas in reading text. The brain can analyze sentences in the same manner, and this was shown by event-related potentials (ERP's) and closure positive shift (CPS) in the brainwave responses. The commas initiated subvocal phonological phrasing in silent reading.
The aforementioned studies demonstrate that prosody does have a physiological correlate in brain activity. The responses are related to appropriate syntactic cues and can be used to improve reading abilities.

**Measurement Tools**

A variety of measurement tools may be used to assess prosody, reading abilities and comprehension in students. Informal tools provide a means of testing in children who may not perform well on standardized measures. The sample tools described below afford a means of gauging reading levels, comprehension levels, and appropriate prosody usage.

*Informal Reading Inventory.* The Informal Reading Inventory (IRI) (Roe, 1999) is a measurement tool which assesses word recognition ability and comprehension. The measure can be used for children who score low on standardized achievement tests and for children who do not have complete records of previous schooling. The authors state that the test may also be used for gifted children in order to gauge levels for appropriate reading materials. This test covers kindergarten (pre-primer and primer) through 12th grade levels. The child's word recognition ability is first tested, and this result is used to determine the appropriate reading passage to use for reading comprehension. At each grade, reading comprehension can be rated as the student's independent reading level, instructional reading level, or frustration level. Each grade has a passage that can be used to assess comprehension as well. This test can be used to properly place a student in reading and would be appropriate for use with children from a variety of cultural backgrounds.
Qualitative Reading Inventory. The Qualitative Reading Inventory (QRI) (Leslie & Caldwell, 2001) is an informal reading measure that assesses prior knowledge and reading comprehension in both narrative and expository writings. The authors have termed this measure an inventory because it is structured as an inventory or a list. The test is divided into Pre-Primer, Primer, 1st - 6th grade, Upper Middle School, and High School levels. There are word lists at each level for assessing word identification, automaticity, and speed, and the lists are utilized for choosing an appropriate starting point with the reading passages. The child’s reading strategies are examined by the use of Look-Backs, Think-Alouds, and Note-Taking Ability. Overall comprehension is assessed by using retelling, questions, and recalls. The Qualitative reading Inventory was found to have high reliability including interjudge reliability, internal consistency, and alternate form reliability. The measure was found to have high validity including content validity, criterion-related validity, and construct validity.

Comprehensive Reading Inventory. The Comprehensive Reading Inventory (CRI) (Cooter, Flynt & Cooter, 2007) is an informal reading inventory which can be used in both general and special education classrooms. The inventory covers the “Big Five” SBRR (Scientifically Based Reading and Research) assessment areas which are phonemic awareness, phonics, fluency, vocabulary, and comprehension. The CRI meets all of the state and federal requirements of the Ready First Guidelines and No Child Left Behind (NCLB). This measure has been shown to be both reliable and valid. There is a Spanish version of the CRI which has been revised by a team of eight experts in bilingual education. There are also a number of instructional strategies and resources provided in the manual for students experiencing difficulties.
Gray Oral Reading Tests, Fourth Edition (GORT-4) (Wiederholt, J. L. & Bryant, B. R.). The GORT-4 is a measurement tool which is used to assess oral reading rate, accuracy, fluency, and comprehension. According to the reviews of the GORT-4 by Crumpton (2004) and by Miller-Whitehead (2004), this widely-used test was first published in 1963 (GORT). There have been major revisions over the years. New normative data (representative of the U.S. population) were collected in 2000 for this recent revision. The test has been standardized in four regions of the U.S.A.: the Northeast, the Midwest, the South, and the West. The sample consisted of 1,677 persons in 28 states across the U.S.A. Reliability and validity studies were completed for all of the subgroups. The test had reliability and validity in all areas. Miller-Whitehead stated that the examiner should be experienced enough to be able to give reading prompts, time the test accurately, and mark the incorrect responses appropriately.

The test consists of 14 reading passages with 5 comprehension questions per story. The vocabulary levels are appropriate for grades 1 through 12 and a scoring rubric is given for analyzing miscues. There are two forms for scoring (A and B) and the scores can be interchanged on these. The overall reading ability or Oral Reading Quotient (ORQ) is calculated by combining the Fluency and Comprehension scores. This test has been used for many years and provides a comprehensive picture of different aspects of prosody, reading, and reading comprehension.

Prosody-Voice Screening Profile. The Prosody-Voice Screening Profile (PVSP), (Shriberg, Kwiatoski, and Rasmussen, 1990) is a measurement tool that is used for assessing and describing prosody and voice in speech. The prosody section of this profile provides a checklist for the components of phrasing, rate, and stress in prosody.
Some qualifiers for the phrasing component are appropriate, word repetition, sound/syllable repetition, one word revision, more than one word revision and, more than one word repetition. For rate, the descriptors are appropriate, slow articulation/pause time, slow, fast, and fast/acceleration. For stress, the qualifiers are appropriate, multisyllabic word stress, reduced/equal stress, excessive/equal/misplaced stress, and multiple stress features.

The voice section of the test provides a number of qualifiers for the components of loudness, pitch, and quality. A number of exclusions apply to the screening such as interfering noises, sound effects, singing, coughing, sneezing, and yawning. The PSVP can be used to assess appropriate prosody in speech.

The above five measures provide ways of assessing numerous factors such as: word recognition, prosody, and reading comprehension throughout the school years. Prosody has been studied in relation to both reading fluency and reading comprehension. The next two sections will present the findings in the current literature in these areas.

