

The Effects of Reading Racetracks on the Fluency of See-to-Say Words in Isolation by a Student with Learning Disabilities

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The purpose of the present study was to determine the effectiveness of using the "reading racetrack" and Precision Teaching techniques to increase the fluency of reading Grade Two Priority Words in isolation with a 10-year-old boy with learning disabilities. Use of the reading racetrack is a novel approach which employs the aspects of Direct Instruction procedures, as well as Precision Teaching techniques. This strategy also uses drill and practice probe sheets that resemble an automotive racetrack. During the reading racetrack intervention, the participant more than doubled his rate for reading see-to-say words in isolation. There was also a marked decrease in the number of errors the student made while reading see-to-say words in isolation.

Regardless of the pedagogical stance taken, educators seem to agree that literacy is one of the most important skills a student can apply to functional living in our society (Sweeney, Omness, Janusz, & Cooper, 1992; Weaver, 1990). Research in reading indicates that the child who reads well has a very high probability of achieving success in school (Slavin, 1989, 1991; Slavin, Madden, Dolan, Wasik, Ross, & Smith, 1994). If these reading skills are not established, the child has a greater chance of later dropping out of school as well as being incapable of performing successfully in today's society (Howard, McLaughlin, & Vacha, in press; McLaughlin & Vacha, 1992a, 1992b; Slavin et al., 1994; Vacha & McLaughlin, 1992, 1993). Unfortunately, there is a great deal of disagreement as how to increase the likelihood that all students will leave our current educational system fluent in their ability to read.

School districts have adopted a somewhat *laissez faire* approach to teaching reading, labeled as whole language (Weaver, 1990). With this approach, students are said to acquire literacy in much the same way as they acquire oral language naturally (Altwerger, Edelsky & Flores, 1987; Goodman, 1986, 1989). While some students still seem to adapt to reading in this manner, an increasing number of instructionally naive students appear to require a more structured and

systematic approach to attain this skill, which can be as complex to teach as it is to learn (Carnine, Silbert, & Kameenui, 1990). Finally, recent scholarship and analysis have called into question the efficacy of employing some of the whole language strategies with students at risk for school difficulties (Lieberman & Lieberman, 1990).

According to the current research literature, two of the most effective and efficient teaching strategies to improve reading fluency are Direct Instruction and Precision Teaching (Carnine et al., 1990; Lindsley, 1991; Sweeney et al., 1992). The following study is a novel approach which implemented aspects of Direct Instruction procedures, as well as Precision Teaching techniques; this strategy uses drill and practice probe sheets called reading racetracks to improve reading fluency.

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Method

Participant and Setting

The participant of this study was a 10-year-old-fourth grade boy. According to scores obtained from the *Wechsler Intelligence Scale for Children-Revised* (WISC-R), the student had a full scale IQ of 78 and had been labeled as learning disabled. He also had a speech impediment and received services from a school district speech pathologist for 40 minutes per week. According to the student's individualized education program, he was achieving at the 2.5 grade level and needed improvement in the areas of language, reading, spelling, and math, for which he received 60 minutes of special education services.

This study took place in the resource room of an urban elementary school in a low socioeconomic area in a large urban city in the Pacific Northwest. The first author, a graduate student at a local university, worked with the participant one-on-one, with one other student (a ten-year-old girl with a learning disability). The primary teacher in the resource room had five years of teaching experience and had an instructional aide and volunteer researcher who carried out the implementation of the present study. The first author worked with the child for five minutes daily in the morning.

Movement Cycles

There were two pinpoints evaluated in this study. The first pinpoint was the number of words read correctly from the reading racetrack during a one-minute timing. The second pinpoint was the frequency of errors during a one-minute timed reading. An error was defined as a word being read incorrectly, and omission or addition of a word, or any words that were read out of order. An error was not counted if the participant made a self-correction before going on to the next word.

Upon the completion of each one-minute timing, the student counted the number of words that he read and self-recorded these data on the lines provided along the bottom of the racetrack (see Figure 1). The first author would tally the number of errors, give this number along with specific feedback to the subject, who would then

record these data below the number correct. These data were then collected and documented by the researcher on Standard Celeration Chart.

