

Technical Report # 43

**The Development of Fifth-Grade Passage Reading Fluency Measures
for use in a Progress Monitoring Assessment System**

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Published by

Behavioral Research and Teaching
University of Oregon • 175 Education
5262 University of Oregon • Eugene, OR 97403-5262
Phone: 541-346-3535 • Fax: 541-346-5689
<http://brt.uoregon.edu>

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Abstract

This technical report describes the development of fifth grade progress monitoring measures in the area of Passage Reading Fluency. This measure was designed to target the fluency component of a developmental model of reading. Twenty alternate forms were written by graduate students and reviewed by the lead author. The passages were piloted and mean scores were compared as a measure of difficulty. In response to these data, the passages were brought into closer alignment by identifying nine passages that showed similar difficulty level and adjusting the remaining passages to match this level. Data on the difficulty of each passage and a summary of revisions are presented.

Introduction

In this technical report, we describe the development alternate forms of fifth-grade Passage Reading Fluency measures as part of a comprehensive progress monitoring literacy assessment system developed in 2006 for use with students in Kindergarten through fifth grade. We begin with a brief overview of the two conceptual frameworks underlying the assessment system: progress monitoring and developmental theories of reading. We then provide context for how the Passage Reading Fluency measures fit into the full assessment system. Additional technical reports provide similar information about measures of Early Literacy such as Letter Names, Letter Sounds, and Phoneme Segmenting (Alonzo & Tindal, 2007) and Reading Comprehension (Alonzo, Liu, & Tindal, 2007).

Conceptual Framework: Progress Monitoring and Literacy Assessment

Early work related to curriculum-based measurement (CBM) led by Deno and Mirkin at the University of Minnesota (*c.f.a.*, Deno & Mirkin, 1977) was instrumental in promoting the use of short, easily-administered assessments to provide educators with information about student skill development useful for instructional planning. In the three decades since, such *progress monitoring probes* as they have come to be called have increased in popularity, and they are now a regular part of many schools' educational programs (Alonzo, Ketterlin-Geller, & Tindal, 2007). However, CBMs – even those widely used across the United States – often lack the psychometric properties expected of modern technically-adequate assessments. Although the precision of instrument development has advanced tremendously in the past 30 years with the advent of more sophisticated statistical techniques for analyzing tests on an item by item basis rather than relying exclusively on comparisons of means and standard deviations to evaluate comparability of alternate forms, the world of CBMs has not always kept pace with these statistical advances.

A key feature of assessments designed for progress monitoring is that alternate forms must be as equivalent as possible to allow meaningful interpretation of student performance data across time. Without such cross-form equivalence, changes in scores from one testing session to the next are difficult to attribute to changes in student skill or knowledge. Improvements in student scores may, in fact, be an artifact of the second form of the assessment being easier than the form that was administered first. The advent of more sophisticated data analysis techniques (such as the Rasch modeling used in this study) have made it possible to increase the precision with which we develop and evaluate the quality of assessment tools. In this technical report, we document the development of a progress monitoring assessment in reading, designed for use with students in Kindergarten through Grade 4. This assessment system was developed to be used by elementary school educators interested in monitoring the progress their students make in the area of early reading skill acquisition.

Reading is a somewhat fluid construct, shifting over time from a focus on discrete skills necessary for working with language in both written and spoken forms, to those more complex combinations of skills associated with decoding, and finally to comprehension—a construct in which all prior literacy skills are called upon in the act of reading. Reading assessment typically follows this general progression as well (Reading First, 2006). Assessments of emerging literacy skills evaluate student mastery of the alphabetic principal. These tests measure students' ability to correctly identify and/or produce letters and the sounds associated with them. They measure students' ability to manipulate individual phonemes (sound units) within words, when, for example, students are asked to blend a list of phonemes into a word, segment a word into its corresponding phonemes, or identify the sounds which begin or end a word (Ritchey & Speece, 2006). The relationships between these constructs in English are well-documented in the

research literature. In early readers, ability to identify letter names and the sounds that letters make predicts phonemic awareness. Phonemic awareness predicts fluency, and low fluency is a strong predictor of difficulties in reading (National Reading Panel, 2000).

