

**Repeated Listening as a Method to Improve Reading Fluency and
Comprehension**

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Abstract

Decades ago, research indicated that using listening methods could be superior to reading methods for language acquisition with younger and lower skilled readers. Acknowledging that children first learn language aurally, practice it orally, and eventually read its text, this pilot study explored the efficacy of a repeated listening method to improve reading fluency and comprehension. Seventy-five second grade students were randomly assigned to three conditions, reading while listening (RWL), listening only (LO), and reading only (RO). The RWL and LO read and/or listened to seven complete stories in the MP3 audio format repeatedly (each story four times) over a seven week period, while the RO group engaged in silent reading. A pretest/posttest design measured the gains using DIBELS for reading fluency and EasyCBM for reading comprehension. Results showed that the Listening Only group gained the most in fluency, and the Reading Only group gained the most in comprehension, although none of the differences between the groups were significant. Refinements in the listening program, using ubiquitous technology such as smartphones, tablets and MP3 devices as well as using stories matched to a student's reading rate and lexile level are suggested to increase the effectiveness of a listening only program.

Keywords: literacy, listening, reading, fluency, comprehension, audiobooks

Elementary classroom teachers employ numerous strategies to develop competent readers, including reading aloud, reading along, reading silently, reading while listening, and repeated reading – all methods that have been studied extensively and shown to be effective in various studies for improving reading fluency and comprehension. Notwithstanding any school's early emphasis on reading text, educators might well consider that reading is that component of literacy that extends a child's pre-literate aural stage of language learning. Strictly speaking, for the purposes of communication and learning from others, language is first experienced aurally and then practiced orally as a child acquires a culture's primary orality (i.e., untouched by literacy, Ong, 2012) or its primary discourse (Gee, 1998) which exist in the natural, oral mode.

The study of orality uses anthropological records to investigate how oral language develops into literate language. In the early years before acquiring the skill of reading and writing, children's understandings of a culture's cognitive and social meanings are experienced through an oral medium. Essentially, by being immersed in a culture, children first learn language by continuous listening. Building upon one's natural settings, Cook-Gumperz and Gumperz (1981) proposed that children need a "saturation" of literary experiences in culturally neutral ways "in order to transform, for themselves, the *rhythms* of spoken language into the written modes" (p. 108). The vehicle for expansion of language beyond the boundaries of oral tradition is writing, which might well be considered to be complementary to oral speech. As Ong (2012) states, "Written texts all have to be related somehow directly or indirectly, to the world of sound, the natural habitat of language, to yield their meanings. 'Reading' a text means converting it to sound, aloud or in the imagination..." (p. 8). In reading, the translation requiring competence in knowing the sound units of letters (phonemes) in a text becomes the challenge for

the beginning reader to develop fluency and comprehension. As Fries (1963) observed, the graphic representations (alone) of text lack the spoken language signals of stress, intonation and tone, all of which must be supplied by the reader automatically and fluidly in the service of comprehension.

Throughout the 20th century, educational researchers have explored the connection between listening and reading. In a comprehensive report that outlined a model for the acquisition and development of auding (listening) and reading, Sticht, Beck, Hauke, Kleinman, and James' (1974) review of 31 research reports (from 1917 to 1970) supported the effectiveness of listening for all age levels, which included students from first-grade to college students and out-of-school adults. One prominent conclusion of their review was that "in the early years of schooling, languaging by auding was more effective than languaging by reading for receiving communication, whereas these processes became equally effective sometime around the seventh or eighth grades" (p. 122).

Dozens of studies were conducted in the 1970s and 1980s to understand differences between reading and listening conditions based on grade level (first grade–college), reading ability (low-high), modality (listening, oral reading, reading while listening), material used (e.g., sentences, passages, narratives, expository, etc.) and the variable measured (e.g., comprehension, recall, inference, etc.). Reporting on the results of 70 studies during these two decades that directly compared reading and listening, Jahandarie (1999) made the following conclusion:

To summarize, the general pattern of findings among younger and poorer readers indicates a comprehension and recall superiority for both listening and oral reading over

silent reading and reading while listening. With more skilled groups of readers, silent reading becomes superior to listening and oral reading (p. 194).