**Prosody and Reading Fluency**

Appropriate prosody in oral reading renders the material easier to follow, emphasizes key words, and adds subtle meaning and mood (such as humor, irony, and sadness) to the printed work. Readers gradually learn to read with appropriate prosody and expression. This is a component of prosodic reading or fluent reading. Fluent reading has been defined by the National Reading Panel (2000) as the combination of speed, accuracy, and prosody (or expressiveness) in reading. When this combination exists in oral reading, the end-product sounds like appropriate oral
language. A number of researchers in the field, such as Schreiber (1991), have studied the various aspects of prosodic or fluent reading. In 1991, Schreiber outlined the role of prosody in reading acquisition and provided a background to reading fluency, phrasing, chunking, and expressiveness. In 2004, Schwanenflugel, Hamilton, Kuhn, Wisenbaker, and Stahl conducted a study to examine the link between speed and prosody and also between speed and comprehension in reading. Other recent studies have included that of Miller and Schwanenflugel (2006) in which reading speed is compared to prosody and to comprehension, a study by Weber (2006), in which the relationship of function words and prosody to fluent reading is examined, and a study conducted in Australia by Whalley and Hansen (2006), in which the relationship of prosodic skills at the word and phrase level are studied in the light of reading abilities. In 2002, Cowie, Douglas-Cowie, & Wichmann conducted a study about fluent reading. However, the definition of fluent reading used by the authors excluded expressiveness and so, the students in the study were categorized as being either fluent or expressive. Some researchers have also examined specific methods for increasing fluency in reading. In particular, Kuhn (2004) conducted a study in which the method of repeated reading was compared to the method of wide reading as a means of increasing fluency. Begeny, Daly III, and Valleley (2006) also studied repeated reading as a method of treatment but they compared this to a phrase drill error correction method. All of these studies shed some light on the relationship of prosody to reading and also on the aspects of fluent reading itself. They provide a gauge for which areas could be explored further.
Schreiber (1991) defined oral reading fluency as, "smooth, expressive production with appropriate phrasing or chunking in accordance with the material being read." (p. 158). He also discussed and defined phonology, morphology, and the components of prosody. Schreiber stated that children in the early school years might use prosody for understanding oral language and its components. Schreiber outlined some studies which had led him to the aforementioned hypothesis. The first study was conducted by Read and Schreiber (1982, as cited in Schreiber, 1991) and involved a game called the "Walrus and Alligator" in which a word probing task was used to elicit data. A number of sentences with inappropriate prosody were created by substituting noun phrases and adjectives with various tape-spliced versions of these words. Sentences with appropriate prosody were also used. These stimulus sentences were presented to 7 and 8-year old children and to adults who were instructed to repeat certain parts (for example, the noun or the adjective) of the sentences. In the results, the adults were able to correctly identify the targets but the children were misled by the inappropriate prosody. The authors created another task using taped sentences which sounded like lists of words. The subjects were asked to define syntactic parts of the sentences. The children did not perform as well as they did on the sentences with appropriate prosody. In the second study children (6 to 9 year-olds) and adults were presented with a sentence (prosodically correct or incorrect). Immediately following the sentence the subject was presented with a probe word from it and was asked to provide the correct next word in the sentence. The responses and response times (RT) were analyzed. The RT's for adults were unaffected, but for the children they were significantly longer for the sentences with incorrect prosody. Schreiber noted that prosody plays an
important role in the acquisition of reading skills. He went on to discuss the technique of repeated reading (RR) and stated that this is a valid method for improving reading fluency.

Schwanenflugel, Hamilton, Kuhn, Wisenbaker, & Stahl (2004) examined prosodic reading. The authors began by stating that, "Prosodic reading, or reading with expression, is widely considered to be one of the hallmarks of reading fluency" (p. 119). The authors then discussed reading prosody including the aspects of loudness, stress, duration, and changes in pitch including sentence-final and phrase-final declinations in fundamental frequency. They mentioned a number of fluency rating scales, but did note that prosody was not a major component in any of these scales. The various scales mentioned were: The National Assessment of Educational Progress (2000, as cited in Schwanenflugel, Hamilton, Kuhn, Wisenbaker, & Stahl, 2004) 4-point fluency scale that was mainly for word-by-word reading, a 6-point scale by Allington (1983, as cited in Schwanenflugel, Hamilton, Kuhn, Wisenbaker, & Stahl, 2004) that differentiated word-by-word reading from phrases that resembled speech, and a scale recommended by Zutell and Rasinski (1991, as cited in Schwanenflugel, Hamilton, Kuhn, Wisenbaker, & Stahl, 2004) that rated smoothness, phrasing, and pace.

