The Effects of Tutor Age on Academic Performance in Reading Accuracy and Fluency

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THE EFFECTS OF TUTOR AGE ON ACADEMIC PERFORMANCE
IN READING ACCURACY AND FLUENCY

by

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A Project
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Specialist in Education
Department of Psychology

Western Michigan University
Kalamazoo, Michigan
April 1996
THE EFFECTS OF TUTOR AGE ON ACADEMIC PERFORMANCE
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David D. Manson, Ed.S.
Western Michigan University, 1996

Many studies have demonstrated that the use of peer tutoring or
peer assistance in the classroom is effective (Ezell, Kohler, &
Jarzynska, 1992; Fantuzzo, Riggio, Connelly, & Dimeff, 1989; Green-
wood et al., 1984; Knapczyk, Johnson, & McDermott, 1983; Stern,
Fowler, & Kohler, 1988; Trapani & Gettinger, 1989). Although this
research appears to be fundamentally sound, several questions have
been left unanswered. First, what has peer tutoring been compared to
when it has been shown to be effective? Second, which variable or
variables of peer tutoring made it effective? This study provided a
partial answer to these questions, through the evaluation of tutor
age as a variable affecting reading accuracy and fluency. The re-
results suggested that age may not be an important variable in the
tutoring of reading skills. This result showed that student reading
performance was similar when using a peer tutor or an adult tutor
which indicates that the use of peer tutors may be a viable option
for teachers.
ACKNOWLEDGEMENTS

I wish to express my gratitude to my wife and best friend, Jennifer Manson, for her patience, assistance, and support.

I also extend my deepest appreciation to my advisor, Dr. Howard Farris, for his endless revisions and support of my efforts. Dr. Farris also was the individual who assisted me during my work at Project Help.

Dr. Michael Bahr deserved my special recognition for his time and patience in helping me complete this research.

Special thanks need to be given to Dr. Kevin Armstrong, Dr. Galen Alessi, and Dr. Wayne Fuqua, all of whom helped me to evaluate this project and to assist me toward completion.

Finally, I want to thank all of the students participating in this project, and the staff of Project Help for their hard work and effort.

David D. Manson
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CHAPTER I
INTRODUCTION

Recently, the United States educational system has received much criticism for its handling of the youth in America (West, 1984). The cornerstones of this system are the teachers, who have been expected to serve multiple roles for the students. These roles range from teaching basic academic skills, counseling students, and even functioning as a parental figure (Riessman, 1988; Sarbin, 1976). By taking on these additional roles, teachers may have inadvertently endangered instructional time, a variable that is highly correlated with academic achievement and performance (Carnine, Silbert, & Kameenui, 1990). Barring changes in the school system to reduce noninstructional tasks, several remedies for the problem of reduced instruction time have been explored, one of which involves utilizing students as instructional guides for their classmates or other peers (Malheady, Harper, & Sacca, 1988). By doing so, teachers receive extra time in which to fulfill their additional roles, and students benefit from the rapid pace, immediate feedback, and opportunity to respond (Delquadri, Greenwood, Whorton, Carta, & Hall, 1986; Greenwood, Terry, Arreaga-Mayer, & Finney, 1992).

The term peer assistance refers to using students as valuable resources in the classroom, and it encompasses peer tutoring, peer supervision, peer monitoring, peer coaching, and peer-mediated
instruction. In the last decade, much research has focused on these five areas, showing their effectiveness in producing improved performance in several diverse areas, such as on-task behavior (Knapczyk, Johnson, & McDermott, 1983), academic achievement (Fantuzzo, Riggio, Connelly, & Dimeff, 1989; Greenwood et al., 1984), social skills training (Trapani & Gettinger, 1989) ability to ask questions (Ezell, Kohler, & Jarzynka, 1992) and the speed of work completion (Stern, Fowler, & Kohler, 1988). Although peer assistance has been shown effective, an examination of the variables that comprise these studies may give some insight into the specific reasons for its success.

Two main types of experimental research on peer assistance have been explored. The first form of research centers around the traditional, or teacher-directed, assistance versus peer-directed assistance (Greenwood et al., 1984; Knapczyk et al., 1983; Russell & Ford, 1983; Sacks & Gaylord-Ross, 1989; Schloss, Santoro, Wood, & Bedner, 1988). These studies attempt to answer the general question, Is peer-directed assistance effective when compared to teacher-directed assistance?