From these studies and others (Guthrie & Tyler, 1976; Horowitz & Samuels, 1985; Perelle, 1975; Swalm, 1972) it's apparent that listening holds advantages over reading for younger and less skilled readers. However, in recent decades (21st century), testing listening methodologies is not as prevalent in the research on reading.

In contemporary classrooms, listening to a story (with and without an accompanying text) might be performed at a class station, or as part of a small group or a whole class read-aloud/read-along activity, but perhaps not as a structured, prescribed and measured *listening* program. It is the position of this paper that elementary educators in particular may be underutilizing the power of spoken texts to improve literacy by using a simple method and a ubiquitous technology—listening repeatedly to digital audio texts in an MP3 format. Thus, to exploit both the accessibility of technology in the form of digital audio, and the natural advantage that children gain through oral speech, the current study explores the efficacy of listening to digital audio texts to improve reading fluency and comprehension.

Repeated Reading and Listening as Methodologies

Reading fluency refers to “a level of accuracy and rate, where decoding is relatively effortless; where oral reading is smooth and accurate with correct prosody; and where attention can be allocated to comprehension” (Wolf & Katzir-Cohen, 2001, p. 219). For practitioners, the familiar adage ‘practice makes perfect’ is undeniably appropriate to the acquisition of reading skills, and for researchers, the benefit of practice has been studied extensively in the form of using various repeated reading and listening methods. Based on a theory of automatic

information processing, LaBerge and Samuels (1974) and Samuels (1979) postulated that the process of repeated reading develops automaticity, and is not unlike the psychomotor learning that occurs when an athlete or musician practices isolated skills in service of a future performance. Some of Samuels' research involved children reading 50-200 word passages repeatedly until fluency was achieved, at which point a new passage was attempted. Typically, students improved by over 50% by the fifth passage, based on the number of times a passage needed to be read to meet a target of 85 words per minute. In contrast, Schreiber (1980) argued that the effectiveness of repeated reading for reading fluency is not fully explained by the practice effect, rather, repeated reading assists a reader's prosodic reading development (e.g., stress, intonation) as the reader unconsciously learns and makes use of syntactic structures (e.g., patterns of sentences and phrases).

Studies incorporating both repeated reading and listening modalities have tested various methods to improve children's reading rate and comprehension, such as assisted reading, i.e., modeled live, using audio tape or computers (Littleton, Wood, & Chera, 2006; Oakley & Jay, 2008), and unassisted reading, i.e., no modeling (Homan, Klesius, & Hite, 1993; Lo, Cooke, & Starling, 2011; Rasinski, 1990), while using nontransfer passages, i.e., using the same material when assessing, and transfer passages, i.e., using new material when assessing (Chomsky, 1978; Dowhower 1987; McGee & Schickedanz, 2007; Therrien, 2004).

For example, Dowhower (1987) used repetition in both assisted (using audio tapes and tutors) and unassisted (practicing independently) reading conditions to study the effects on second grade students' reading rate, word recognition and comprehension, on nontransfer and transfer words, sentences, and passages. Over a series of practice and testing sequences for five

passages, Dowhower found a nearly similar amount of improvement in both non-transfer and transfer conditions, but she observed a positive cumulative *practice effect* in the later sequences of her experiment. Additionally, Therrien's (2004) meta-analysis of 33 studies of nontransfer/transfer passages showed improvement in reading fluency and comprehension from repeated reading in both type of conditions, but the largest effect sizes were found in the fluency rate improvement using non transfer passages (using the same material when assessing).

