



TECHNICAL REPORT #17:

Characteristics of Reading Aloud, Word Identification, and
Maze Selection as Growth Measures: Consistency of
Standard Error of Estimate, Standard Error of Slope, and
Confidence Intervals

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RIPM Year 3: 2005 – 2006

Dates of Study: January 2005 – May 2006

September 2009

Note: Data set and data collection procedures are the same for Technical Reports #17, #18, #19, and #20.

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Produced by the Research Institute on Progress Monitoring (RIPM) (Grant # H324H30003) awarded to the Institute on Community Integration (UCEDD) in collaboration with the Department of Educational Psychology, College of Education and Human Development, at the University of Minnesota, by the Office of Special Education Programs. See progressmonitoring.net.

There are four sets of analyses related to the data set and methods used in this study. The four sets of analyses are reported in four technical reports:

Technical Report #17 - Characteristics of Reading Aloud, Word Identification, and Maze Selection as Growth Measures: Consistency of Standard Error of Estimate, Standard Error of Slope, and Confidence Intervals

Technical Report #18 - Characteristics of Reading Aloud, Word Identification, and Maze Selection as Growth Measures: Identifying the Number of Data Points Needed to Obtain Consistency in Slopes

Technical Report #19 - Reading Aloud, Word Identification, and Maze Selection as Growth Measures: A Comparison of Slopes Derived from Different Data Collection Schedules

Technical Report #20 - Characteristics of Reading Aloud, Word Identification, and Maze Selection as Growth Measures: Relationship between Growth and Criterion Measures

The method used in all four technical reports is described in detail in this report. The results and discussion for each set of analyses are reported separately in each technical report.

The purpose of this study was to compare the characteristics of reading aloud, word identification, and maze selection as growth measures across grade levels. Two research questions were addressed:

1. Which weekly progress monitoring measures in reading (reading aloud, word identification, maze selection) are most sensitive to growth over time?
2. How consistent are slopes obtained on weekly progress monitoring measures? How large is the error (“bounce”)?

Method

Participants and Setting

The study took place in two urban elementary schools and one urban high school in Minnesota. Participants in the study were 192 (89 male and 103 female) students in Grades 1 ($n = 53$), 2 ($n = 10$), 3 ($n = 41$), 4 ($n = 6$), 5 ($n = 32$), and 9 ($n = 50$). Sixty percent of the students were White, 6% Hispanic, 7% Asian, 26% African American, and 1% American Indian. Approximately 87% of the students spoke English as their home language. Other languages spoken in the home included Hmong (3%), Spanish (4%), Somali (4%), Ewe (1%), and Tibetan (1%). Eight percent of the students were receiving English as a Second Language services, and 7% of the students were receiving special education services. Participants were recruited from the classrooms of ten different teachers (7 elementary, 3 secondary). All students with permission to participate were included in the study.

Measures

Measures used in the present study consisted of CBM reading aloud, maze selection, and word identification.

Reading aloud. The grade level reading aloud passages consisted of Grade 1 passages selected from the Edcheckup website (www.edcheckup.com; Children's Educational Services, 1987), Grade 3 and Grade 5 passages were selected from passages created at Vanderbilt University (Fuchs, Fuchs, & Hamlett, 2002), and Grade 9 passages were taken from the Star Tribune and modified with permission (Espin, Wallace, Lembke, Campbell, & Long, 2009). The passage length ranged from 116 – 201 words for Grade 1, 284 – 473 words for Grade 3, 343 – 433 words for Grade 5, and 387 – 1104 words for Grade 9. Various readability formulae were used to identify passages with similar difficulty levels (see Figures 1 – 4).

