THE EFFECTS OF USING PROGRESS MONITORING IN EARLY WRITING USING
CURRICULUM-BASED MEASUREMENT

A Thesis
presented to
the Faculty of the Graduate School
University of Missouri, Columbia

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts

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MAY 2007

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ABSTRACT

The purpose of this study was to examine the technical adequacy of progress monitoring assessments in early writing using curriculum-based measurement principles. The participants were 23 students in two first grade classrooms in a small elementary school in a medium sized city in the Midwest. The measures assessed include word copying, word dictation, sentence copying, and sentence dictation. Three minute samples were obtained and analyses were conducted for each minute increment, and were scored using two different methods, correct sequences, and correct minus incorrect sequences. We examined the alternate form reliability of the measures along with the criterion validity of the measures compared to the Test of Early Written Language-2 (TEWL-2), as well as with teacher perceptions of writing proficiency. Examination of the potential of the measures to be sensitive to growth over time was examined after the study's completion. The results are discussed in terms of technical adequacy, utility of the measures, and ability of the measures to serve as indicators of performance and progress early writing.

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CHAPTER 1

INTRODUCTION AND LITERATURE REVIEW

<u>Statement of the Problem</u>

Writing is a difficult and demanding task that many children find difficult to master (Lienemann et al., 2006).   Three out of four 4th-8th, and 12th grade students achieve only partial mastery of the writing skills and knowledge they need at their respective grade levels (Persky, Daane, & Jin, 2003). Only 1 in 100 students will attain "advanced" writing proficiency (Persky et al., 2003). Difficulties in mastering the writing process are even more prevalent for students with special needs or disabilities (Graham, Harris, & Larsen, 2001; Harris & Graham, 1999; Resta & Elliot, 1994). Evaluations done as part of the National Assessment of Educational Progress indicated that only one out of every five high school seniors acquires the writing knowledge and skills needed at their grade level (Persky et al., 2003). A recent longitudinal study by the National Assessment of Educational Progress (National Center for Educational Statistics, 1999) showed no positive trends in fourth grade students' writing scores as they progress through higher grades, with only 23% of fourth graders scoring at or above a proficient level.

The difficulty experienced by many students in writing can be a challenge for teachers as they seek to find effective instructional interventions that can lead to improved writing. Teachers must not only contend with the instructional needs of their students, they need to be concerned with effective instructional interventions due to the advent of large-scale assessment as required by the No Child Left Behind Act (Issacson, 2007, p.214). Specific to students with disabilities, the Individuals with Disabilities Education Act (2004) mandates that students with

disabilities be included in the general education curriculum and participate in district and state-wide assessments (Issacson, 2007, p.214).

Much attention has been paid to early identification of problems in reading and mathematics and screening tools such as the Dynamic Indicators of Basic Early Literacy (DIBELS 6th ed., 2002), developed by researchers at the University of Oregon, and progress monitoring using curriculum-based measurement in early numeracy. Both DIBELS and progress monitoring instruments such as number identification, quantity discrimination, and missing number probes have demonstrated technical adequacy for monitoring student performance and progress. Yet writing, also considered to be a foundational skill essential to lifelong literacy (Graham & Harris, 2005; Snow, Burns, & Griffin, 1998), has not garnered the same amount of attention in the research literature, especially in early elementary grades (Graham & Harris, 2005; Edwards, 2003). Standards released by the National Research Council illustrate numerous goals that students must meet in writing by the end of kindergarten. Examples of these goals include; using phonemic awareness and letter knowledge to spell independently, writing most letters and some words when they are dictated, and writing their own name (first and last) and the first names of some friends and classmates.

