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The Relationship between Prosodic Oral Reading assessments and Standards-based Reading
assessment in a 2nd grade classroom

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Abstract

The purpose of this study was to examine the relationship between prosodic oral reading and overall reading comprehension of second grade students. The sample consisted of ten students who were randomly selected from a second grade classroom. The students read aloud from the book *Bedtime for Frances* by Lillian and Russell Hoban for a total of three and a half minutes. Data were collected using the Multi-dimensional Fluency Scale developed by Rasinski to score the students prosodic oral reading. Overall reading comprehension was measured using the Pearson Benchmark assessment for language arts and reading. The results indicated a significant relationship between prosodic reading and comprehension ($r = .884$). Multiple regression on selected predictors did not indicate significant influence on overall comprehension. Classroom teachers are encouraged to use prosodic reading as an additional tool to reading comprehension.

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Literature Review

Spoken language, especially prosody, or reading with expression, has contributed to both the development of association between letters to form spelling patterns, and between those patterns and the rest of the system of language. When teachers read books aloud to students, it forms connections between the words and their meaning. Teachers have always depended on the students to understand the spoken word in order to carry out instruction, as well as basic interaction in the classroom (Adams, 1990). According to Kuhn and Stahl (NICHD, 2000), “prosodic text reading has always been necessary beyond automatic individual word decoding for adequate comprehension to occur, because prosodic reading is indicative of the ability to segment text according to major syntactic/semantic elements” (2003). In fact, some evidence, although mixed, suggests that comprehension may be related to skill in syntactical phrasing in young readers. Its place in the development of fluency must be acknowledged, and all definitions of fluency have included prosody as a main component. Fluency combines accuracy, automaticity, and oral reading prosody, which, taken together, facilitate the reader’s construction of meaning. It is demonstrated during oral reading through ease of word recognition, appropriate pacing, phrasing, and intonation. It is a factor in both oral and silent reading that can limit and support comprehension (Pikulski & Chard, 2005). The expressiveness implied in the definition has never been taken to mean that the text must be a play or fiction literature if prosody is involved; all types of literature have their own style of text (Carlson et al., 2009). Sentences contain multiple phrases and readers are expected to phrase things correctly for much of any prose text, whether when read silently or aloud. Appropriate expression expected from competent oral reading includes: “an ability to vary expression and volume to match one’s

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interpretation of the passage; to vary one's treatment of text in light of purposes, knowledge, the content of the author's message, and the accessibility of that message; and meaningful thought units that are indicated by appropriate pauses and inflections of the voice" (Zutell & Rasinski, 1991).

Studies have also indicated that poor readers at all age levels showed improvement in their comprehension when text was presented in a manner comparable to speech; when it was organized into appropriate prosodic phrase units for the reader (Casteel, 1988; Stevens, 1981; Weiss, 1983). Research has even suggested that infants have been known to not only use prosody as a primary cue to the syntactic structure of their language, but also that their babbling mimics the prosodic characteristics inherent in their primary language (Kuhn & Stahl, 2003). Given the evidence demonstrating that children's understanding of oral language is to some extent dependent upon the use of prosodic features, one could reasonably assume that "prosody has been an important determining factor in children's ability to derive appropriate meaning from text as well" (Dowhower, 1991; Kuhn & Stahl, 2003; Schreiber, 1991).

The Role of Prosody in Reading Comprehension

It is important to have an understanding of the two main theories regarding the role of fluency in a reader's ability to comprehend text. The first seminal work on automaticity (rate and accuracy) was written by LaBerge and Samuels; they argued that individuals have a limited amount of attention available for any given cognitive task, including reading. It was then asserted that in order for readers to have enough attention available to construct meaning from text, their decoding must first become automatic. Automaticity theory has maintained that this

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shift will occur through practice that consists of “successive exposure to print.” It was further argued that quick and effortless word recognition allowed readers to focus their attention upon a text’s “meaning rather than upon its words” (Adams, 1990; LaBerge and Samuels, 1974). The automaticity model of LaBerge and Samuels (1974) described how a complex skill like reading can be made possible through coordination of a number of different processes in a limited amount of time. This theory accounted for automaticity’s role in fluency, but not the prosodic oral component.