Figure 1. Readability for Grade 1 Passages

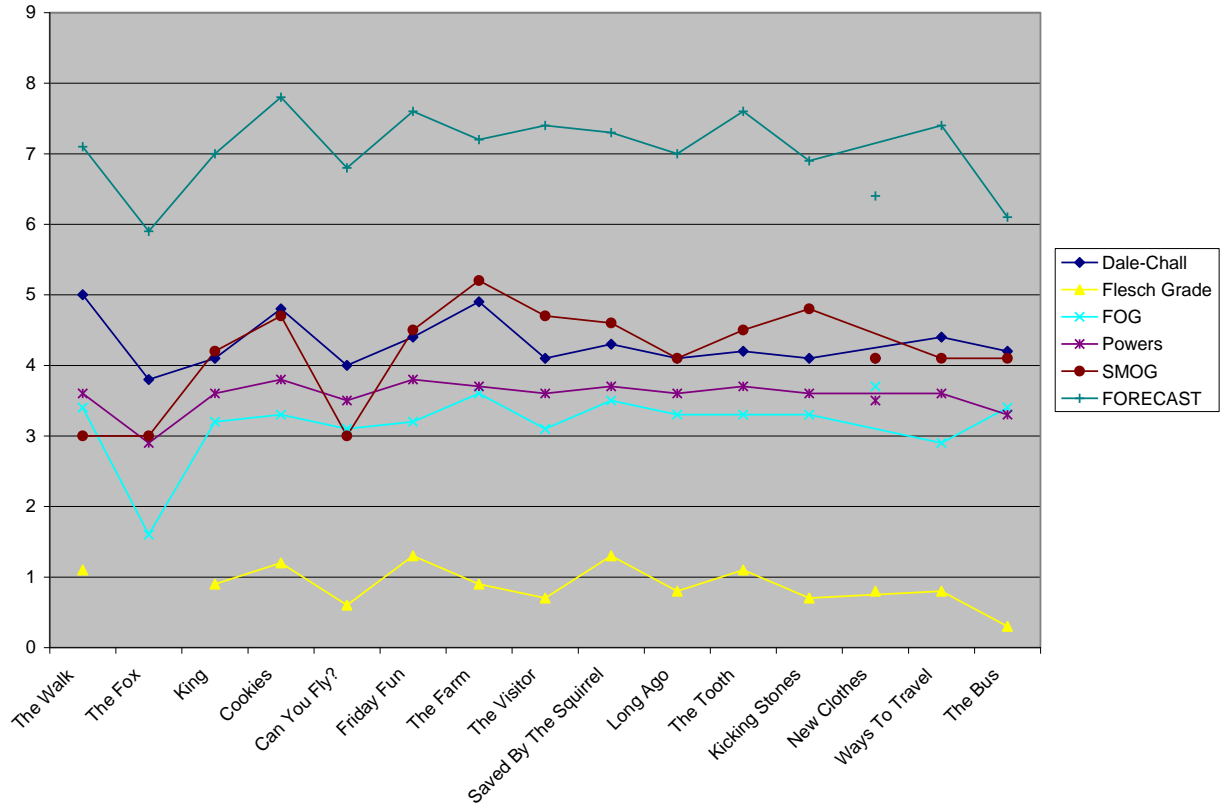


Figure 2. Readability for Grade 3 Passages

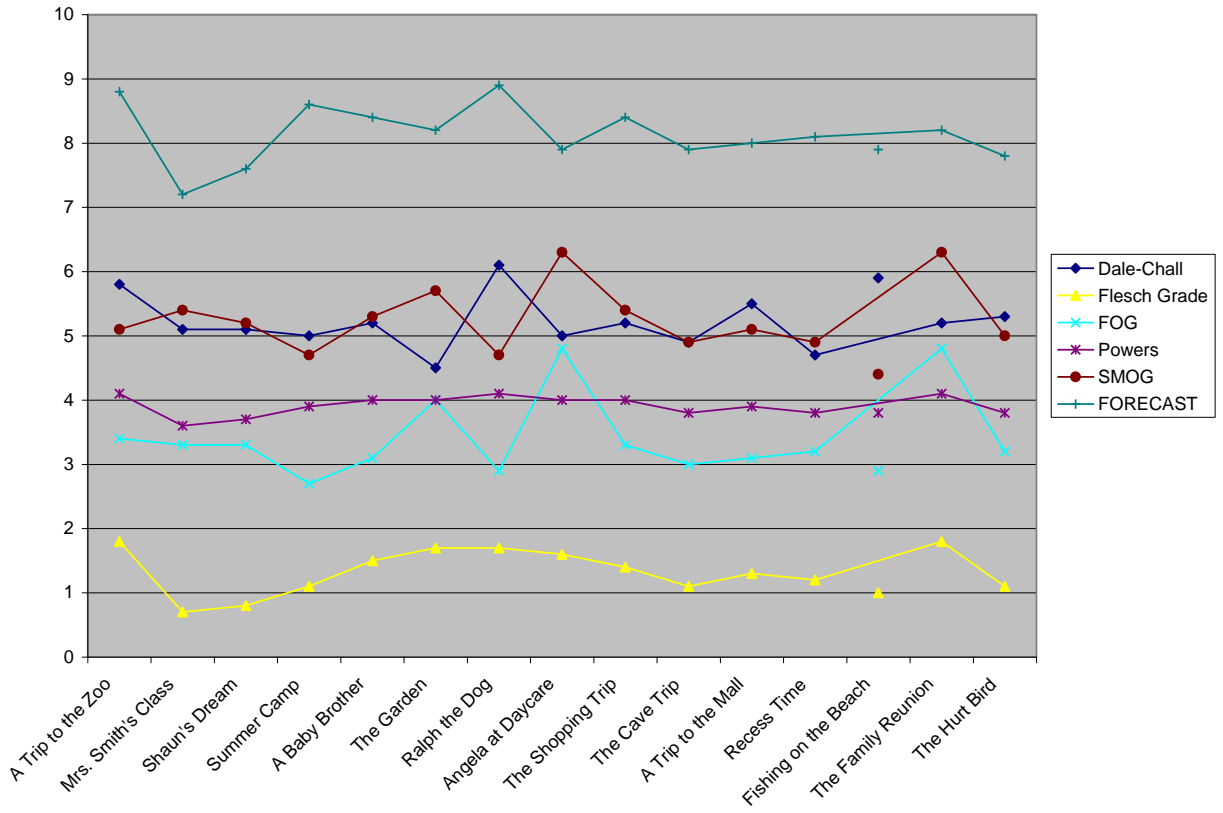


Figure 3. Readability for Grade 5 Passages

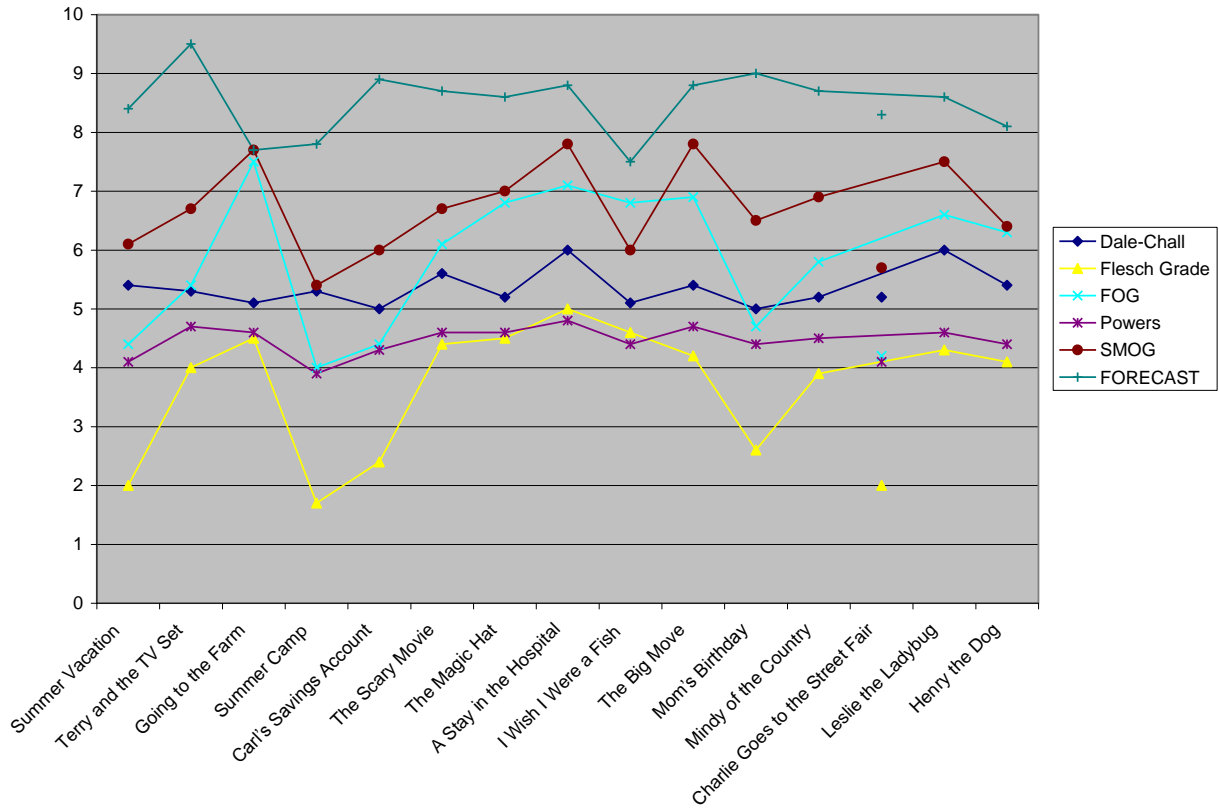
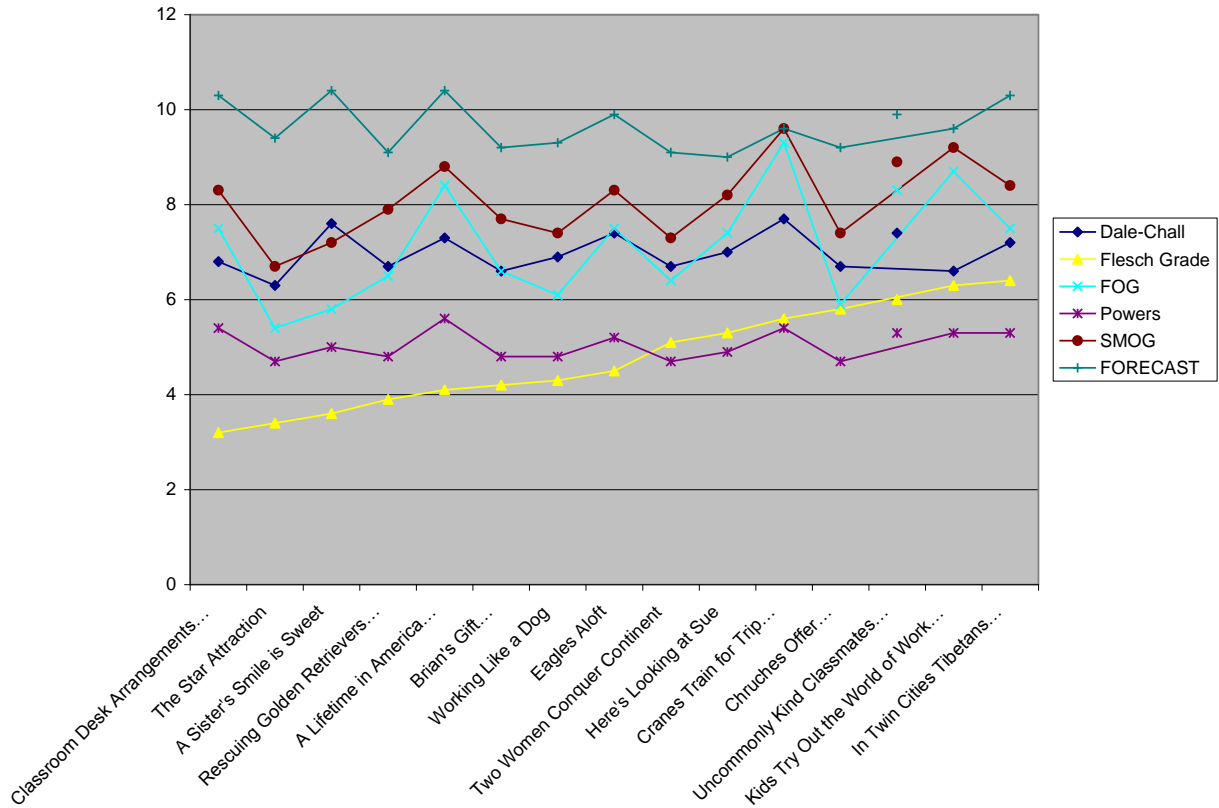


Figure 4. Readability for Grade 9 Passages



Participants were asked to read each passage aloud for one minute, and the examiner scored the number of words correctly read. Repetitions, self-corrections, insertions, and dialect/articulation were scored as correct. Mispronunciations, word substitutions, omissions, hesitations, and reversals were marked incorrect. If the student hesitated for more than three seconds, the examiner provided the correct word, asked the student to continue reading, and marked the word as incorrect. The total number of words read correctly was recorded.

Maze Selection. The grade level reading aloud passages administered to the participants were also administered in a maze format. The students were asked to read the maze passages silently and select word choices for two minutes. The number of correct word selections was recorded.

Word Identification. Grade 1 students were administered a word identification measure in addition to the reading aloud and maze selection measures. The word lists were created by randomly selecting words from the Dolch word lists (Dolch, 1955). Each list consisted of 100 words selected randomly with replacement from the preprimer, primer, and first grade Dolch word lists. Participants were asked to read each list aloud for one minute, and the examiner scored the number of words read correctly. Repetitions, self-corrections, insertions, and dialect/articulation were scored as correct. Mispronunciations, word substitution, omissions, and hesitations were marked incorrect. If the student hesitated for more than three seconds, the examiner asked the student to continue reading, and marked the word as incorrect. The total number of words read correctly was recorded.

Procedure

