Considering Instructional Time and Comprehension Rate when Evaluating the Effectiveness of Reading Interventions in Classrooms

Kelly E. Thomason

Eastern Illinois University

This research is a product of the graduate program in School Psychology at Eastern Illinois University. Find out more about the program.

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Considering Instructional Time and Comprehension Rate when Evaluating the Effectiveness of Reading Interventions in Classrooms

BY

Kelly E. Thomason

THESIS
SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

Specialist in School Psychology

IN THE GRADUATE SCHOOL, EASTERN ILLINOIS UNIVERSITY CHARLESTON, ILLINOIS

2004
YEAR

I HEREBY RECOMMEND THIS THESIS BE ACCEPTED AS FULFILLING THIS PART OF THE GRADUATE DEGREE CITED ABOVE

7-20-2004
Date
Thesis Director

7-20-2004
Date
Department/School Head
Considering Instructional Time and Comprehension Rate when Evaluating the Effectiveness of Reading Interventions in Classrooms

Kelly E. Thomason

Eastern Illinois University
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I would like to take this opportunity to thank key people who helped me complete this thesis. First, I would like to thank my thesis chair, Dr. Gary Cates, for his passion for research and assistance in determining a thesis topic. He donated a great deal of his time in helping to input data, analyze results, and edit numerous drafts. I would also like to thank Dr. Michael Havey and Dr. Christine McCormick for being an important part of my committee and contributing their expertise.

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Abstract

The purpose of this investigation was to replicate and extend research done by Daly et al. (1998), which focused on the functional analysis of academic problems. This research examined comprehension and amount of instructional time as dependent variables to determine the effectiveness and efficiency of reading interventions (repeated reading, contingent reinforcement for rapid reading, and listening passage preview). Results suggest that when evaluating increases in oral reading fluency (words read correct per minute), each participant obtained greatest gains using different combinations of interventions. However, when examining instructional time specifically, it becomes clear that the contingent reinforcement and listening passage preview interventions showed greatest gains when evaluating the amount of time that educators spend with students. This indicates that methods may be available that show substantial improvements in reading fluency and require less teacher time. When examining comprehension, contingent reinforcement showed improvements when evaluating factual, inferential, and total comprehension.
Considering Instructional Time and Comprehension Rate when Evaluating the Effectiveness of Reading Interventions in Classrooms

With the knowledge base that exists for reading acquisition and instruction, a large number of children in the educational system fail to develop adequate reading skills for meeting societal demands (Daly, Lentz, & Boyer, 1996). The National Assessment of Educational Progress (NAEP), also known as “the Nation’s Report Card”, is the only nationally representative and continuing assessment of America’s students across various subject areas. Results for the 2003 NAEP reading assessment of the nation’s fourth-graders show a relatively stable pattern in student’s average reading scores during the last decade. No significant change has been detected in fourth-grade reading scores since 1992 (National Assessment of Educational Progress, 2003). Despite gains made by higher achieving students, children who struggle to read are continuing to confront problems (National Assessment of Educational Progress, 2001). All too often, children who are challenged with difficulties in the classroom are being referred to special education for evaluations without receiving adequate assistance in the classroom. According to the U.S. Department of Education, nearly half of all children receiving special education services are considered learning-disabled (U.S. Department of Education, 2000). Special education students are mandated to be placed in the least restrictive environment, therefore, it is becoming increasingly important for regular education teachers to provide adaptations to students in their classrooms in addressing academic difficulties. Additionally, school psychologists must be prepared to act as consultants to teachers in helping them to provide effective intervention strategies in dealing with these problems.
Although there is an abundance of research addressing reading difficulties in classrooms, two concerns persist. First, assessment and intervention tools available to educators are not sufficiently refined to provide the kind of information necessary for making good educational decisions about children on an individual basis (Daly et al., 1996), and second, when decisions have been made, teachers do not have the extra time in their busy schedules to address each individual student’s needs. In fact, easier solutions are more likely to be implemented consistently while solutions which are more time consuming or technically difficult for teachers and support personnel are less likely to be implemented correctly (Gresham, 1989). Because time is a precious commodity, educators need to be efficient when problem solving. Under many circumstances, the most efficient thing to do is to test the easiest hypothesis first, implement an intervention, and monitor and evaluate outcomes. If that approach fails to improve student performance, then something progressively more time intensive can be attempted until a suitable intervention is identified (Daly, Witt, Martens, & Dool, 1997).

**Individualized Education**

Haring and Eaton (1978) believed that teachers could be more efficient in planning and instruction if they had an instructional hierarchy that could serve as systematic guidelines to use in selecting instructional procedures. Through the evaluation of student’s abilities, Haring and Eaton (1978) determined that students were functioning at differing instructional phases: acquisition, fluency building, generalization, and adaptation. According to Haring and Eaton (1978), teaching procedures used need to “match” the steps of the hierarchy. Acquisition of a skill occurs when the skill becomes part of a student’s behavioral repertoire. Techniques often used during acquisition are
demonstration and modeling. After a skill has been acquired, the emphasis in the learning process shifts from acquisition to proficiency or fluency building. In order for a skill to be functional in an individual’s environment, it must be mastered or performed proficiently. Fluency building typically involves the use of drill. The next stage of the hierarchy is generalization, which is defined as performing a skill in response to new stimuli similar to those used during instruction. Practice and opportunities to use the skill are required to promote generalization and are necessary if the skill is to become useful outside of the specific instructional setting. Once a skill has been generalized to different settings, the child must learn to adapt the skill for use in situations which not only require a response to a new stimulus but also actually demand that the mode of response be modified in some way as well. When flexible application of a skill has been demonstrated, then that skill has been “learned” (Haring and Eaton, 1978).

Many researchers have begun to expand upon this instructional hierarchy for making educational decisions. Daly et al. (1996, 1997, 1998, 1999) has specifically formulated a model for conducting a functional analysis of academic responding in determining effective interventions for reading. The main premise of this functional analysis of academic responding model is that rate of academic responding will link assessment to intervention, making it easier to identify relevant intervention targets and generative interventions that have a potential to increase academic competence. Refining intervention targets dictates the kinds of interventions warranted across differing levels of student responding across the instructional hierarchy.

Further research by Daly et al. (1997) outlines how it is possible to bring about appropriate academic responding using functional analysis of academic performance
problems. However, rather than using an instructional hierarchy, interventions are
selected based on five hypotheses as to why students fail, which include 1) they do not
want to do it, 2) they have not spent enough time doing it, 3) they have not had enough
help to do it, 4) they have not had to do it that way before, or 5) it is too hard. For
example, effective interventions for a student who does not want to do the work might
include manipulation of motivation through contingency management. Therefore, in the
specific case of reading, performance might be increased through incentives for reading.
By using a functional assessment method, the source of the problem can be identified, as
well as the chances of choosing an effective intervention are increased (Daly et al., 1997).

Daly et al. (1998, 1999) evaluated the effects of reading interventions grouped
 hierarchically as a treatment package to develop individualized treatment
 recommendations for students who experience difficulty in learning to read. As
treatments were ranked hierarchically, they required more assistance from an adult with
each successive treatment. Treatment strategies included contingent reinforcement for
rapid reading, repeated readings, listening passage preview, phrase drill error correction,
application of treatment to both the instructional and generalization text, and modifying
the difficulty level of the materials at which the student was being instructed. Contingent
reinforcement was always the first intervention procedure administered in an attempt to
rule out the possibility that poor student reading rates were the result of a performance
deficit. Prior to exposure of the experimental conditions, students chose in order of
preference three items from a reinforcement survey for which they would be willing to
work. If the student read the passage based on a specified correct read words/minute
criterion, they were rewarded the preferred items. If the student failed to improve his or
her performance under this condition, it was assumed that a skill deficit was affecting student performance and that teaching would be required to improve response rates. Repeated readings were implemented next because it was the simplest of instructional strategies, requiring less adult involvement than other treatment strategies. In an effort to increase students' opportunities to respond, the researchers required the students to read the passage four times. If repeated readings did not improve student performance, listening passage preview was implemented to increase exposure to modeling in improving student accuracy of reading. Individualized conditions contained one or more of these treatment components based on the hypothesized nature of the problem.

Favorable effects of these treatment strategies differed for each participant. Combinations of interventions were required for some; however, the authors concluded that further research is needed in treatment selection. Overall, results from this investigation suggest that brief functional analyses can be conducted successfully with academic behaviors like oral reading fluency (Daly, Martens, Dool, & Hintze, 1998).

A similar study conducted by Daly, Martens, Hamler, Dool, & Eckert (1999) determined interventions on the basis of grouping them hierarchically. This allowed students with reading difficulties to receive individualized instruction. Treatment strategies in this study were the same as Daly et al. (1998) and included a reward for rapid reading, repeated readings, listening passage preview, application of a treatment to both the instructional and the high content overlap (HCO) text, and lowering the difficulty level of the materials by using passages that were taken from one level lower than the prior level at which the student was being instructed. Individual conditions contained one or more of these treatment components. Results of this investigation
indicate that it may be possible to conduct brief analyses of the effects of combining instructional components on students' oral reading fluency. However, a potential limitation of this study is that despite improvements in oral reading fluency, the examiners did not evaluate the amount of instructional time required to implement each of these interventions.

*Instructional Time*

When relative learning levels are assessed, researchers often compare the effects of interventions without regard for the amount of instructional time required to complete each intervention (Skinner, Ford, & Yunker, 1991). Instructional time is an important variable for two reasons. First, research investigating the extent to which instructional time may influence the comparison and evaluation of instructional procedures found that while interventions may be similar in effectiveness, analysis of efficiency data shows clear differences in learning rates for students. This demonstrates that basing decisions solely on effectiveness data may be poor educational practice that fails to maximize student learning rates (Cates, Skinner, Watson, Smith, Weaver, & Jackson, In press; Watson & Ray, 1997; Skinner et al., 1991). Second, although one treatment may be perceived as more effective than another, it may be more beneficial to implement an intervention if it requires less time of a teacher in its implementation. Research evaluating teacher perceptions of classroom interventions has increasingly shown that there is a concern that many effective treatment procedures remain unused because they are simply unacceptable to participants, caregivers, or consumers (Witt, Martens, & Elliott, 1984). In relation to the influence of time as a variable involving the treatment acceptability of interventions, it is documented in the literature that interventions that
require less time to implement are viewed as more acceptable than more time consuming techniques (Witt & Martens, 1983). Similarly, another study determined that teachers’ judgments concerning the acceptability of classroom management techniques were influenced markedly by the amount of time needed to plan and implement such interventions (Witt, Martens, & Elliott, 1984). According to Elliott (1988), this has implications for consultation because of the impact these perceptions have on outcome. A teacher who may find a model of consultation or intervention unacceptable due to time requirements may be reluctant to participate in the process or carry out a specific intervention. Therefore, it is necessary to evaluate both the effectiveness and the efficiency of an intervention when choosing interventions for prevention and remediation of academic skills deficits.

Although it has been shown to affect teachers’ preferences for interventions, instructional time has also been shown to be important for increasing opportunity to respond. Increasing the number of opportunities a student has to learn can lead to improving students’ academic performance across the learning hierarchy. Increasing learning opportunities has been shown to increase accuracy (Albers & Greer, 1991), fluency (Skinner, Ford, & Yunker, 1991), and maintenance of academic performance gains (Ivarie, 1986). Furthermore, increasing opportunities to respond allows for more opportunities for stimulus and response discrimination and generalization programming. Researchers have shown that increasing the number of opportunities to respond to academic stimuli often results in increased learning (Greenwood, Delquadri, & Hall, 1984; Skinner & Shapiro, 1989). This supports the hypothesis by Daly et al. (1997) that
one reason for academic deficits is due to insufficient active student responding in curricular materials, which is necessary for skill mastery.