Experimental Design and Experimental Conditions

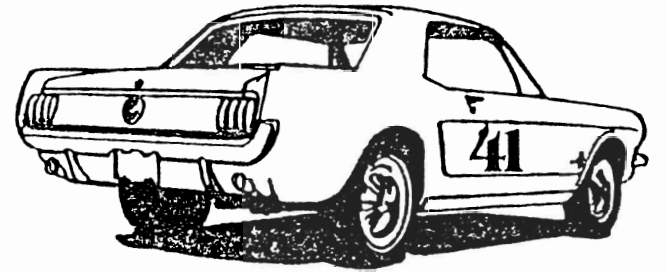
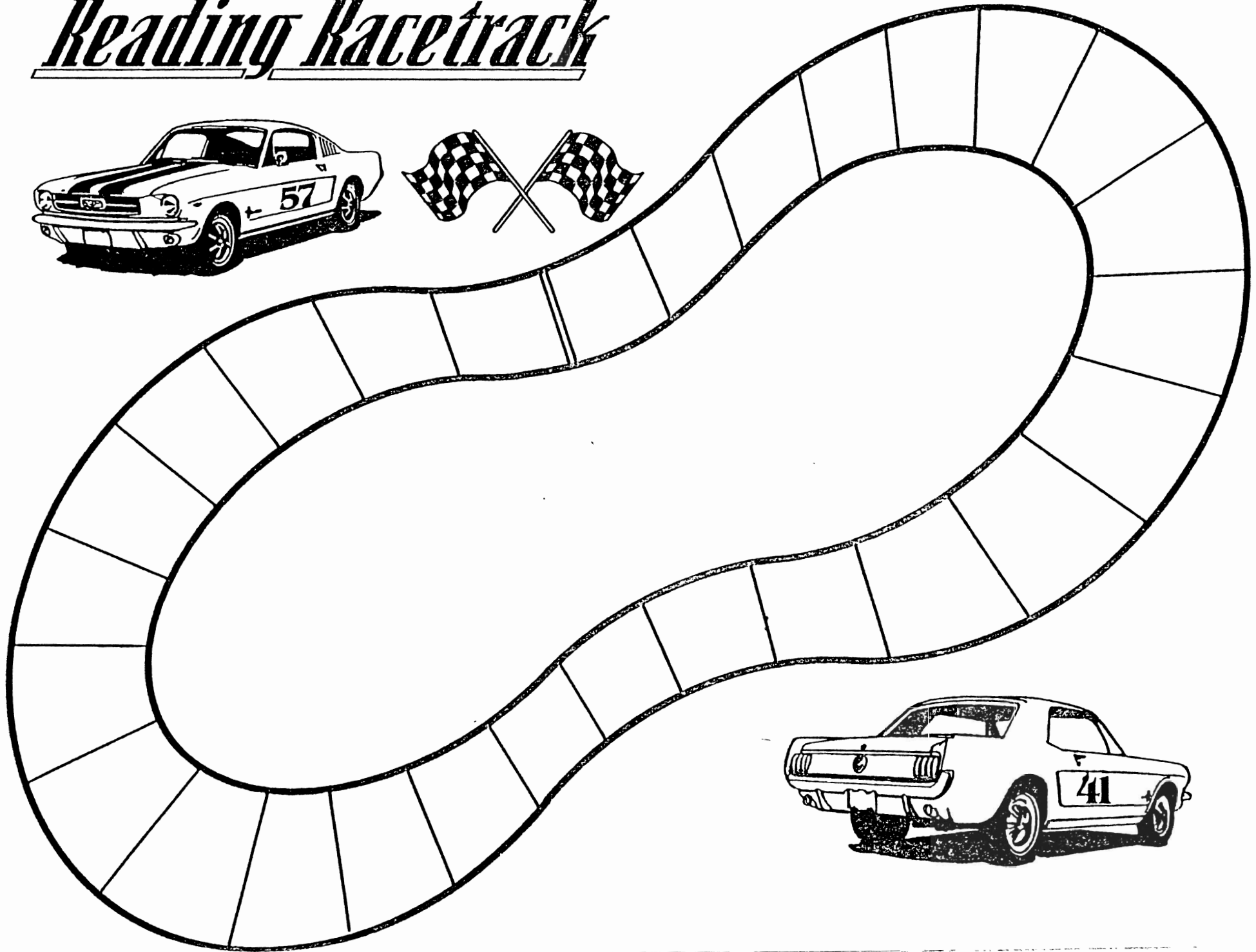
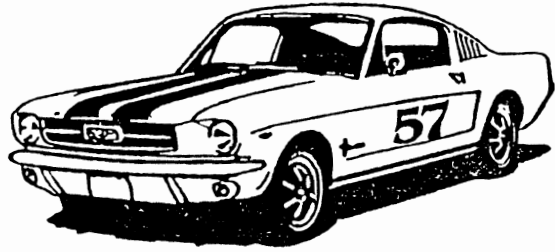
This study used an ABCDEF design (Kazdin, 1982) to evaluate the effectiveness of using reading racetracks and Precision Teaching techniques to increase the fluency of reading see-to-say words in isolation.