A number of authors have indicated that poor readers are not as prosodic in their reading or as facile with their use of appropriate phrasing as are good readers (Dowhower, 1991; Reutzel, 1996; Schreiber, 1991). Some of the best-known work in this area comes from two special studies of the National Assessment of Educational Progress (NAEP) that measured oral reading fluency of fourth-grade students using a 4-point oral reading fluency scale (Daane, Campbell, Grigg, Goodman, & Oranje, 2005; Pinnell et al., 1995). Both NAEP reports produced findings for all three variables associated with oral reading fluency—rate (words read per minute), accuracy, and prosody (the 4-point prosody rubric)—and examined the relations among these variables, and with comprehension. The results indicated that being fluent, as defined by the NAEP rubric, did not ensure being among the most accurate or fastest readers. Therefore, prosody was thought to be distinct from accuracy and rate. The 2005 report concluded that, “the three separate oral reading abilities—rate, accuracy, and fluency—are related to each other and all three are related to reading comprehension” (Daane, et al., 2005; pg. 5).

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Prosody as a Variable in the Path to Comprehension

As with accuracy, prosody alone has not been shown to contribute notably to reading comprehension. For example, Schwanenflugel, Hamilton, Kuhn, Wisenbaker, and Stahl (2004) and Miller and Schwanenflugel (2006) found that, of the prosody features they examined, only pitch changes accounted for additional variance in reading comprehension of text; but only in a minor way compared to word and text reading fluency skills. In both studies, prosodic variables accounted for small amounts of unique variance (range =.03%—6.7%) in reading comprehension performance. In this more recent seminal research, the results of these studies indicated that accurate prosodic reading did not aid in the comprehension of written text in an important manner. It has been asserted that the exact cognitive mechanisms and processes that index oral reading fluency, and the manner in which they do so, “remain theoretically unsettled and experimentally uncertain” (Kame’enui & Simmons, 2001; NICHD, 2000). It must be noted that prosody has received the least amount of research attention with respect to oral reading fluency, and its contribution to reading comprehension has remained unclear.

By cognitively bracketing key informational units such as phrases, prosody has assisted in maintaining an utterance in working memory until a more complete semantic analysis can be carried out (Koriat, Greenberg, & Kreiner, 2002). Although there has been no conclusive evidence to back this assertion that the development of appropriate reading prosody has allowed for enhanced memory of words read aloud, it has been shown that people have had better memory for poetic versions of texts that have enhanced prosodic features (Goldman, Meyerson, & Coté, 2006). Based on these studies that have been conducted, it is possible that the construction of a good prosodic reading might improve comprehension. Prosody has been

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understood to be more than just syntactic phrasing; different prosodic patterns convey different emotions. For example, happiness is characterized by fast speech rate, high, rising pitch and variability, and fast voice onsets; and sadness nearly the opposite. Uncertainty is signaled by a sustained rise in pitch (Hirschberg, 2002). However, during the period where children are developing fluency, their understanding of emotional prosody is still not fully adult-like, so we should not expect them to convey these attitudes fully in their readings (Banse & Scherer, 1996; Juslin & Laukka, 2003).

Yet prosody is most certainly related to the development of reading fluency. As children become more fluent readers, they have been known to make shorter and less variable inter-sentential pauses, shorter and less frequent intra-sentential pauses, and larger pitch declinations that have displayed a more adult-like intonation contour (Miller & Schwanenflugel, 2006, 2008). In a study from 2006 it was observed that changes which occurred in reading prosody between first and second grade were “predictive longitudinally of later reading fluency, beyond measures of word reading efficiency and text reading rate” (Miller & Schwanenflugel, 2006, 2008).