In spite of this, providing more time to learn is problematic for several reasons. First, many students requiring additional services within the educational system typically suffer from more than one area of difficulty (i.e., a student with a mathematics disability also has problems in reading or writing) (Skinner, Belfiore, & Watson, 2002). Therefore, if more time is spent teaching mathematics then conversely less time is spent on other subjects. Furthermore, teachers’ responsibilities are not limited to the traditional three R’s. They are also required to address social skills, self-esteem, drug and alcohol prevention, unsafe sex, and so forth (Skinner et al., 2002). Teachers will quickly reach an upper limit on the amount of time by which they can increase allocated instructional time (Rosenshine, 1978). With so much learning expected across so many areas, it is understandable that teacher’s rate interventions that require more time as less acceptable (Witt, Elliot, & Martens, 1984). Therefore, because students with disabilities are typically referred because they are not learning at an acceptable rate, it is necessary to assess instructional time needed when evaluating the relative effects of interventions (Skinner, Belfiore, & Watson, 2002) in allowing teachers to use the most efficient intervention available.

**Comprehension Rate**

In addition to instructional time, the Daly et al. (1998, 1999) studies did not consider comprehension as a variable. While it is important for students to be able to read quickly and accurately, the primary reason people read is to understand or comprehend (Sindelar & Stoddard, 1991). Early studies on repeated readings by LaBerge
and Samuels (1974) were based on an automaticity theory that suggested fluent readers decode text automatically leaving attention free for comprehension. Therefore, by increasing students' rates of reading, their comprehension levels may increase as well (LaBerge & Samuels, 1974). Theories of this type suggest that rapid accurate readers may comprehend at higher levels than slow accurate readers because they are more efficient readers (i.e., they have more cognitive capacity available to apply to understanding what they are reading) (LaBerge & Samuels, 1974). However, results of another study on repeated reading by Freeland, Skinner, Jackson, McDaniel, & Smith (2000) found that when comparing repeated readings to a control condition, repeated readings were effective in increasing factual comprehension levels and factual reading comprehension rates, but no differences were found for inferential comprehension. This research suggests that comprehension may increase due to multiple exposures of specific facts rather than on speed (Freeland et al., 2000).

Therefore, the purpose of the present research is to replicate and expand Daly's (1998) brief functional analysis of academic problems by evaluating intervention effectiveness and efficiency using comprehension and amount of instructional time as dependent variables in conjunction with the standard variable of reading rate. This will be accomplished through replication and extension of Daly's (1998) study comparing repeated reading, contingent reinforcement for reading, and listening passage preview.

Method

Participants

Participants were six general education fourth grade students from a suburban elementary school. Three students were Hispanic females (Natasha, Kara, Patrice), one
was an African-American male (Thomas), one was a Caucasian male (Jim), and one was a Caucasian female (Becky). The names of the students have been changed to protect their identity. The students were either nine or ten years of age, and none had ever received special education services or had been retained.

Participants were recruited by first obtaining approval to conduct this study from the elementary school principal (Appendix A). Next, participants were identified by an analysis of baseline data collected by the schools Title 1 staff at the beginning of the school year. After being assessed in the areas of word recognition, comprehension, and words per minute read, this group of students did not qualify for additional services according to district criteria. However, these students struggle in the area of reading fluency specifically. According to District 200 criteria, 4th grade students should be reading 110 words per minute (wpm). The following is a summary of the words per minute read by each participant when evaluated by Title 1 staff: Thomas (68 wpm), Kara (34 wpm), Natasha (62 wpm), Becky (71 wpm), Jim (66 wpm) and Patrice (80 wpm).

Classroom teachers were informed that their students were eligible to receive additional reading assistance and asked to send a permission slip home with their students to be signed. Because services were being provided through the Title 1 department, Title 1 permission slips were sent home in addition to the slip sent home by the examiner (Appendix B, C). Additionally, the permission slip was sent home in Spanish for those students coming from Spanish-speaking homes (Appendix D).

The fourth grade population was chosen because instruction during elementary school focuses on basic skills and it is at this grade level that the curriculum begins switching to subject content (Mercer, Campbell, Miller, Mercer, & Lane, 2000).
Approximately 75% of poor readers in third grade continue to be poor readers in ninth grade, and furthermore only 25% of students in Grade 4 achieve proficient reading standards (Mercer et al., 2000).

**Materials**

Reading probes were obtained from the Kansas State Department of Education website (www.kansped.org/ksde/archive/miffin) (Appendix E - W). The majority of passages were drawn from the 4th grade reading level, however some were at the 3rd and 5th grade levels. For each treatment condition, the students were provided with a different reading passage.

Six questions were developed for each passage by the examiner. The questions were divided into three factual questions and three inferential questions. Factual questions are those that can be found within the text, while inferential questions are those that must be obtained through context. A stopwatch was used to measure the amount of instructional time necessary for each of the reading interventions.

**Procedure**

*Baseline.* Prior to administration of the reading interventions, baseline data was collected for each of the students by having them read a passage aloud to the examiner. While the student was reading, the examiner recorded the amount of time it took for the student to complete the passage, as well as answer six comprehension questions. Additionally, the number of words read during the first minute of reading was recorded as a measure of words read correctly per minute (wrcpm). The number of wrcpm was calculated according to curriculum based measurement criteria.
Following collection of baseline data, the student met with the experimenter a total of eighteen sessions. During each session, students were exposed to only one condition of the six interventions (contingent reinforcement for rapid reading, repeated readings, listening passage preview, contingent reinforcement for rapid reading and repeated readings, contingent reinforcement for rapid reading and listening passage preview, and repeated readings and listening passage preview). Furthermore, each student was exposed to each intervention three times. In order to compare the effects of each condition on student learning, each student was exposed to each condition randomly.

Students completed the assessment in a quiet area outside of their classroom. Upon meeting with the examiner, the students were asked to read the passage aloud. Using a stopwatch, the examiner recorded the amount of time taken to provide the student with instructions, to read the passage, as well as answer the comprehension questions provided by the experimenter. The stopwatch started when instructions were provided and stopped when the student answered the last comprehension question.

**Reinforcement Inventory.** Prior to beginning the study, students were administered a reinforcement inventory asking them to choose three items from an informal reinforcement survey that they would be willing to work for in order of preference (see Appendix X).

**Contingent Reinforcement for Rapid Reading.** During this condition, the examiner provided the student with a passage to read and asked the student to “read this aloud.” Once the student read the passage, they were asked to answer questions for
comprehension. If the student read the passage faster than baseline, they were provided with one of their chosen reinforcers.

Repeated Readings. During this condition, students were asked to “read the passage three times.” Research by O’Shea, Sindelar, & O’Shea (1987), found that reading a passage three times was sufficient to obtain fluency and comprehension, as well as significant gains were not made by reading a passage a fourth time as was done with the study by Daly et al. (1998). After reading the passage three times, students answered questions for comprehension.

Listening Passage Preview. During this condition, the experimenter read the passage aloud to the student and then the student read the passage aloud to the experimenter. The student was asked to “listen to the passage I am reading and follow along, when I am finished reading; I want you to read the passage to me.” If the student did not immediately begin reading once the examiner stopped reading, they were prompted to “go ahead.” Once the student completed reading the passage, they were asked to answer questions for comprehension.

Design

The present study utilized a brief multielement design (or alternating treatments design). The primary dependent variable to be measured was words read per minute of instructional time. Additionally, the students’ level of comprehension and oral reading rate was evaluated to determine if repeated readings, contingent reinforcement, and listening passage preview can increase comprehension rates. As mentioned, the treatment strategies included contingent reinforcement for rapid reading, repeated readings, and listening passage preview. However, treatments were also combined to
determine the strategy that allowed each child to be most successful. Therefore, the
treatment strategies included contingent reinforcement for rapid reading, repeated
readings, listening passage preview, contingent reinforcement for rapid reading and
repeated readings, contingent reinforcement for rapid reading and listening passage
preview, and repeated readings and listening passage preview. These treatment
conditions were implemented in an alternating treatment design fashion. Benefits of
using an alternating treatment design are 1) when comparing two or more therapies,
questions of relative effectiveness can be answered without a withdrawal phase, 2) useful
data are produced more quickly than a withdrawal design, 3) alternating treatment
designs are relatively insensitive to background trends in behavior because one is
comparing the results of two treatments or conditions in the context of whatever
background trend is occurring, and 4) no formal baseline phase is required (Barlow &
Hersen, 1984).

Analysis

The six dependent variables to be measured were a) words read correctly per
minute, b) words read correctly per minute of instructional time, c) percent correct of
factual comprehension questions, d) percent correct of inferential comprehension
questions, e) percent correct of factual comprehension questions per minute of
instructional time, and f) percent correct of inferential comprehension questions per
minute of instructional time. There was a visual inspection of the data.

Research Questions

Research Question 1. Will there be an increase in words read correctly per
minute across all conditions of the experiment from baseline? Daly et al. (1998) suggests
that there could be an increase in words read correctly per minute across all conditions; however, results vary across each individual student's performance. Daly et al. (1998) did not find an increase in words read correctly per minute for the contingent reinforcement condition; however, this may suggest that he did not have students with a motivation deficit. Therefore, depending on the participants for this study, it is possible that this condition may cause increases in words read correctly per minute as well. It is believed that each student will respond most successfully to a particular treatment condition (i.e., one student may show greater increases in words read correctly per minute by exposure to repeated readings, while another may show greater increases from contingent reinforcement).

Research Question 2. Will an examination of words read correctly per minute of instructional time result in different interpretation of data? Research by Daly et al. (1996) examined an instructional hierarchy of interventions for reading, in which interventions were presented from those requiring the least adult involvement to those requiring the most adult involvement. While improvements in reading were made by students, it is important to remember that teachers will eventually reach an upper limit on the amount of time they can allocate instructional time to each individual student. Results of the present research may show that despite increases made by reading interventions, it is necessary to examine the amount of instructional time required by educators in making sound educational decisions because other methods may show substantial improvements which require less time of teachers. Therefore, instructional time may result in different interpretation of data.
Research Question 3. Will there be a change in the number of correctly answered factual comprehension questions across all conditions? Prior research by Freeland et al. (2000) found that repeated readings were effective in increasing factual comprehension levels. This research suggests that comprehension may increase due to multiple exposures of specific facts rather than on speed (Freeland et al., 2000). Furthermore, researchers have found positive correlations between words read correctly per minute and reading comprehension making it an indirect measure of functional reading skills (Marston, 1989). Therefore, if students increase the number of words read correctly per minute, they may simultaneously increase factual comprehension.

Research Question 4. Will the number of correctly answered inferential comprehension questions increase for any of the treatment conditions? Research by Freeland et al. (2000) found no increases in the number of inferential questions answered correctly through the use of repeated readings. However, research on the other interventions is lacking.

Research Question 5. Will there be an increase in the number of factual comprehension questions answered correctly per minute of instructional time? Treatment conditions requiring the most instructional time may result in greater increases in factual comprehension. Research has shown that when teachers allocated more time to instruction, students were more engaged with the academic material (Rosenshine, 1980). However, time may be spent on the actual “procedure” as opposed to student academic engaged time. Therefore, instructional time may impact the interpretation of data.

Research Question 6. Will there be an increase in the number of inferential comprehension questions answered correctly per minute of instructional time? Research
by Freeland et al. (2000) found no increases in inferential comprehension rates when applying repeated readings. However, research on other interventions is lacking.

Results

*Oral Reading Rate and Instructional Time*

Figure 1 provides the data for participant 1 with regard to words read correctly per minute (wrcpm) and words read correctly per minute of instructional time (wrcpmIT). During baseline Natasha read 69 words per minute. During the repeated readings intervention, she initially experienced gains, but then returned to her original rate. Therefore, results of her performance when exposed to a repeated readings intervention varied. During the listening passage preview intervention, Natasha experienced gains almost immediately and these gains were maintained over the treatment sessions. However, the contingent reinforcement intervention resulted in no change for Natasha as her fluency decreased during the last session of the intervention. When exposed to the contingent reinforcement/listening passage preview intervention, Natasha's oral reading fluency steadily decreased. Of the treatments administered, repeated readings/contingent reinforcement and repeated readings/listening passage preview led to the greatest increase in oral reading fluency over baseline. Specifically, Natasha’s performance when exposed to these interventions showed a steady increase.