The goals of the study were, first, to characterize the development of prosodic reading using measurements of reading prosody and second, to test the predictions of reading prosody in connection with decoding and comprehension skills. There were 120 second and third grade children (mean age was 8 years and 6 months; SD was 7 months; range 7 years 4 months to 10 years 4 months), who attended public schools in urban northeast Georgia or in suburban central New Jersey. The children who were
included in the study spoke English as their native language and were able to decode > 90% of words in the target passage. There were 16 adults from New Jersey and 18 adults from Georgia whose responses were recorded as a baseline for comparison of prosody. The reading passages were digitally recorded. Half of the children received the reading prosody and word decoding assessments first, while the other half received the reading comprehension assessment as a counterbalance. A number of tests were used to assess reading prosody, word decoding, and reading comprehension (The Gray Oral Reading Test, Third Edition –GORT III; Weiderholt & Bryant, 1992, the Test of Word Reading Efficiency -TOWRE; Torgesen, Wagner, & Rashotte, 1999, and the Wechsler Individual Achievement Test -WIAT; 1992, as cited in Schwanenflugel, Hamilton, Kuhn, Wisenbàker, & Stahl, 2004). The authors proposed models of decoding skills and prosodic abilities that would lead to further comprehension in reading. The results in these three areas were as follows: the primary grade children with good decoding skills read with clear separations at sentence boundaries that were marked with a greater declination in pitch, and they also had shorter pauses between sentences. The children with poor to moderate decoding abilities had long, hesitant pauses, which occurred in the middle of sentences, and they had a flat prosodic contour. The results showed that there was just a minor role for prosody in reading comprehension. The authors concluded that decoding speed is a major factor in prosodic reading as opposed to the other components of prosody, such as intra-sentential pause length and structure, sentence-final pause length and structure and sentence-final pitch decliration. The authors' findings showed that short pauses were used (intra and inter-sentential) by good
readers, declarative sentences were ended with relatively large declinations in pitch, and that pitch contours matched those of adult readers. The authors also noted that decoding abilities were more important to comprehension than prosody.

Miller and Schwanenflugel (2006) tested prosodic or expressive reading. This study was conducted to consider the limitations of the previous study by Schwanenflugel et al. (2004) and it included a large number of 3rd graders only (as opposed to both 2nd and 3rd grade, as in the previous study). The authors surmised that the results of the previous study may not have shown a relation between reading prosody and reading comprehension because the reading pre-primer passage consisted of simple declarative sentences in which many fluctuations in prosody were not required. Another major difference between this study and the previous one was that the text included more grammatical features which could be used to observe marked prosody such as: basic declaratives and quotatives, questions, complex adjectival phrases, and phrase-final commas. The purposes of the study were: to first determine to what extent prosody of complex sentences varied with speed and accuracy, and to second determine the role of prosody in different levels of comprehension.

The participants consisted of 80 third grade children (mean age = 9 years, 3 months; SD = 4 months; range = 8 years, 7 months to 10 years, 6 months) from four public schools in Georgia. Children were able to decode more than 90% of the words in the passage. There were also 29 undergraduates from the University of Georgia, who were used for an adult comparison. All of the speakers were native speakers of English. The participants read created reading passages, and the readings were recorded. Both fundamental frequency and pause length measures were calculated for
the following: basic declarative sentences, basic quotatives, wh questions, yes-no questions, complex adjectival phrase commas, and phrase-final commas. The authors concluded that quick and accurate reading contributed to both prosodic reading and comprehension and, also, that prosody did contribute to comprehension. The results also showed that skilled readers demonstrated large pitch rises following yes-no questions, and a marked decline in pitch at the end of declarative sentences. The authors also suggested that long pauses might indicate difficulties with decoding the passage and that large pitch changes at the end of sentences might signal good comprehension of the passage. The authors suggested that examining pitch changes instead of pause structures would be more helpful in examining the question of how prosody affects good comprehension skills.


Weber (2006) discussed function words, their prosody, and how this is involved in fluent reading. The author noted that function words are often difficult for young readers because of similar appearance, irregular spellings, and meanings that vary according to the sentence. Weber noted that function words are acquired after content words. The linguist Charles Fries (Fries, 1952, as cited in Weber, 2006), classified 15 categories of function words in English speech. As function words usually play a supporting role to content words in speech, they are not given the same amount of stress as content words. The author noted that function words often have weak stress
and tend to have the schwa vowel sound in them. So, how does this relate to reading fluency? Weber noted that function words may adversely affect speed and accuracy in reading, as they are difficult to identify and recall. Function words such as **of/for** and **even/ever** may be interposed throughout the reading. Studies by Blank (Blank, 1985, as cited in Weber, 2006) and Stuart, Masterson, & Dixon (2000 as cited in Weber, 2006) showed that function words may be difficult to master. This may be an added disadvantage to children who are learning English as a second language. Other studies showed that coordinating appropriate prosody or “pointing with their voice” (p. 266) while reading word-by-word may be very difficult for children to learn (Clay, 1991, and Clay & Imlach, 1971, Kuhn & Stahl, 2003, and Pinnell et al., 1995, as cited in Weber, 2006). Finally, the author noted that two beneficial approaches to improve fluent reading are repeated reading and modeling of fluent oral reading.