Connections between early literacy skills and early writing are important. One of the most important goals stated in attaining proficiency in early literacy is phonological awareness, which is identified as a foundational skill for writing proficiency (Graham & Harris, 2006, Snow et al., 1998). The ability to encode letters to form speech sounds or segment and blend sounds is a key skill needed for reading success (Kerins, 2006). Encoding skills are important as they serve a foundational function in the ability of students to decode words leading to rapidly and with increasing accuracy, read and understand words (Kerins, 2006). Proficiency in decoding is

especially important in building basic literacy skills including writing proficiency (Kerins, 2006). Building writing skill follows a similar progression of those same skills needed to progress in reading comprehension (Snow et al., 1998). For instance, to be able to write in a manner that conveys a purposeful message to the reader, a writer must focus attention toward building narrative cohesion which promotes comprehension by the reader. Comprehension in reading is dependent upon having adequate skill in decoding beyond letter sequences, and matures into understanding word sequences to gain meaning of what is read. The same holds true with writing. Effective writers are able to focus on conveying meaning of narrative via sentences and paragraphs. Struggling writers, much like struggling readers find themselves stuck trying to find meaning within the word by decoding letter sequences. Such focused attention on the basic structure of the word takes the writer away from the job of writing to convey meaning at the narrative level (Snow et al., 1998).

While the goal of creating logical and meaningful narrative seems reasonable for most learners, they are very often difficult for some of our struggling writers (Lienemann, Graham, Leader-Janssen, & Reid, 2006; Graham & Harris, 2005; Rogier, Owens, & Patty, 1999). Struggling writers often become struggling learners in a number of content areas throughout their educational careers (Lienemann et al., 2006, Graham & Harris, 2005). A possible tool to assist in remediating this foundational skill deficit can be found in early identification and intervention. The task of identifying technically adequate measures in order to gather information on writing proficiency and to monitor student growth in writing skills is an important aspect of early intervention that has received little attention to this point (Graham & Harris, 2005; Lembke, Deno, & Hall, 2003).

<u>Review of Literature</u>

In the following review of literature, three major themes will be discussed. First, the importance of writing proficiency for learners will be reviewed. Second, methods of measuring early writing proficiency and monitoring student progress in emerging writing skills will be discussed. Finally, an overview of curriculum-based measurement and progress-monitoring in regards to early writing will be presented, including an exploration of research literature examining the technical adequacy of progress-monitoring measures in providing an indication of the growth of early writing skills.

<u>The Importance of Writing Proficiency</u>

The study of writing has been of interest to scientists and scholars for centuries, as evidenced by the analyses of cave and cliff drawings of early humans and hieroglyphics of ancient civilizations. In fact, writing and speaking are two basic mechanisms for verbal communication, and ultimately knowledge demonstration (Hooper, 2002). Graham & Harris (2005) assert that mastery of writing is essential for success in and out of school. Skill in writing allows people who are separated by distance and time the ability to communicate. Writing makes it possible for people to gather, archive and transmit information widely across the public domain. Writing also provides for a malleable form for the expression of artistic, political, and personal ideas (Applebee, 1984; Diamond, 1999, Durst & Newell, 1989; Graham & Harris, 2000). Written communication skills are critical to the demonstration of what has been learned in the school setting and in a number of other venues, and they provide avenues for sharing thoughts and feelings between individuals (Hooper, 2002).

Writing Proficiency in Early Elementary Grades

Students at the beginning of their educational careers seem to display the effects of poor handwriting and spelling the most acutely (Graham, 1999). Difficulty mastering these transcription skills can result in at least three unwanted consequences. One consequence is that illegibilities and misspellings can influence perceptions of how well a child writes (Graham, 1999). When teachers or other adults are asked to rate multiple versions of a paper differing only in handwriting legibility or number of words misspelled, neatly written papers and those without spelling errors are assigned higher marks for writing quality than are papers with poorer penmanship or papers containing misspelled words (Chase, 1986; Marshall & Powers, 1969). A second frequent consequence exists when spelling words or writing the letters interferes with the execution of other significant processes during the act of writing (Graham, 1990). For students in early elementary grades who have not yet mastered the mechanics of writing, having to consciously attend to the more basic skills of placing language onto paper may inhibit a writer's processing memory (Beringer & Graham, 1998), interfering with critical higher-level writing skills such as planning and content production. For example, a beginning writer may have to switch attention during composing toward the mechanics of writing, such as figuring out the spelling of a word. This switch may result in forgetting ideas or plans already held in working memory (Graham, 1999). A third consequence lies in difficulties with handwriting and spelling which may constrain a student's development as a writer. Not only are spelling skills predictive of individual differences in writing competence (Graham, Beringer, Abbott, Abbott, & Whittaker, 1997), but instruction in these production skills can lead to improvements in writing performance (Graham et al., 1997).