CBM administration. CBM data were collected across 12 consecutive weeks starting in January, 2006. Half of the students at each elementary grade level were administered reading aloud at the beginning of the week and maze selection at the end of the week, and the other half of the students were administered maze selection at the beginning of the week and reading aloud at the end of the week. The word identification measure was administered during the same session as the reading aloud measure (Grade 1 only). All high school students were administered maze selection at the beginning of the week and reading aloud at the end of the week due to scheduling issues. Students at each grade level received all reading passages in the same order across the 12 weeks. Ninth graders were not administered reading aloud during the 3rd week of the study due to scheduling difficulties.

The reading aloud and word identification measures were individually administered by trained graduate students with one exception: Classroom teachers administered reading aloud to

9th graders during weeks 1 and 2 (see Appendix A for administration directions). The 9th grade classroom teachers had agreed to administer the reading aloud measures weekly at the beginning of the study, but asked the graduate students to take over after week 3 due to scheduling difficulties. All the elementary level classroom teachers preferred to have the graduate students administer the reading aloud measures from the beginning of the study. Graduate students were trained to administer and score reading aloud and word identification measures during a one-hour training session. During the training session, graduate students practiced administering and scoring reading aloud and word identification measures. Inter-scorer agreement was checked on three reading aloud passages for each graduate student. All graduate students needed to obtain inter-scorer agreement of 90% or higher with the trainer on all three passages. The inter-scorer agreement was calculated by dividing the smaller number by the larger number. If the inter-scorer agreement criteria of 90% or higher was not met, procedures for administering the reading aloud and word identification measures were reviewed and inter-scorer agreement was checked again until the 90% criteria was met.