Baseline. The Baseline consisted of having the participant read the list of Grade Two Priority Words orally as they normally appeared (see Figure 2). The researcher had an exact replica of this list and recorded whether or not the subject had read each word correctly using the + - system; the only addition to the regular program was the presence of a timer. The participant was given the list of words and was told to read them as quickly and as accurately as he could. The participant was aware that he was being timed, and he began reading when the researcher cued him to start. At the end of one minute, the first author said "stop," praised the subject for his hard work and cooperation and then recorded the data for errors and corrects. Baseline consisted of five one-minute timings over the course of three sessions. Days consisting of more than one timing were averaged together for a total of one data point representing the student's average.

Reading racetrack interventions. The procedures used during the intervention were somewhat similar to those during the Baseline condition; however, the words were placed in the individual cells of the Reading Racetrack before having the subject read them (see Figure 1). The words read from the racetrack were taken from the second grade priority word list that was commonly used district wide. The words taken from this list were carefully selected as to avoid having any two words on a particular racetrack that were either auditorily or visually similar. This measure was taken not only to help avoid student confusion, but also to aide the researcher in the ability to discriminate between words read correctly and errors.

There were two different types of racetracks, each containing 28 cells. The first type of racetrack consisted of seven words that were

Reading Racetrack



Name _____

Grade 2 Priority Words

after				
all				
am				
an				
and				
are				
at				
away				
be				
bed				
been				
best				
big				
book				
boy				
brother				
but				
by				
called				
came				
can				
car				
cat				
come				
day				
did				
do				
dog				
door				
down				
eat				
end				
even				

ever				
every				
father				
fell				
find				
fire				
fish				
five				
food				
for				
found				
four				
from				
fun				
game				
gave				
get				
girl				
give				
go				
going				
gone				
good				
got				
had				
happy				
has				
have				
he				
her				
here				
him				
his				

home				
horse				
house				
how				
if				
I'm				
in				
is				
it				
just				
know				
land				
last				
let				
like				
little				
live				
long				
look				
lot				
love				
made				
man				
may				
me				
men				
more				
most				
mother				
my				
name				
need				
never				

repeated in random order. The random order was an attempt to avoid the occurrence of patterns which may have interfered with the participant learning the words, and instead focusing on the learning the pattern in which the words appeared. Every fifth racetrack was a review racetrack containing the accumulation of the 28 different words that had been introduced in the four previous racetracks.

At the beginning of each intervention session, the participant was given the particular racetrack that he was working on. The participant was then instructed to inform the researcher giving the cue, "On your mark, get set, go!" The researcher would then keep track of the number of words read by placing a tally mark each time the participant completed a full circle around the track. At the end of the one-minute timing, the researcher would say, "Stop!" The participant would then mark the word that he had just read. The participant, aided by the researcher, would then compute the number of words read and record his score along the bottom of the racetrack. The researcher would then give the participant the number of errors and specifically point out words that he had trouble with. Finally, the participant would self-record the number of errors.