Along with Samuels, another pioneer in the repeated reading/listening methodology was Carol Chomsky (1978), who maintained that emerging readers would benefit from being inundated with language, especially in cases where their home environments lacked significant exposure to literature. Working with third grade children, Chomsky gave children audiotope players, and the children listened to the stories while following along with a physical copy of the book; they were also provided some tutoring in the form of word and sentence analysis. By using complete stories and by giving children the choice to listen to any story as much as they wanted, Chomsky's study exemplified a whole language approach (see Goodman, 1992), which emphasizes narrative comprehension, and deemphasizes decoding. Chomsky found that children's reading fluency scores improved along with their confidence as the numerous repetitions enabled them to nearly "memorize" the stories.

The *repeated listening method* employed in the current study is not easily found in the literature, particularly when it involves listening to complete stories for an explicit number of times *without* an accompanying text, and using test passages that were independent of the texts (i.e., the transfer concept). Utilizing *audio only* as a *reading* development method is intriguing when one considers that for all children, communicative language is first learned through

listening to speech, shaping their original form of language – their primary orality. Although an audiobook is not exactly live speech (as in discourse), it is essentially recorded spoken text, and by representing the characteristics of speech – such as the narrator’s prosody, and tone, etc. (see Smiley, Oakley, Worthen, Campione, & Brown, 1977) – audiobooks may mitigate the prosodic challenges for an emerging reader and promote fluency.

There are several practical and research advantages to using audiobooks in a digital format. First, although many classrooms are still equipped with usable, but antiquated tape players, or even CD players, the availability of audiobooks in the MP3 format utilizes ubiquitous mobile devices, e.g., MP3 players, tablets, and smartphones. Second, MP3 audiobooks are widely available for free, downloaded from the public library or websites like Project Gutenberg, and Lit2go. Third, considering the practical circumstances, listening to a story using headphones or earbuds, offers a unique, ‘inside the head’ experience, but in terms of the actual physiological activation in the brain when listening, medical researchers are discovering some interesting parallels to the brain’s processing of language while reading.

Listening, Comprehension and the Brain

With the development of functional magnetic resonating imaging (fMRI), it’s possible to capture digital images of brain activity while listening to words, phrases and stories. Numerous researchers have demonstrated that auditory narrative comprehension (i.e., the ability to understand spoken material) shares overlapping circuits with reading and reading comprehension (Berl, et al., 2010; Horowitz-Kraus, Vannest, & Holland, 2013; Jobard, Vigneau, Mazoyer, & Tzourio-Mazoyer, 2007). For example, Berl et al. (2010) measured brain area activation and hemispheric laterality of 36 children (7-12 years old) who listened to and read stories while

being scanned. All the children completed post-scan comprehension tests, which provided verification of the children actually processing the content while in the scanner. For both types of story conditions, researchers found “robust activation along the superior temporal sulcus as well as less extensive activation in the left inferior frontal gyrus and right cerebellum” (p. 121), prompting them to refer to this conjunction as the “comprehension cortex”. Essentially, the same areas of the brain were activated while doing both tasks, but slightly more of the brain’s overall network was recruited when reading, likely due to higher level language processing and working memory.

Children’s brain activity at a pre-literal oral stage relates to brain functions at a more skilled stage of reading. In their longitudinal study, Horowitz-Kraus et al. (2013) used five audio stories with sixteen children to examine the relationship between auditory narrative comprehension when the children were five to seven years old with their reading comprehension at age eleven. In addition to confirming the overlapping neural circuits for listening and reading, mentioned earlier, the children’s auditory narrative comprehension at age five to seven positively correlated with reading comprehension at age eleven. When the children were older, Horowitz-Kraus et al. (2013) found additional activity in the occipital lobe, something that was expected for the visual task of reading, but the evidence also pointed toward the development of visualization in the readers at their later age.