The study of word level and phrase level prosody conducted by Whalley and Hansen (2006) examined the relationship between children’s prosodic skills and reading ability. The participants were children attending two primary schools in the low-to-middle income area of Brisbane, Australia. There were 84 children (46 girls and 38 boys), whose ages were between 8.8 to 10.5 years, with a mean age of 9.3 years (SD = 4.58 months). The non-speech rhythm task and the prosodic sensitivity task were pre-recorded by a professional female speaker. The children were tested for reading ability, phonological awareness, prosodic sensitivity, and non-speech rhythm. Reading ability was assessed using the Word Identification and Word Attack subtests of the Woodcock Reading Mastery Tests – Revised (Woodcock, 1987, as cited in Whalley & Hansen, 2006). Reading comprehension was assessed using the Neale
Analysis of Reading Ability – Revised (Neale, 1988, as cited in Whalley & Hansen, 2006). Phonological awareness was assessed using an “odd-one-out” or phonological oddity task. The stimuli for this task were selected based on a task devised by Bowey, Cain, and Ryan (1992, as cited in Whalley & Hansen, 2006). Prosodic sensitivity was assessed at the word level by the use of two subtests. The first subtest came from the Profiling Elements of Prosodic Systems – Children test (PEPS-C) (Wells & Peppe, 2003, as cited in Whalley & Hansen, 2006) and examined features such as intonation, stress, and pause (Wells & Peppe, 2003, as cited in Whalley & Hansen, 2006) by assessing whether children could differentiate between compound nouns and noun phrases. The second word subtest consisted of the same format, except that no contextual cues were given for distinguishing between compound nouns (e.g. ‘highchair’) and noun phrases (e.g. ‘high chair’). Prosodic sensitivity was assessed at the phrase level by a DEEdee task. In this reiterative speech task each syllable in a phrase was replaced by the syllable ‘dee’ (thus eliminating phonemic information) but the rhythm, stress, and intonation pattern of the original phrase remained the same (Kitzen, 2001, as cited in Whalley & Hansen, 2006). The non-speech task assessed whether the children were able to distinguish rhythm and stress in a non-speech context. The children were asked to indicate on answer sheets whether two drumbeat patterns were the same or not. The children were tested in each of these areas over three sessions, which lasted for 20 minutes each. The prosodic and rhythmic tasks were administered to groups that consisted of three to six children. The phonological awareness and reading tests were administered in two separate sessions.
The results of the study showed that prosodic skills are important for proficient reading ability. The compound noun and DEEdee task showed a pattern of relationships with word-level reading and comprehension in reading. The authors noted that phonological awareness was the strongest predictor of reading skills. The authors stated that the DEEdee task is predictor of reading comprehension and that a positive relationship exists between children’s prosodic sensitivity and reading skills. They noted that appropriate prosody for any reading material is only partially supplied by the punctuation and the beginnings of sentences. The reader must supply the remainder of the prosodic interpretation. They noted that the exact relationship between prosody and reading must be further examined.

Cowie, Douglas-Cowie, and Wichmann (2002) examined fluency and expressiveness in 8 to 10-year-old readers. The study was a follow-up study to one by Perera (Perera, 1989, as cited in Cowie, Douglas-Cowie, & Wichmann, 2002). This study was conducted in Britain. The authors had decided to explore and define the terms expressiveness and fluency based on the interpretations of adult raters who judged the readings of 67 school children. The authors of this study then defined expressiveness as separate from fluency in oral reading. All of the statistical analyses were conducted accordingly. Therefore, this study cannot be compared to studies conducted in the U.S. in which fluency is defined as a combination of speed, accuracy, and expressiveness (or prosody) in reading.

The following two studies examined different approaches to improving reading fluency. Kuhn (2004) compared the approaches of repeated reading (RR) and wide-reading used in small groups to improve accurate, expressive reading. Wide-reading
consisted of choral or echo-reading by students without repetition of any text. This increased the number of texts they covered. Begeny, Daly III, and Valleley (2006) compared the approaches of repeated reading (RR) with phrase drill (PD) error correction in an alternating treatments design in a case study.

Kuhn (2004) stated that fluent readers are able to read a text with accuracy, automaticity, and with expression and that, "prosody makes oral reading sound like a spoken language" (p. 338). Previous studies conducted by Kuhn, and Kuhn and Stahl (2003, as cited in Kuhn, 2004) about the approaches of repeated-reading and wide-reading had been shown to be effective in improving fluency development. Therefore, the author included these types of instruction as part of a fluency-oriented oral reading curriculum in order to gauge effectiveness of the curriculum in fluency development of struggling readers. The author focused on expressive oral reading as one of the goals of the study.

Twenty four second graders were included in this study. There were 10 boys and 14 girls, who spoke English as their primary language. There were 19 African Americans, 4 European Americans, and one Hispanic. The Qualitative Reading Inventory (QRI, 1988, as cited in Kuhn, 2004) and the Qualitative Reading Inventory – II (QRI-II, 1995, as cited in Kuhn, 2004) were administered to the children. All of the students were reading at or below the first-grade reading level. However, listening comprehension, as assessed by the QRI-II was at the second-grade level. This reading intervention program lasted for six weeks and the children were not part of any other reading interventions. There were three intervention groups, each consisting of six children. The first group was a fluency-oriented oral reading (FOOR) group, the
second was a wide-reading group, and the third was a listening-only group. The author noted that the listening-only group was included to check the Hawthorne effect. This effect causes some students to improve by just being included in a study. Finally, a control group was made of two children from each of the classrooms who did not participate in any of these interventions. The reading material consisted of reading texts that were at the high end of the instructional level for the children. The author modified the repeated-readings approach so that children read a story three to four times during the sessions. In the fluency-oriented oral reading (FOOR) approach, repeated reading and echo or choral reading were used along with positive feedback from the instructors. The treatment consisted of three day cycles with the following: Day 1 -- story introduction and echo reading with choral reading, if possible. Day 2 -- story reading of alternate pages with a partner with repetition, if time permitted. Day 3 -- final choral reading of the material with a performance, if desired.