One study in particular, by Knapczyk et al. (1983), characterizes this first type of research and relates directly to the research question to be proposed herein. This team of researchers focused on the effects of peer and teacher supervision on work performance and on-task behavior comparing three conditions, a baseline condition (no supervision), a teacher supervised condition, and a peer supervised condition. Results showed that peer supervision consistently produced higher levels of on-task behavior than did
teacher supervision. The study, however, failed to eliminate differences in the type of supervision provided. In other words, one does not know whether the differences in the results between teachers and peer supervisors was due to different levels of supervision (i.e., various tactics of supervision and different consequences controlled by the supervisions) or the inherent differences between the adult teachers and peers. This inability to determine the source of improved student performance lays the foundation for the following research.

The second variable that is often viewed in peer assistance research deals with the age difference among peers and their tutors (Beirne-Smith, 1991; DePaulo, Tang, Webb, Hoover, Marsh, & Litowitz, 1989; Trapani & Gettinger, 1989). The basic premise behind much of this research is whether cross-age tutoring or same-age tutoring is more effective. A vital gap in these studies also exists, due to the way that the tutors are told to present information. Generally, the tutors are given instructions such as "provide dictated practice with corrective feedback" (Trapani & Gettinger, 1989, p. 4). These instructions are ambiguous because each tutor delivers and interprets them in their own manner, making cross-tutor comparisons contingent on delivery style as well as innate characteristic differences among the tutors. As noted above, one has no way of separating the results to demonstrate whether differences from the baseline condition are due to the way in which tutors present information or simply due to inherent character and age differences among the tutors.

In order to separate these results, the potential confounds
between tutor age and tutoring activities must be viewed separately. One way to do this is by standardizing the tutoring procedures across tutors, so that each administers assistance in a systematic way. As Kratochwill and Van Someren (1985) point out, "standardization can help consultants identify target behaviors (e.g., innate characteristics of the tutor versus delivery style) that ultimately lead to the design of effective interventions" (p. 227). Without these standardization precautions, the integrity of the intervention derived from this research would be questionable at best.

After reviewing the two major areas of research in peer assistance, it becomes apparent that gaps in the literature still need to be examined. The effectiveness of peer assistance techniques has been adequately demonstrated in prior research (Ezell et al., 1992; Fantuzzo et al., 1989; Greenwood et al., 1984; Knapczyk et al., 1983; Stern et al., 1988; Trapani & Gettinger, 1989). However, the area of systematic peer instruction continues to lack a sound research base. The purpose of this research is to provide additional data on the problems existing in the current literature, so that one can apply the knowledge of this solution to improve future peer assistance programs. The present study views the effects of tutor/supervisor age on performance in reading fluency and accuracy. In order to determine whether the age of the tutor/supervisors is related to reading performance, this study will eliminate the effects of different presentation methods by standardizing the actions and verbalizations of both the adult and peer tutors.
CHAPTER II

METHOD

Subjects

This investigation focuses on four subjects (Subject 1, female, age 11; Subject 2, male, age 9; Subject 3, male, age 13; Subject 4, male, age 67). All four of these students range from first grade to sixth grade and have been identified on the Woodcock Reading Mastery Tests-Revised (Woodcock, 1987) as being approximately one to three grade levels below that of their same-grade peers. Due to this reading deficit, each of the subjects is enrolled in Project Help, a program specifically designed to increase reading ability by using one-on-one remediation with college-age tutors. Admittance into Project Help is determined on an individual basis, following referral by a parent, teacher, counselor, school psychologist, or any combination of the above individuals. Project Help has a high population of minority students and students from low socioeconomic status families, both of which are represented in the subjects designated for the study. The level of parental involvement in Project Help is also extremely high, thereby allowing frequent feedback and easily assessed consent.
Setting

This study took place on the campus of Western Michigan University in the Project Help program. Project Help is conducted Monday through Thursday from 4:00 to 6:00 p.m., after the subject completes his/her school day. Each subject that attends Project Help is assigned an individual tutor who works with the subject in a preselected quiet and empty classroom. The tutor and subject work in this setting for the remainder of the program, using the necessary materials (i.e., blackboard, workbooks, reading books) involved in the one-on-one instruction. Direct observation of reading fluency and reading accuracy occurred during the individualized reading instruction. Each of the settings remained constant throughout the entire study with the exception of the experimental manipulation of varying tutors.