Students in early elementary grades go through a series of developmental or transitional spelling stages as they learn to write (Henderson, 1990; Tangel & Blachman, 1992). An example of a developmental or transitional spelling sequence can be seen in the example of a word train. When children begin to learn about letter-sound relationships, they start to write phonetically related letters for the initial phoneme of a word (Edwards, 2003). Although it is important to understand how children's writing and spelling develops and will reflect their understanding of speech sounds and spelling, writing and spelling need to be taught and assessed to determine proficiency (Ball & Blachman, 1991; Foorman, Francis, Novy, & Liberman, 1991; Treiman, 1998).

Research has shown that skills such as reading and writing are basic literacy skills that provide a foundation for the future academic success of students (Graham & Harris, 2006; Henderson, 1990; Treiman, 1998; Snow et al., 1998). If proficiency is important, then identification of students with difficulties in writing must be completed and subsequent monitoring of student progress in meeting proficiency benchmarks becomes important in terms of effective teaching practice.

<u>Methods of Measuring Early Writing Proficiency</u>

There are currently several methods of assessment of early writing skills available to educators. These include standardized, norm-referenced assessments, curriculum-based measurement, and teacher-made criterion-referenced assessments. Formal assessments that are normed across population samples include the Test of Early Written Language-2 (Hresko, Herron, & Peak, 1996), Test of Language Development-3 (Hammill & Necomer, 1996), and various writing subtests of achievement and aptitude tests such as the Mini Battery of Achievement (Woodcock, McGrew, & Werder, 1994). Two subtests of the MBA that are

specific to writing are dictation, which requires the subject to have knowledge of letter forms, spelling, punctuation, capitalization and word usage. The second subtest is in proofreading which assesses the ability to identify an error in the skills listed in the dictation subtest (Woodcock et al., 1994).

A major purpose of formal assessments can be found in the identification of children who may exhibit delays in early written language (Hresko et al., 1996). Many authors of standardized assessments also tout the relevance of their assessment tools in determining possible need for specialized educational placement for students who exhibit lower levels of early writing proficiency as evidenced by scores on standardized assessments (Hresko et al., 1996).

While standardized assessments yield important information in terms of identification of deficiencies in writing proficiency, or the risk for developing these difficulties in early elementary students, the vast majority of these assessments are not practical for teacher use due to their high costs, complex scoring methodologies, and limited direct relevance to instructional objectives (Ritchey, 2006). One important criterion for effective assessment is teacher utility, often referring to ease of administration and scoring, which is a significant draw back of a large number of standardized assessments (Ritchey, 2006).

Educators are involved in creating writing assessments for their students on a day to day basis. Teacher-made criterion referenced assessments are used routinely across all levels of education and especially in early elementary grades in order to determine writing proficiency and to monitor instructional effectiveness (Graham & Harris, 2005; Ritchey, 2006). Teachers often use story prompts with story starters consisting of opening sentences or pictures that prompt the student to write a passage describing the picture. These criterion-referenced assessments are scored based upon achieving a mastery level, typically by using a rubric of expected criteria that

should be exhibited by the student writer. Vocabulary tests are another example of criterion-referenced assessment. Teachers use mastery levels that students must achieve in order to be considered proficient in using vocabulary.

In 1995, the National Council of Teachers of English issued a position statement on the topic of writing assessment. While this group advocates the utilization of multiple methods of authentic writing assessments, it asserts several assumptions regarding the process of evaluating student writing.   An example of a core assumption contained within the position statement asserts that writing assessment is useful primarily as a means of improving learning. Both teachers and students must have access to the results and must be knowledgeable in using the assessment results in order to be able to modify or alter curricula or specific lessons that meet the individual needs of students, considered to be a foundational practice for effective teaching (NCTE, 1995). Further, NCTE states that standardized tests that are usually developed by large testing organizations, tend to be for accountability purposes. When used to make statements about student learning, standardized tests often misrepresent levels of student proficiency, disproportionately, the skills and abilities of African American students (NCTE, 1995). Further, they would argue that standardized testing typically results in outcomes that are negative: students are said to demonstrate what they do incorrectly or deficiently, rather than what they do well (NCTE, 1995).