In the wide-reading approach, echo and choral reading were used, but there was no repeated reading of the text. Twelve extra books were added to the materials so that the children had enough reading material to avoid any repetition. In the third group, which was the listening only group, all of the material from the wide-reading section was used. The author read the texts to the group in order to ensure that all of the children were exposed to the same amount of text.

The results showed that the wide-reading and fluency-oriented oral reading (FOOR) groups could identify more words in isolation than the listening only or the control group. They also had greater reading accuracy than the listening only and control groups. Independent raters judged the wide-reading and FOOR groups to have
greater fluency than the listening only and FOOR group. Finally, only the children of the wide-reading group showed improved comprehension. The author concluded that the FOOR method and the wide-reading method could be used to effectively increase fluency in a literacy curriculum.

Begeny, Daly III, and Vallely (2006) conducted a single subject study in order to compare the repeated readings approach to the phrase drill (PD) error correction approach to see which approach improved oral reading fluency more. The study examined accuracy in fluent reading. The repeated readings approach involves repeated practice of all of the text. The phrase drill approach consisted of the teacher's modeling the appropriate response and the student repeating only the phrases which contained the corrected word. The study was an alternating treatment design.

The subject was an 8-year-old Caucasian boy in the third-grade, who had been experiencing reading difficulties. He had been referred to a rural outpatient clinic for both behavioral and academic problems. He was receiving services for Speech-Language Impairment and Learning Disability in Written Expression. The subject's fluency was assessed by Words Correct Per Min (WCPM) and Words Incorrect Per Minute (WIPM). He read 1<sup>st</sup> and 2<sup>nd</sup> grade level material and was at the frustrational level in 3<sup>rd</sup> grade material. Reading passages that increased in difficulty were used for the alternating treatment design. A baseline condition and three other treatments, which were the repeated (RR), the PD, and a reward (RE), were studied. For the RR, the subject had to read the text twice before the fluency assessment was given. For the PD, the subject had to read the passage then practice any corrected words by reading the phrases three times before re-reading the passage. For the RE, the
subject had to read a passage, which he had not practiced before, as fluently as possible. This condition was assessed to see if a reward was equally as effective, or more effective than the treatments in the experiment.

The results showed that both the repeated reading (RR) and phrase drill (PD) error correction treatments were effective to the same degree, when compared to the reward (RE) and baseline (BL) results. The error rate for the PD condition was lower than for all of the other conditions. They surmised that the PD method may have been so effective, because the subject was required to practice all the incorrect responses and to target all of the weak or incorrect responses. The authors concluded that both the RR and PD methods showed an increase in oral reading fluency. Some limitations of the study included the single subject design and the fact that maintenance and generalization of effects were not examined. This study focused on the accuracy component of fluent reading. It did not examine the speed component or the prosody component of fluent reading.

*Prosody and Reading Comprehension*

The National Reading Panel (2000) has concluded that reading fluency and comprehension are linked. O'Connor, White, and Swanson (2007) compared the effects of repeated reading and continuous reading on reading fluency and comprehension. Walczyk and Griffith-Ross (2007) discussed the importance of reading fluency on comprehension with an emphasis on the Compensatory-encoding theory (C-ET). The Reread-Adapt and Answer-Comprehend (RAAC) Intervention was outlined in an article by Therrien, Gormley, and Kubina (2006). Finally, in a
commentary about the role of prosody in reading comprehension, Rasinski (2006) outlined the idea of the Readers Theatre.

O'Connor, White, and Swanson (2007) compared the method of repeated reading (RR) with continuous reading (CR) to see which method resulted in improved reading rate and reading outcomes for struggling readers. The authors posed four questions: Will reading rate improve with 15 minutes of practice out loud for 3 days/per week for 14 weeks? Which method is better (RR or CR) for improving reading? With this type of practice, do poor readers in 2nd and 4th grades respond differently? How does the method affect improvement in vocabulary, word identification, and reading comprehension?

The authors selected 48 students who qualified as low-skilled readers. Out of these, 50% were European American, 29% Hispanic American, 18% African American, and 3% were other minorities. Two students with average reading skills were also monitored to see what changes there would be without intervention. The final number of students (due to attrition) who participated was 37. There were 16 students who qualified for special education in LD. There were seven students who spoke English as a second language. Three reading measures were used as pre-tests, midway tests, and post-tests. The three measures were The Peabody Picture Vocabulary Test – Third Edition, PPVT-III (Dunn et al., 1997, as cited in O'Connor, White, & Swanson, 2007) to evaluate any changes in vocabulary; the Woodcock Reading Mastery Tests-NU (WRMT – NU; Woodcock, 1998, as cited in O'Connor, White, & Swanson, 2007) to assess word identification; the GORT – 4 (Wiederholt & Bryant, 2001, as cited in O'Connor, White, & Swanson, 2007) to evaluate reading rate.
accuracy, and comprehension. A statistical analysis consisting of a mixed model of repeated measures was used to analyze the results.