It is possible that different aspects of prosody maybe linked to different aspects of the reading process. Evidence that reading prosody is related to reading comprehension indicates that it may depend on the aspect of prosody measured. According to studies by Schwanenflugel and colleagues (Miller & Schwanenflugel, 2006; Schwanenflugel et al., 2004), as well as a recent study by Ravid and Mashraki (2007), children who showed more “adult-like intonation contours and who marked various sentence-type appropriate changes in pitch were more likely to have good reading comprehension skills.” Ravid and Mashraki found that children’s pausing was less

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correlated with reading comprehension than intonation scores were. Consequently, prosody may serve comprehension processes by bracketing major syntactic and semantic boundaries but mainly through changes in pitch. Long pauses could possibly signal decoding difficulties, as children might pause while they mentally attempt to identify an upcoming word. Pitch changes, by contrast, could possibly be more relevant to reading comprehension skills (Miller & Schwanenflugel, 2008; Speece & Richey, 2005).

Punctuation served as a main visual cue to syntax related prosody in a study during 2003 which found that commas in silent reading elicited covert brain responses similar to those shown for speech boundaries, suggesting a similar underlying mechanism for both (Steinhauer, 2003). This was a study that used brain monitoring equipment to look for a physiological relationship between recognizing punctuation and prosody. Miller and Schwanenflugel (2006) have argued for a distinct contrast between reading prosody and punctuation.

For example, Miller and Schwanenflugel's study observed the following:

that adults marked phrase-final commas, such as "As they waited, they could hear..." and quotatives, such as "'Let's find out,' said Toad," but did not mark commas for adjectives presented in a series, such as "pretty, colorful, tidy garden." Further, adults reserved sentence-final pitch rises for yes-no questions (e.g., "Did Melanie go?") but not "wh-" questions (e.g., "Where did Melanie go?"). In fact, strict reliance on punctuation to signal reading prosody seemed to be more characteristic of children's oral reading than of adults. One of the tasks children have in learning to read is to learn the limits of punctuation as a cue to

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the underlying prosodic structure of the text. (Miller and Schwanenflugel, 2006, p. 846)

According to Chall's (1996) *Stages of Reading Development*, the development of prosodic text reading occurred in the second of six proposed stages called confirmation and fluency, or "ungluing from print" (p. 18). During this stage, readers confirmed what is already known to have developed in their fluency and, having established accurate decoding skills in the previous stage, would develop automaticity with text (Chall, 1996; Kuhn & Stahl, 2003).

According to Chall and Kuhn and Stahl, children were expected to develop automaticity and ultimately prosodic text reading skills during the confirmation and fluency stage, which typically spans from the end of first grade through third grade. To do this required use of prosodic features that included appropriate phrasing, pause structures, stress, rise and fall patterns, and general expressiveness. This model suggested that the development of accurate decoding and automatic word recognition in connected text created the conditions necessary for full prosodic reading to occur.

Although research has suggested throughout the years that skilled readers are more likely to read prosodically (Dowhower, 1987; Miller & Schwanenflugel, 2006; Schwanenflugel et al., 2004; Rasinski, et al., 2009) as of yet there has been only one study that may be considered a systematic longitudinal study to look at the development of prosodic reading; this being Miller & Schwanenflugel's 2008 research that was also built upon their and others' previous work. The goal of this research was to develop a better understanding of the role that reading prosody plays in the reading process. The study examined the development of prosodic text reading from

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grades 1 to 2 and the relationship between reading prosody and general reading fluency and comprehension outcomes in grade 3. Children were administered assessments that included measures of word reading efficiency, oral reading fluency, and reading comprehension (in addition to prosodic measurements).