Reliability. Interobserver reliability checks were taken once during Baseline and once during the intervention. The researcher and another observer would independently tally the number of words read and the number of errors made during the one-minute timing. The researcher then compared the data to find the overall agreement. The percent of interobserver agreement was calculated by dividing the smaller number recorded by the larger and multiplying by 100. The overall percent of interobserver agreement was 100%.

Results and Discussion

The number of words read correctly, and the number of errors during Baseline and reading racetrack sessions are shown on the Chart. The mean number of words read correctly during Baseline was 25.0 (range 21.5 to 32). The mean number of errors made during Baseline was 6.0

(range 6 to 7). With the implementation of the reading racetracks, there was an immediate increase in the number of words read correctly by the participant. The mean number of words read correctly during the reading racetrack intervention phases was 74 (range 45 to 86). The number of errors markedly decreased. The mean number of errors made during the intervention phases was .63 (range 0 to 9).

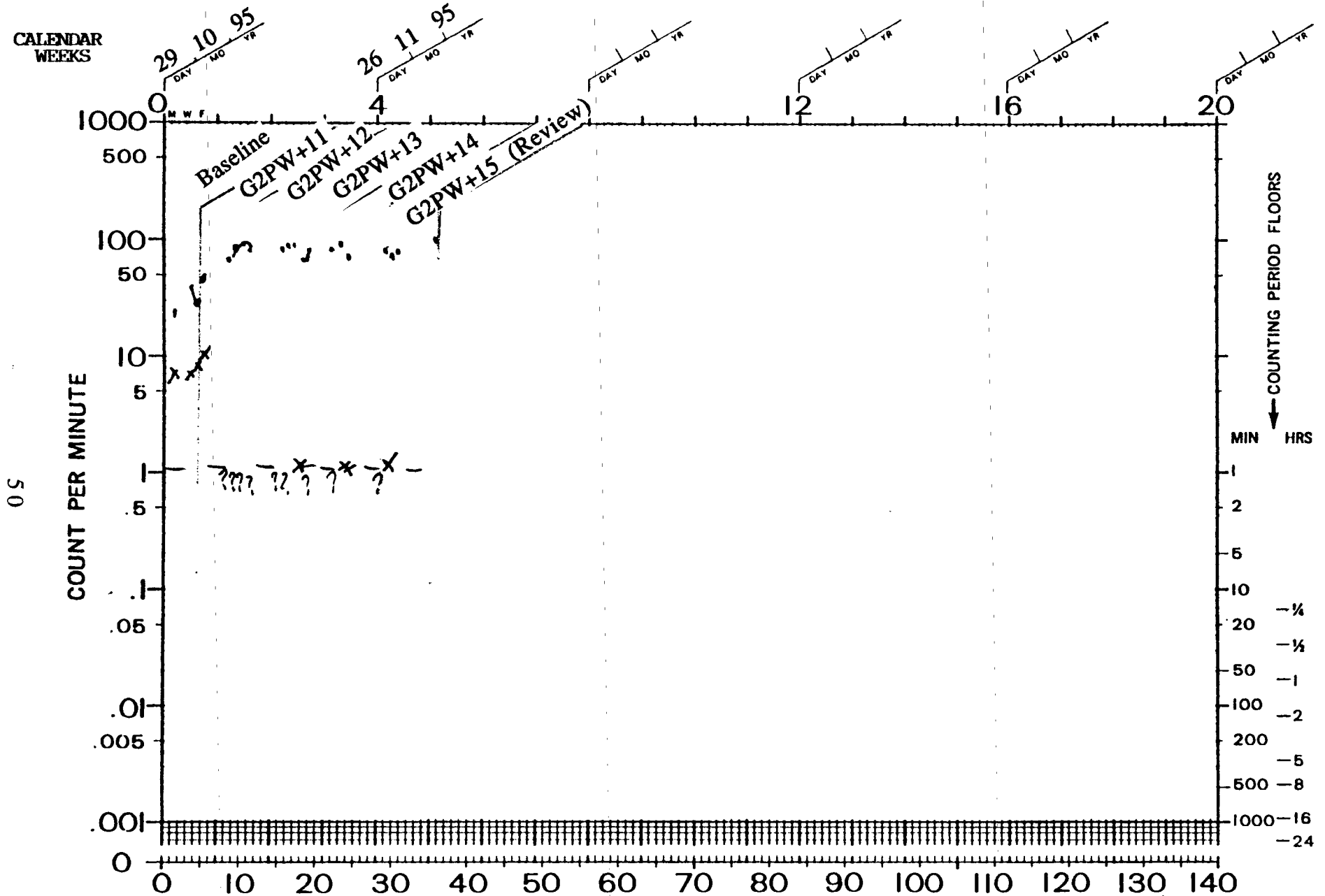
The intervention was effective not only in terms of a marked increase in the number of words read in a one-minute timing, but also in the elimination of nearly all errors. The first author felt that the increase in corrects, which more than doubled the highest score during Baseline and more than tripled the low score, was very significant for this student. The decrease in errors during the phases of this intervention were equally significant. The participant's regular classroom teacher as well as his resource room teacher were also highly impressed with his performance in reading see-to-say words in isolation during this program.