As student reading skill progresses, it is necessary to use different reading measures to be able to continue to track the progress students are making as developing readers. Oral reading fluency, which measures a combination of students' sight vocabulary and their ability to decode novel words rapidly and accurately, is consistently identified in the literature as one of the best predictors of student reading comprehension in the early grades (Graves, Plasencia-Peinado, Deno, & Johnson, 2005; Hasbrouck & Tindal, 2005). Eventually, however, the information provided by measures of oral reading fluency is limited. Readers attain a fluency threshold that enables them to attend to comprehension rather than decoding (Ehri, 1991, 2005). Once this threshold has been reached, fluency is no longer sensitive to increases in reading comprehension. At this point, one must turn to measures designed to assess comprehension more directly. Although this technical report provides information specifically related to the Word and Passage Reading Fluency measures developed for use in our Progress Monitoring assessment system, it is important to provide an overview of the complete system so readers can understand how the fluency measures fit into the system as a whole.

The Measures that Comprise Our Complete Assessment System

Based on previous empirical studies of early literacy assessment (see, for example, the report from the National Reading Panel, 2000), we decided to develop two measures of alphabetic principle (Letter Names and Letter Sounds), one measure of Phonological Awareness (Phoneme Segmenting), two measures of fluency (Word Reading Fluency and Passage Reading Fluency), and one measure of comprehension (Multiple Choice Reading Comprehension). The

specific technical specifications for the Word and Passage Reading Fluency measure are described in the methods section of this technical report. First, we describe the specific requirements related to the intended use of the measures in our assessment system.

When one is interested in monitoring the progress students are making in attaining specific skills, it is important to have sufficient measures to sample student performance frequently. Thus, our goal was to create 20 alternate forms of each measure in our assessment system at each grade level where the measure was designed to be used (see Table 1). Because these alternate forms are designed to be used for progress monitoring, it is essential that all forms of a particular measure in a given grade level be both sensitive to showing growth in a discrete skill area over short periods of time (1-2 weeks of instruction) and comparable in difficulty. These two equally important needs informed all parts of our measurement development effort: the construction of the technical specifications for each of the measures, the design of the studies used to gather data on item and test functioning, the analytic approaches we used to interpret the results of the pilot studies, and subsequent revision of the measures. In all cases, we sought approaches that would provide us with enough information to evaluate the *sensitivity of the individual measures* to detect small differences in student performance and the *comparability of the different forms* of each measure to allow for meaningful interpretation of growth over time.

Table 1
Distribution of the Measures Across the Grades

Grade	Measure					
	Letter Names	Letter Sounds	Phoneme Segmenting	Word Reading Fluency	Passage Reading Fluency	MC Reading Comp
Kindergarten	X*	X	X	X		
Grade 1	X	X	X	X	X	
Grade 2			X	X	X	
Grade 3				X	X	X
Grade 4					X	X
Grade 5					X	X

*Note: Each “X” represents 20 alternate forms of the measure for that grade level.

In the section that follows, we describe the piloting methods used to gather information on the relative difficulty of different forms of the fifth-grade passage reading fluency measures.

The Passage Reading Fluency Measure

The Passage Reading measure tests students’ ability to read connected narrative text accurately. In this individually-administered measure, students are shown a short narrative passage (approximately 250 words) printed on one side of a single sheet of paper and given 60 seconds to read as much of the passage as they can. A trained assessor follows along as the student reads, indicating on his/her own test protocol each word the student reads incorrectly and prompting the student to go on if he/she hesitates for more than three seconds. Student self-corrections are counted as correct responses. At the end of the allotted time, the assessor marks the last word read and calculates the total number of words read correctly to arrive at the student’s score, words read correctly in one minute.

Methods

Our goal was to create 20 alternate forms of each measure at each grade level where the measure was designed to be used (see Table 1). Because these alternate forms will be used for progress monitoring, it is essential that all forms of a particular measure in a given grade level be comparable in difficulty. The methods we used to create these comparable alternate forms are described in the following section.