Apparatus and Materials

The materials used by Project Help to assist students in remediating their reading skills are the Corrective Reading Series published by Science Research Associates, Inc., (SRA). Specifically, two levels of these materials were used, Direct Instruction Decoding B1 and B2, (Engelmann et al., 1988). These levels consist of multiple lessons and exercises, designed to provide students the basic skills missing in their knowledge base, through the use of effective teaching techniques and the proper sequencing of the materials. A portion of every lesson requires the administration of a 1-minute
reading task to check fluency and accuracy (see Appendix A). The timed reading selections are directly related to the basic reading skills being systematically taught. Improvement on these timed readings is necessary for attainment of reinforcers decided on by the tutor and subject in advance; for this study the type of reinforcer remained consistent across tutors. However, it should be noted that in this Direct Instruction curricula, the lessons get progressively harder. This means that although a student may not increase the number of words they read per minute in the timed checkouts, they are still showing reading improvement. Performance on the timed reading task served as the dependent variable for the following study.

A script was furnished for all the tutors participating in the study (see Appendix B). The script allowed each tutor to administer the timed reading in a standardized fashion. The script outlined what tutors were to say before, during, and after the timed reading checkout.

Additional materials used included a daily recording sheet (see Appendix C), to keep track of student progress in fluency and accuracy, a timed reading graph (see Appendix D) to visually represent subject performance on the two dependent measures, use of a digital stopwatch to reliably record exactly 1 minute worth of reading, and an audiotape recorder, manufactured by the Craig Corporation, model number #2628, used to determine interobserver reliability checks.

Several procedures or prerequisites existed across all experimental conditions. One of the most essential procedures involved preparing the subjects for the experimental manipulations. Prior to
collecting data, each subject was told that three different tutors would alternate in administering a timed reading check. Each subject fully understood that a change in tutor meant a change in authority and that the subject should treat the new tutor in the same way as the former tutor.

Every subject that participated in the study followed the same set of procedures or instructions. Before each timed reading occurred, the subject had reviewed a lesson and studied a list of possible words and sounds that may exist in the timed reading story. Both the lesson and the word list were taken directly from the Direct Instruction Corrective Reading Series. Consequently, each subject was exposed to an equivalent amount of review prior to each timed reading.

Independent Variable

The independent variable in this research was the age of the tutor. This study attempted to determine whether tutor age affects reading accuracy and fluency of a tutee. Two conditions, in addition to baseline and control, were established. In the baseline and control condition the subject's regular tutor administered the timed reading, while an independent observer (the experimenter) assisted in timing the session. The results obtained from baseline were then used as a measure of consistency across the experiment and to note any fluctuations due to possible extraneous variables influencing performance.

In the other two conditions, the age of the tutors who
administered the timed readings varied, while all other conditions are held constant. In Condition 1 (the youth condition) an 11-year old tutor was selected to administer the timed reading check to all of the subjects. Condition 2 (the adult condition) used an 18- to 22-year old adult different than the control tutor. In each of these conditions, the experimenter served as an independent observer, gathering information and timing the session from a distance of about 30 feet. Each trial lasted only a few minutes, allowing enough time for the tutor to follow the standardized procedure in Appendix B, which included: allowing the subject to read for 1 minute, having the tutor count the number of words that were read correctly, and work with the subject on the correction of any errors. Overall, the conditions were run over a time span of 3 and 1/2 months. Baseline extended throughout this entire period, while the experimental conditions ran approximately 2 and 1/2 months.