During data collection, inter-scorer reliability for reading aloud and word identification was checked by the trainer. Graduate students tape-recorded every individual reading aloud and word identification session. Twenty percent of the tape-recorded sessions were independently scored by the trainer and inter-scorer reliability was calculated by dividing the smaller number by the larger number for each sample. The average inter-scorer reliability for reading aloud was 98% and the average inter-scorer reliability for word identification was 97%.

The maze selection measure was group administered by the classroom teacher (see Appendix A for administration directions). All classroom teachers were trained to administer the maze during a one-hour training session. Fidelity of administration was checked by trained

graduate students using a checklist created by a team of researchers (see Appendix B). The items on the checklist included: completing sample items, providing standardized directions, demonstrating correction procedure, saying “Begin”, starting the stopwatch on time, giving the 30 sec prompt, stopping the task at 2 min, collecting all materials, and providing assistance to students following standardized directions. The average fidelity was 97%.

Analysis

For all analyses, students in Grade 2 ($n = 10$) were included in the same group as students in Grade 3 and students in Grade 4 ($n = 6$) were included in the same group as students in Grade 5. This decision was made based on the fact that there were two classrooms that combined grade levels (one Grade 2/3 split and one Grade 4/5 split) and the classroom teachers reported that there was no differentiation in reading instruction based on grade level within the classroom. Students in Grade 2 were receiving the same reading instruction as students in Grade 3 and students in Grade 4 were receiving the same reading instruction as students in Grade 5.

Group level. In order to calculate the growth rate and intercept for reading aloud, maze selection, and word identification for the group level, and the confidence interval based on group level, the latent growth model (LGM) that is based on group level was employed. LGM was performed using the AMOS 4.0 program. Missing data were handled using the full-information maximum likelihood (FIML) statistical method in the AMOS program. The AMOS program changes from its default algorithm (moment-based maximum likelihood) to the FIML automatically when the AMOS detects missing values in the data (Dembo, Wothke, Livingston, & Schmeidler, 2002).

Individual level. In order to calculate to standard error of estimate (SEE) and standard error of slope (SEb), slopes were computed for each student using ordinary least squares (OLS).

For Grades 2/3, 4/5, and 9, SEBs and SEEs were compared for reading aloud and maze selection using dependent t-test (matched-pairs t-test).. For Grade 1, the SEBs and SEEs were compared for reading aloud, maze selection, and word identification using a repeated measurement Analyses of Variance (ANOVA). In addition, box plots were used to graphically inspect how large the SEb was at each grade level.

Results

Group level: Estimates of Intercept and Slope

The intercept and slope estimates for reading aloud, word identification, and maze selection are shown in Table 1.

Reading Aloud. The estimated average reading aloud intercept for Grades 1, 2/3, 4/5, and 9 was 44.46 words read correctly (WRC), 108.52 WRC, 142.04 WRC, and 164.27 WRC respectively. The intercepts were all significantly different from zero ($p < .0001$). The estimated average reading aloud slope for Grades 1, 2/3, 4/5, and 9 was 1.21 WRC per week, .84 WRC per week, .93 WRC per week, and -1.60 WRC per week respectively. All slopes were significantly different from zero ($p < .0001$).

Maze selection. The estimated average maze selection intercept for Grades 1, 2/3, 4/5, and 9 was 4.82 correct selections (CS), 14.13 CS, 20.92 CS, and 21.46 CS respectively. The intercepts were all significantly different from zero ($p < .0001$). The estimated average maze selection slope for Grades 1, 2/3, 4/5, and 9 was .39 CS per week, .57 CS per week, .71 CS per week, and .43 CS per week respectively. All slopes were significantly different from zero ($p < .0001$).

Word Identification (WID). The estimated average WID intercept for Grade 1 was 27.02 WRC. The intercept was significantly different from zero ($p < .0001$). The estimated average

slope for WID was 1.75 WRC per week. The group slope for WID was significantly different from zero ($p < .0001$).

Table 1. Estimates of Intercepts and Slopes for Grades 1- 9

Grade Level Reading Aloud				
Grade	Intercept	Slope	P_Intercept	P_Slope
1	44.461	1.207	0.000	0.000
2/3	108.524	.839	0.000	0.000
4/5	142.041	.932	0.000	0.000
9	164.271	-1.598	0.000	0.000
Grade Level Maze Selection				
Grade	Intercept	Slope	P_Intercept	P_Slope
1	4.8193	.387	0.000	0.000
2/3	14.131	.565	0.000	0.000
4/5	20.921	.714	0.000	0.000
9	21.457	.428	0.000	0.000
Grade Level Word Identification				
Grade	Intercept	Slope	P_Intercept	P_Slope
1	27.018	1.754	0.000	0.000

Group level: 95% Confidence Interval for Slopes

The lower and upper bound of the 95% confidence interval based on group slopes are presented in Table 2. For reading aloud, 95 out of 100 times the true group slope would fall between .26 and .51 words read correctly per week for students in Grade 1, .49 and 1.19 words read correctly per week for students in Grade 2/3, .34 and 1.53 words read correctly per week for students in Grade 4/5, and -2.67 and -.53 words read correctly per week for students in Grade 9. For maze selection, 95 out of 100 times the true group slope would fall between -.39 and 1.17 correct selections per week for students in Grade 1, .27 and .86 correct selections per week for students in Grade 2/3, .30 and 1.13 correct selections per week for students in Grade 4/5, and .26 and .60 correct selections per week for students in Grade 9. For word identification, 95 out of 100 times the true group slope would fall between -.21 and 3.72 words read correctly per week.

Table 2. 95% Confidence Interval for Slopes by Grade and CBM Measure

Grade Level Reading Aloud			
Grade	Slope	Confidence Interval for slope	
		Lower bound	Upper bound
1	1.207	.26	1.51
2/3	.839	.49	1.19
4/5	.932	.34	1.53
9	-1.598	-2.67	-.53
Grade Level Maze Selection			
Grade	Slope	Confidence Interval for slope	
		Lower bound	Upper bound
1	.387*	-.39	1.17
2/3	.565	.27	.86
4/5	.714	.30	1.13
9	.428	.26	.60
Grade Level Word Identification			
Grade	Slope	Confidence Interval for slope	
		Lower bound	Upper bound
1	1.754*	-.21	3.72

* Confidence interval contains zero

Individual Level: Standard Error of Slope (SEb) and Standard Error of Estimate (SEE).

The ordinary least squares (OLS) based on each student's CBM scores was used to calculate standard error of estimate (SEE) and standard error of slope (SEb). The individual OLS graphs are presented by type of measure and grade level in Appendix C. The 95% confidence interval for the OLS intercepts and slopes are presented by type of measure and grade level in Appendix D.

Figures 5, 6, and 7 show box plots of the SEb for maze selection, reading aloud, and word identification. The confidence intervals for maze selection decrease from Grade 1 to Grade 4/5, but increase from Grade 4/5 to Grade 9. Mean scores for maze selection and reading aloud increase as grade level increases. This means that the consistency of slopes for the two measures decreases as grade level increases.