However, when considering instructional time the data provide a different picture. It is evident that when accounting for the amount of time taken to implement interventions, contingent reinforcement was most efficient in producing increases in oral reading fluency. While initially stable, Natasha showed gains when exposed to contingent reinforcement. Although not as evident as contingent reinforcement, the
listening passage preview intervention revealed increases in reading fluency in a shorter amount of time. In addition, a combination of this intervention with listening passage preview also showed an increase in oral reading fluency.

![Graph 1](image1.png)

Fig. 1. Number of words read correctly per minute (wrcpm) and words read correctly per minute of instructional time (wrcpmIT) for Participant 1.

Figure 2 provides the data for participant 2 with regard to words read correctly per minute (wrcpm) and words read correctly per minute of instructional time (wrcpmIT). During baseline participant 2 (Thomas) read 65 words per minute. Under the repeated readings intervention, Thomas experienced an increase in wrcpm on all administrations; however, despite initial gains, his rate of responding decreased on the final
administration. Under the listening passage preview intervention, Thomas initially experienced gains from baseline, but on subsequent administrations his rate of responding decreased to less than baseline. The contingent reinforcement intervention did not reveal immediate increases in fluency; however, overall increases were steady from baseline. Under the contingent reinforcement/listening passage preview intervention, subtle increases in rates of responding were experienced at first, but overall steady progress was made in his oral reading fluency over baseline. Under the repeated readings/listening passage preview intervention, no change was observed in oral reading fluency. Of the treatments administered, repeated readings/contingent reinforcement showed the greatest increases overall baseline. Despite initially obtaining a fluency score less than baseline, Thomas experienced a steady increase in fluency overall.

However, when considering instructional time, the data provide a different picture. It is evident that when accounting for the amount of time taken to implement interventions, contingent reinforcement was most efficient in increasing oral reading fluency. While very little change in fluency was observed among the other interventions, contingent reinforcement showed steady gains with regard to instructional time. Similar to participant 1, Thomas' performance showed increases when exposed to the contingent reinforcement/listening passage preview intervention, as well as the listening passage preview intervention alone.
Fig 2. Number of words read correctly per minute (wrcpm) and words read correctly per minute of instructional time (wrcpmIT) for participant 2.

Figure 3 provides the data for participant 3 with regard to words read correctly per minute (wrcpm) and words read correctly per minute of instructional time (wrcpmIT). During baseline participant 3 (Jim) read 91 words per minute. Under the listening passage preview intervention, Jim’s performance varied as he initially experienced gains above baseline, but then decreases the number of wrcpm and then again experienced an increase. The contingent reinforcement intervention did not result in any change in fluency and the fluency levels were below baseline. Under the repeated readings/listening passage preview intervention, Jim immediately experienced gains above baseline, but on subsequent sessions his rate of responding continually decreased.
above baseline, but on subsequent sessions his rate of responding continually decreased. The repeated readings/contingent reinforcement intervention did not produced gains in fluency above baseline on any one of the sessions, although rates of responding showed some increases across sessions. Of the treatments administered, contingent reinforcement/listening passage preview and repeated readings led to the greatest increases in oral ready fluency over baseline. The repeated readings intervention showed steady gains across sessions; however, the contingent reinforcement/listening passage preview interventions produced the greatest gains in fluency over baseline.

However, when considering instructional time, the data present a different picture. It is evident that when accounting for the amount of time taken to implement interventions, contingent reinforcement was most efficient in increasing oral reading fluency. Although not as evident as contingent reinforcement, the listening passage preview intervention revealed increases in reading fluency in a shorter amount of time. In addition, combinations of these interventions (i.e. contingent reinforcement/listening passage preview) also showed increases in oral reading fluency.
Fig 3. Number of words read correctly per minute (wrcpm) and words read correctly per minute of instructional time (wrcpmIT) for participant 3.

Figure 4 provides the data for participant 4 with regard to words read correctly per minute (wrcpm) and words read correctly per minute of instructional time (wrcpmIT). During baseline participant 4 (Patrice) read 88 words per minute. Under the repeated readings intervention, she experienced gains above baseline on all administrations; however, there was relatively no change over time across sessions. The contingent reinforcement intervention resulted in immediate gains in performance from baseline; however, on the final administration her rate of responding decreased. When exposed to the repeated readings/listening passage preview and contingent reinforcement/listening
passage preview intervention, Patrice initially experienced gains in oral reading fluency, but on the final administration of both her overall fluency decreased. Of the interventions administered, repeated readings/contingent reinforcement and listening passage preview showed the greatest gains from baseline. On the repeated readings/contingent reinforcement intervention, she experienced a steady gain in fluency from baseline. While initially experiencing an increase in fluency from baseline on the listening passage preview intervention, she later decreased her performance and then concluded with an increase.

However, when instructional time is taken into consideration, the data provide a different picture. It is evident that when accounting for the amount of time taken to implement interventions, contingent reinforcement was most efficient in increasing oral reading fluency.
Fig 4. Number of words read correctly per minute (wrcpm) and words read correctly per minute of instructional time (wrcpmIT) for participant 4.

Figure 5 provides the data for participant 5 with regard to words read correctly per minute (wrcpm) and words read correctly per minute of instructional time (wrcpmIT). During baseline participant 5 (Kara) read 47 words per minute. Unlike the performance demonstrated by the other participants, Kara did not exhibit a clear distinction in the intervention that was most beneficial in increasing her oral reading fluency from baseline. In fact, under the contingent reinforcement and repeated readings interventions, as well as a combination of these two interventions (i.e. contingent reinforcement/repeated readings), Kara’s oral reading fluency did not result in increases above baseline. During
the contingent reinforcement/listening passage preview intervention, her performance initially experienced an increase from baseline, but on the following two administrations her performance steadily decreased to below her baseline measure. Kara’s performance when exposed to the repeated readings/listening passage preview intervention was inconsistent, as measures were observed to fall both above and below her baseline measure. Of the interventions administered, Kara was most successful when administered the listening passage preview intervention. Among the three sessions, her scores increased above baseline on all administrations, despite a slight decrease on the final administration.

However, when considering instructional time the data provide a different picture. As with the previous participants, contingent reinforcement displayed the greatest gains in the shortest amount of time. However, it is evident when accounting for the amount of time taken to implement interventions, listening passage preview was the most efficient in increasing her oral reading fluency. While contingent reinforcement did reveal increases, it was not as beneficial for Kara as it was for the other participants.
Fig 5. Number of words read correctly per minute (wrcpm) and words read correctly per minute of instructional time (wrcpmlT) for participant 5.

Figure 6 provides the data for participant 6 with regard to words read correctly per minute (wrcpm) and words read correctly per minute of instructional time (wrcpmlT). During baseline participant 6 (Becky) read 66 words per minute. During the repeated readings intervention, Becky initially experienced a decrease in her overall reading fluency, but on the following administrations, her performance steadily increased from baseline. Again, during the contingent reinforcement intervention her performance initially fell below her baseline measure, experienced a slight increase and then again fell
to below baseline. During the listening passage preview intervention she initially showed a steady increase over baseline; however, during the final session her performance decreased. Her performance on the contingent reinforcement/listening passage preview intervention varied as she experienced a gain in oral reading fluency, then a decrease, followed by an increase. Of the interventions administered, repeated readings/contingent reinforcement and repeated readings/listening passage preview both showed steady gains from baseline, despite a slight decrease during the final administrations. The greatest gains from baseline were experienced when exposed to the repeated readings intervention.

However, when considering instructional time, Becky’s performance was similar to Kara. Unlike the other participants, her performance was most efficiently increased under the listening passage preview intervention. A consistent increase over baseline was experienced when exposed to the contingent reinforcement intervention.
Fig 6. Number of words read correctly per minute (wrcpm) and words read correctly per minute of instructional time (wrcpmIT) for participant 6.
Summary of Interventions Showing Greatest Gains for Words Read Correctly Per Minute (WRCPM) and Words Read Correctly Per Minute of Instructional Time (WRCPM (IT))

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Comprehension level and comprehension rate

In addition to the visual analysis of words read correctly per minute and words read correctly per minute of instructional time, visual analysis of comprehension levels (i.e. percent of accurate responding) and rates of comprehension (i.e. number of correct responses per minute of instructional time) were also conducted.

Figure seven provides the data for participant 1 with regard to total reading comprehension and comprehension rate. These data indicate that during baseline, Natasha successfully answered 67% of the comprehension questions presented to her. During the repeated readings intervention, Natasha’s overall percentage of comprehension questions answered successfully was consistent with her baseline measure; however, on one administration she answered 100% of the questions correctly. During the contingent reinforcement intervention her performance initially fell below her baseline measure; however, on subsequent administrations she experienced a steady gain in the percentage of questions answered correctly. Natasha’s performance on the listening passage preview intervention varied, as percentages correct were either consistent or below her baseline measure. During the contingent reinforcement/listening passage preview intervention, Natasha’s overall percentage initially increased, followed by a decrease to below baseline, and then a gain consistent with baseline. When exposed to the repeated readings/listening passage preview intervention, Natasha’s overall percentage initially fell below baseline, and then she experienced a steady gain, followed by a return to her baseline measure. On the repeated readings/contingent reinforcement intervention, Natasha experienced immediate gains, followed by a decrease below baseline, and then a return to her baseline measure.
However, when considering instructional time, results for comprehension rate are not as obvious as those obtained from oral reading fluency. A visual analysis of the results reveals that rates of total comprehension fall below baseline for all measures. However, despite performance measures initially falling below baseline for contingent reinforcement, steady gains were obtained during this intervention to above her baseline measure.

Fig 7. Percentage of total comprehension and total comprehension rate for participant 1.
Figure eight provides the data for participant 2 with regard to total reading comprehension and comprehension rate. These data indicate that during baseline, Thomas successfully answered 33% of the comprehension questions presented to him. During the repeated readings intervention, Thomas’s performance varied, as it was initially consistent with his baseline measure, then increased, and then fell below baseline. During the listening passage preview intervention, Thomas’s performance on all administrations was either consistent with or above his baseline measure. During the contingent reinforcement/listening passage preview intervention, Thomas’s overall percentage initially increased above baseline and was maintained; however, on the final administration it decreased to his baseline measure. When exposed to the repeated readings/listening passage preview intervention, Thomas’s overall percentage initially increased above baseline, then experienced a decrease, followed by an increase. On the repeated readings/contingent reinforcement intervention, Thomas’s performance was initially consistent with his baseline measure; however, on subsequent administrations, his performance fell below baseline. During the contingent reinforcement intervention Thomas experienced the greatest gains in overall comprehension, as his first administration resulted in a measure consistent with baseline; however, steady gains were obtained on the following administrations.

When considering instructional time, results for comprehension rate are consistent with the analysis of overall percentages of questions answered. A visual analysis of the results reveals that rates of total comprehension fall below baseline for all measures, with the exception of contingent reinforcement. While initially consistent with his
performance during baseline, Thomas experienced steady gains on subsequent administrations.

Fig 8. Percentage of total comprehension and total comprehension rate for participant 2.

Figure nine provides the data for participant 3 with regard to total reading comprehension and comprehension rate. These data indicate that during baseline, Jim successfully answered 50% of the comprehension questions presented to him. During the repeated readings intervention, Jim’s performance was consistent with his baseline
repeated readings intervention, Jim’s performance was consistent with his baseline measure during the first two sessions; however, on the final administration of the repeated readings intervention, he experienced a gain in overall comprehension. During the contingent reinforcement intervention, Jim’s overall percentage correct fell below baseline; however, on the final administration it was consistent with his baseline measure. During the contingent reinforcement/listening passage preview intervention, Jim’s overall percentage correct initially increased above baseline; however, on the final administration it decreased to his baseline measure. When exposed to the repeated readings/listening passage preview intervention, Jim’s overall percentage was inconsistent, as it fluctuated above and below his baseline measure. On the repeated readings/contingent reinforcement intervention, Jim’s performance initially decreased below his baseline measure; however, on the final administration, his performance increased to above baseline. Jim experienced the greatest gains in overall comprehension during the listening passage preview intervention. Despite his performance initially falling below baseline, he experienced steady gains on subsequent administrations.