In order to insure that the independent variable was consistently administered across time and subjects, several precautions were taken. Each condition, "normal," "adult," and "youth" received an approximately equal number of contacts with the subject through the use of a randomization procedure. This procedure provided each condition an equal chance of occurrence. After baseline data were collected and shown to be relatively stable, an alternating procedure began. The study was designed to use all three conditions once for every three timed reading checks. For example, for readings 1 through 3, the order may be adult-youth-normal. While on readings 4 through 6, the order may change to youth-adult-normal.
When the child's normal tutor reached a timed reading portion of the lesson, the tutor delayed the reading check until the end of the session. The experimenter then informed the tutor whether the timed reading would be administered by the normal, youth, or adult tutor.

Dependent Variables

Two dependent variables, reading fluency and reading accuracy were examined to determine the effects of cross-age tutoring on reading performance. Reading fluency was defined as the number of complete words pronounced correctly during the 1-minute timed reading interval. Reading accuracy was defined as the number of words mispronounced (not due to dialect or speech impediments) that were not self-corrected within 5 seconds during the 1-minute timed reading. After observing many students, the period of 5 seconds was selected for self-corrections because sounding out unfamiliar words can often times take at least 5 seconds. An accuracy percentage was calculated by dividing the number of mispronunciations by the number of total words read and multiplying by 100. Skipped words not read within 5 seconds were considered errors, while inserted words did not count as a mispronunciation.

General Procedures

Observation and Scoring Procedures

The observation and scoring procedures were held constant throughout the entire study. Each trial was audiotaped and scored by
an independent adult and the researcher. Both the adult and re­searcher were both equipped with the timed reading story on which to record errors and the number of words completed by the subject. These two data sheets were then compared to obtain interobserver agreement. During the scoring procedure, only one discrepancy be­tween the two scorers was noted. On this particular instance, the audiotape was replayed until a consensus could be reached. Documenta­tion of this treatment integrity can be reviewed by listening to the original audiotapes. This procedure was followed for every lesson from which data were collected. An example of the scoring procedure, coding key, and interobserver reliability used to determine reading fluency and accuracy is presented in Appendix E.

Observer Training and Selection

The importance of observer selection and training was emphasized in the research. Each tutor had to demonstrate an ability to admin­ister the script provided for the timed reading at least five con­secutive times without error. Selection of the peer tutor was of particular importance, since the peer needed to be reading at a sufficiently high level (placement in Decoding B2 or above sixth grade on the Woodcock Reading Mastery Test-Revised) to recognize reading errors. In addition to meeting the above criterion, the peer tutor received extensive review of the subject's next timed reading prior to evaluating the results of the timed reading.

The expectations for all tutors (normal, adult, and youth) are outlined in the script given to them for administration of the timed
checkouts (see Appendix B). More specifically, the expectations included administering the timed reading, counting the number of words read correctly, identifying errors, and reviewing the mistakes through the use of a modeling correction procedure.

Both the peer tutor and the college-age tutors received an incentive for accurately recording data. The peer tutor received points toward a long-term incentive discussed prior to the experiment, and the college-age tutors understood that accurate recording of fluency and accuracy contributed to their grade in the Project Help class. The use of both incentives is standard procedure in Project Help and were not altered for the study.

In addition to observer training and selection, the researcher was present to monitor and correct any errors that developed as the study progressed. The experimenter planned correction procedures in case significant problems in tutoring or scoring occurred. The first was that additional training could have been given to the student tutor if procedural problems developed, and the second involved audiotaping all sessions to assist in identifying any scoring conflicts. Therefore, inaccurate administration and scoring posed only slight problems, and if present, they could be immediately identified and resolved.

Confidentiality

The question of confidentiality is always an important one, but since this study only slightly altered the current Project Help program, confidentiality was easily maintained. The following
precautions were taken in order to assure that the information and data that were gathered remained anonymous. Every individual involved in data collection was instructed that the information would be confidential and should not be discussed with anyone else. In addition, both the subject and guardian were also notified that the information would be used for research purposes only and that the names of the subjects would not be used during any portion of the experiment.