The study found that decreases in the number of pausal intrusions are related to the development of a more adult-like intonation in the development of reading prosody. The number of pausal intrusions was related to the development of word reading skills, but the development of appropriate intonation was most relevant to predicting later reading fluency. However, both aspects of reading prosody were relevant to predicting later reading comprehension skills beyond reading rate and accuracy (Miller & Schwanenflugel, 2008). Although the authors found prosody to be relevant to predicting reading comprehension, the study was still unable to provide a conclusive correlation.

Research and scholarly literature support several specific methods to promote fluency in reading (Kuhn & Stahl, 2003; NICHD, 2000). One interesting method studied in a second-grade classroom used Readers Theatre (incorporated with the standard curriculum) to encourage reading fluency throughout the school year. Readers Theatre is a performance of a written script that demands repeated and assisted reading that is focused on delivering meaning to an audience. Because no acting, props, costumes, or scenery was used in the Readers Theatre, the readers had to use their voices to carry the meaning. Thus, the goal of this fluency instruction was aimed at improving prosody and meaning (Young & Rasinski, 2009). Readers Theatre allowed the students to work towards fluency with a totality not found in other methods. Students were more

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likely to practice or rehearse (assisted and repeated readings) since they knew that they would be performing a reading for an audience. Moreover, such rehearsal was not aimed at reading speed but at reading with meaningful expression to help an audience of listeners better understand the passage. Chase Young was a second-grade classroom teacher in Texas, who made Readers Theatre an integral part of his reading curriculum for the first time in the 2007–2008 school year. The study recognized several methodological limitations, but added that there was a certain authenticity and contextual integrity to the research that came from the realm of a regular classroom that was lead by the regular classroom teacher. According to the authors, Readers Theatre had a profound positive effect on all readers, and gave an opportunity for struggling readers to read fearlessly in the limelight.

Measurement of Prosodic Oral Reading

Measurement of prosody has been primarily conducted using the National Assessment of Educational Progress Oral Reading Fluency Scale, the Gray Oral Reading Test, and the Multi-dimensional fluency scoring guide (Rasinski, et al., 2009; Kuhn & Stahl, 2003; Dowhower, 1987, 1991; Miller & Schwanenflugel, 2008). Some studies have included the use of a spectrographic measure and other electronic devices to measure nuances associated with prosody (Steinhauer, 2003; Schwanenflugel, et al 2004). Although all of these tools of measurement have been constructed with simplicity in mind, all of the assessments offer an accurate means of looking for the elements of good prosodic oral reading. The National Assessment of Educational Progress Oral Fluency Scale uses a very concise 4 point scale that divides into fluent or non-fluent, and has been primarily used to measure short, one minute readings (Daane, M.C., et al,

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2005). The Multi-dimensional Fluency Scale was developed by Timothy Rasinski, and has given researchers and instructors a more comprehensive measure of fluency that includes a column for phrasing and expression; accuracy and smoothness; and pacing (Rasinski, 2009).

Conclusion

“Prosody has been the *way* we say words and phrases beyond their phonemic and lexical qualities” (Cutting et al., 2009). Sentences have always contained multiple phrases, and readers are expected to infer reasonable phrasing for much of any prose text. Although the research on prosodic oral reading and its relationship to overall reading comprehension has revealed some interesting findings, there have been some questions yet to be answered. What researchers have found to be of particular interest regarding prosody has had to do primarily with its potential for helping children find meaning in text by reading the text in a conversational way. Prosody has also been observed, mainly in qualitative measures, to have been a helpful method of engaging students in learning to read through such approaches as Readers Theatre (Young & Rasinski, 2009) It has still been left unclear what the relationship of prosody to reading comprehension, as measured by a standards-based assessment, has meant. The research has made it clear that a relationship between prosodic oral reading and reading comprehension has existed since prosody has been considered one of the main components of fluency, a precursor to gaining meaning from text. What research has not clarified is to what extent prosody has affected reading comprehension. Miller and Schwanenflugel’s longitudinal study did conclude “that the development of reading prosody is an important element of reading fluency and should be considered a key aspect of any definition of it. In sum, it is concluded that reading prosody plays

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an important role in the general development of reading skills” (2008, p.352). It has also been stated that the oral reading of texts that draw on various sentence types (Miller & Schwanenflugel, 2006) and non-default prosody, such as sarcasm, exclamation, and sentence ambiguity might be profitably examined. The foundation for further studies into the relationship between prosodic oral reading and overall reading comprehension has been well established.