Hearing and reading words and phrases in various domains (e.g., metaphors, direct and indirect speech, odor-related words) can also activate specific brain regions to a greater or lesser extent. For example, in a study investigating conceptual metaphor theory, comprehension of metaphors activated sensory areas of the cerebral cortex when listening to phrases that contain

textural words, such as ‘rough day’, or ‘slimy person’ (Lacey, Stilla, & Sathian, 2012). The brain also registers more activity when hearing sentences that are phrased as direct speech, e.g., Mary said, “I’m hungry”, versus indirect speech, e.g., “Mary said she was hungry” (Yao, Belin, & Scheepers (2012). Gonzalez et al. (2006) found that reading words like cinnamon, and garlic stimulates the olfactory region of the brain, indicating that words with strong sensory characteristics activate the brain as if a person was actually experiencing the events. Combined with studies that demonstrated the overlapping circuits of reading and listening mentioned previously, one wonders if *listening* to odor-related words might follow a similar pattern. Regardless, the collection of brain studies mentioned above indicates that listening to words and stories is an active cognitive activity that is closely related to the task of reading and comprehension.

Method

This experimental study took place in a Title I public elementary school in the Pacific Northwest, with the cooperation of three classroom teachers who collaborated on their reading program to provide comparable reading instruction to all students. To create equivalent groups, 75 second grade students were ranked according to their scores on a DIBELS pretest for oral reading fluency. In groups of three (highest three, next highest three, etc.), students were then randomly assigned to one of three reading conditions—Reading While Listening (RWL), Listening Only (LO) and Reading Only (RO). ANOVA established that the three groups of 25 students were statistically equivalent. To measure reading comprehension, an additional pretest using the EasyCBM assessment was also administered, but it was not used as a factor for the group assignment.

Over the course of seven weeks, seven children's books were used by both the RWL and the LO group, with the children covering one story title per week. The story titles were specifically chosen for grade level appropriateness, length and engagement. The stories were all rated at grade levels two–four, with an average length of twelve minutes so that each title could be listened to as a complete story within the twenty minutes allotted to the intervention. Each story was read/listened to once a day, four times per week. The stories were purchased in the MP3 format, and loaded onto low-cost MP3 devices with an individual device for each child in both the RWL and the LO groups. For the two groups listening to the stories (RWL and LO) earbuds were used, and each RWL student also had a physical copy of the story to read along while listening. To assist students in the RWL group who might need assistance keeping pace with the narrator, a bell sound was inserted into the MP3 file to indicate when the students should turn the page of the physical book. The students in the LO group listened to the identical story used by the RWL group each week, but without the physical book. The students assigned to the RO group were in the control condition, and were engaged with silent reading of a book of their choice in the school library, under supervision of a classroom teacher.

Protocol

The random assignment to the three groups required shuffling the students from their regular classrooms to different classrooms at the start of the activity. Each day at a specified time, the students would relocate to the classroom assigned to their reading condition. In their assigned classroom, the RWL and LO groups would go to a plastic bin, locate their personal pouch that contained their MP3 device, find an empty seat, put in their earbuds and get the device ready to start the story. The students in the RWL would also gather up the book with the

same title in order to read along while listening. For the RWL group, a teacher and a research assistant would assist the children who had difficulty getting the book, MP3 device and earbuds set up for use. The RWL and LO groups were provided two “training days” before the start of the seven week program, to learn how to use the MP3 devices and get set up at their desks. The RO group (the control) would go to the school library and read any book of their choice for approximately 12 minutes each day (matching the time that the other groups were reading/listening). The students in the RO were not asked to do repeated reading of the same material as the other two groups. Each of the three groups was monitored by one of the second grade teachers involved in the study, and the fidelity of the reading and listening activities was checked daily by the researcher and a research assistant.

Results

At the end of seven weeks, all students were tested again on both the DIBELS for oral reading fluency and EasyCBM for reading comprehension. DIBELS was administered by the school’s reading specialist, and the EasyCBM posttest using different but equivalent passages to the pretest was administered by the classroom teachers. ANOVA was used to analyze the difference in gain between the groups after the posttests. The measured gains in reading fluency and reading comprehension after seven weeks of the intervention are presented in Table 1.