Creating Alternate Forms of the Passage Reading Fluency Measures

The passages used in the Passage Reading Fluency measures were all written specifically for use in this progress monitoring assessment system. All 20 passages were written by graduate students enrolled in College of Education courses in the spring and summer of 2007. Passage writers followed written test specifications (see Appendix A). All passages underwent a four-stage review process. First, the lead author, who holds a Bachelor's of Arts degree in English and is a National Board for Professional Teaching Standards certified English teacher, reviewed each passage. She edited the passages for grammatical correctness and grade-level appropriateness. Then, two graduate students edited for formatting consistency. They divided each passage into three paragraphs of approximately even length and checked the readability of each paragraph using the Flesch-Kincaid readability index feature available on Microsoft Word. Each fifth-grade paragraph was adjusted as needed to create three paragraphs with a readability level between 5.4 and 5.6.

Third, each passage was reviewed by a teacher with a minimum of three years' teaching experience at that particular grade level to ensure the topics, wording, and style were appropriate for the target grade levels. Finally, passages were sent back to the lead author for a final review

to ensure that they still met test specifications. Once the review process was complete, the passages were printed on 8 ½ by 11 inch paper for use during the pilot testing process.

Analysis of the Passage Reading Fluency Measures

Unlike the other measures in the Progress Monitoring Assessment System, the Passage Reading measures are not appropriate for analysis using Item Response Theory, as each form of the measure would be considered a single ‘item’ with a score ranging from 0 – 255. Thus, we analyzed the Passage Reading Fluency forms using classical statistics. More specifically, we analyzed both correlations and mean differences between the different forms of the measures using a repeated measures analysis. To increase the reliability of our score interpretations, we administered all 20 alternate forms of each grade level passage to the same group of students, over the course of one week (each student completed five Passage Reading Fluency forms per day).

Results

The fifth-grade Passage Reading Fluency measures were pilot tested in February of 2008. We present the results of this pilot testing below.

Results of the Passage Reading Fluency Pilot Testing

Descriptive statistics from the fifth-grade Passage Reading Fluency pilot study are presented in Table 2. Correlations between each of the 20 forms are presented in Table 3.

Table 2
Descriptive Statistics for Grade 5 Passage Reading Measures

Passage	Topic	<i>n</i>	<i>M</i>	<i>SD</i>
Gr5PRF_1	Crossword puzzles	74	134.96	32.239
Gr5PRF_2	Playing baseball	74	156.00	38.253
Gr5PRF_3	New baby brother	74	164.15	42.690
Gr5PRF_4	Moving to a new country	74	164.53	36.961
Gr5PRF_5	Zoo animals	74	162.54	39.541
Gr5PRF_6	Seating charts	74	161.82	39.808
Gr5PRF_7	Astronaut	74	165.95	34.937
Gr5PRF_8	Jen's crush	74	154.07	40.710
Gr5PRF_9	School pranks	74	168.99	38.482
Gr5PRF_10	Piano recital	74	165.89	43.019
Gr5PRF_11	Spider snack	70	160.26	41.254
Gr5PRF_12	Puppy of her own	70	165.74	42.009
Gr5PRF_13	Time machine	70	153.63	41.202
Gr5PRF_14	Real life hero	70	149.86	36.328
Gr5PRF_15	Spelling quiz	70	160.31	33.414
Gr5PRF_16	Tooth aches	68	164.57	38.255
Gr5PRF_17	Talent show	69	163.43	37.618
Gr5PRF_18	Book club	69	162.86	38.926
Gr5PRF_19	New bike	68	160.31	37.912
Gr5PRF_20	Career choices	69	170.86	38.611

Table 3
Correlations between Each of the Fifth-Grade Passage Reading Fluency Forms