Experimental Conditions

Baseline

The baseline or "normal" condition consisted of the typical Project Help experience. Every subject was paired with their own individual tutor, an undergraduate student approximately 18 to 22 years old. Each of these tutors were trained over a 2- to 3-week period in tutoring and the use of Direct Instruction materials that included following a standardized script for administering the timed reading check (see Appendix B). Baseline data were collected after an initial adjustment phase (about 2 weeks), during which the subject became familiar with Project Help. The baseline data were gathered when the subject's normal tutor administered timed reading checks, prior to administration of the experimental conditions. Both dependent variables, accuracy and fluency, were observed until a consistent level of performance was achieved.
Experimental Design

The goal of the study was to determine which intervention, older tutors or younger tutors, produces the higher level of desired change in reading fluency and accuracy. In order to achieve this goal, a multiple-treatment design was employed. More specifically, a simultaneous-treatment design was developed to compare the effects of the three conditions (youth, normal, and adult).

According to Kazdin (1982), the most crucial feature of the simultaneous-treatment design is that different interventions are administered concurrently. Due to this feature, the experimenter placed a great deal of importance on an appropriate balance in the order of interventions. By balancing the order of interventions and by having a standardized script for tutors to follow, interpretation problems due to extraneous variable effects were minimized.

Under the typical simultaneous-treatment design, the experimenter obtains baseline observations until they stabilize, and then moves on to the intervention phase. This study followed the same format, but it extended the baseline throughout the entire intervention phase. By extending the baseline, changes in the data could be seen more easily, helping the experimenter recognize any significant effects not brought about by the independent variable. Therefore, the intervention phase consisted of rapid alternation of the two levels of the independent variables (youth and adult) and the baseline until stability in the data was achieved. In addition, it has become common practice to continue with the best intervention in
the follow-up portion of the simultaneous-treatment design.

Once again, the normal condition consisted of the subject's everyday tutor administering the timed readings, while the youth and adult conditions consisted of the subject being administered the timed readings from a peer or adult who had not previously worked with the subject. This experimental configuration was selected so the age variable would not be confounded.
CHAPTER III

RESULTS

Subject Performance

No significant difficulty was experienced in collecting data from any of the four subjects; however, due to their reading rate, attendance, and lesson level, Subjects 2 and 3 had several more trials than did Subjects 1 and 4.

A graphic representation of the data permits easy interpretation and quick visual inspection (Kazdin, 1982). Therefore, the data from each subject were broken down into two graphs, accuracy and fluency. Identifying an experimental effect can be achieved by simply viewing the data for an indication of a clinically significant difference. In some instances, no effect or a mixed effect is clearly evident; therefore, the use of tabular displays will assist in interpretation.

As stated earlier, subject performance was viewed in two areas, accuracy and fluency. First, baseline data were gathered to demonstrate the relative performance of each subject. Then subject performance was viewed under three conditions, the normal (control) condition, the adult condition, and the young (peer) condition. Tables 1 and 2 summarize the overall performance of each subject during these conditions. The tables show fluency in terms of the mean and standard deviation, while accuracy is viewed in terms of the
mean and percentile of errors per total words read.

Table 1

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Baseline Mean</th>
<th>SD</th>
<th>Normal Mean</th>
<th>SD</th>
<th>Adult Mean</th>
<th>SD</th>
<th>Young Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>177 5.0</td>
<td></td>
<td>164.6 2.1</td>
<td></td>
<td>162.0 3.7</td>
<td></td>
<td>170.1 1.0</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>38.2 5.7</td>
<td></td>
<td>48.2 1.1</td>
<td></td>
<td>48.0 1.1</td>
<td></td>
<td>57.8 5.6</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>84.2 3.6</td>
<td></td>
<td>88.5 1.2</td>
<td></td>
<td>97.1 3.8</td>
<td></td>
<td>92.0 .9</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>42.5 6.3</td>
<td></td>
<td>56.1 1.6</td>
<td></td>
<td>58.6 3.0</td>
<td></td>
<td>56.3 1.7</td>
<td></td>
</tr>
</tbody>
</table>

Mean = The average number of words read correctly during the 1-minute timed reading.
SD = Standard deviation