Table 1: Gains in Reading Fluency and Comprehension

Group	<u>n</u>	<u>Fluency (wpm)</u>	<u>Comprehension (%)</u>
Listening Only	23	24	4
Reading Only	23	19	6.5
Reading & Listening	24	18	-1

$p > .05$

On the measure of oral reading fluency, the largest gain was made by the Listening Only group – an average improvement of 24 words per minute. The second largest gain was made by the Reading Only group – an average improvement of 19 words per minute. The smallest gain was made by the Reading While Listening group – an average improvement of 18 words per minute. None of the differences between the groups were statistically significant.

On the measure of reading comprehension, the largest gain was made by the Reading Only group, which had an average gain of 6.5%, which represented a higher percentage of correct answers on the EasyCBM assessment. The second largest gain was made by the Listening Only group, which had an average gain of 4%, and the Reading While Listening Group registered an average loss of 1% in the comprehension assessment. Once again, none of the differences between the groups were statistically significant. Of the original 25 students assigned to each group, five students (two from LO, two from RO, and one from RWL) did not complete the posttest, and therefore they were removed from the analysis.

Discussion

It has been well documented in previous studies that listening to spoken text, by itself or in conjunction with reading can improve reading fluency and comprehension, and that younger and lower performing students, in particular, can benefit from listening to a greater extent than reading (Jahandarie, 1999; Sticht et al., 1974). Furthermore, listening comprehension, the active process whereby individuals construct meaning from what they hear, and make connections with what they already know, has been shown to be a predictor of reading comprehension in students' later grades (Cadime et al., 2017). As stated earlier, learning language naturally as part of one's family and culture (in the pre-literacy stage) is surprisingly effective. In support of this

understanding, Chomsky (1972) demonstrated that children's native language competence (e.g., grammar, syntax) at age six approaches adult level competence; growing up, a child practices with language, listening and speaking repeatedly to learn sounds, words, sentence structure, etc., in a natural way.

However, in most contemporary classrooms, has incorporating the listening modality been overlooked as a *method* in developing literacy? The current study's exploration using 'listened to' stories was an attempt to take advantage of children's natural listening skills, and perhaps even their visualization of a story's events and characters. The concept of repetition, used in previous studies (e.g., Dowhower, 1987; Homan et al., 1993; McGee & Schickedanz, 2007; Rasinski, 1990; Samuels, 1979), was applied in two groups in the current study that engaged with repeated listening, with the expectation that repeated listening to rhythms and syntax of language would improve fluency. The largest reading fluency gain of the three groups was by the Listening Only group (24 words per minute), a positive result that might be explained by either the mode of listening or the repetition that may have had an inculcation effect. The practice effect is consistent with Sticht et al.'s (1974) view that both auditing and reading "consist of elements and processes that provide for predictability. For example, spelling patterns, grammatical structure, and syntactical rules exhibit certain regularities and entail certain invariants which suggest what will follow" (p. 77).

On the other hand, the worst results in both reading fluency and reading comprehension were achieved by the Reading While listening Group. What might explain this seemingly poor result, as most educators would predict that the RWL group would benefit the most because the students could follow along in the book while listening? It's conceivable that for some students

at this second grade level, the reading while listening method may have presented a type of cognitive overload, as they needed to follow along and turn pages while reading and listening. Broadbent's (1958) single channel hypothesis proposed that a person who is presented with two types of stimuli at once, will selectively attend to only one of them at a time, although taking in low level information from two (or more) sources is feasible. Others have made similar suggestions, citing cognitive load theory to explain circumstances where multiple simultaneous inputs are detrimental to learning (Plass, Moreno, & Brunken, 2010). Another explanation might be that some students might have been still growing out of the decoding phase, and they might have had difficulty keeping pace with a professional reader of the digital recording. A child's reading rate may be inadequate for the listening task, whereby one must follow the pace of a professional narrator. In previous studies comparing a student's reading rate to a narrator's speaking rate, with first and third grade children (McMahon, 1983) and middle school children (Neville, 1975) results showed that the best performances by the children were evident when the narrator's rate on an audiotape *matched* the child's own oral reading rate.