Another exciting outcome of this procedure is that employing reading racetracks appeared to have a positive effect on the reading fluency of the participant while reading orally during his regular reading group. Further investigation will be needed to substantiate this claim, as there may be other confounding variables that have been overlooked.

The reading racetracks procedure was practical. The first author spent a minimal amount of money implementing this intervention--the only outgoing funds were for making photocopies of the racetracks. On the other hand, the initial time involved in making the racetracks was considerable. This, however, can be warranted because of the permanence of the racetracks once they have been initially made. The success of the participant also eased the burden of time involved in making the racetracks.

While implementing this program, the first author discovered that the review racetracks not only served as the cumulative review they were intended to, but they also served as an efficient and effective initial assessment tool. Following the Baseline session, the researcher presented the participant with the review racetracks; if the student was able to read the words on the given

CALENDAR WEEKS



McLaughlin	McLaughlin	Mclaughlin	SUCCESSIVE CALENDAR DAYS			"Bob"	10	LD	See-Say
SUPERVISOR	ADVISER	MANAGER				BEHAVER	AGE	LABEL	COUNTED
Rinaldi	Gonzaga University		Rinaldi	Rinaldi		Rinaldi			Words
DEPOSITOR	AGENCY		TIMER	COUNTER		CHARTER			

review racetrack at the target rate, then he would move on to the next review racetrack until reaching one that the student was unable to read through at an acceptable rate. At this point, the researcher was able to determine the appropriate starting point for the participant.

Another aspect of this program that made it very attractive and practical is the fact that after the initial session, subsequent daily sessions lasted a maximum of five minutes. It is our opinion that this program, in conjunction with class-wide peer tutoring, could offer individualized instruction for an entire classroom in less than 10 minutes of daily classroom time. This could be especially valuable in grades one and two when students are expected to learn and remember sight words that do not follow the phonetic rules that are being taught.

The present outcomes suggest the use of data based procedures such as repeated readings (Sweeney et al., 1992), assisted reading (Van Wagenen et al., 1994), tutoring by trained adults (Slavin, 1989; Slavin et al., 1994), Direct Instruction (Carnine et al., 1990), and Precision Teaching (Lindsley, 1991). It appears to assist children at-risk for difficulty in reading, active approaches such as Direct Instruction, teaching code based reading, and active student responding should be implemented. Reading racetracks are straightforward, effective, and make use of both Direct Instruction and Precision Teaching techniques. Additional research may wish to determine which components of reading racetracks produce the greatest improvements in children's reading performance.

As mentioned previously, the resource room teacher was very impressed with the reading racetrack procedure on improving the reading fluency of see-to-say words in isolation with this student. She also plans to implement this procedure with several other students who receive special services in her classroom. Although this research project was prepared to reflect the outcome of this program with one student, the researcher was simultaneously implementing the same procedure with another student (a 10-year-old girl with a learning disability) and had similar effects. The first author plans to continue working with the participant and will continue to collect data on the effectiveness of this program in the future.

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