Figure 5. Box plots of SEb for Maze Selection

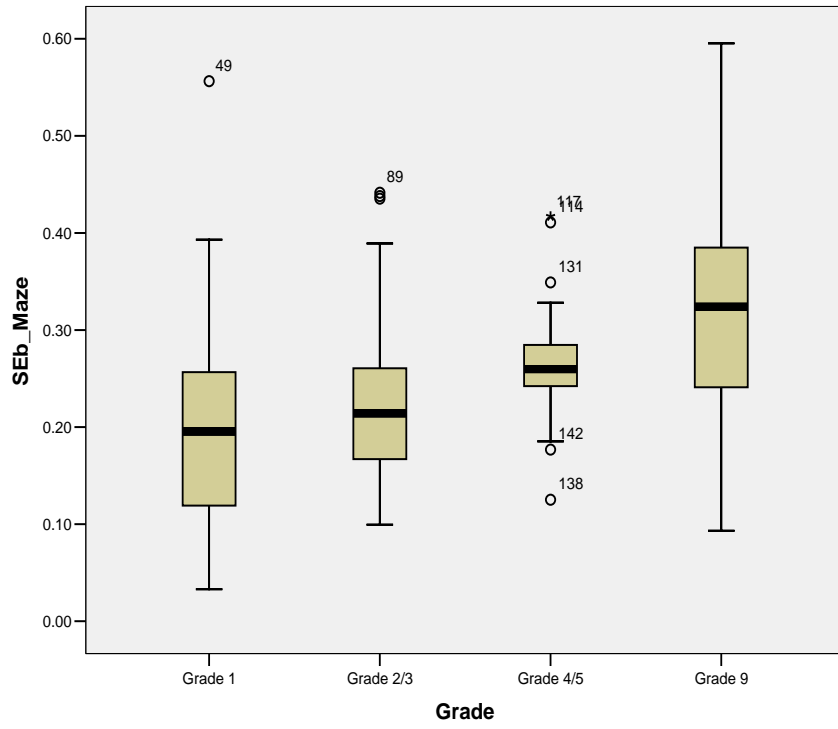


Figure 6. Box plots of SEb for Reading Aloud

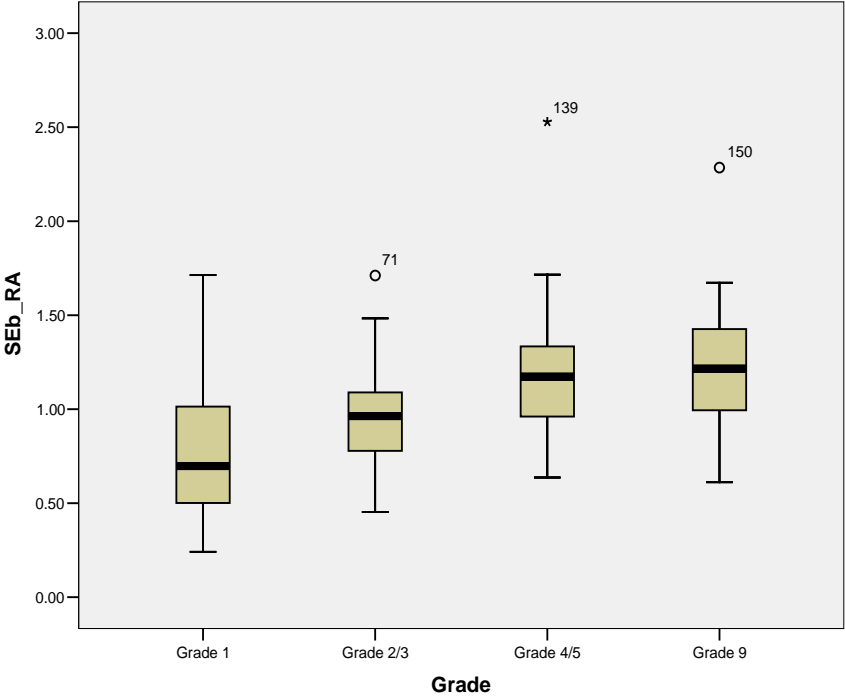


Figure 7. Box plots of SEb for Word Identification

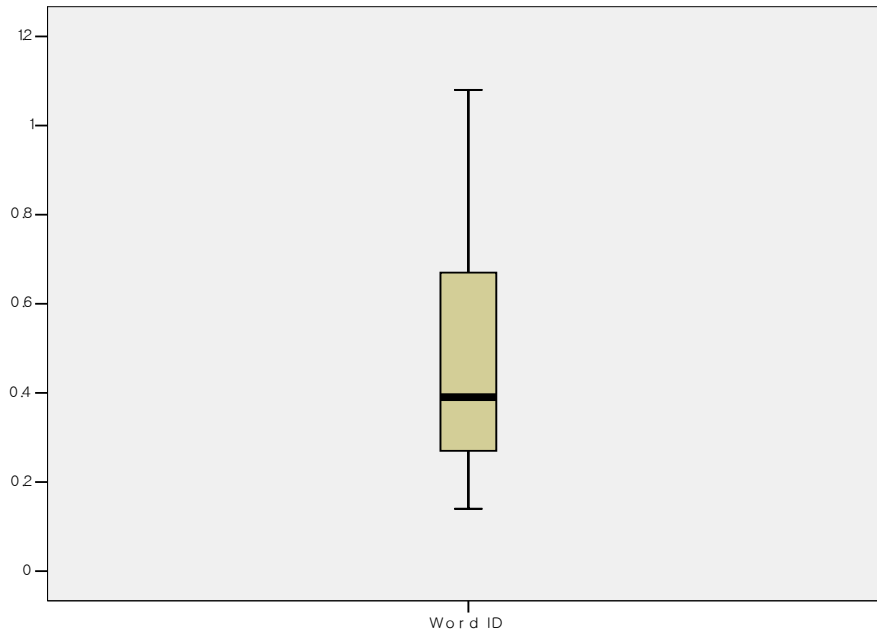


Table 3 shows descriptive statistics and confidence intervals of the SEb for maze selection and reading aloud at each level. For reading aloud, 95 out of 100 times the true group SEb would fall between .70 and .93 words read correctly per week for students in Grade 1, .90 and 1.03 words read correctly per week for students in Grade 2/3, 1.08 and 1.30 words read correctly per week for students in Grade 4/5, and 1.12 and 1.30 words read correctly per week for students in Grade 9. For maze selection, 95 out of 100 times the true group SEb would fall between .17 and .23 correct selections per week for students in Grade 1, .20 and .25 correct selections per week for students in Grade 2/3, .24 and .28 correct selections per week for students in Grade 4/5, and .29 and .35 correct selections per week for students in Grade 9. For word identification, 95 out of 100 times the true group SEb would fall between .38 and .67 words read correctly per week for students in Grade 1.

Overall, the means of the SEb for maze selection were lower than those for reading aloud, which indicated that the slopes of maze selection at each grade level were less variable than those of reading aloud. Yet, because the confidence intervals for the two measures did not include zero, the SEb for both measures were considered to be significantly different from zero. The means of the SEb for word identification were lower than those for reading aloud, but higher than those for maze selection. These results indicate that word identification may produce less variable slopes than reading aloud, but more variable slopes than maze selection.

Table 3. Descriptive statistics and Confidence Interval of SEb

Descriptive statistics of SEb						
Grade	Measure	Mean	N	S.D.	Confidence Interval for slope	
					Lower bound	Lower bound
1	Maze	.200	52	.098	.1735	.2283
	RA	.815	52	.399	.7046	.9269
	WID	.47	52	.26	.38	.67
2/3	Maze	.227	51	.082	.2045	.2507
	RA	.966	51	.229	.9022	1.0314
4/5	Maze	.262	38	.057	.2439	.2815
	RA	1.190	38	.331	1.0821	1.3000
9	Maze	.3188	47	.107	.2874	.3503
	RA	1.201	47	.309	1.1221	1.2956

Note. *** $p < .001$

Individual Level: Dependent t-test of SEb and SEE for Reading Aloud and Maze Selection.

Table 4 shows the results from the dependent t-test for the SEb between reading aloud and maze selection (repeated measurement design for Grade 1 using reading aloud, maze selection, and word identification). As Table 4 indicates, there was a statistically significant difference in the SEb for reading aloud and maze selection at each grade level: ($F(52) = 143.01$,

$p < .001$ for Grade 1; $t(50) = -22.03$, $p < .001$ for Grade 2/3; $t(37) = -16.88$, $p < .001$ for Grade 4/5; $t(46) = -18.37$, $p < .001$ for Grade 9), which indicated that the means of the SEb in maze selection were significantly lower than those in reading aloud. In other words, the results showed that the slope of maze selection was more stable than reading aloud at each grade level. Similar results were found for Grade 1 with reading aloud, maze selection, and word identification. Maze selection was more stable than reading aloud and word identification, and word identification was more stable than reading aloud.

Table 4. Results of the Dependent t-test for the SEb between Maze Selection and Reading Aloud

Dependent t-test (SEb)					
Grade	Measure	Mean	N	S.D	t-value
1	Maze	.200	52	.098	243.01***
	RA	.815	52	.399	
	WID	.47	52	.26	
2/3	Maze	.227	51	.082	-22.030***
	RA	.966	51	.229	
4/5	Maze	.262	38	.057	-16.876***
	RA	1.190	38	.331	
9	Maze	.3188	47	.107	-18.367***
	RA	1.201	47	.309	

Note. *** $p < .001$. Repeated measurement design was used for Grade 1.

Table 5 shows the results from the dependent t-test (repeated measurement design for Grade 1) for SEE between reading aloud and maze selection were statistically different at each grade level ($F(52) = 123.145$, $p < .001$ for Grade 1; $t(50) = -22.03$, $p < .001$ for Grade 2/3; $t(37) = -16.88$, $p < .001$ for Grade 4/5; $t(46) = -18.37$, $p < .001$ for Grade 9), which indicated that the means of the SEE in maze selection were lower than the SEE in reading aloud. In other words, maze selection was more stable than reading aloud was at each grade level. Word identification was more stable than reading aloud, but less stable than maze selection.

Table 5. Results of the dependent t-test for SEE between Maze Selection and Reading Aloud

Dependent t-test (SEE)					
Grade	Measure	Mean	N	S.D	t-value
1	Maze	2.402	52	1.176	125.145***
	RA	9.754	52	4.774	
	WID	5.89	52	3.28	
2/3	Maze	2.721	51	.982	-22.030***
	RA	11.561	51	2.746	
4/5	Maze	3.141	38	.683	-16.876***
	RA	14.242	38	3.964	
9	Maze	3.812	47	1.281	-18.367***
	RA	14.366	47	3.700	

Note. *** $p < .001$. Repeated measurement design was used for Grade 1.

Discussion

The purpose of this study was to compare the characteristics of reading aloud, word identification, and maze selection as growth measures across grade levels. Two research questions were examined. The first research question investigated which weekly progress monitoring measures in reading were more sensitive to growth over time and the second research question investigated the consistency of the slopes. The data analysis was divided into group level data and individual level data.

First, in terms of group level, the growth rate and intercept was reported using latent growth model. The results showed that growth rate and intercept of reading aloud, word identification, and maze selection were significantly different from zero. The confidence interval around the slopes for reading aloud and maze selection did not contain zero for students in grades 2/3, 4/5, or 9, meaning that both reading aloud and maze selection reflected changes in student performance from week 1 to week 12 for these students. Although the confidence interval around the reading aloud slopes for students in Grade 9 did not contain zero, the

estimated reading aloud slope was negative. In contrast, the estimated slope for maze selection was positive suggesting that maze selection may be a better growth measure for students in Grade 9 (assuming that students did not regress in reading performance over time). The confidence interval around the word identification and maze selection slopes for students in Grade 1 contained zero, however, the confidence interval around the reading aloud slope for students in Grade 1 did not contain zero. These results indicate that reading aloud may reflect changes in reading performance better than either word identification or reading aloud for students in Grade 1.

Second, with regard to individual level, the standard error of estimate (SEE), standard error of slope (SEb), and confidence interval for maze selection and reading aloud were investigated using OLS for each student at each grade level. The results based on each student showed that SEb for each measure was significantly different from zero, indicating that there was error associated with the slopes. In addition, the results showed that the mean SEb increased as grade increased, indicating that the error around the slopes got larger as students got older. The results from the dependent t-test revealed that, overall, maze selection was more stable than reading aloud.