The differences in the average scores between the three groups were not statistically significant, so it cannot be claimed that listening is *better* than reading to improve fluency, but results show the methods may often yield similar results. Others have shown similar (inconclusive) results when comparing modalities. In a recent study, college students' retention performance was comparable, whether they listened to an audiobook, read from an electronic tablet, or read while listening (Rogowsky, Calhoun, & Tallal, 2016). In our current study, results indicated that the Listening Only group gained the most in fluency, and the Reading Only group improved the most in comprehension. Considering comprehension, a student reading silently has the opportunity to read at her own pace, and even backtrack to reread or review story events for

clarity and understanding. Under the conditions of this current study, the Listening Only group did not have rewind or review opportunities, and the pace of the audio recording was not customized to each student's reading rate. Further research is recommended to determine if refinements in the listening methodology can improve the results.

The limitations of this study, such as controlling for a selected story's lexile text level, a student's lexile reading level, the reading rate of the narrator, and even the level of comfort using earbuds represent improvements that can be accounted for in further studies. For example, to improve reading fluency, an audiotext could be chosen that would be just above each student's reading level and the speaking rate of the story's narrator (to be called the "listening rate") would be taken into consideration. In a future study, better fitting, noise-cancelling headphones would be highly recommended, as children in this study would sometimes be observed adjusting the earbuds during the listening session. Educators might consider structuring a listening period where all children employ quality headphones to eliminate noise distractions, based on the single channel hypothesis (Broadbent, 1958; Plass et al., 2010).

In second language studies, researchers know that encountering words beyond one's vocabulary creates attention problems that interfere with comprehension (Rost, 2016). To nurture comprehension, a preview of a story's vocabulary, themes and concepts, not unlike what is found in most basal readers might be used, or perhaps using a group practice reading, coupled with two or three times listening only might be most effective. Geva, Galili, Katzir, and Shany (2017) demonstrated that not only were fourth grade Hebrew students "more successful in inferring novel word meanings when they listened to narratives than when they read these narratives on their own" (p. 1938), but their success in both modalities was positively related to vocabulary

ability and reading ability. The current study did not identify second language learners (e.g., native Spanish speakers), or students with learning disabilities (e.g., dyslexia), but there should be an obvious benefit of listening to literature (repeatedly) for these student populations. Finally, employing a standardized instrument like the EasyCBM was a valuable gauge of the skill of comprehension using transfer passages, but it would also be interesting to measure comprehension using questions based on the same stories the children listened to repeatedly (i.e., nontransfer passages).

The results of this study are not conclusive, but are encouraging, that repeated *listening* to complete stories can be as useful as *reading* stories to improve reading fluency and comprehension. If, in learning to read, the child is transferring his knowledge from one modality (aural) to another (visual), as Schreiber (1980) and others have suggested, it's reasonable to assume that repeated listening can facilitate that transfer – provided the child's vocabulary is approximately matched to the reading level. Sticht et al. (1974) proposed that, in “learning to read, the child uses the same cognitive content and languaging competencies used earlier in auding, plus the additional competencies involved in decoding print-to-language” (p. 122). Especially for the lower elementary grades, a listening only program utilizes the child's natural mode of language learning. Both educators and parents should be aware of the numerous digital audiobooks available as free downloads on the Internet, on websites such as Project Gutenberg, Lit2Go, LibriVox, and even most public libraries. Low cost MP3 devices (\$30-\$60) are equipped with 8-32 gigabytes of storage, capable of storing hundreds of audiobooks. Making language learning available and affordable to all socioeconomic levels might help resolve the foreseeable “linguistic incompatibility” between some homes and schools (Akinnsaso, 1982). Children love stories, and they should be encouraged to listen to as many stories as they want, as many times as

they want, and the ubiquity of digital audiotexts facilitates those opportunities.

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