The students were randomly assigned to the repeated reading (RR) group, the continuous reading (CR) group, or the control group. The method consisted of 15 minutes of reading aloud (to an adult who was trained), three times per week for 14 weeks. The students in the RR group read each page three times while the CR group read different pages for 15 minutes. Daily logs were used for recording the data. The results showed that there was overall improvement in all the groups of students. The average readers performed better than the less-skilled readers. The students who were treated did better than the poor reader control group. There was no significant difference in any of the reading measures between the repeated reading (RR) group and the continuous reading (CR) group. The authors concluded that the study did not support the hypothesis that repeated reading (RR) would improve both fluency and word identification, and that vocabulary and comprehension would be improved by continuous reading (CR). The authors concluded that further studies would have to be conducted to examine improvement in reading rate and comprehension in poor and average readers.

Walczyk and Griffith-Ross (2007) examined the relationship between reading and comprehension. They outlined the compensatory-encoding theory (C-ET) and utilized this theory to show the relationship to comprehension. They referred to the automaticity theory (AT; LaBerge & Samuels, 1974; Samuels & Flor, 1997 as cited in Walczyk & Griffith-Ross, 2007) and the verbal efficiency theory (VET; Perfetti, 1985, 1999, as cited in Walczyk & Griffith-Ross, 2007) and noted that, according to both of
these theories, when most of the attention is given to word reading, then less attention is given to comprehension of the text. The authors also noted that comprehension difficulties may have occurred for a number of different reasons including difficulty understanding oral language, smaller working memory, and difficulty with syntax. The compensatory-encoding theory (C-ET) explains how children with poor reading skills use other methods for comprehending the text.

The compensatory methods used for comprehension, according to Walczyk and Griffith-Ross (2007), are usually followed in order of increasing difficulty because the easiest ones disrupt the reading process the least. The methods are described as follows: **Slow reading rate** - Children can read at their own pace and tend to do this when they are having difficulty; **Pause** - This type of pause is longer than normal and usually occurs when children are looking for other strategies to use; **Look Back** - This strategy can be used to help with a smaller working memory and understanding concepts and words in the text; **Read aloud** - This strategy enables children to focus in noisy classrooms, provides auditory feedback and helps focus attention; **Sounding out, analogizing to sight words or contextual guessing** – the three strategies are using phonics rules for decoding, thinking of similarly spelled words to understand the meaning, and looking at the context in the text; **Jump over** – jumping over the word and trying to comprehend without it and; **Reread text** – rereading words and phrases in the text that were not comprehended. The authors discussed a large scale study of CE-T which was funded by the National Science Foundation. The study showed that students who are not fluent readers can comprehend better when they can freely use compensatory strategies and are not hindered by conditions such as time pressure,
constant reading rate requirements, and having to read silently. The authors concluded by stating that CE-T shows that there is more than one way to increase understanding of text. The authors mentioned that other strategies, such as pausing at punctuation marks of phrases and sentences, could be taught to struggling readers. The authors did not, however, discuss any other aspects of prosody or any methods for developing prosody such as modeling of appropriate prosody in oral reading.

In an article about improving reading achievement, Therrien, Gormley, and Kubina (2006) discussed methods of boosting fluency and comprehension. The authors stated that repeated reading and question generation have been approved by the National Institute (2000). In this article, the authors discussed a reading intervention method which combined repeated reading and question generation. This intervention, The Reread-Adapt and Answer-Comprehend (RAAC) Intervention, could be used for reading levels between first and third grade levels. Prior to implementing this program, teachers should choose appropriate reading material, decide performance criteria for reading fluency, and determine the types of question prompts to be used. The suggested performance criteria (Hasbrouck and Tindal, 2005, as cited in Therrien, Gormley, and Kubina, 2006) was: First grade, 53 correct words per minute (cwpm); Second grade, 89 cwpm; Third grade, 107 cwpm; Fourth grade, 123 cwpm. For the reading passages, the authors suggested that the reading passages should be a complete narrative or encompass a complete idea and be relatively short. The suggested passage lengths were: First grade, 53 – 66 words; Second grade, 89 – 111 words; Third grade, 107 – 133 words; Fourth grade, 123 – 153 words.
After the initial preparation, the RAAC sequence consisted of the following seven steps:

1. Prompt student by saying “Read this story the best you can and as quickly as you can. Pay attention to what you are reading, as you will need to answer a few questions.”

2. Read prompts – ask the student to read the question-generation prompts. 3. Reread – ask the student to reread the passage between two to four times until the goal is reached. 4. Correct errors – correct word errors during reading of the passage and any other errors afterwards. 5. Praise – provide positive feedback on any improvements that are noted. 6. Adapt and answer – ask student to adapt and answer questions. 7. End and Adjust – adapt the text for the next session. The material should be adapted according to whether the student was able to read fluently in two to four readings. The authors concluded that this RAAC method of intervention was relatively easy to implement and would provide the benefits of repeated reading and question generation at the same time. Prosody was not directly addressed in this method, however, accuracy and reading rate were directly addressed. The authors also stated that this method could be used for children with reading disabilities.