Table 2

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Baseline Mean %</th>
<th>Normal Mean %</th>
<th>Adult Mean %</th>
<th>Young Mean %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4.6 2.53</td>
<td>5.6 3.29</td>
<td>6.0 3.57</td>
<td>5.7 3.24</td>
</tr>
<tr>
<td>2</td>
<td>.44 1.14</td>
<td>1.0 2.03</td>
<td>.71 1.45</td>
<td>.60 1.03</td>
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<td>3</td>
<td>3.2 3.66</td>
<td>2.0 2.21</td>
<td>.90 0.92</td>
<td>1.8 1.90</td>
</tr>
<tr>
<td>4</td>
<td>1.5 3.41</td>
<td>2.7 4.59</td>
<td>2.2 3.62</td>
<td>2.9 4.90</td>
</tr>
</tbody>
</table>

Mean = The average number of word read correctly during the 1-minute timed reading.
SD = Standard deviation
When viewing Subject 1's performance across the three experimental conditions, the following results are evident. In the area of fluency, Subject 1 shows a clear tendency to read more words under the direction of a young tutor. Under the young tutor, Subject 1 averaged 8.1 words per minute greater than under the adult tutor and 5.5 words per minute greater than under the normal tutor. Figure 1 graphically represents this conclusion.

![Figure 1. Fluency - Subject 1.](image)

In the area of accuracy, no substantive differences were seen in Subject 1's performance across experimental conditions. The percentage of errors for Subject 1 only varied by .33% at the greatest point. Figure 2 represents Subject 1's performance in the area of accuracy. Figure 2 appears to show a fairly high level of variability for Subject 1, but this result is a bit misleading because of
Subject 1's high fluency rate. In other words, a subject who makes between 2 and 10 errors while reading 175 words per minute is not that different than a subject who makes between 3 and 5 errors while reading only 50 words per minute.

![Figure 2. Accuracy - Subject 1.](image)

Subject 2's results were very similar to those of Subject 1. Subject 2 demonstrated a substantive difference across experimental conditions in the area of fluency. The subject averaged 9.6 to 9.8 more words per minute under the direction of the young tutor than under either the adult or normal tutor. In addition, the accuracy of Subject 2 was slightly greater under the young tutor. Subject 2's low standard deviations under the normal and adult conditions are a direct result of variability occurring around the mean. Figures 3 and 4 display these results for Subject 2.
Figure 3. Fluency - Subject 2.

Figure 4. Accuracy - Subject 2.
The results of the third subject were different from the results of the first two subjects. Subject 3's performance in the areas of fluency and accuracy were both dramatically improved under the adult tutor condition. During the timed readings, Subject 3 read 8.6 more words correctly per minute with the adult tutor than with the normal tutor, while making 1.1 less errors per minute. Also, Subject 3 read 5.1 more words correctly per minute with the adult tutor than the young tutor, while making .9 less errors per minute. Figures 5 and 6 represent these differences in fluency and accuracy rates.

Figure 5. Fluency - Subject 3.
The results of the last subject were less conclusive than the results of Subjects 1, 2, and 3. Subject 4 did not demonstrate a tendency to perform better under any of the experimental conditions in the area of fluency. No relevant effect was found. In the area of accuracy, Subject 4 showed a slight improvement in performance under the adult tutor, making errors approximately 1% of the time less than other conditions. Figures 7 and 8 show Subject 4's mixed outcomes.

Figure 6. Accuracy - Subject 3.
Figure 7. Fluency - Subject 4.

Figure 8. Accuracy - Subject 4.
The purpose of the experiment was to determine whether students show improvement in their reading skills under the direction of an older or younger tutor. More specifically, the study viewed reading fluency and accuracy rates dependent upon tutor age. This focus on the effectiveness of peer tutors is similar to many other studies (Ezell et al., 1992; Fantuzzo et al., 1989; Greenwood et al., 1984; Knapczyk et al., 1983; Stern et al., 1988; Trapani & Gettinger, 1989), but different because tutor age was the sole variable being examined.

After studying the analyses and graphic displays, two conclusions can be drawn. First, the data generally do not point to any clear improvement in reading fluency or accuracy with the various tutors, because there was no one specific group of tutors under which the subjects performed markedly better. This suggests that tutor age may not be an important variable in the tutoring of reading skills. Even though this result does not indicate that a young tutor is more effective than an adult tutor, the results are similar to other peer tutoring studies (Ezell et al., 1992; Fantuzzo et al., 1989; Greenwood et al., 1984; Knapczyk et al., 1983; Stern et al., 1988; Trapani & Gettinger, 1989) that support the effectiveness of using peer tutors. Given that research has found that the use of peer tutors is
effective when compared to other methods of teaching, this study extends our knowledge by demonstrating that young tutors can be just as effective as adult tutors. These findings may allow educators to use peer tutoring more often with only a minimal concern of detrimental effects.