In sum, the study shows that reading aloud and maze selection were reflected changes in student performance in reading. However, based on the findings of comparison of maze selection and reading aloud for SEE and SEb, maze selection has a more stable growth trajectory than reading aloud. The comparison of the maze selection and reading aloud SEb confidence intervals also indicates that maze selection has a more stable growth rate than reading aloud although the SEb for maze selection and reading aloud both increase as grade level increases.

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Appendix A

READING ALOUD

ADMINISTRATION DIRECTIONS

MATERIALS

1. Unnumbered copy of passage (student copy)
2. Numbered copy of passage (examiner copy—in student test packet)
3. Stopwatch
4. Clipboard
5. Red pen
6. Calculator

DIRECTIONS

1. Place the unnumbered copy in front of the student. Say “I’m going to have you read a story to me.”
2. Place the numbered copy in front of you but shielded so the student cannot see what you record.
3. Say these specific directions to the student for the first passage.
“When I say ‘begin’, start reading aloud at the top of this page.”
Point to the first word of the story, not to the title.
“Read across the page.”
Demonstrate by pointing.
“Try to read each word. If you come to a word you don’t know, I’ll tell it to you. If you get to the end of the passage before I say stop, start at the beginning of the passage again. Be sure to do your best reading. The title of the passage you will be reading is: (***READ THE TITLE OF THE STORY OUT LOUD***). Are there any questions?” (***Pause***)
4. Point to the first word and say “**Ready? Begin**” Start your stopwatch when the student says the first word. If the student fails to say the first word of the passage after 3 seconds, tell them the word and mark it as incorrect, then start your stopwatch.
5. Follow along on your copy. Put a slash (/) through words read incorrectly (see scoring procedures).
6. If a student stops or struggles with a word for 3 seconds, tell the student the word and mark it as incorrect.
7. At the end of 1 minute, place a bracket (]) after the word that the student has just read, and say, “**Stop.**”

8. Collect the first passage from the student; place the unnumbered copy of the second passage in front of the student. Administer this second passage with the following directions.
9. Say, “Now you’re going to do the same thing with another story. Remember to do your best reading. The title of this story is _____. Any questions?”

COLLECT ALL MATERIALS

NOTE:

- Make sure to score the students’ passages immediately after administering the measures.
- If you make an examiner’s mistake during the administration of the reading aloud passage, tell the student to stop, restart your stopwatch, and have the student read from where they left off (or at the beginning of the next paragraph or sentence).

Adapted from CBM Administration and Scoring Module.
Shinn, M.R. (1989). Curriculum-based measurement: Assessing special children. New York: Guilford Press.

CBM MAZE
ADMINISTRATION DIRECTIONS

MATERIALS

1. Maze packet for each student.
2. Stopwatch.

DIRECTIONS

Say to the students: "Please write today's date on the top of your packet."

"Today I want you to read 1 short story. The story you are going to read have some places where you need to choose the correct word. You will read the story, and whenever you come to three words that are in brackets, underlined, and in dark print, you will circle the word that belongs in the sentence."

"Before you begin, we will do some examples. Look at the first page in your booklet. The first sentence says:

He put on his (**trees / boots / houses**) and walked to school."

"Circle the word that belongs in the sentence."

After 10 seconds: "The word boots belongs in the sentence, **He put on his boots and walked to school.** Circle the word boots."

Monitor the students for compliance.

Say to the students: "Now let's try sentence number two. The sentence says:

She was late, so she (**map / see / ran**) to catch the bus."

"Circle the word that belongs in the sentence."

After 10 seconds: "The word ran belongs in the sentence, **she was late, so she ran to catch the bus.** Circle the word ran."

Monitor the students for compliance. Point to the word if necessary.

PASSAGE 1

Say to the students: "Please put your pencils down and listen to my directions." (Pause and monitor students for compliance.)

"Now you are going to do the same thing by yourself. You will read a story. Whenever you come to three words that are in brackets, underlined, and in dark print, circle the word that belongs in the sentence."

“Circle a word even if you’re not sure of the answer. I cannot tell you any words, so do your best. If you make a mistake, don’t erase, but put an X on the answer that you didn’t want, circle the answer that you wanted, and move on.”

Demonstrate for students. Put the words “He put on his (trees / boots / houses) and walked to school. ” on the board or overhead. Circle trees, X it out, and then circle boots.

“Continue working until I tell you to stop. If you finish early, check your answers. You may begin when I tell you to. Are there any questions? Turn to page 2 in your booklet.”

Monitor students to make sure they are on the first maze passage in their booklet.

Say to the students: “Remember to do the best you can. Pick up your pencils. Ready? Begin.”

After 30 seconds, say: “Remember, circle a word, even if you are not sure of the answer.”

At 2 minutes, say: “Stop. Put your pencils down. Close your packets.”

COLLECT ALL MATERIALS

NOTE:

- Don’t forget to give the following prompt after 30 seconds has passed, “Remember, circle a word, even if you are not sure of the answer.”
- If students ask you to identify a word, remind them to just do the best they can.
- It is very important for our reliability that you keep a close watch on the timing of the test. Have a back-up (clock or watch) available in case your stop watch doesn’t work.

Word Identification
Directions for Administration and Scoring

Materials

1. Student copy of probe.
2. Examiner copy of probe.
3. Stopwatch.
4. Red or blue pen.

Directions for Administration

1. Use these instructions to explain the task:

I'm going to show you a list of words. When I say, "BEGIN," you will read the words as quickly and correctly as you can. Start here and go across the page (run your finger across the first row). If you don't know a word, just tell me and I'll tell you to try the next word. Keep reading until I say stop. Do you have any questions? Remember to read quickly, and just tell me if you don't know a word. (Place student probe in front of the child.)

You can point to each word so you don't lose your place. Ready? Go.

Time the student for **1 minute**. If the student hesitates, prompt him/her by saying, "Go on" after three seconds. Do NOT correct mistakes. When 1 minute is up, say "**Stop**" and something positive.

Draw a line under the student's last response (after 1 minute).

Directions for Scoring

1. Score correct responses as a 1, incorrect responses as a 0. Record the score in the blank next to each word on the examiner form.
2. Add the total score and record it at the bottom of the examiner form.

Appendix B

ACCURACY OF IMPLEMENTATION RATING SCALE CBM MAZE

Examiner: _____ **Date** Observation 1: _____

Observer: _____ Observation 2: _____

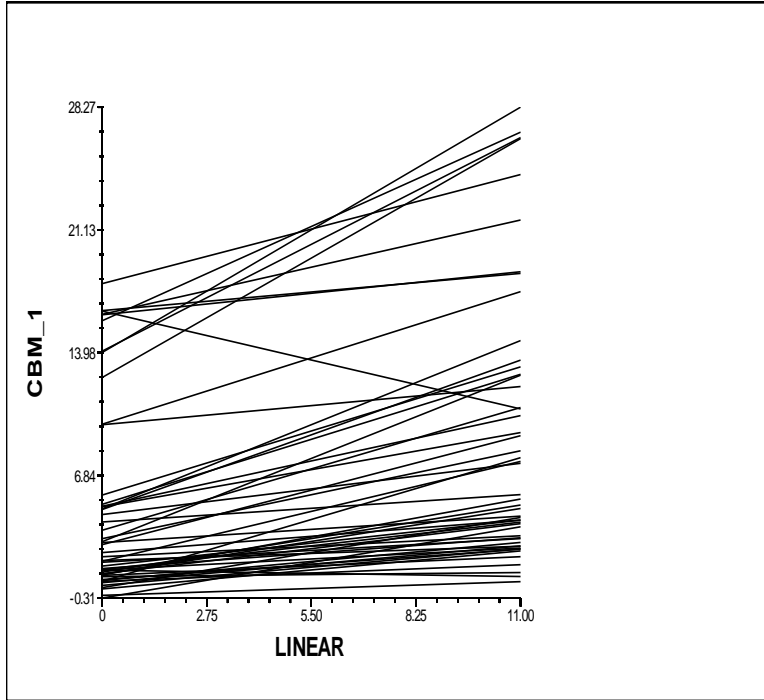
X = Correct; O = Incorrect Observation 3: _____

STEP	OBSERVATION 1	OBSERVATION 2	OBSERVATION 3
Completes sample question (weeks 1-2 ONLY)			
Provides standardized directions for <i>Passage</i>			
Places sample “correction” procedure on board (weeks 1-2 ONLY)			
Says “Begin”			
Starts stopwatch at correct time			
Gives 30 second prompt (weeks 1-2 ONLY)			
Stops test at 2 minutes			
Collects all materials			
Assistance to students (following standardized directions)			

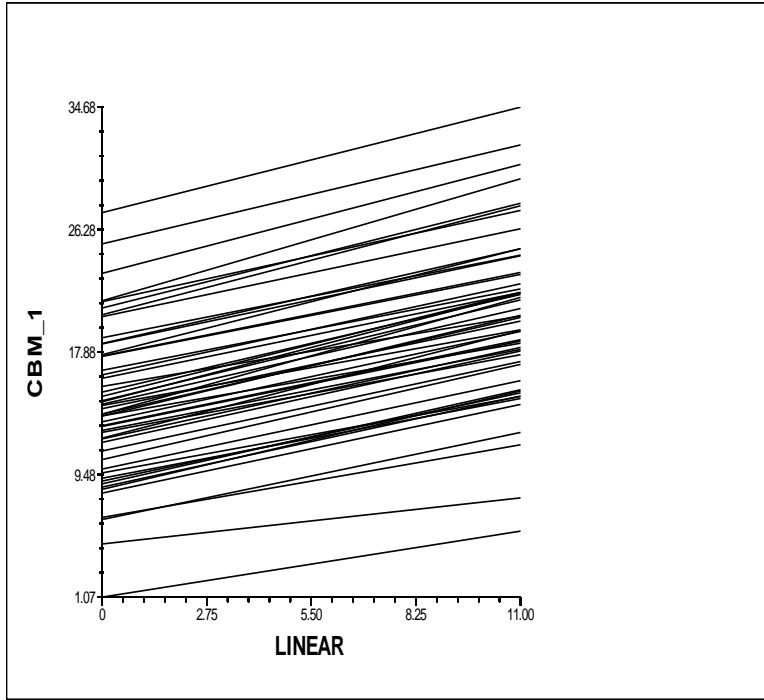
Appendix C

Estimated Individual Graphs (OLS)