Rasinski (2006) stated that prosody in reading is taught through techniques such as teaching appropriate intonation, modeling of appropriate prosody in phrases, and providing reading assistance when necessary. He noted that the focus on the reading rate leads to faster reading without much comprehension of the reading material. He suggested that texts that are used for performance, such as, plays (Readers Theatre), poems, dialogues, and song lyrics lend themselves to reading with expression with the extra incentive of performance in front of peers. Rasinski (2006) cited a number of
prior studies which demonstrated that reading rate also increased when performance
texts and materials were used for reading. A second grade study by Martinez, Roser,
and Strecker (1999, as cited in Rasinski, 2006) showed that children who participated
in repeated reading in Readers theatre had a reading rate that was twice the reading
rate of the control group. The children were also able to read with expression. In
another study by Rasinski, Padak, Linek and Stutivant (1994, as cited in Rasinski,
2006), second grade students who read poetry after rehearsing and performing it
increased reading rate when compared to students who did not rehearse or perform it.
Even first grade poetry readers who were at risk for reading failure benefited from
rehearsing poetry as shown in a study by Rasinski and Stevenson (2005, as cited in
Rasinski, 2006). The children who rehearsed the poetry increased reading rate by two-
and-a-half times that of the group that did not rehearse. Finally, a fourth-grade study in
which children practiced and performed Readers Theatre once a week more than
doubled the rate of reading. Griffith and Rasinski (2004, as cited in Rasinski, 2006)
conducted a study of a federally funded program for at-risk children. Rasinski noted
that, in this study, expressive reading with appropriate prosody increased along with
an increase in reading rates. Rasinski (2006) concluded by saying that repeated
reading should not only lead to faster reading but also to expressive, meaningful
reading of a text. Rasinski (2006) emphasized the prosodic component of fluent
reading and its connection to comprehension.
Prosody and Bilingual Populations

Current literature reveals a number of studies regarding reading and reading skills in bilingual and multi-lingual populations. These studies have been outlined here to indicate the variety of existing work, even though prosody, specifically, has not been studied. Peregoy and Boyle (2000) have conducted research on how English learners learn how to read and how aspects such as phonemic awareness, background knowledge of context, and literacy abilities in L1 affect learning outcomes. McCollin and O'Shea (2005) have also written about reading achievement, but they have provided suggestions and examples as to how to integrate cultural ideas and vocabulary into reading material in order to enhance achievement levels. In contrast to the two prior studies, Lesaux and Siegel (2003) and Fitzgerald and Noblit (2000) have conducted experimental research studies in L2 populations. Lesaux and Siegel (2003) conducted a study which compared patterns of reading development in L1 children and L2 (or English as a second language) children. This longitudinal study followed and tested children in Kindergarten through 2nd grade in Canadian schools. Fitzgerald and Noblit (2000) conducted a natural study in which a one-year balanced reading program was incorporated in a diverse 1st grade classroom. Observations about reading progress and attitudes toward reading were recorded by a participant observer. The four aforementioned studies provide a kaleidoscope of insight into reading development in multilingual populations. However, the aspect of prosody, per se, has not been investigated in these studies.

In their article entitled “English Learners Reading English: What We Know, What We Need to Know”, Peregoy and Boyle (2000) provided some suggestions for teaching
reading in English to English learners. They stated that all non-native English language learners bring three variables to the task of learning to read which are: a) English language proficiency, b) background knowledge of the text material, c) first language literacy abilities. The authors concluded that the greater the level of ability in these three areas, the greater the ability to read in English would be. English language proficiency varies greatly with each student and can prove to be a real disadvantage when students are taking standardized reading achievement tests. Background of the text material subject can be a double disadvantage for an English learner, as the actual words and sentences, as well as the cultural concepts and references, may cause confusion. The authors noted that the genre and structure of the text might be difficult for English language learners to gauge. Greater levels of primary language ability provide a solid foundation for further learning of English. Other factors which are discussed in this article are different types of orthographic systems, right to left decoding, as opposed to left to right coding, and phonemic awareness skills in different languages. Perego and Boyle (2000) did not address the question of prosody in reading in English language learners. However, they provided some suggestions for classroom teaching for English language learners. The suggestions included learning about individual students in order to utilize their prior knowledge and background skills as a starting point, and pairing non-verbal cues such as gestures, pictures, and demonstrations with verbal instructions. The authors concluded by saying that there is much research to be carried out in this field.

Mc Collin and O’Shea (2005) have also provided some strategies for enhancing reading achievement for students of culturally and linguistically diverse backgrounds.
The authors of this article focused on the phonological awareness gaps, fluency gaps, and comprehension gaps which may be present in English learners. They provided various strategies that could aid in closing the gap in reading achievement and that might prevent English learners from being diagnosed as special education students. Some strategies for phonological awareness were using a variety of instructional materials at different reading levels, incorporating cultural themes and vocabulary in the material, and teaching strategies for decoding unfamiliar words. For the gaps in fluency, strategies such as repeated readings, choral readings, and pre-teaching vocabulary were outlined. The authors did not specifically discuss the prosody aspect of fluent reading although repeated reading and choral readings may emphasize rhythm, rate, and tone. Finally, for comprehension gaps, they suggested using culturally appropriate reading materials, opportunities to paraphrase, and using story maps and organizers to emphasize relevant details. The authors provided many suggestions, but did not investigate prosody in relation to reading skills.