When considering instructional time, results for comprehension rate are consistent with the analysis of overall percentages of questions answered. A visual analysis of the results reveals that rates of total comprehension fall below baseline for all measures, with the exception of listening passage preview and contingent reinforcement/listening passage preview. During two sessions, Jim’s comprehension rate increased above his baseline measure when exposed to the contingent reinforcement/listening passage preview intervention. However, on the final administration, his comprehension rate fell below baseline. The listening passage preview intervention reveals the greatest gains in
overall comprehension when evaluating rate. While initially decreasing below his baseline measure, Jim experienced steady gains on subsequent administrations.

Fig 9. Percentage of total comprehension and total comprehension rate for participant 3.

Figure ten provides the data for participant 4 with regard to total reading comprehension and comprehension rate. These data indicate that during baseline, Patrice successfully answered 50% of the comprehension questions presented to her. During the repeated readings intervention, Patrice initially experienced gains above baseline; however, during the following session, her overall comprehension fell below baseline and
then increased to her baseline measure on the final administration. During the contingent reinforcement intervention Patrice’s overall percentage correct fell below baseline initially; however, during the second and third sessions it was consistent with her baseline measure. During the listening passage preview intervention, Patrice’s performance initially decreased below baseline, then increased to her baseline measure, and then decreased below baseline once again. During the contingent reinforcement/listening passage preview intervention, Patrice’s overall percentage correct initially decreased below baseline; however, on the second administration it increased above baseline, and then decreased to her baseline measure. When exposed to the repeated readings/listening passage preview intervention, Patrice’s overall percentage was inconsistent, as it fluctuated above and below her baseline measure. On the repeated readings/contingent reinforcement intervention, Patrice’s performance was consistent with her baseline measure during the first two sessions; however, on the final administration, her performance decreased to below baseline. Unlike the fore mentioned participants; there was not an intervention that consistently increased Patrice’s overall reading comprehension.

When considering instructional time, results for comprehension rate are consistent with the analysis of overall percentages of questions answered. A visual analysis of the results reveals that rates of total comprehension fall below baseline for all measures, with the exception of contingent reinforcement. Despite her performance initially decreasing below her baseline measure, Patrice’s performance increased above baseline, and then decreased to her baseline measure. Therefore, contingent reinforcement is most efficient in quickly increasing her overall comprehension.
Fig 10. Percentage of total comprehension and total comprehension rate for participant 4.

Figure eleven provides the data for participant 5 with regard to total reading comprehension and comprehension rate. These data indicate that during baseline, Kara successfully answered 67% of the comprehension questions presented to her. During the repeated readings intervention, Kara’s performance during the first and third sessions resulted in overall comprehension consistent with her baseline measure; however, during the second session, her overall comprehension fell below baseline. During the contingent reinforcement intervention Kara’s overall percentage correct fell below baseline initially;
however, during the third session it increased above her baseline measure. During the contingent reinforcement/listening passage preview intervention and the repeated readings/listening passage preview intervention, Kara’s overall percentage correct initially decreased below baseline; however, on the second administration it increased to her baseline measure, and then decreased to below baseline. On the repeated readings/contingent reinforcement intervention, Kara’s performance decreased substantially as she did not answer any comprehension questions correctly during the first sessions; however, on subsequent administrations, her performance steadily increased to her baseline measure. Kara experienced the greatest gains in overall comprehension during the listening passage preview intervention. Kara’s performance initially decreased below baseline; however, on the two final administrations, she answered all comprehension questions correctly.

When considering instructional time, results for comprehension rate reveal that Kara obtained the greatest increase in overall comprehension most efficiently when exposed to the listening passage preview and contingent reinforcement interventions. A visual analysis of the results reveals that rates of total comprehension fall below baseline for all measures, with the exception of listening passage preview and contingent reinforcement. When exposed to both interventions, her comprehension rate decreased below baseline during the first administration; however, she experienced steady gains above baseline on subsequent administrations.
Fig 11. Percentage of total comprehension and total comprehension rate for participant 5.

Figure twelve provides the data for participant 6 with regard to total reading comprehension and comprehension rate. These data indicate that during baseline, Becky successfully answered 83% of the comprehension questions presented to her. During the repeated readings, contingent reinforcement, and repeated readings/contingent reinforcement interventions, Becky’s performance decreased below baseline on all administrations. During the listening passage preview intervention, Becky experienced decreases in overall comprehension below baseline on the first two administrations; however, her percentage increased above baseline on the final administration. During the
however, her percentage increased above baseline on the final administration. During the contingent reinforcement/listening passage preview intervention, Becky’s overall percentage correct initially was consistent with her baseline measure; however, on the second administration it decreased below baseline, and then increased to baseline. Becky experienced the greatest gains in overall comprehension during the repeated readings/listening passage preview intervention. Becky’s performance was consistent with her baseline measure on the first and final administration; however, on the second administration it increased above baseline.

When considering instructional time, results for comprehension rate reveal that Becky obtained the greatest increase in overall comprehension most efficiently when exposed to the listening passage preview intervention. A visual analysis of the results reveals that rates of total comprehension fall below baseline for all measures, with the exception of listening passage preview and contingent reinforcement. When exposed to the listening passage preview intervention, her comprehension rate decreased below baseline during the first administration; however, she experienced steady gains above baseline on subsequent administrations.
Fig 12. Percentage of total comprehension and total comprehension rate for participant 6.
Summary of Interventions Showing Greatest Gains for Total Comprehension and Comprehension Rate

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Percent factual comprehension and factual comprehension rate

Figure thirteen provides the data for participant 1 with regard to percent factual comprehension and factual comprehension rate. These data indicate that during baseline, Natasha successfully answered 100% of the factual comprehension questions presented to her. When exposed to the contingent reinforcement and repeated readings/listening passage preview intervention, Natasha’s performance initially decreased below her baseline measure, however on the final two administrations, her performance increased to 100% factual comprehension. During the listening passage preview and repeated readings/contingent reinforcement intervention, Natasha’s performance was initially consistent with her baseline measure, but on subsequent administrations it decreased to below her baseline measure. Natasha was most successful when administered the repeated readings and contingent reinforcement/listening passage preview interventions, as her overall factual comprehension was 100% on all administrations.

When taking instructional time into consideration, none of the interventions were successful at quickly increasing rates of factual comprehension, with the exception of contingent reinforcement and contingent reinforcement/listening passage preview. During the contingent reinforcement intervention, Natasha’s rate of efficiently answering factual comprehension questions decreased below her baseline measure; however, her factual comprehension steadily increased to above her baseline measure on subsequent administration. The contingent reinforcement/listening passage preview was initially efficient at increasing rates of factual comprehension, as Natasha’s performance during the first session increased above her baseline measure; however, on subsequent administrations it decreased slightly below her baseline measure.
Fig 13. Percentage of factual comprehension and factual comprehension rate for participant 1.

Figure fourteen provides the data for participant 2 with regard to percent factual comprehension and factual comprehension rate. These data indicate that during baseline, Thomas successfully answered 33% of the factual comprehension questions presented to him. During all sessions of the contingent reinforcement and repeated readings/listening passage preview interventions, Thomas’s performance increased above his baseline measure to 67% factual comprehension. When exposed to the repeated readings intervention, his performance was consistent with his baseline measure during the first and last administration; however, during the second session he answered 100% of the
factual comprehension questions. Initially, when administered the listening passage preview intervention, Thomas's performance increased above baseline to 100%, then decreased to his baseline measure, and then increased again. When exposed to the contingent reinforcement/listening passage preview intervention, Thomas experienced steady gains above baseline; however, on the final administration, his performance decreased. During the repeated readings/contingent reinforcement intervention, Thomas’s performance initially increased above baseline and then on subsequent administration was consistent with his baseline measure.

When taking instructional time into consideration, it becomes evident that contingent reinforcement was most efficient in quickly increasing factual comprehension rates. While other interventions were successful at increasing rates of comprehension on some administrations, contingent reinforcement reveals evident rates above baseline.
Fig 14. Percentage of factual comprehension and factual comprehension rate for participant 2.

Figure fifteen provides the data for participant 3 with regard to percent factual comprehension and factual comprehension rate. These data indicate that during baseline, Jim successfully answered 33% of the factual comprehension questions presented to him. During the contingent reinforcement intervention, Jim’s performance was consistent with his baseline measure on all administrations. The contingent reinforcement/listening passage preview intervention resulted in steady increases above baseline on the first two administrations; however, on the final administration overall factual comprehension decreased. When exposed to the repeated readings/listening passage preview
decreased. When exposed to the repeated readings/listening passage preview intervention, Jim’s performance increased steadily above baseline; however, on the final administration it decreased to his baseline measure. During the listening passage preview intervention, Jim’s performance increased above baseline and on the final administration Jim answered 100% of the factual comprehension questions. When exposed to the repeated readings and repeated readings/contingent reinforcement interventions, Jim’s overall factual comprehension increased above baseline to 67% on all administrations.

However, when considering instructional time, it becomes more evident which intervention is most efficient at quickly increasing rates of factual comprehension. Both the listening passage preview and contingent reinforcement/listening passage preview interventions resulted in rates above baseline for all three sessions of each treatment. Steady increased above baseline were initially observed during the contingent reinforcement/listening passage preview intervention; however, on the final administration his performance decreased. During the listening passage preview intervention, Jim’s performance was consistent above his baseline measure during the first two sessions; however, on the final administration it increased once again.
Fig 15. Percentage of factual comprehension and factual comprehension rate for participant 3.

Figure sixteen provides the data for participant 4 with regard to percent factual comprehension and factual comprehension rate. These data indicate that during baseline, Patrice successfully answered 67% of the factual comprehension questions presented to her. When exposed to the contingent reinforcement intervention, Patrice’s performance was consistent with her baseline measure during all three sessions. During the repeated readings intervention, her performance initially increased above baseline during the first administration; however, on subsequent administrations it decreased to baseline. Patrice answered 100% of the factual comprehension questions during the first two sessions of
the contingent reinforcement/repeated readings intervention; however, on the final administration her comprehension decreased to baseline. When exposed to the listening passage preview intervention, her performance was initially consistent with baseline; however, during following sessions it decreased below her baseline measure. During the repeated readings/listening passage preview intervention, her performance was initially consistent with baseline, then increased to 100% factual comprehension, and finally decreased below her baseline measure. On the first administration of the contingent reinforcement/listening passage preview intervention, Patrice incorrectly answered all factual comprehension questions resulting in a decrease below her baseline measure. However, during the following sessions, her comprehension increased above baseline to 100% and then decreased to baseline.

When taking instructional time into consideration, Patrice’s rate of factual comprehension did not increase above baseline during any of the interventions administered. However, it is apparent that contingent reinforcement is most efficient at quickly increasing rates of factual comprehension in comparison to the other interventions.
Fig 16. Percentage of factual comprehension and factual comprehension rate for participant 4.

Figure seventeen provides the data for participant 5 with regard to percent factual comprehension and factual comprehension rate. These data indicate that during baseline, Kara successfully answered 100% of the factual comprehension questions presented to her. When exposed to the repeated readings/listening passage preview, repeated readings/contingent reinforcement, and contingent reinforcement listening passage preview interventions, Kara’s performance did not increase above her baseline measure during any of the administrations. During the repeated readings intervention, Kara’s performance was consistent with her baseline measure on the first and final
administration; however, during the second administration her performance decreased below her baseline measure. During the first two sessions of the contingent reinforcement intervention, Kara’s performance decreased below her baseline measure; however, on the final administration her performance increased to her baseline measure. Listening passage preview was most effective at increasing factual comprehension, as Kara correctly answered all questions during all sessions.