One possible tool that meets the requirements for teacher utility, sensitivity to instructional effectiveness, monitoring progress of student performance, adaptability for use in identification and intervention, and relevance to the issue of measuring multiple skills contained in proficient writing can be found in Curriculum-Based Measurement tools for writing (Graham & Harris, 2006).

Curriculum-Based Measurement in Early Writing

General Background of Curriculum-based measurement

Curriculum-based measurement (CBM) is a systematic assessment tool used to monitor students' proficiency and progress in a variety of basic skill areas such as, reading, spelling, mathematics and written expression (Deno, 1985, Deno & Fuchs, 1987). These standard fluency measures are considered to be of utility to educators due to their simplicity in construction and administration and targeted focus on specific skills. CBM has been referred to as an "academic thermometer" to measure students' academic health. Much like a thermometer serves as an indicator of physical health, CBM functions as an indicator that allows teachers to make informed instructional decisions regarding the learning needs of students (Shinn & Bamonto, 1998). It is important to note that CBM measures are not instructional methods or interventions in and of themselves, rather they serve as indicators of academic proficiency in a targeted skill (Hosp, Hosp, & Howell, 2007).

CBM was developed in the 1970's by Stanley Deno and colleagues at the University of Minnesota, in order to provide educators with a simple, efficient and effective tool for monitoring progress of students' academic growth over the span of time. CBM is useful to both general and special educators in that CBM can assist individual instructional programs and enhancing teacher instructional planning, increasing ease of communication by use of visual graphs of performance data, screening to identify students who are at-risk academically, evaluating classroom prereferral interventions, and predicting performance on high-stakes assessment to name a few (Deno, 2003). Deno asserted that teachers need to use measures that are technically sound and that educators should respond to the data in a manner that is commensurate with students' needs. CBM has been termed as technically adequate in that

reliability and validity are assessed for measures that are implemented using standardized procedures to measure performance in core academic areas (Deno, 2003). CBM differs from most informal measurement systems in that the concepts of reliability and validity are primary traits (Deno, 2003). The benefit to progress monitoring lies in the nature of simplicity for teacher use, time efficiency for inclusion into the instructional routine, and the sensitivity to present evidence of student growth or stagnation over a period of time (Deno, 1985). Fuchs and Fuchs (1986) noted that teachers who use CBM are more likely to construct and adapt their curriculum to respond to the needs of their students. As a result, students demonstrate higher rates of achievement in reading, math and spelling. This supports the notion that CBM is useful for the development of appropriate instructional strategies to maximize opportunities for student success. It is important to note that the original and one of the current purposes of CBM was to enable teachers across grades to formatively evaluate and subsequently adjust their instruction according to the specific needs of their students (Deno, 2003).

Since its inception, CBM has taken on a broader role in general education (Deno, 2003). Increasingly, principals and general educators are seeking out CBM as a means to identify students at-risk and to monitor progress within the basic skill areas for whole school and district populations (Shinn, 1998).

CBM and early writing

Beringer (2000) developed a framework for understanding the writing development of younger students or students with low-level writing skills. Beringer's Functional Writing System consists of four components, transcription, text generation, executive functions, and memory. The first two components provide a foundation skill needed to engage adequately in the final two components. Other researchers familiar with the area of CBM have similarly

attempted to define the construct of writing through a series of measures that target specific

component skills that lead to a full picture of the writing process (Crawford, Tindal, &

Carpenter, 2006).

Writing is a difficult and demanding task that is a conscious and self-directed activity and

requires the use of a variety of mental operations to satisfy the goals of the writer while meeting

the needs of the reader (Lienemann et al., 2006). The instruction of writing is no less complex

and requires teaching of multiple target skills such as spelling, punctuation, capitalization,

semantics and syntax that are contained in proficient writing (Graham & Harris, 2006). The

complex skills needed in writing seem to provide a sensible backdrop to the utilization of

progress monitoring tools that target those specific skills. CBM may provide an avenue for such

assessment and monitoring of student progress. One reason for this compatibility comes from

the reliability and validity of CBM by using standardized observational procedures for repeatedly

assessing subject performance (Deno. 2003). Another aspect of CBM that lends itself to

practical use in measuring early writing proficiency is that it is time efficient; in that the

measures are short, often lasting a minute or two, and they are easy for teachers to administer.