Lesaux and Siegel (2003) conducted a longitudinal study which compared reading development patterns of English-speaking and bilingual or English as second language (ESL) or ELL students. The Kindergarten participants (1,040 L1 speakers and 197 ESL speakers) and 2nd grade students (790 L1 speakers and 188 ESL speakers due to attrition) were tested for literacy, phonological processing, lexical access, syntactic awareness, memory, and spelling. The 2nd graders were also tested for arithmetic skills in order to test non-verbal tasks with literacy tasks. The investigators did not test for prosody in reading fluency or oral language. The results of this study showed that a balanced literacy instruction program was as effective for ESL speakers as L1 speakers
even though the Kindergarten children had very little, if any, experience with English. The authors concluded that this type of program was beneficial for children of diverse language backgrounds. The aforementioned studies revealed numerous findings regarding reading abilities in L2 populations. However, the question of prosody in bilingual and multi-lingual populations needs to be further investigated.

Even so, there are a number of programs that are currently in use in the United States for English language learners. Many of these programs have been reviewed by the Institute of Education Sciences (I.E.S.) in the Department of Education and they are listed on the What Works Clearinghouse website (http://www.whatworks.ed.gov). The programs that were reviewed are for English language learners in grades K – 6. Children who had limited English language skills (even though they were not classified with limited proficiency in English language by the schools) were also included in the programs. In order for a program to qualify for the review, approximately 80% of instruction had to be conducted in English. There were 73 different studies conducted to determine program qualification for 32 programs. Finally, there were 12 programs which met with all of the required qualifications to be included in the review. The areas that were reviewed were reading achievement, mathematics achievement, and English language development.

The 12 programs that were reviewed are Arthur, Bilingual Cooperative Integrated Reading and Composition, Enhanced Proactive Reading, Fast ForWord Language, Instructional Conversations and Literature Logs, Peer Tutoring and Response Groups, Peer-assisted Learning Strategies, Read Naturally, Read Well, Reading Mastery, Success for All, and Vocabulary Improvement Program. The rating scale consisted of
the following six choices: Positive effects, Potentially positive effects, Mixed effects, No discernible effects, Potentially negative effects, and Negative effects. Various outcomes were measured in each of the three areas. In the area of Reading Achievement, the outcomes that were measured were phonemic awareness, phonics, reading fluency (which would directly or indirectly include prosody), vocabulary, and reading comprehension. The programs which showed the greatest average improvement in Reading Achievement were Instructional Conversations and Literature Logs, Reading Mastery, and Bilingual Cooperative Integrated Reading and Composition. In the area of English language development, the outcomes that were measured were listening comprehension, receptive vocabulary, grammar, syntax, and some other linguistic features of English. The programs which showed the greatest average improvement in English language development were Fast ForWord language, Instructional Conversations and Literature Logs, and Vocabulary Improvement Program. The programs which met all of the requirements in all three areas (Reading Achievement, Mathematics Achievement, and English language development) were Bilingual Cooperative Integrated Reading and Composition, Instructional Conversations and Literature Logs, and Vocabulary Improvement Program. The What Works Clearinghouse gives a comprehensive view of programs that are available for developing reading fluency and English language abilities.
Conclusion

The extant literature contains a number of studies, articles, and other publications regarding prosody. Brain research by Steinhauer and Freiderici (2001) on prosody shows that there is indeed a definite brain response to prosody both in reading and oral language. The responses may occur in the right hemisphere more than the left hemisphere, as shown by tonal languages such as Chinese. These responses to prosody may allow for and enable acquisition and development of language and reading development as shown by Pugh, Sandak, Frost, Moore, and Mencl (2005). Studies on prosody show a connection between prosody and oral language however, there is a paucity of research on prosody and multi-lingual language development.

There are a number of studies, such as one by Schwanenflugel, Hamilton, Kuhn, Wisenbaker, and Stahl (2004) which show the relationship of prosody to reading. Prosody, along with accuracy and speed, is a component of fluent reading, as defined by the National Reading Panel (2000). Various studies in the current literature have demonstrated that appropriate prosody in fluent reading is a part of expressive reading which is both smooth-flowing and sounds like speech. In his ASHA publication, Kamhi (2003) stated that fluent readers have the ability to divide words into appropriate phrases or groups and he noted that fluent readers see, “chunks of text and use these chunks to read and write more quickly” (p. 6). He went on to say that speech-language pathologists need to be more involved in developing reading fluency after the early years of reading.

There is some research, such as the study of prosody and reading comprehension by Whalley and Hansen (2006), on the connection between prosody and
comprehension. However, these studies are limited and further research needs to be conducted. Combining all of these findings into a global view leads to the conclusion that there are many areas in the field of Communication Sciences and Disorders in which prosody needs to be directly studied. There are definitely a limited number of studies which directly examine the connections of prosody especially in multi-lingual development. This area could be studied further.

Early reading skills involve decoding, phonemic awareness, and vocabulary acquisition. The skills involving knowledge of syntactic cues, chunking, and appropriate pitch for declarative and interrogative sentences are skills which are acquired later and are acquired gradually. Given the research background presented in this paper, it would seem plausible that appropriate prosody development could be taught after the early reading skills are acquired. As appropriate prosody is gradually acquired, it could be modeled and taught to improve reading skills. This could be an aspect which could be developed in the middle school years (as opposed to the early years), with demonstrations of appropriate prosody usage in various types of reading materials. The methods used could be combined with the successfully tested methods of repeated-readings, wide-readings, and modeling of appropriate prosody to increase expressiveness and fluency in reading abilities. The development of appropriate prosody in reading in the middle school years would provide a means of improving comprehension and reading abilities that are required for higher texts. Prosody could provide the link between and comprehension and advanced literacy abilities.
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