When taking instructional time into account, it becomes evident that contingent reinforcement and listening passage preview were most efficient at quickly increasing rates of factual comprehension. For all other interventions administered, Kara’s performance decreased below her baseline measure. Despite initial decreases below her baseline measure, Kara’s performance increased steadily above baseline when exposed to the contingent reinforcement intervention. During the listening passage preview intervention, her performance was above her baseline measure on all administrations.
Fig 17. Percentage of factual comprehension and factual comprehension rate for participant 5.

Figure eighteen provides the data for participant 6 with regard to percent factual comprehension and factual comprehension rate. These data indicate that during baseline, Becky successfully answered 100% of the factual comprehension questions presented to her. During the repeated readings/contingent reinforcement intervention, Becky's performance was initially consistent with her baseline measure; however, her performance steadily decreased below baseline on subsequent administrations. When exposed to the contingent reinforcement intervention, her performance was initially
consistent with baseline, then decreased below baseline, and finally increased once again. When exposed to the contingent reinforcement/listening passage preview intervention, Becky’s performance was consistent with her baseline measure during the first and final administrations; however, on the second administration her performance decreased below baseline. During the repeated readings and listening passage preview interventions, Becky’s performance initially decreased below baseline; however, on subsequent administrations increased to 100% factual comprehension. Becky was most successful when exposed to the repeated readings/listening passage preview intervention, as she answered 100% of the factual comprehension questions during all sessions.

When taking instructional time into account, it is apparent that the listening passage preview intervention was most efficient at quickly increasing rates of factual comprehension. Despite an initial decrease below her baseline measure, steady gains were observed on subsequent administrations.
Fig 18. Percentage of factual comprehension and factual comprehension rate for participant 6.
Summary of Interventions Showing Greatest Gains for Percent Factual Comprehension and Factual Comprehension Rate

<table>
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<th>Participant</th>
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Percent inferential comprehension and inferential comprehension rate

Figure nineteen provides the data for participant 1 with regard to percent inferential comprehension and inferential comprehension rate. These data indicate that during baseline, Natasha successfully answered 33% of the inferential comprehension questions presented to her. During the repeated readings and repeated readings/listening passage preview interventions, Natasha’s performance was initially consistent with her baseline measure, then increased to 100% during the second session, and then returned to baseline. During the contingent reinforcement intervention, her performance was consistent with her baseline measure during the first two sessions, but then increased during the final administration. When exposed to the listening passage preview intervention, her performance was initially consistent with her baseline measure, then decreased to 0%, and then increased to above baseline. During the contingent reinforcement/listening passage preview intervention, her performance increased above baseline, then decreased to 0%, and then increased to her baseline measure. The repeated readings/contingent reinforcement resulted in her performance increasing above baseline, then decreasing to her baseline measure, and then increasing once again.

When considering instructional time, results are inconsistent as to which intervention was most efficient in increasing Natasha’s inferential comprehension rate. For each of the interventions, one session of three for each of the treatment conditions resulted in increases above her baseline measure. During the first two sessions, the contingent reinforcement intervention resulted in rates below her baseline measure; however, on the final administration, her performance increased above her baseline measure.
Fig 19. Percentage of inferential comprehension and inferential comprehension rate for participant 1.

Figure twenty provides the data for participant 2 with regard to percent inferential comprehension and inferential comprehension rate. These data indicate that during baseline, Thomas successfully answered 33% of the inferential comprehension questions presented to him. During the repeated readings/contingent reinforcement intervention, Thomas’s overall inferential comprehension decreased below his baseline measure on all administrations, as he did not answer any of the inferential items correctly. Initially, when exposed to the contingent reinforcement intervention, his performance decreased below baseline, then steadily increased above baseline, and then was maintained during
the final session. During the repeated readings intervention, Thomas’s performance was consistent with his baseline measure, then increased on the second administration, and finally decreased below baseline on the final administration. During the listening passage preview intervention, Thomas’s performance increased above baseline and then returned to his baseline measure during the final two sessions. When exposed to the repeated readings/listening passage preview and contingent reinforcement/listening passage preview interventions, his performance was consistent with his baseline measure on the first and final administration, but decreased below baseline on the second administration, as all inferential questions were answered incorrectly.

However, when taking instructional time into account, it becomes more evident which intervention was most efficient in quickly increasing inferential comprehension. Thomas’s overall rates of inferential comprehension decreased below his baseline measure when exposed to all interventions, with the exception of listening passage preview and contingent reinforcement. Initially, his rates of inferential comprehension increased above baseline when exposed to the listening passage preview intervention; however, on the second and final administration, his rate fell below baseline. Despite Thomas’s performance initially decreasing below baseline on the contingent reinforcement intervention, he experienced increases above baseline on subsequent administrations.
Fig 20. Percentage of inferential comprehension and inferential comprehension rate for participant 2.

Figure twenty-one displays the data for participant 3. These data indicate that during baseline, Jim successfully answered 67% of the inferential comprehension questions presented to him. During the repeated readings/contingent reinforcement intervention, Jim’s performance decreased below baseline to 0% during the first two sessions; however, on the final administration his inferential comprehension increased above his baseline measure. When exposed to the repeated reading and contingent reinforcement interventions, Jim’s performance decreased below baseline during the first two administrations; however, on the final administration it increased to his baseline
measure. During the repeated readings/listening passage preview intervention, Jim's performance initially decreased below his baseline measure, then increased, and finally decreased below his baseline measure once again. On the listening passage preview intervention, Jim initially answered all inferential questions incorrectly; however, his performance steadily increased to above baseline on subsequent administrations. Jim's performance was consistent with his baseline measure during the first two administrations of the contingent reinforcement/listening passage preview intervention; however, during the final session his performance decreased to below baseline.

When taking instructional time into account, Jim’s inferential comprehension rate decreased below baseline for all interventions, with the exception of listening passage preview. Despite Jim’s performance initially decreasing below baseline when exposed to the listening passage preview intervention, his rate of inferential comprehension steadily increased above baseline.
Fig 21. Percentage of inferential comprehension and inferential comprehension rate for participant 3.

Figure twenty-two provides the data for participant 4 with regard to percent inferential comprehension and inferential comprehension rate. These data indicate that during baseline, Patrice successfully answered 33% of the inferential comprehension questions presented to her. During all sessions of the contingent reinforcement/repeated readings intervention, Patrice’s performance decreased below baseline, as all inferential comprehension questions were answered incorrectly. During both the listening passage preview and repeated readings/listening passage preview interventions, Patrice’s
performance initially decreased below baseline as all inferential questions were answered incorrectly. However on subsequent administrations, her comprehension increased above baseline and then returned to her baseline percent. When exposed to the contingent reinforcement/listening passage preview intervention, her performance was consistent with her baseline measure on the first and final administrations; however, during the second session her performance increased above baseline. During the contingent reinforcement intervention, Patrice’s performance decreased below her baseline measure on the first administration; however, on subsequent administrations it was consistent with baseline. When exposed to the repeated readings intervention, Patrice’s comprehension increased above baseline during the first session, then decreased below baseline, and finally increased to her baseline measure.

When taking instructional time into account, rates of inferential comprehension decreased below baseline when exposed to repeated readings/contingent reinforcement, reinforcement repeated readings/listening passage preview, and repeated readings. For the remaining interventions, results are inconsistent, as there was not one intervention that increased rates of inferential comprehension most efficiently across all sessions.
Fig 22. Percentage of inferential comprehension and inferential comprehension rate for participant 4.

Figure twenty-three provides the data for participant 5 with regard to percent inferential comprehension and inferential comprehension rate. These data indicate that during baseline, Kara successfully answered 33% of the inferential comprehension questions presented to her. During all administrations, Kara’s performance on the repeated readings intervention was consistent with her baseline measure. When exposed to the contingent reinforcement intervention, Kara’s performance was consistent with baseline during the first two sessions; however, during the final session her
comprehension increased above baseline. During the listening passage preview intervention, Kara’s performance decreased below baseline during the first session, however on subsequent administrations she answered 100% of the inferential items. When exposed to the contingent reinforcement/listening passage preview intervention, Kara’s performance decreased below baseline during the first and final administration; however, on the second administration her performance increased above baseline. During the repeated readings/contingent reinforcement intervention, Kara’s performance decreased below baseline during the first two sessions; however, increased above baseline during the final session. When exposed to the repeated readings/listening passage preview intervention, Kara’s performance initially decreased below baseline, then increased above baseline, and finally decreased to her baseline measure.

When taking instructional time into account, it becomes evident that the listening passage preview and contingent reinforcement interventions were most efficient in increasing rates of inferential comprehension. Despite initial decreased below baseline when exposed to the listening passage preview intervention, steady increases were observed on subsequent administrations. When exposed to the contingent reinforcement intervention, steady increased in rates of inferential comprehension were observed during each session.
Fig 23. Percentage of inferential comprehension and inferential comprehension rate for participant 5.

Figure twenty-four provides the data for participant 6 with regard to percent inferential comprehension and inferential comprehension rate. These data indicate that during baseline, Becky successfully answered 67% of the inferential comprehension questions presented to her. When exposed to the repeated readings and contingent reinforcement interventions, Becky’s performance decreased below her baseline measure on all sessions. During the repeated readings/contingent reinforcement intervention, her performance initially decreased below baseline; however, then increased to her baseline
measure. Becky’s performance was consistent with her baseline measure on the first and final administration of the contingent reinforcement/listening passage preview intervention; however, during the second administration her performance decreased below baseline. When exposed to the listening passage preview intervention, Becky’s performance was consistent with her baseline measure, then decreased below baseline, and finally increased above baseline. During the repeated readings/listening passage preview intervention, Becky’s performance was consistent with baseline on the first and final administration; however, during the second administration her performance increased above baseline.

When taking instructional time into account, it is apparent that the listening passage preview intervention was most efficient at quickly increasing rates of inferential comprehension. Despite initial decrease below baseline, Becky’s performance increased on the final administration.
Fig 24. Percentage of inferential comprehension and inferential comprehension rate for participant 6.
### Summary of Interventions Showing Greatest Gains for Percent Inferential Comprehension and Inferential Comprehension Rate

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Note: CR represents Comprehension Rate, RR represents Reading Rate, and LPP represents Language Processing Potential.
Discussion

The current study investigated the extent to which using different variables may affect clinical judgment with regard to selecting specific reading interventions using a functional analysis of academic responding. Specifically this study compared the outcomes of the traditional variable (i.e. reading rate) with the outcomes of three other variables (i.e. reading rate as a function of instructional time, comprehension rate, and comprehension rate as a function of instructional time).

The present results indicate that when evaluating oral reading fluency, there were not consistent increases in words read correctly per minute from baseline across all conditions. Research by Cates et al., (In press), Watson & Ray, (1997), and Skinner et al., (1991) suggests that basing decisions on effectiveness data may be poor educational practice that fails to maximize student learning rates. Results of the present research are consistent with these findings. When simply evaluating the effectiveness of the interventions, each participant experienced greatest gains from baseline on a variety of the administered interventions. When visually examining the results, none of the participants experienced gains from baseline when exposed to only the contingent reinforcement intervention, which is consistent with research by Daly et al. (1998). However, results suggested that for the variable of reading rate as a function of instructional time it is necessary to take instructional rate into consideration as it results in a different interpretation of the data. When taking instructional time into account, four of the six participants experienced gains most quickly when exposed to the contingent reinforcement intervention. Previous research by Daly et al. (1998) used contingent reinforcement as a method of ruling out the possibility that poor reading rates were the
result of a performance deficit, rather than a skill deficit. As for possible reasons as to why this group of students were successful when exposed to the contingent reinforcement intervention, these students may have been driven to succeed due to the attention they obtained by working with the examiner one on one or by their desire to please. The remaining two participants experienced gains in oral reading fluency most efficiently when exposed to the listening passage preview intervention. While listening passage preview may be a more time intensive intervention, students seemed to benefit from having previous exposure to the text at hand. As previously mentioned, with the increased amount of responsibilities placed on educators today, it is vital to evaluate the instructional time necessary in administering interventions.