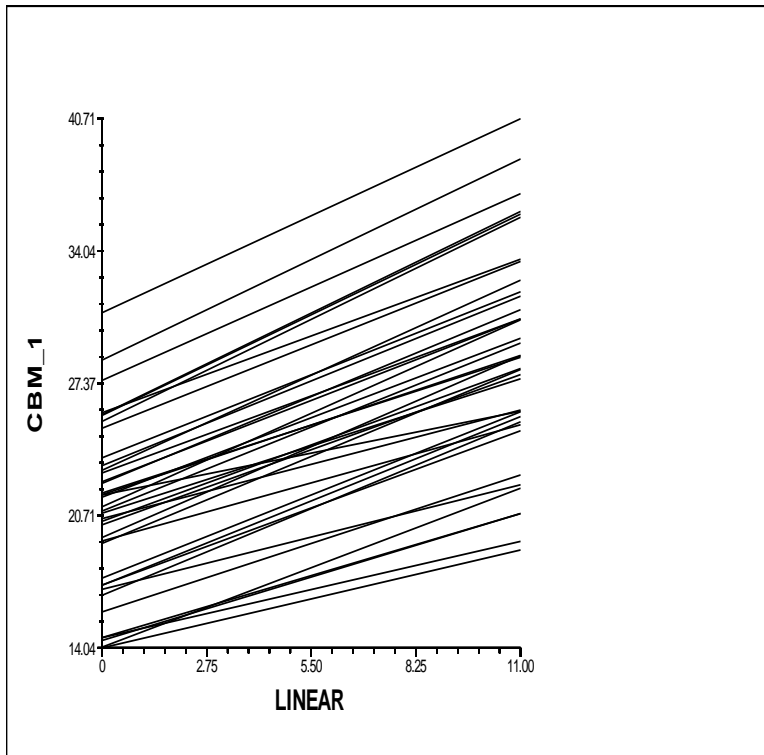
Maze Selection Grade 1



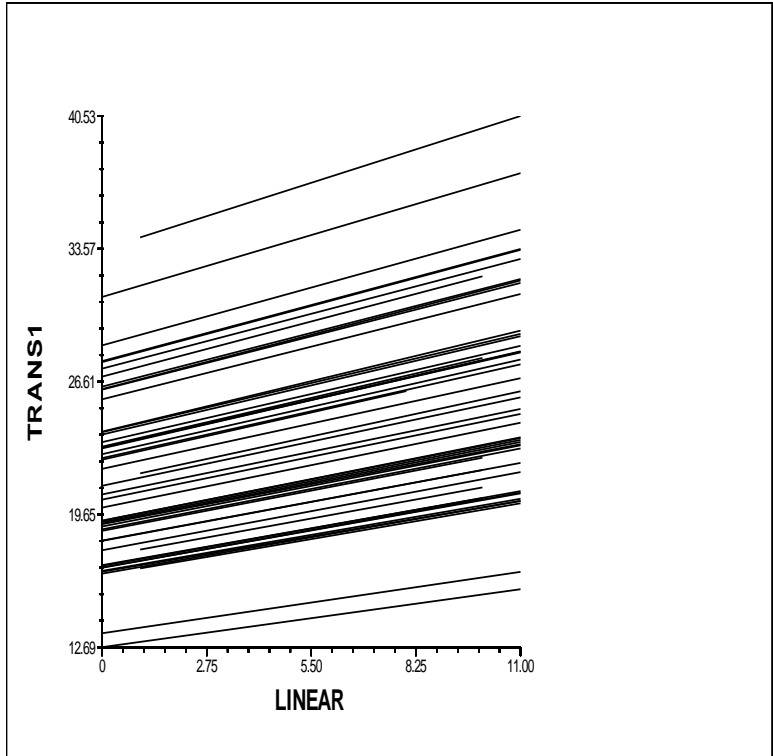
Maze Selection Grade 2/3



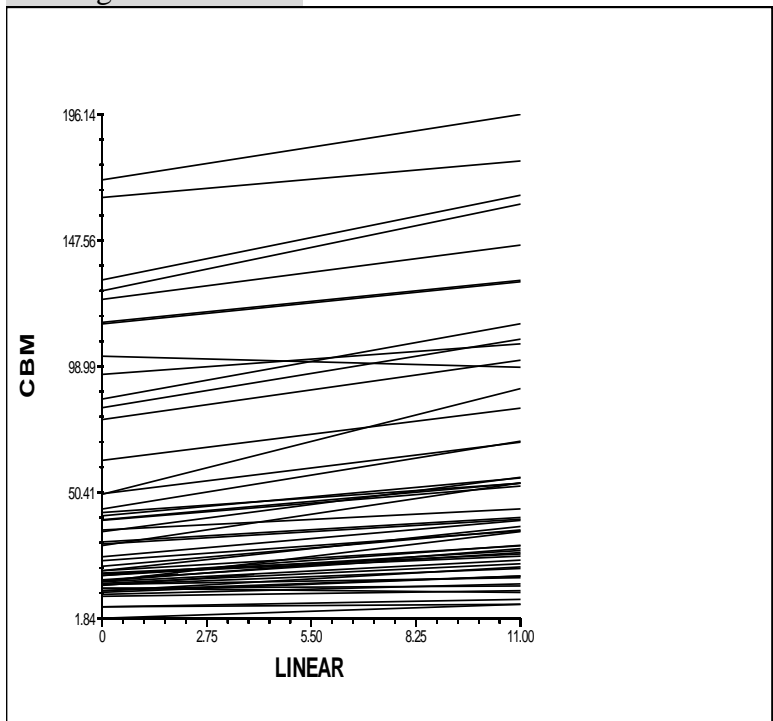
Maze Selection Grade 4/5



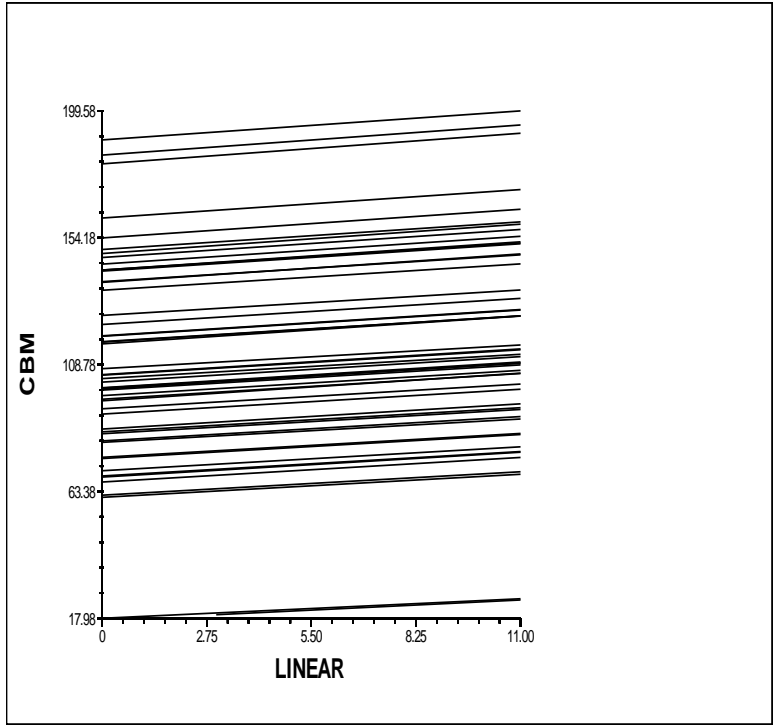
Maze Selection Grade 9



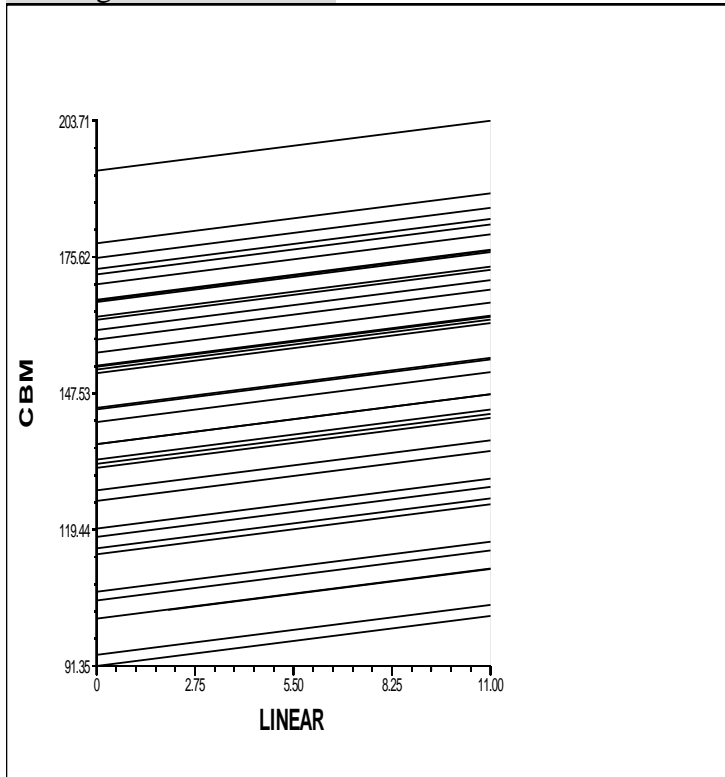
Reading Aloud Grade 1



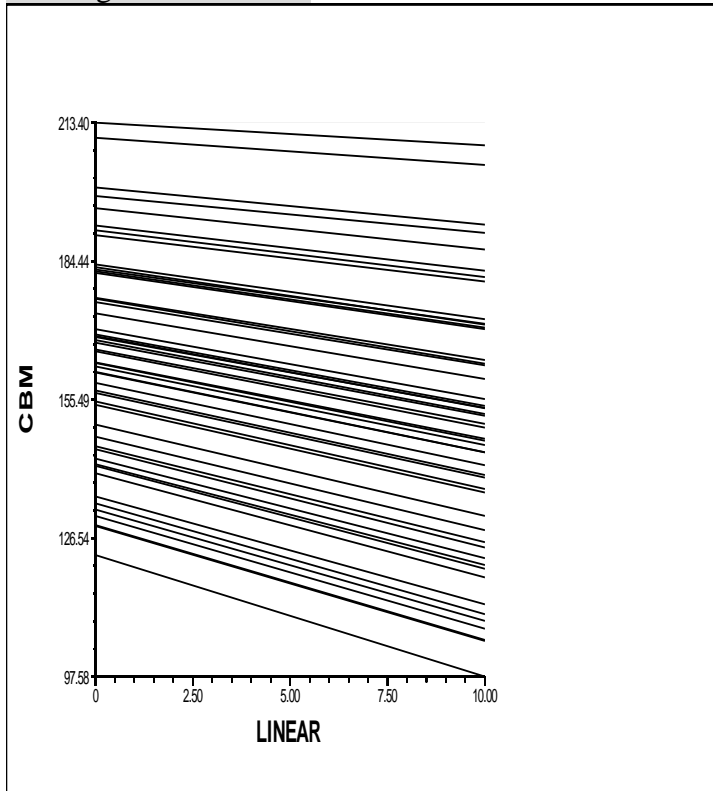
Reading Aloud Grade 2/3



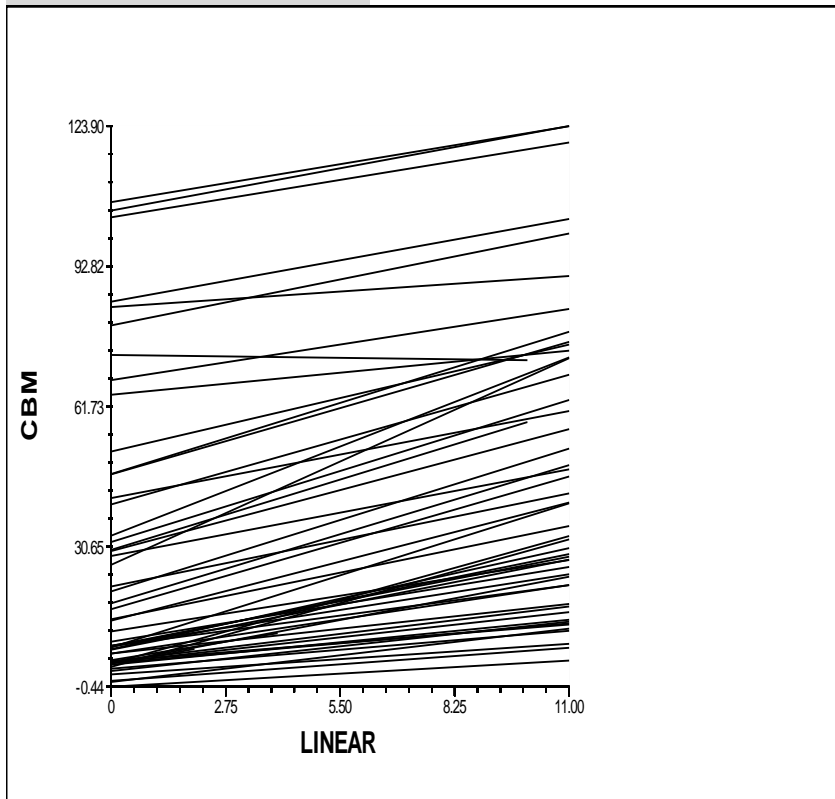
Reading Aloud Grade 4/5



Reading Aloud Grade 9



Word Identification Grade 1

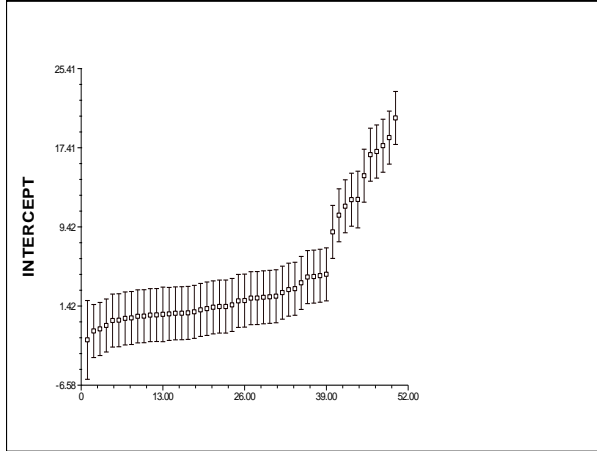


Appendix D

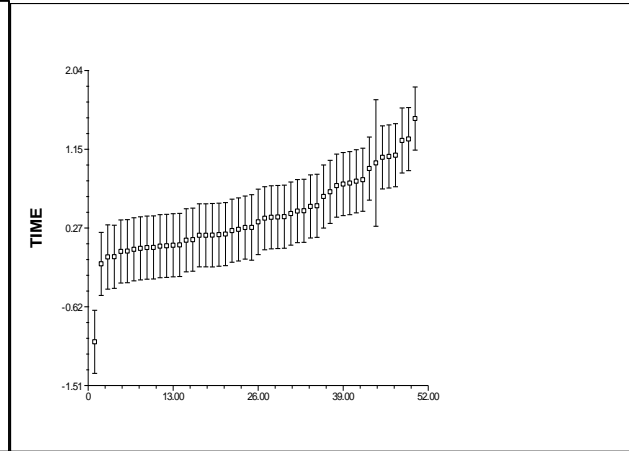
95% Confidence Interval for OLS Intercepts and Slopes