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	1																			
2	.89**	1																		
3	.89**	.94**	1																	
4	.86**	.92**	.93**	1																
5	.88**	.93**	.94**	.93**	1															
6	.92**	.94**	.94**	.93**	.92**	1														
7	.89**	.92**	.92**	.89**	.91**	.93**	1													
8	.90**	.91**	.92**	.91**	.90**	.94**	.91**	1												
9	.89**	.94**	.93**	.92**	.93**	.95**	.92**	.96**	1											
10	.86**	.94**	.92**	.92**	.91**	.94**	.93**	.93**	.94**	1										
11	.87**	.93**	.94**	.93**	.93**	.94**	.92**	.93**	.92**	.94**	1									
12	.84**	.90**	.92**	.89**	.90**	.94**	.92**	.92**	.92**	.93**	.94**	1								
13	.82**	.89**	.91**	.88**	.89**	.93**	.85**	.86**	.86**	.88**	.85**	.87**	1							
14	.80**	.83**	.85**	.81**	.84**	.87**	.84**	.86**	.85**	.87**	.89**	.88**	.81**	1						
15	.80**	.85**	.85**	.83**	.84**	.85**	.83**	.84**	.84**	.86**	.85**	.81**	.76**	.79**	1					
16	.83**	.89**	.87**	.85**	.87**	.85**	.91**	.95**	.95**	.91**	.93**	.91**	.89**	.88**	.84**	1				
17	.87**	.93**	.92**	.91**	.89**	.95**	.87**	.87**	.88**	.92**	.85**	.85**	.81**	.79**	.78**	.88**	1			
18	.83**	.85**	.86**	.83**	.82**	.87**	.87**	.87**	.87**	.88**	.93**	.85**	.85**	.81**	.79**	.78**	.88**	1		
19	.85**	.91**	.92**	.89**	.92**	.92**	.89**	.90**	.93**	.93**	.95**	.94**	.90**	.87**	.87**	.90**	.93**	.83**	1	
20	.80**	.89**	.88**	.86**	.89**	.89**	.87**	.88**	.92**	.90**	.89**	.89**	.87**	.83**	.81**	.81**	.88**	.85**	.90**	1

Discussion

Creating Alternate Forms of the Passage Reading Fluency Measures

We used the information about passage difficulty to modify the passages and bring them into closer alignment. First, we identified the nine passages that were most similar in difficulty. Then, we increased the difficulty of the passages that were too easy (based on more average words read correctly than the other passages included in the pilot testing) and decreased the difficulty of the passages that were too challenging (based on fewer average words read correctly than the other passages included in the pilot testing). The changes made to the fifth-grade passages are indicated in Table 4.

Table 4

Changes Made to Grade 5 Passage Reading Measures

Passage	Changes made to the passage
Gr5PRF_1	Made less challenging by changing Mr. Jacobson to Mr. Jacobs, ‘assigned to groups’ to ‘put in groups’, replacing ‘vertically and horizontally’ with ‘up and down and across the paper’, and changing several ‘the students’ to ‘they’.
Gr5PRF_2	Made slightly less challenging by changing ‘bannister’ to ‘railing’, ‘dreamt’ to ‘had dreamed’, and ‘sluggishly’ to ‘slowly’
Gr5PRF_3	No changes made
Gr5PRF_4	No changes made
Gr5PRF_5	No changes made
Gr5PRF_6	No changes made
Gr5PRF_7	No changes made
Gr5PRF_8	Made slightly easier by changing ‘Jasmine’ to ‘Jen’
Gr5PRF_9	Made slightly more difficult by changing Jose to Mario, lengthening a few sentences.

Table 4

Changes Made to Grade 5 Passage Reading Measures (Continued)

Passage	Changes made to the passage
Gr5PRF_10	No changes made
Gr5PRF_11	No changes made
Gr5PRF_12	No changes made
Gr5PRF_13	Made slightly easier by changing ‘garage’ to ‘house’, ‘bin’ to ‘box’, ‘Derrick’ to ‘Danny’, and ‘came across’ to ‘found’
Gr5PRF_14	Made easier by changing ‘dreamt’ to ‘dreamed’, ‘characters’ to ‘people’, ‘daydream’ to ‘dream’, ‘dreaming’ to ‘thinking’, ‘Lancaster’ to ‘Lee’
Gr5PRF_15	No changes made
Gr5PRF_16	No changes made
Gr5PRF_17	No changes made
Gr5PRF_18	No changes made
Gr5PRF_19	No changes made
Gr5PRF_20	Made more challenging by replacing ‘Jason’ with ‘Jeremy’, ‘all of his friends knew’ with ‘all of his friends already had career plans’, ‘Brian’ with ‘Amanda’, and ‘Jamie’ with ‘Jimmy’

This revision process resulted in 20 comparable forms. For the Student Form of the measures, we used size 14 Verdana font (see Appendix B). The Assessor Copy of each of the forms includes administration and scoring directions as well as a smaller version of the student measure (see Appendix C). All forms of the measures were then loaded to the EasyCBM website for web-based access.