Methodology and Procedures

The purpose of this study was to investigate the relationship between prosodic oral reading assessments and standard based reading assessments in a 2nd grade classroom. The population of this study came from a suburban public elementary school in Northeast Tennessee. The school had 494 students enrolled and 48% of these students were eligible for the reduced or free lunch program. 83% of the students were White; 11% were Black, non-Hispanic; 5% were Hispanic; and < 1% was of Asian/Pacific Island descent.

The sample for this study was drawn from one second grade class of 24 students. All students were suburban. Twenty students were Caucasian, two were Black, one was a Hispanic student still learning the English language, and one student was of Indian descent. The ability levels of the class were varied, but developmentally on schedule. The class comprised of 7 and 8 year olds. Two children had Autistic Spectrum Disorder, but were high functioning. Ten students were randomly selected to participate in the study. Of the ten students that were involved in the study, six were males and four were female.

Data for this study were collected using the Multi-dimensional Fluency Scale and the Pearson Reading Comprehension Test for 2nd grade. The Multi-dimensional Fluency Scale was

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originally developed by Dr. Timothy Rasinski and has been considered more adequate for determining the level of prosody with which a student reads text. The categories included within this assessment rubric included the following components of reading fluency: expression and volume; phrasing; smoothness; and pace. Each component was rated on a four point scale (4 being the highest rating, 1 the lowest), and a student that received over 10 points total was seen as making solid progress in fluent reading. Readings were conducted one at a time with a passage(s) of approximately 250 words written at the student's grade placement, and it was emphasized that the text should be read aloud in a normal way, and not faster than normal. The scores from the four point rubric Multi-dimensional Fluency Scale were correlated to the results of the Pearson Reading Comprehension Test. The results of the Pearson Reading Comprehension Test for each student included an average score that was compiled from the scores of three separate times that the test was taken. The mean of the combined scores of the Pearson Reading Comprehension Test was correlated to the score from the Multi-dimensional Fluency Scale.

Procedure

Before the study began, permission was sought from the school principal, Dr. Crowe. Permission forms were then sent to the parents of the students to participate in the study. After permission was granted, the sample was selected. The sample consisted of 10 students from a second grade class of 24 students. The ten students were selected through a simple random sample. There were 4 females, and 6 males. One student at a time was given an age appropriate sample reading from *Bedtime for Frances* by Lillian and Russell Hoban. The student read the text aloud for three and a half minutes. The Multi-dimensional Fluency Scale was used to rate

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the Prosodic elements within the oral reading. Students were given a score of 1-4, 4 being the highest level attainable, 1 being the lowest. With four categories there was a total score of sixteen points. The results of the most recent commercial standardized Pearson Language Arts and Reading assessment, which is taken every nine weeks, were then compared with each individual Multi-dimensional Fluency Score.

Results

Research questions

Two research questions were used to guide the analysis of data.

Research Question 1: Is there a relationship between Prosodic oral reading, as measured by the Multi-dimensional Fluency Scale, and overall reading comprehension, as measured by the Pearson Reading Comprehension Test?

Research Question 2: What is the influence of expression and volume, phrasing, smoothness, and pace, as measured by the Multi-dimensional Fluency Scale, on overall reading comprehension, as measured by the Pearson Benchmark Test?

Each research question was followed by a research hypothesis. The first research question was analyzed using the Pearson Product Moment Correlation test while the second research question was analyzed using the multiple regression procedure.