Similar to the results obtained for oral reading fluency, each participant benefited from different interventions for the variable of comprehension rate. There was not a particular intervention that consistently increased overall rates of comprehension across conditions. Minimal research has been done to evaluate interventions that are effective in increasing rates of comprehension. Research by Rosenshine (1980) found that treatment conditions requiring more instructional time may result in greater increases in factual comprehension specifically. Therefore, it would be expected that the repeated readings or listening passage preview interventions would be most beneficial in increasing rates of comprehension as participants have multiple exposures to the same material. Four of the six participants in the study benefited from the aforementioned interventions (participant 1 = repeated readings/contingent reinforcement, participant 3 = listening passage preview, participant 5 = listening passage preview, participant 6 = repeated readings/listening passage preview). Participant 2 exhibited the greatest gains in
comprehension rate when exposed to the contingent reinforcement intervention and participant 4 did not benefit from any of the interventions when attempting to increase comprehension.

Finally, the results of the current study suggested that for comprehension rate as function of instructional time, participants most efficiently increased rates of comprehension when exposed to the contingent reinforcement and/or listening passage preview interventions. Three of the participants increased rates of comprehension most efficiently when exposed to the contingent reinforcement intervention and two participants benefited most from the listening passage preview intervention. The final participant increased rates of comprehension most quickly when exposed to the listening passage preview/contingent reinforcement intervention. Unlike the results for oral reading fluency, instructional time does not impact overall results of comprehension as dramatically. In fact, for the majority of participants, the same intervention was most effective and efficient for increasing rates of comprehension.

When evaluating factual comprehension specifically, there were not consistent changes in the number of correct factual questions across all conditions. Prior research by Freeland et al. (2000) found that repeated readings were effective in increasing factual comprehension. A repeated reading intervention combined with other interventions was effective in increasing factual comprehension for four of the six participants. For the remaining two participants, factual comprehension increased when exposed to the listening passage preview intervention. However, results varied when taking instructional time into account. Contingent reinforcement and listening passage preview were most efficient in increasing factual comprehension levels. Three of the six
participants increased their overall factual comprehension when exposed to the contingent reinforcement intervention and three of the six participants benefited most from the listening passage preview intervention.

When evaluating inferential comprehension, results are not as obvious as those found with the other variables. Previous research by Freeland et al. (2000) found no increases in the number of inferential questions answered correctly through the use of repeated readings specifically. Current results found repeated readings when combined with listening passage preview was effective in increasing inferential comprehension with one participant. Consistent with results for factual comprehension, the other participants benefited most when exposed to the contingent reinforcement or listening passage preview intervention. When taking instructional time into account, contingent reinforcement and listening passage preview proved to be most efficient in quickly increasing rates of inferential comprehension as well.

The current study extended earlier research on a functional analysis of academic responding by taking instructional time and comprehension into account. While prior research by Daly et al (1996) examined an instructional hierarchy for reading interventions, this research did not take teacher time into consideration. Current results have shown that students using a variety of interventions can make improvements in oral reading fluency and comprehension; however, it does not exclude the fact that there may be more efficient methods to achieving the same results.

The current study is not without limitations however. First, the small number of participants included in this study limits the generalization of the present findings. Secondly, effectiveness of intervention is based on minimal exposures to each of the
interventions. Results are limited, as the interventions cannot be examined over extended periods of time. Additionally, the examiner developed comprehension questions and correct responses were at the discretion of the examiner as well.

Future research should investigate additional interventions that impact both factual and inferential comprehension rates. Minimal research has been conducted in this area and this is vital, as students read to comprehend what they have read. Additionally, similar research should be aimed at extending research over greater periods of time using a larger participant pool.

Despite these limitations and the need for future research, this study does have implications for both researchers and practitioners. First, it is necessary for practitioners to examine not only the effectiveness, but also the efficiency of interventions used within the school system today. As mentioned, educators have a limited amount of time for working with students and it is most efficient to achieve results quickly. Second, interventions as simple as contingent reinforcement can increase rates of fluency and comprehension quickly, rather than using more complex (i.e., time consuming) interventions. With the results of future research and current potential implications, functional analysis of academic responding may have great potential for increasing the efficiency of service delivery focusing on remediation and prevention of reading rate and comprehension problems of school aged children.
References


Appendix A

Request for Permission to Complete Research

August 29, 2003

Dear Marcie Nordlund,

As you well know, I am currently an intern for District 200 and as a condition of obtaining my specialist degree from Eastern Illinois University; I am required to complete a thesis. In return for permission to complete this study at Johnson Elementary, I may be able to provide helpful insight into useful reading interventions that could be used by your classroom teachers and special staff.

The study I am completing, *Considering Instructional Time and Comprehension Rate when Evaluating the Effectiveness of Reading Interventions in Classrooms*, will evaluate the amount of time required by teachers to implement reading interventions within their classrooms. While teachers have a vast repertoire of interventions for use, their time is a precious commodity and it is necessary to evaluate the time needed in implementing these interventions so that teachers can best serve our students.

After speaking with the Title 1 staff, it has come to my attention that there are a number of 4th grade students who did not qualify for services, yet had some difficulty with fluency. These students would be ideal candidates for my thesis, as the interventions I would be providing could be useful in helping these students to be successful readers. I will implement all interventions and minimal time will be required for student participation. Furthermore, times will be arranged with classroom teachers to determine the best time for working with each individual child. Parent permission would be obtained through Title 1 permission, as well as a form explaining my role in the school this year. All data collected will be anonymous and will not be linked to the school or children in any way.

I appreciate having the opportunity to work with students at Johnson Elementary, as well as being able to fulfill my internship responsibilities.

Sincerely,

Kelly Jennings

I grant permission for Kelly Jennings, a school psychology intern for District 200 to administer reading interventions by assisting Johnson Elementary Title 1 staff. I understand that the purpose of this administration is to provide insight into research on teacher time spent during classroom interventions, as well as reading comprehension. Additionally, all data collected will not be linked to Johnson Elementary or its students.

Marcie Nordlund, Johnson Elementary Principal

Date
Appendix B

Title 1 Permission Slip

September 10, 2003

Dear Parent,

Your child ____________________________________________________________________________, has been referred to the Title 1 Program at Johnson School to receive support services in:
__________________________________________________________________________________________.

The Title 1 Program is a federally funded program that provides extra assistance to students in reading or math, either in the classroom setting, or through small group tutoring in a “pull-out” format. Title 1 is NOT special education. Students may enter or exit the program at any time during the school year. Title 1 complements and supplements the regular classroom curriculum in reading and math.

Your child has met at least 2 to 3 of the following qualifications:

- Formal test scores (MAT, ISAT). Student is at risk of not meeting state standards.
- Teacher Recommendation
- Received Title 1 services in the past
- Informal test results

Your child will be receiving Title 1 services in a small group setting or in the classroom From ___________________________ on _____________________________.

Please read and sign the attached compact and return to your child’s teacher as soon as possible. Please feel free to call if you have any questions. Thank you.

Sincerely,

Denise Szafran, Barbara Michulsky and Kristi Lindahl
Title 1 Teachers

________________________________________________________________________________________

No, I do not wish my child, __________________________________________________________________________ to receive supplemental assistance in class.

________________________________________________________________________________________

Parent Signature

Yes, my child has permission to participate in the Title 1 program.

________________________________________________________________________________________

Parent Signature
August 29, 2003

Dear Parent,

Recently, you signed permission for your child _________________ to participate in the Title 1 Program at Johnson Elementary. The support services provided will help your child improve in reading.

I am writing this letter to introduce myself. This year, I am a school psychology intern for District 200 and as a requirement for my graduate degree, I will be working with your child individually in helping them to improve their reading fluency skills. A time will be determined with your child’s classroom teacher in limiting the amount of time your child will be outside of their regular classroom. This additional reading assistance will occur two to three times per week during this semester.

As you know, your child’s participation is voluntary and you may pull your child from Title 1 services at anytime.

I appreciate you allowing me to work with your child and ask that you could please sign consent for your child to work with me. Please complete the form below and have your child return it to school.

I grant permission for Kelly Jennings, a school psychology intern for District 200 to administer reading interventions to my child, _________________, for whom I am the parent or guardian. I understand that the services provided will help my child to improve their reading fluency skill, as well as reading comprehension.

__________________________
Signature of Parent or Legal Guardian

__________________________
Date
Appendix D

Parent Permission (Spanish version)

29 de agosto, 2003

Estimado Padre:

Recientemente, Ud. firmó un permiso para que su hijo __________________ participare en el programa de Título 1 en Johnson Elementary. Estos servicios de apoyo le ayudarán a su hijo a mejorar a leer.

Le escribo esta carta para presentar yo misma. Este año, yo soy asistente de sicología de escuela para District 200 y como requésito de obtener la carrera, trabajare con su hijo individualmente en ayudarle a mejorar sus habilidades de leer con fluidez. Un tiempo específico será determinado con el maestro de su hijo para limitar la cantidad de tiempo que su hijo no estará en la clase regular. Esta ayuda adicional de leer sucederá dos a tres veces cada semana durante el semestre.

Como ya sabe, la participación de su hijo es voluntaria y puede dejar de los servicios de Título 1 en cualquier momento.

Yo aprecio que Ud. me permita trabajar con su hijo y le pido que por favor firme el permiso para que su hijo pueda trabajar conmigo. Por favor complete el formulario abajo y su hijo puede llevarlo a la escuela.

_____________________________

Yo le doy permiso a Kelly Jennings, asistente de sicología de escuela para District 200, administrar intervenciones de leer a mi hijo _____________________________, para quien yo soy padre o guardián legal. Entiendo que los servicios le ayudará a mi hijo a mejorar sus habilidades de leer con fluidez, además de leer con comprensión.
Appendix E

Miranda watched for bits of greenery along the path to the lighthouse, but there was nothing there, not even a blade of grass. When they left Grandma’s farm that morning, pink roses had been in bloom…would this barren island ever seem like home?

“Look,” said father. “Here’s an old coop for your chickens.” It was made of odds and ends. Not fancy, Miranda thought, but it would keep the hens safe.

They climbed the stone steps to the cottage and pulled open the heavy door. Miranda walked quickly through the kitchen and peeked into the parlor. Then she ran upstairs to see her bedroom. It looked sunny and cheerful. She took an old cushion from the chair by the bed and put it on the wide stone windowsill. This is where I’ll read, she decided, where I can look up and see the waves.

Then Miranda hurried downstairs. She could hardly wait to explore the lighthouse.

“Come along,” said father. “It’s right through this door.”

Mother and Miranda followed him from the kitchen into the storeroom at the base of the tower. Mother took just one look at the long circular stairs. “I think I’ll stay down here,” she said.

But father and Miranda climbed upward until they reached the room at the top, with its circle of lamps and its windows all around. They looked out at the ocean.

(TW = 230)

Why were Miranda and her family exploring their new home? (I)
What did the passage mean when it said “barren island?” (I)
Where did Miranda decide she would read? (F)
What was Miranda’s father’s job? (I)
What did Miranda want to explore? (F)
What had been in bloom at grandmas? (F)
Except for one terrifying moment when the boy had poked his finger through the mouse hole, a hungry young mouse named Ralph eagerly watched everything that went on in Room 215. At first he was disappointed at the size of the boy who was to occupy the room. A little child, preferably two or three children, would have been better. Little messy children were always considerate about leaving crumbs on the carpet. Oh well, at least these people did not have a dog. If there was one thing Ralph disliked, it was a snoopy dog.

Next Ralph felt hopeful. Medium-sized boys could almost always be counted on to leave a sticky candy-bar wrapper on the floor or a bag of peanuts on the bedside table, where Ralph could reach them by climbing up the telephone cord. With a boy this size the food, though not apt to be plentiful, was almost sure to be of good quality.