Appendix A

Test Specifications for Creating Passage Reading Fluency Measures

Instrument Development: ORF Passages

Goal: To develop a series of reading assessments that can be used for progress monitoring and tracking RTI data for 1st- through 4th-grade students at risk for reading failure.

Overall Task : Write 25 ORF passages (each 250 words long) for 1st, 2nd, 3rd, and 4th-grade students (for a total of 100 ORF passages).

Grade 1 ORF passages should be written at a 1.5 grade level.

Grade 2 ORF passages should be written at a 2.5 grade level.

Grade 3 ORF passages should be written at a 3.5 grade level.

Grade 4 ORF passages should be written at a 4.5 grade level.

Grade 4 ORF Passages should be written at a 5.5 grade level.

- Each ORF passage should ‘stand alone’ with no reference to any other ORF passage.
- Each ORF passage should tell a story.
- ORF passages should contain no dialogue.
- Give each ORF passage an appropriate title.
- Include Word Count, on each ORF passage.
- Email each ORF passage to me AS SOON AS YOU COMPLETE IT so I can keep track of our overall numbers.

I’ve provided an example ORF passage from each of the grade levels we’re writing them for on the next few pages of this document. Please familiarize yourself with the basic format / approach, and then jump right into writing!

Thank you!

--Julie

Appendix B

Example Fifth Grade Passage Reading Fluency Test: Student Copy

Jeremy had no idea what he wanted to be when he grew up. It seemed like all of his friends already had career plans. His friend Amanda wanted to be a doctor, and his friend Jimmy wanted to be a police officer. His sister and his brother wanted to be teachers. But none of these jobs seemed right to Jeremy. His mother told him to try to think of a job that was related to his favorite subject in school. But Jeremy didn't think anything he had studied was very exciting. He knew that he had time to decide what kind of job he wanted, but he still wished that he had an idea like everyone else.

One day, Jeremy's class went on a field trip to the science museum. There was a special exhibit there called The Human Brain. Jeremy was excited because he had never learned about the brain before. As soon as Jeremy walked into the museum, he was amazed. There were models and pictures of brains. There was a woman talking about how different parts of the brain have different roles. At another station, a man was talking about how differences in brains are what make people unique.

After his day at the museum, Jeremy knew what he wanted to do when he grew up. He wanted to do research on the brain. Maybe someday he could even work at a museum and teach students everything he had learned. Jeremy couldn't wait to go home and tell his family about his dream.

Appendix C

Example Fifth-Grade Passage Reading Fluency Test: Assessor Copy

1. Place the first passage without numbers in front of the student. Point to any names in the document and tell the student how to say the name. Then say:
 “I want you to read this story to me. You’ll have 1 minute to read as much as you can. When I say “begin,” start reading aloud at the top of the page. Do your best reading. If you have trouble with a word, I’ll tell it to you. Do you have any questions? Begin.”
2. Start the timer.
3. While the student is reading, mark errors with a slash (/).
4. At 1 minute, say “stop.”
5. Mark the last word read with a bracket (]).

Jeremy had no idea what he wanted to be when he grew up. It	14
seemed like all of his friends already had career plans. His friend	26
Amanda wanted to be a doctor, and his friend Jimmy wanted to be a	40
police officer. His sister and his brother wanted to be teachers. But	52
none of these jobs seemed right to Jeremy. His mother told him to try	66
to think of a job that was related to his favorite subject in school. But	81
Jeremy didn’t think anything he had studied was very exciting. He	92
knew that he had time to decide what kind of job he wanted, but he	107
still wished that he had an idea like everyone else.	117
One day, Jeremy’s class went on a field trip to the science	129
museum. There was a special exhibit there called The Human Brain.	140
Jeremy was excited because he had never learned about the brain	151
before. As soon as Jeremy walked into the museum, he was amazed.	163
There were models and pictures of brains. There was a woman talking	175
about how different parts of the brain have different roles. At another	187
station, a man was talking about how differences in brains are what	199
make people unique.	202
After his day at the museum, Jeremy knew what he wanted to do	215
when he grew up. He wanted to do research on the brain. Maybe	228
someday he could even work at a museum and teach students	239
everything he had learned. Jeremy couldn’t wait to go home and tell	251
his family about his dream.	256

Total Words Read: _____ # of Errors: _____

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