The results for research question 1 yielded a significant correlation ($r=0.884$, $P=.001$). The coefficient of determination ($r^2=.78$) indicated that 78% of the variance in comprehension could be attributed to prosodic oral reading. The results are displayed in Table 1

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Table 1

Correlation Between Pearson Benchmark and Fluency Scale

	Mean	SD	r	r ²	Sig.
Pearson Benchmark	77.04	16.016	.884	.781	.001
Fluency Scale	12.70	3.561			

Note: $p < .01$

Research Question two indicated a multiple regression @ coefficient of .897. The coefficient of determination (R^2) indicated that 80% of the variance in comprehension could be attributed to the predictor variables. However, none of the predictor variables were significant in isolation.

Discussion

In response to research question 1: Is there a relationship between prosodic oral reading, as measured by the Multi-dimensional Fluency Scale, and overall reading comprehension as measured by the Pearson Benchmark Test? A Pearson correlation test was run, and the results indicated there was a positive correlation ($r = .884$) between scores on the Multi-dimensional Fluency Scale and the Pearson Benchmark test. The coefficient of determination (r^2) indicated that 78% of the variance in comprehension could be explained by prosodic oral reading and 22% could be explained by other variables. This relationship suggests that the more the students were exposed to prosodic oral reading the more their comprehension excelled. When students displayed strong prosodic reading during their read aloud session, this correlated directly with their performance on the benchmark for reading comprehension. This is consistent with findings in the literature review which stated that a child's ability to draw meaning from text was strengthened when that text was presented in a manner comparable to speech (Casteel, 1988;

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Stevens, 1981; Weiss, 1983). Other researchers have found that poor readers are not as prosodic in their reading or as facile with their use of appropriate phrasing as are good readers (Dowhower, 1991; Reutzel, 1996; Schreiber, 1991). They believe that in regards to prosody and reading comprehension, there could be more of a simultaneous relationship rather than one happening before the other takes place. Due to the significance of the correlation in this study, the null hypothesis was rejected.

In response to research question 2: What is the influence of expression and volume, phrasing, smoothness, and pace, as measured by the Multi-dimensional Fluency Scale, on overall reading comprehension, as measured by the Pearson Benchmark Test? A multiple regression test was conducted and found that $R = .897$ and the coefficient of determination $R^2 = .804$. This means that 80% of the variance of overall comprehension as measured by the Pearson Benchmark Test could be explained by expression and volume, phrasing, smoothness, and pace. Thus, 20% of the variance could be explained by other variables.

Further examination of the beta scores revealed a positive value for each predictor variable. Although none of the predictor variables were significant in predicting the criterion variable, the results suggest that all of these predictors are important components of comprehension, and one cannot emphasize one more than the other. However, beta scores for phrasing, and expression and volume were higher than the rest respectively. Prior research in determining what aspects of fluency, and especially prosody, contribute to comprehension has also yielded some ambiguous results. Two studies mentioned in the literature review revealed that prosodic variables accounted for small amounts of unique variance in reading comprehension performance, and that accurate prosodic reading did not aid in the

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comprehension of written text in an important manner (Schwanenflugel et al, 2004; Miller and Schwanenflugel, 2006). Of the prosodic features examined in the 2006 study, pitch change in oral reading accounted for a slight variance in reading comprehension. Phrasing, which garnered the highest beta value out of the predictor variables has been considered an essential and important component to silent reading and oral reading, for comprehension of any text relies upon the reader using reasonable phrasing (Zutell & Rasinski, 1991).

Conclusion

The purpose of this study was to determine the relationship between prosodic oral reading, as measured by the Multi-dimensional Fluency Scale and overall reading comprehension, as measured by the Pearson Benchmark test. This study showed that there was a significant relationship between prosodic oral reading and reading comprehension. Multiple regression analysis did not yield significant results; however, all of the predictor variables could account for 80% of the variance in the criterion variable.

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