The third emotion felt by Ralph was joy when the boy laid the apple core by the telephone. This was followed by despair when the mother dropped the core into the metal wastebasket. Ralph knew that anything at the bottom of a wastebasket was lost to a mouse forever. (TW = 206)

When Ralph said the food would not be plentiful, what did he mean? (I)
What kind of animal was Ralph? (F)
What type of animal did Ralph dislike? (F)
Why did Ralph feel despair when the mother dropped the apple core into the metal wastebasket? (I)
Why was Ralph disappointed at the size of the boy to occupy the room? (I)
What emotion did Ralph feel when the boy laid the apple core by the telephone? (F)
Appendix G

Only on one point does everyone agree. Nessie doesn’t look like anything they have ever seen. People have also seen Nessie doing strange things. They say:

She streaks beneath the water like a torpedo. She trails a sizzling wake of white foam. She showers spray in all directions when she surfaces. She sinks back into the water straight down like a stone.

Also, Nessie is not only a water monster! She has been spotted several times on land! For years, there have been frightening stories about Nessie. Most people are just afraid when they see her. But sometimes Nessie makes people fear for their lives.

One story is about three fishermen. Late one night they set out in a small boat looking for salmon. Loch Ness is a fine lake for fishing. It is full of salmon, eel, pike, and trout. But these fishermen were breaking the law. No fishing is allowed in Loch Ness after eight at night.

It was a beautiful spring night. The men were sure they would catch lots of fish. Suddenly, they forgot about fishing. Something very big was under their boat. And that something was lifting them up and out of the water. They men went white with fright.

What strange force could do this? Then, suddenly their boat came back down. The men saw a giant shape swim away. Was it Nessie? (TW = 229)

Besides in the water, where else has Nessie been spotted? (F)
What law did the fishermen break? (F)
What do the people think Nessie is? (I)
What does it mean when the passage said, “she streaks beneath the water like a torpedo?” (I)
What types of fish could be found in Loch Ness? (F)
What does it mean when the passage said, “she sinks back into the water straight down like a stone?” (I)
Appendix H

As the wedding party moved through the forest, brightly plumed birds darted about in the cool green shadows beneath the trees. Though anxious about her sister, Nyasha was soon filled with excitement about all there was to see.

They were deep in the forest when she saw the small boy standing by the side of the path.

“You must be hungry,” she said, and handed him a yam she had brought for her lunch. The boy smiled and disappeared as quietly as he had come.

Later, as they were approaching the place where the two paths crossed, the old woman appeared and silently pointed the way to the city. Nyasha thanked her and gave her a small pouch filled with sunflower seeds.

The sun was high in the sky when the party came to the grove of towering trees. Their uppermost branches seemed to bow down to Nyasha as she passed beneath them.

At last, someone announced that they were near their destination.

Nyasha ran ahead and topped the rise before the others could catch up with her.

She stood transfixed at her first sight of the city. “Oh, my father,” she called. “A great spirit must stand guard here! Just look at what lies before us. I never in all my life dreamed there could be anything so beautiful!” (TW = 220)

How did Nyasha know the person getting married? (I)
What is one emotion Nyasha felt as she walked through the forest? (F)
What does the passage mean when it said she stood transfixed at the sight of the city? (I)
What does the passage mean when it said the trees were towering? (I)
What did Nyasha give the small boy? (F)
What did Nyasha give the old woman to thank her? (F)
Appendix I

Constance had been working so hard, she had not had time to notice that a beautiful animal little Andrew Nicholas was becoming. He was less like a furry ball and more like a polar bear. He was developing the long muscular neck that makes polar bears look so different from other bears.

Although the first four weeks had not been easy, the new four were even harder. By the end of January, Andy was becoming very sick. Just as Constance had feared, the milk formula was the cause of his problems. His delicate digestive system was not working properly. Constance knew if Andy got any sicker, he could die. Polar cubs are so rare in captivity that neither Constance nor the zoo veterinarian knew exactly what to do for Andy. They tried several “people medicines”, hoping to find the one that would save Andy’s life.

To make matters worse, Andy was cutting his baby teeth, and his gums were very sore. The doctor gave him milk painkillers to make the teething easier. Constance wondered how this tiny bear that weight just five pounds could possibly survive. It seemed hopeless, but she would not give up.

Hour after hour, day after day, Constance sat with the sick little bear until the medicines finally began to work. Andy at last rested more comfortably. (TW = 221)

Why were Andy’s gums sore? (F)
How many pounds did Andy weight? (F)
What was the relationship between Andy and Constance? (I)
What do they mean by “people medicine?” (I)
What was the cause of Andy’s problem? (F)
What did Constance do for a living? (I)
Saint Columba asked one of his men to swim across the lake and bring back a boat. Soon the swimmer heard a great roar. He also saw a big, wide-open mouth. The poor swimmer thought he was done for. But Saint Columba was watching. He raised his arms and cried out to the monster with holy words. And the monster was driven away.

No one can be quite sure if this story about Saint Columba and the monster really happened. But it was the first story about this monster ever written down. It was called “Of the Driving Away of a Certain Water Monster by Virtue of Prayer.”

This story also raised a big question. If Saint Columba spotted Nessie in the sixth century, is she thousands of years old today? Absolutely not! Not even monsters can live that long. If Nessie is real, she must be the great-great-great-grandchild of the first one.

But how did Nessie’s ancestors get into Loch Ness in the first place? Only one little river joins Loch Ness to the sea. Nessie is said to be too big to swim through this river. Several geologists explained it this way. Thousands of years ago there was no Loch Ness. This lake was really part of the sea. The Ice Age helped change all this. Land rose between certain areas of water, making lakes.

Possibly Nessie’s ancestors were trapped in Loch Ness after this happened. (TW = 238)

During what century did Saint Columba spot Nessie? (F)
How was the lake separated from the rest of the sea? (F)
Who let out the roar heard by the swimmer? (I)
What were the holy words spoken by Saint Columba? (I)
How did Nessie get into Loch Ness even though she was so big? (F)
What did the passage mean when it said the monster was driven away? (I)
Appendix K

One day, a woolly mammoth fell into a deep crack in a glacier. It broke some bones and died. Snow and ice covered its body.

Thousands of years passed. Slowly the weather grew warmer again. The Ice Age ended. Ice began to melt.

In 1901, the mammoth’s body was discovered in Siberia. Part of it was showing above the ice. Men passing by noticed their dogs sniffing the rotting flesh.

Scientists uncovered the body. Most of it was still frozen. That part was perfectly fresh. Dogs ate some of the meat, and liked it, even though it was more than 10,000 years old.

The food the mammoth had eaten before it died was still in its stomach. And what food! There were thirty pounds of flowers, pine needles, moss, and pinecones.

Later, scientists tasted the mammoth flesh, too, and lived to brag about it.

Now scientists know a great deal about this ancient animal, even though the last one died thousands of years ago. Scientists found more frozen woolly mammoths. They found other kinds of mammoths, too. (TW = 178)

What did the woolly mammoth fall into? (F)
How was the flesh of the woolly mammoth still fresh? (I)
What year was the woolly mammoth discovered? (F)
How were scientists able to learn about the woolly mammoth thousands of years after it died? (I)
How were the scientists able to know the woolly mammoth was over 10,000 years old? (I)
What did the scientists find in the stomach of the woolly mammoth? (F)
Next day the land was the same, the sky was the same, the circle did not change. Laura and Mary were tired of them all. There was nothing new to do and nothing new to look at. The bed was made in the back of the wagon and neatly covered with a gray blanket; Laura and Mary sat on it. The canvas sides of the wagon-top were rolled up and tied, so the prairie wind blew in. It whipped Laura’s straight brown hair and Mary’s golden curls every-which-way, and the strong light screwed up their eyelids.

Sometimes a big jackrabbit bounded in big bounds away over the blowing grass. Jack paid no attention. Poor Jack was tired, too, and his paws were sore from traveling so far. The wagon kept on jolting, the canvas top snapped in the wind. Two faint wheel tracks kept going away behind the wagon, always the same.

Pa’s back was hunched. The reins were loose in his hands, the wind blew his long brown beard. Ma sat straight and quiet, her hands folded in her lap. Baby Carrie slept in a nest among the soft bundles.

“Ah-wow!” Mary yawned, and Laura said: “Ma, can’t we get out and run behind the wagon? My legs are so tired.” (TW = 212)

How were Mary and Laura related? (I)
Why were Jack’s paws sore? (F)
What kind of animal was Jack? (I)
Why were there wheel tracks behind the wagon? (I)
What did the girls ask their mother if they could do? (F)
What color was the blanket that covered the bed in the back of the wagon? (F)
Appendix M

While riding in the truck, Justin sniffed a strange but nice fragrance. Surely Grandpa hadn’t put on that smelly stuff Mama forced on him, Justin thought. Now he was glad Anthony was not there. What would he think about Grandpa wearing that stuff? Another whiff came Justin’s way. It’s not so bad, though, he decided. But he liked Grandpa better when he smelled like work, sweet grass, soap – stuff like that.

They arrived just in time for the cake-baking contest. One contestant had entered fifteen cakes – everyone a different flavor. Some of them looked too pretty to eat, Justin thought. The judges thought they were perfect. The woman who had baked them won a blue ribbon in every category.

A girl as young as Hadiya won second place for her lemon chiffon cake. Justin clapped and clapped for her. Then the judges came to announce the winner for the best biscuits. The lady chosen to do the honors wore a big flower on her bosom and one on her hat. She seemed nervous and dropped all the ribbons. Why doesn’t she hurry up, Justin thought. His stomach felt weak, his hands were cold. He was not worried that maybe Grandpa would not win.

“First place winner,” the lady said in a loud, excited voice, “Phillip Ward, Junior!” Justin let out a yell. Grandpa smiled and rushed up to get a shiny blue ribbon and a certificate. “The Best Biscuits in the World,” the certificate said. (TW = 245)

Justin referred to someone named Anthony, who do you think he is? (I)
How did Justin know the woman announcing the prizes was nervous? (F)
What kind of cake did the girl bake that won 2nd prize? (F)
Where did the fragrance come from that Justin smelled on Grandpa? (I)
What did Justin’s Grandpa win a prize for? (F)
Who was Phillip Ward, Junior? (I)
Appendix N

One afternoon Henry arrived at Mr. Capper's garage in plenty of time to fold his papers. He counted his stack of forty-three Journals and as long as he was early, he took time to glance through the paper. He looked at the headlines and read the comic section. Then a picture of a smiling lady caught his eye. It was the lady who gave people advice when they wrote to her about their problems.

Because he had a problem, Henry paused to read her column. A girl who signed her letter “Flat Broke” said that her father did not give her a big enough allowance. Her father did not understand that she needed more money for school lunches, bus fare, and other things. What should she do about it? The smiling lady told her to talk it over with her father and explain to him exactly what her expenses were. The smiling lady was sure he would understand.

Henry thought this over. Maybe he should write to the lady about Ramona. He could write, I have a problem. A girl in my neighborhood has a little sister who pesters me on my paper route. How can I get her to stop? Then he could sign the letter Disgusted.

Henry tried to think how the lady would answer his letter. Dear Disgusted, she would say, but what would she say next? Probably she would tell him to talk his problem over with Ramona’s mother and everything would be all right. (TW = 249)

How many Journals did Henry have to fold? (F)
Why did Henry pause to read the column with the smiling lady? (F)
What did the passage mean by expenses? (I)
What was Henry’s problem? (F)
Why did Henry think the woman would tell him to talk to Ramona’s mother? (I)
Why did Henry want to sign his letter Disgusted? (I)
Appendix O

“Hear that, Gramps? Maybe your baseball’s not lost. Just follow the clue!” exclaimed Meg. “I doubt it’s that simple, Meg-O. Just another of her pranks. I saw that note years ago, but I couldn’t make head nor tail of it,” Gramps sighed.

“It’s probably too old to make sense now,” added Liddy. “But it might really mean something. I’ve got to investigate,” insisted Meg. Just then the phone rang. “Hey, Nut-Meg, Peter here. Remind Gramps that I’ll be there in the morning.”