Second, when viewing the data collected for each subject in isolation, differences in reading performances across tutors were noted. These individual tendencies support the conclusion that each individual subject is unique and that what works for some students may not generalize to others.

Several additional comments must be noted regarding the results of this study. First, several specific observations were made regarding the behavior of individual subjects. For example, the behavior of Subject 1 included, wanting to count the number of words read, stating that she would beat yesterday's total, skipping or inserting words, and taking a huge breath before reading. These behaviors indicated that Subject 1 possessed a strong desire to read as fast as she could regardless of errors. The behaviors of Subjects 2 and 3 were different than the behaviors of Subject 1. The behavior of Subjects 2 and 3 was characterized by reading slowly and carefully, examining each word, self-correcting multiple words, and rereading errors several times. These behaviors indicated that Subjects 2 and 3 possessed a strong desire to read more accurately than quickly. These individual differences contributed to the differences in findings across subjects.

Further research would be required to differentiate between
those who would benefit from one condition versus the other. Ideas for further research could include:

1. Does gender matter in performance under peers? For example, the only female subject (Subject 1) performed best under the youth condition.

2. Could performance under peers be contingent on the grade level of the subject? For example, the youngest subject (Subject 4) did not perform well under the youth condition.

3. Do personality characteristics such as introversion and extroversion play a role in performance under peers?

In addition, future research could also benefit from clearer demonstration of treatment integrity. This study attempted to display integrity by audiotaping each individual trial, but further attempts could be made. For example, future studies may want to devise a checklist which would indicate that the experiment was implemented as planned. Such documentation is not only important for treatment integrity, but also helpful to future researchers that plan to replicate any of the study.

The benefits accrue from this research will have a direct impact on the Project Help program and could possibly impact other educational settings. Project Help can utilize the information in the program, by learning to individualize tutoring to impact reading fluency and accuracy. In instances where youth tutors are found to be more effective than adult tutors, a change in the tutor may help facilitate correcting a student's deficits in reading. In contrast, when adult tutors are found to be more effective, the program can
remain essentially the same. The mixed results suggest that Project Help may experiment with programming for each individual student. At the same time, it is possible that other programs involving tutoring could use the information in their educational systems design.

Overall, the most important interpretations of the data that can be taken from this study are:

1. The reading performance of students does not dramatically change under the direction of peer tutors compared to their performance under adult tutors.

2. Individual student characteristics may play a role in determining the effectiveness of a peer tutor.
Appendix A

A Sample Timed Reading From the Direct Instruction Decoding Placement Test
There is a redwood tree living today in northern California. That redwood, like many others, has had an interesting life.

Its life began with a seed contained in a cone. A redwood cone is about as big as a quarter. The cone starts to grow in early summer. By late summer it is full-sized and bright green with many seeds inside. The cone is not yet full grown, however. As fall approaches, the cone begins to change color, turning brown. Small flaps on all sides of the cone open, and as they do, the tiny seeds fall out. The seeds are so small that ten of them would easily fit on the end of your finger. If you wanted half a kilogram of these seeds, you would have to collect about 120 thousand of them.
Appendix B

Script for Administering Timed Reading
Script for the Systematic Administration of a Timed Reading

1) "Okay ______, you've reached the timed reading portion of the lesson."
2) "Open your student book to page ___" (if not opened).
3) "I want you to start here (points) and read as fast as you can, but try not to make any errors."
4) "You have one minute. begin."
5) (Student read for one minute).
6) (If the subject slow down considerably or stops and gets stuck on one word the tutor may prompt in this manner). "Remember, to read as fast as you can, you only have one minute."
7) (As time expires) "Stop! Let's see how you did." (tutor and student count the number of words read correctly and pinpoint errors made).
8) (Tutor asks student if they can figure out what the errors are without assistance, if assistance is required then tutor provides instruction by modeling the correct response and having the student repeat the correct response.)
9) (Tutor leaves the student with original tutor) "Thanks for trying your hardest, I'll see you again soon."
Appendix C