Maze Selection Grade 1

Intercept

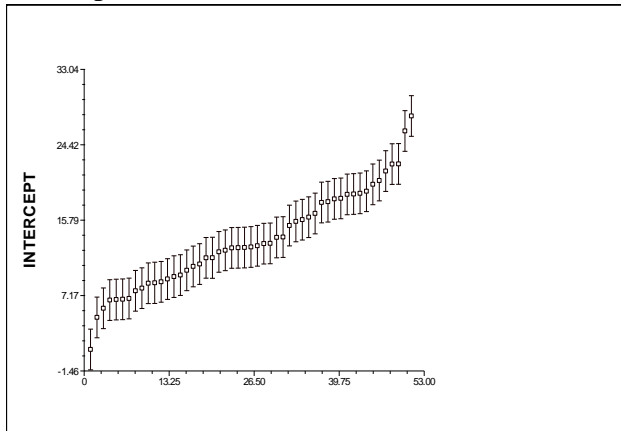


Slope

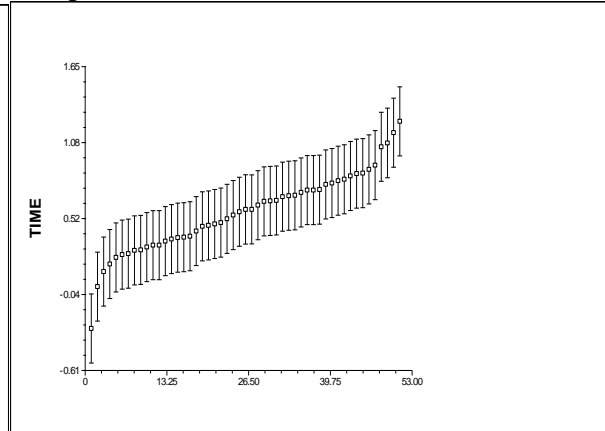


Maze Selection Grade 2/3

Intercept

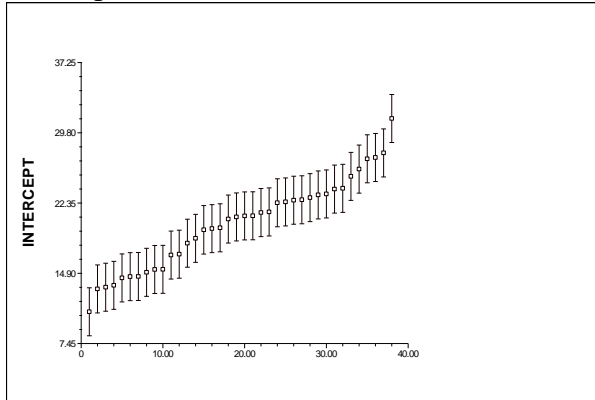


Slope

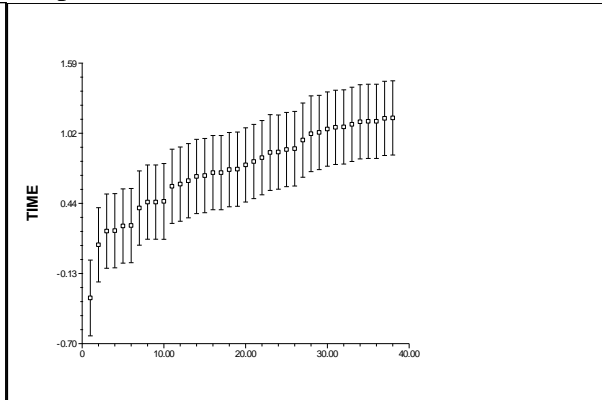


Maze Selection Grade 4/5

Intercept

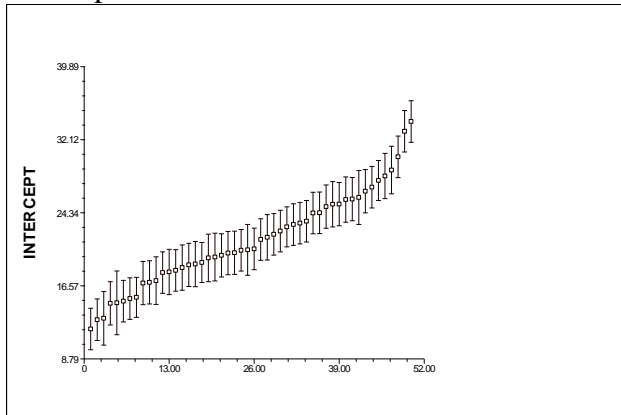


Slope

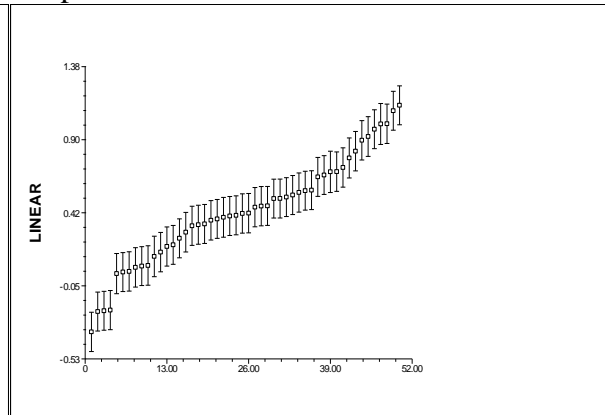


Maze Selection Grade 9

Intercept

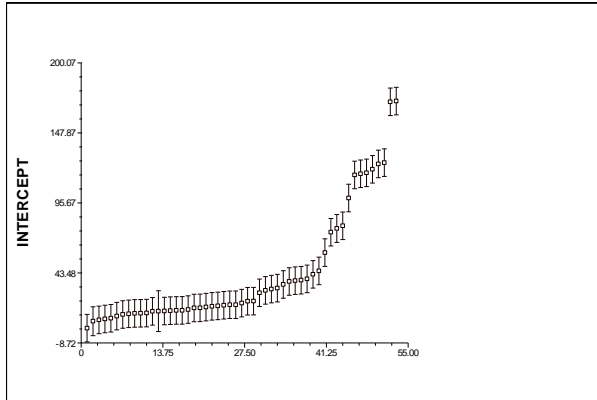


Slope

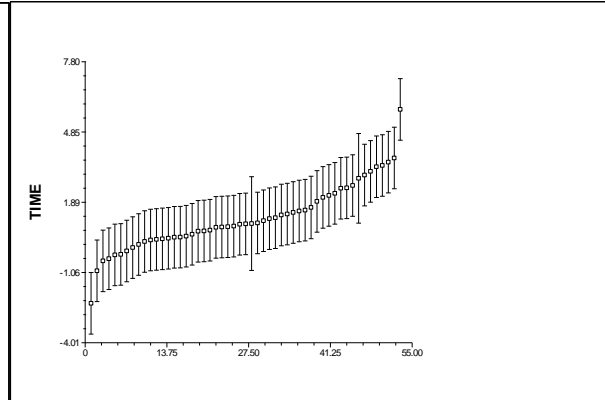


Reading Aloud Grade 1

Intercept

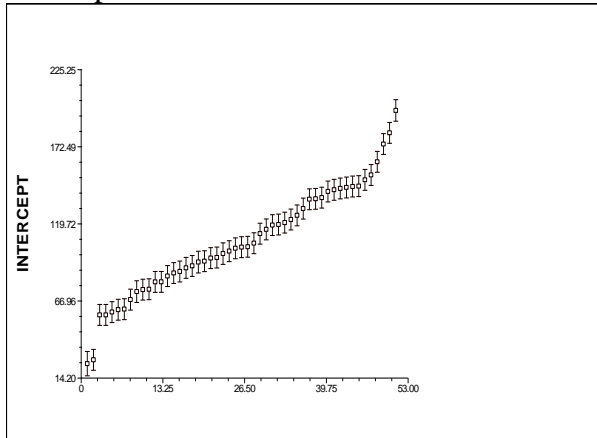


Slope

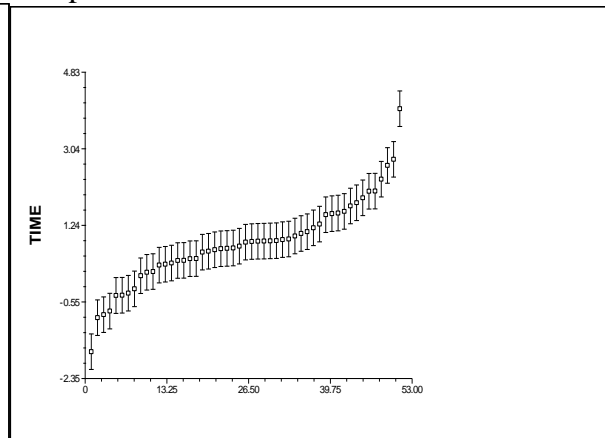


Reading Aloud Grade 2/3

Intercept

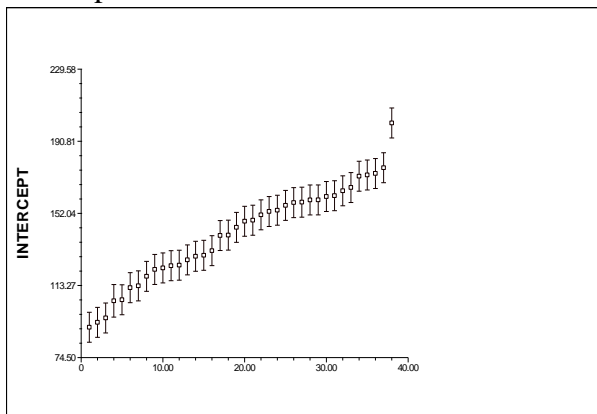


Slope

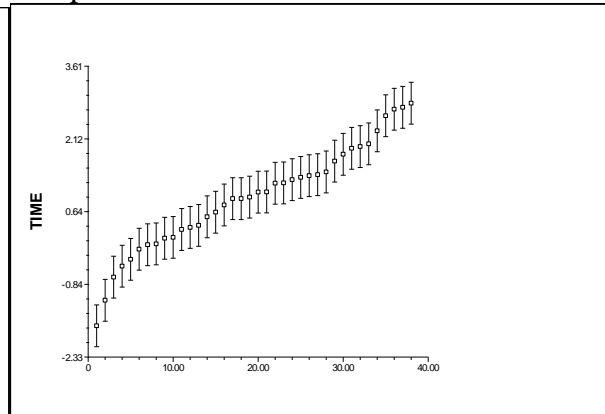


Reading Aloud Grade 4/5

Intercept

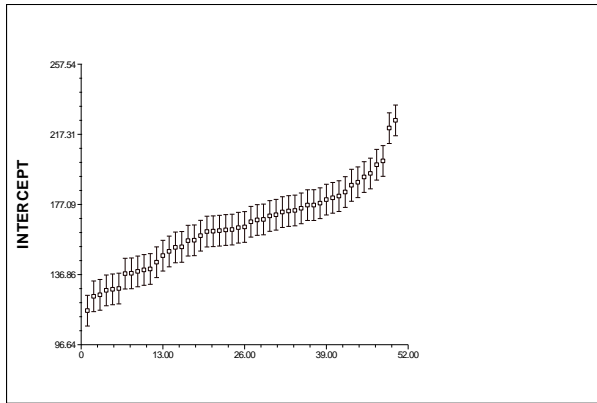


Slope

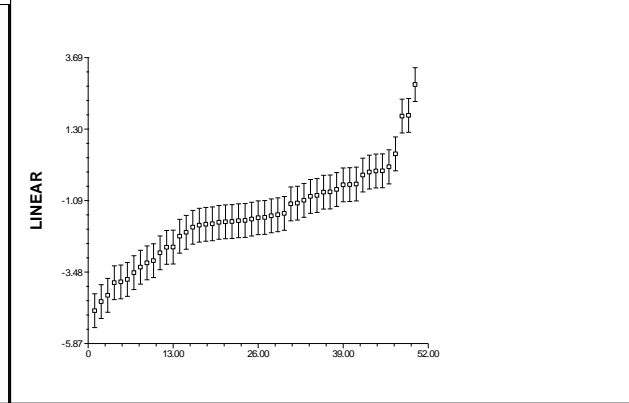


Reading Aloud Grade 9

Intercept

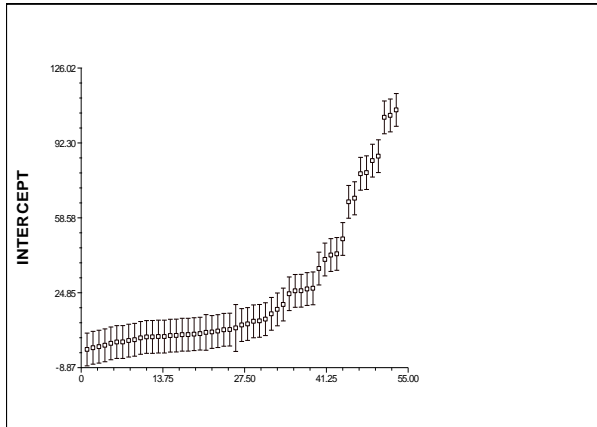


Slope



Word Identification Grade 1

Intercept



Slope