“Take your time. I’ve found a mystery. Something to do with a Babe Ruth baseball,” Meg teased. “A Babe Ruth baseball? That’s worth a fortune! Don’t touch anything until I get there!” shouted Peter.

“Tough luck, Sherlock, I can solve this one myself. Bye.”

Upstairs in Gramps boyhood room, where Meg always stayed, she took out her notebook and pencil. “Finally. The chance I’ve been waiting for!” Meg told Liddy. “Peter won’t let me join his Detective Club until I have ‘proof’ that I can solve a mystery.”

“Well, you’d better do it before he gets here tomorrow,” warned Liddy. “He’ll never give you a chance.” Meg knew Liddy was right. She sat down at the desk and started a list. (TW = 203)

Why hadn’t grandpa followed the clue years ago? (F)
Why did they want to find the Babe Ruth baseball? (I)
Why was the baseball worth a fortune? (I)
Where did Meg stay while at Grandpa’s? (F)
What kind of club did Meg want to join? (F)
What did the passage mean by ‘boyhood’ when they described Grandpa’s room? (I)
When they came up again she saw a white figure diving off the ship’s side. Edmund was close beside her now, treading water, and had caught the arms of the howling Eustace. Then someone else, whose face was vaguely familiar, slipped an arm under her from the other side. There was a lot of shouting going on from the ship, heads crowding together above the bulwarks, ropes being thrown. Edmund and the stranger were fastening ropes round her. After that followed what seemed a very long delay during which her face got blue and her teeth began chattering. In reality the delay was not very long; they were waiting till the moment when she could be got on board the ship without being dashed against its side. Even with all their best endeavors she had a bruised knee when she finally stood, dripping and shivering, on the deck. After her Edmund was heaved up, and then the miserable Eustace. Last of all came the stranger—a golden-headed boy some years older than herself.

“Ca—Ca—Caspian!” gasped Lucy as soon as she had breath enough. For Caspian it was; Caspian, the boy king of Narnia whom they had helped to set on the throne during their last visit. (TW = 208)

Who was the white figure diving off the side of the ship? (I)
Who was Caspian? (F)
What was the result of Lucy and Edmund helping to set Caspian on the thrown? (I)
What did they use to pull them aboard the ship? (F)
After putting rope around the girl, why did they have to wait to pull her on board? (F)
Why did the person in the water turn blue and their teeth chatter? (I)
Appendix Q

There were a number of ways of cracking eggs. The most popular, and the real reason for bringing an egg to school, was knocking the egg against one’s head. There were two ways of doing so, by a lot of timid little raps or by one big whack.

Sara was a rapper. Ramona, like Yard Ape, was a whacker. She took a firm hold on her egg, waited until everyone at her table was watching, and whack – she found herself with a handful of crumbled shell and something cool and slimy running down her face.

Everyone at Ramona’s table gasped. Ramona needed a moment to realize what had happened. Her egg was raw. Her mother had not boiled her egg at all. She tried to brush the yellow yolk and slithery white out of her hair and away from her face, but she only succeeded in making her hands eggy. Her eyes filled with tears of anger, which she tried to brush away with her wrists. The gasps at her table turned into giggles. From another table, Ramona caught a glimpse of Yard Ape grinning at her.

Marsha, a tall girl who always tried to be motherly, said, “It’s all right, Ramona. I’ll take you to the bathroom and help you wash off the egg.”

Ramona was not one bit grateful. “You go away,” she said, ashamed of being so rude. She did not want this third-grade girl treating her like a baby. (TW = 243)

What was the most popular way of cracking an egg? (F)
What were the two ways to crack an egg? (F)
Why did they say that Sara was a “rapper”? (I)
Why did they say that Ramona was a “whacker”? (I)
What had Ramona’s mother forgotten to do? (F)
Why did everyone at Ramona’s table gasp? (I)
Appendix R

I didn’t know if what Ben said was true or not, but it made me mad just the same. I didn’t think it was a very helpful thing for a friend to say. When I got home, I found Mom and Dad moving furniture around. They had moved the TV from the family room into the living room and record player into Beth’s room.

“We’re making room for Uncle Joe,” Mom said when she saw me. “You’re just in time to help.” Dad and I brought an extra bed up from the basement into the family room. Uncle Joe would sleep there.

“Whew,” said Mom when everything was in place. “The social worker just called to say Uncle Joe will be here tomorrow. I wish we’d known sooner.”

Tomorrow! Beth was sitting on the back porch with her hands over her face. I could tell she’d been crying. “I had to cancel my slumber party for tomorrow night,” she told me between sobs. “Why?” I asked. “Did mom make you?” “No,” she said. “But how can I have the girls over with him around?”

“I don’t know,” I said. I understood how Beth felt. Early the next day, Mom and Dad drove to the state school to bring Uncle Joe home. All morning, Amy and Beth and I waited at the front window, watching for them to return. Finally, about noon, we saw our car turn into the driveway. (TW = 239)

What had been moved into Beth’s room? (F)
Who were they making room for? (F)
How was the person telling the story related to Beth? (I)
How did that person know Beth had been crying? (I)
Why did Beth have to cancel her slumber party? (I)
Where did mom and dad go to get Uncle Joe? (F)
Appendix S

With all four members of the family leaving at different times in different directions. Mornings were flurried in the Quimby household. On the days when Mr. Quimby had an eight o'clock class, he left early in the car. Beezus left next because she walked to school and because she wanted to stop for Mary Jane on the way.

Ramona was third to leave. She enjoyed these last few minutes alone with her mother now that Mrs. Quimby no longer reminded her she must be nice to Willa Jean.

“Did you remember to give me a hard-boiled egg in my lunch like I asked?” Ramona inquired one morning. This week hard-boiled eggs were popular with third-graders, a fad started by Yard Ape, who sometimes brought his lunch. Last week the fad had been individual bags of corn chips. Ramona had been left out of that fad because her mother objected to spending money on junk food. Surely her mother would not object to a nutritious hard-boiled egg.

“Yes, I remembered the hard-boiled egg, you little rabbit,” said Mrs. Quimby.

“I’m glad you have finally learned to like them.”

Ramona did not feel it necessary to explain to her mother that she still did not like hard-boiled eggs, not even when they had been dyed for Easter. Neither did she like soft-boiled eggs, because she did not like slippery, slithery food. Ramona liked deviled eggs, but deviled eggs were not the fad, at least not this week. (TW = 245)

What does fad mean? (I)
How do Beezus and Mary Jane know one another? (I)
Who was Yard Ape? (I)
What was the fad this week at school? (F)
How many people were in the Quimby household? (F)
Why was Ramona third to leave? (F)
Appendix T

Mother caught sight of him and said: “Come in, Almonzo.”

Almanzo went in. He sat up straight in a haircloth chair and pushed his toes against the floor to keep from sliding off. Father and Mother were telling all about the visit to Uncle Andrew’s. There was no black splotch anywhere on the wall.

“Didn’t you worry, leaving the children alone here and you so far away?” Mrs. Webb asked.

“No,” Mother said, proudly. “I know the children would take care of everything as well as if James and I were at home.”

Almanzo minded his manners and did not say a word.

Next day, when no one was looking, he stole into the parlor. He looked carefully at the place where the black splotch had been. The wallpaper was patched. The patch had been cut out carefully all around the gold scrolls, and the pattern was fitted perfectly and the edges of the patch scraped so thin that he could hardly find them.

He waited until he could speak to Eliza Jane alone, and then he asked:

(TW = 178)

How did Almanzo keep from sliding off the chair? (F)
Who were mother and father talking to about their visit? (F)
Who put the black splotch on the wall? (I)
How did mother know James? (I)
How had the black splotch been covered up on the wall? (F)
What do you think Almanzo might ask Eliza Jane? (I)
“Mannie, you’ll get an awful whipping.” Royal said. Royal was sorry, but he couldn’t do anything. They both knew that Almanzo deserved whipping, and there was no way to keep Father from knowing it. So Almanzo said, “I don’t care.”

He helped do the chores, and he ate supper. He wasn’t hungry, but he ate to show Eliza Jane he didn’t care. Then he went to bed. The parlor door was shut, but he knew how the black splotch looked on the white-and-gold wall.

Next day Father and Mother came driving into the yard. Almanzo had to go out to meet them with the others. Alice whispered to him: “Don’t feel bad. Maybe they won’t care.” But she looked anxious, too.

Father said, cheerfully: “Well, here we are. Been getting along all right?”

“Yes, Father,” Royal answered. Almanzo didn’t go to help unhitch the driving horses; he stayed in the house.

Mother hurried about, looking at everything while she untied her bonnet strings.

“I declare, Eliza Jane and Alice,” she said, “you’ve kept the house as well as I’d have done myself.” (TW = 182)

Mannie was a nickname of one of the characters, which one? (I)
How were Eliza Jane and Almanzo related? (I)
What did Royal think would happen to Almanzo for putting the black splotch on the wall? (F)
Where do you think Father and Mother had been? (I)
What color were the walls in the parlor? (F)
Was their mother happy with the way they had kept the house? (F)
Appendix V

It is April 14, 1912. The Titanic is in icy waters off the coast of Canada. It is almost midnight. The ship is quiet. The sea is smooth as glass. The air is biting cold.

The passengers have had a good dinner. Some of them are still up playing cards. Most are asleep in their rooms. It is a good night to be inside. But the lookout must watch for danger. He is high above the ship in the crow’s nest. He stares into the darkness.

Suddenly the lookout sees a dark shape. It is a mountain of ice! And the Titanic is heading right into it! The lookout sounds an alarm. He calls, “Iceberg straight ahead!”

A seaman is below, steering the ship. He tries to turn the ship away. But it is too late. The giant iceberg scrapes the side of the ship. There is a bump. A grinding noise. It doesn’t seem like much. Some people do not even notice. But the captain hurries from his room. He goes down below. He wants to see if the ship is hurt. Soon he learns the terrible truth.

The iceberg has hurt the ship badly. Water is pouring in. Five of the watertight compartments are already flooded. And that is too many. Nothing can be done now. It seems impossible. But it is true. The Titanic is going to sink! (TW = 231)

What does the passage mean when it said, “the sea is smooth as glass?” (I)
What does the passage mean when it said, “the air is biting cold?” (I)
What was the mountain of ice? (I)
What had the ship hit? (F)
What was the job of the lookout? (F)
How many compartments had flooded? (F)
Appendix W

Monsters are often thought of as big, frightening creatures that scientists can’t explain. Some people think that prehistoric animals were monsters. These animals were giant reptiles that lived long before people. The dinosaur was one prehistoric reptile.

A frightening monster in fairy tales is the dragon. In stories its sharp claws can tear a person to pieces, and its hot breath can burn a person to a crisp. However, scientists know that no real animal can breathe fire. The dragon is a make-believe monster. For hundreds of years people all over the world have said they have seen real monsters. Some are thought to live in oceans and lakes. Others are said to haunt forests. Many children believe that monsters visit their bedrooms at night. These, of course, aren’t real.

Sometimes monsters turn out to be real animals that we know. Long ago, many sailors were afraid of the sea. They were afraid that sea serpents or monsters would attack their ships. Sometimes, these monsters turned out to be strange, large animals like the octopus or giant squid. At other times, these monsters stayed a mystery.

One mysterious monster is so famous that it has often made newspaper headlines. Some people have left their jobs, homes, and families to look for this monster. Several British politicians thought this monster so important that they talked about it in Parliament. (TW = 228)

What was one prehistoric reptile? (F)
What does the passage mean by prehistoric? (I)
What is a frightening reptile in fairy tales? (F)
What does the passage mean by make-believe? (I)
What was the strange, large animal in the sea that was thought to be a monster? (F)
What does the passage mean when it said some monsters stay a mystery? (I)
Appendix X

Reinforcement Inventory

1. Candy
   a. ____________
   b. ____________
   c. ____________

2. Popcorn

3. Cookies

4. Soda

5. Ice cream token

6. Gum

7. Stickers

8. Pencils

*Of the items listed above, rate them in order or preference:*

1. ______________________

2. ______________________

3. ______________________