Daily Chart of Reading Fluency and Accuracy
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Appendix D

Graph of Reading Fluency and Accuracy
Graph for 1 minute timed reading (2 week period)

Tutor:

Client:

Level:

Lesson #

difference equals

\[ X = \frac{\# \text{ of words read}}{\# \text{ of errors (accuracy)}} \]

\[ D = \frac{\# \text{ of words read correctly (fluency)}}{\# \text{ of words read}} \]
Appendix E

An Example of Scoring Procedure and Interobserver Reliability
There is a redwood tree living today in northern California. That redwood, like many others, has had an interesting life.

Its life began with a seed contained in a cone. A redwood cone is about as big as a quarter. The cone starts to grow in early summer. By late summer it is full-sized and bright green with many seeds inside. The cone is not yet full grown, however. As fall approaches, the cone begins to change color, turning brown. Small flaps on all sides of the cone open, and as they do, the tiny seeds fall out. The seeds are so small that ten of them would easily fit on the end of your finger. If you wanted half a kilogram of these seeds, you would have to collect about 120 thousand of them.

Key

- error
- self correct before 5 seconds
- end of reading
- every 50 words

Subject's Scores

- total # of words read = 104
- # of errors (accuracy) = 4
- (not self-corrected)
- # of words read correctly 100
- (fluency)
There is a redwood tree living today in northern California. That redwood, like many others, has had an interesting life.

Its life began with a seed contained in a cone. A redwood cone is about as big as a quarter. The cone starts to grow in early summer. By late summer, it is full-sized and bright green with many seeds inside. The cone is not yet full grown, however. As fall approaches, the cone begins to change color, turning brown. Small flaps on all sides of the cone open, and as they do, the tiny seeds fall out. The seeds are so small that ten of them would easily fit on the end of your finger. If you wanted half a kilogram of these seeds, you would have to collect about 120 thousand of them.

Observer A = tutor
- There is a redwood tree living today in northern California. That redwood, like many others, has had an interesting life.
- Its life began with a seed contained in a cone. A redwood cone is about as big as a quarter. The cone starts to grow in early summer. By late summer, it is full-sized and bright green with many seeds inside. The cone is not yet full grown, however. As fall approaches, the cone begins to change color, turning brown. Small flaps on all sides of the cone open, and as they do, the tiny seeds fall out. The seeds are so small that ten of them would easily fit on the end of your finger. If you wanted half a kilogram of these seeds, you would have to collect about 120 thousand of them.

Observer B = researcher
- There is a redwood tree living today in northern California. That redwood, like many others, has had an interesting life.
- Its life began with a seed contained in a cone. A redwood cone is about as big as a quarter. The cone starts to grow in early summer. By late summer, it is full-sized and bright green with many seeds inside. The cone is not yet full grown, however. As fall approaches, the cone begins to change color, turning brown. Small flaps on all sides of the cone open, and as they do, the tiny seeds fall out. The seeds are so small that ten of them would easily fit on the end of your finger. If you wanted half a kilogram of these seeds, you would have to collect about 120 thousand of them.

# of words read = 80
# of errors (not SC) = 6
# of totally correct words read = 74

Percent agreement on occurrences of errors only

\[
\% = \frac{\text{# of agreements on occurrences}}{\text{# of occurrences scored by A or B}}
\]

\[
37.5\% = \frac{3}{8}
\]
Appendix F

Human Subjects Institutional Review
Board Approval
Date: January 22, 1993
To: David Manson
From: M. Michele Burnette, Chair
Re: HSIRB Project Number 93-01-11

This letter will serve as confirmation that your research protocol, "The effects of tutor age on academic performance in reading accuracy and fluency" has been approved after full review by the HSIRB. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the approval application.

You must seek reapproval for any changes in this design. You must also seek reapproval if the project extends beyond the termination date.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: January 22, 1994

xc: Farris, PSY
BIBLIOGRAPHY


performance and on-task behavior. *Journal of the Association for People With Severe Handicaps, 8*, 41-48.