CBM in early writing consists of short, simple measures administered in order to gauge

students' writing skills. Typically, writing measures in CBM have consisted of story prompts

that cue students to write for three minutes on an instructional-level story starter, resulting in a

score on specific writing skills (Hosp et al., 2007). A problem exists in using these measures for

students who are in the emerging stages of writing proficiency. Very often, story prompt

measures are too difficult to provide accurate information regarding progress in acquiring writing

skills (Lembke, Deno, & Hall, 2003).

When looking to relevant literature as a guide in identifying appropriate measures for progress monitoring in early writing, there is a significant gap in empirical data.

In an effort to examine early writing skill for kindergarten students, Ritchey (2006) developed a progress-monitoring tool to assess beginning writers that focused on measuring foundational skills that students should exhibit at a reasonable rate of improvement at the beginning of their educational experiences. Four instruments that assess beginning writing skills were developed and explored with children during the last portion of their kindergarten year, just prior to entry into the first grade. Ritchey (2006) utilized Letter Writing, Sound Spelling, Real Word Spelling, and Nonsense Word Spelling to measure these kindergarteners emerging writing proficiency. Letter Writing was designed to assess whether students could write uppercase and lowercase letters when presented to the students without a model. The responses were scored correct on the basis of whether the letter was legible. Letters did not have to meet all criteria for the handwriting curriculum in place, such as proper size, alignment, and letter spacing. Also, because letter reversals were a common mistake, reversals were counted as correct unless they created a valid letter. For example, reversals of b and d were scored as errors, but reversals of other letters such as f and m were scored as correct (Richey, 2006). Sound Spelling required the student to write the letter that makes a particular sound. For example, the observer might say, "write the letter that makes the /s/ sound." The same scoring criteria for letter writing were used for sound spelling (Ritchey, 2006). Real Word Spelling and Nonsense Word Spelling were used to assess students' beginning whole-word spelling skills in consonant-vowel patterns. Five real words and five nonsense words were used. The spelling instruments were scored utilizing correct-letter-sequences (CLS) a method which has received support in previous literature (Tindal & Marston, 1990; White & Haring, 1980). In CLS, the total possible score for each

word is the number of letters in the word plus one, which allows credit for beginning and ending sequences of words (Tindal & Marston, 1990; White & Haring, 1980).

A study was performed by researchers in Minnesota (Lembke, Deno, & Hall, 2003) who identified potential early writing measures, and conducted an investigation to examine reliability and validity of the measures. Four measures were developed in order to individually assess student performance. The first measure was Word Copying in which students copied words onto a line below each word. In this study, the task was composed of 30 words and was administered for two minutes. Second, Sentence Copying was used with students copying printed sentences onto lines below the sentence. In the Lembke study (2003), the measure consisted of 12 sentences, each with five to seven words, and was administered for three minutes. Third, Word Dictation consisted of having students write a word that was dictated twice by the teacher. This task consisted of 30 words and was administered for three minutes. Last, Sentence Dictation measures were administered in a manner similar to the word dictation measure. The task consisted of 12 sentences, each with five to seven words in length, and was administered for three minutes. Scoring for word copying and word dictation consisted of counting number of words written, words spelled correctly, correct word sequences, and correct minus incorrect word sequences. Words written included all words that the student wrote; a word was counted even if it was spelled incorrectly. Words spelled correctly included all correctly spelled words with no regard to context. Correct letter sequences were defined as two letters adjacent to each other that are correctly placed in the word. Correct word sequences were defined as any two adjacent correctly spelled words that were semantically and syntactically acceptable within the context of the sentence (Lembke et al., 2003). Students completed these measures twice at the beginning and the end of a summer school session (Lembke et al., 2003).

The purpose of the Lembke study was to identify indicators of writing performance in early elementary grades using criteria identified by Tindal and Parker (1991). Tindal and Parker (1991) identified four markers that can be used to assess effective assessment procedures. The markers, or criteria, included (a) consistent administration and reliable scoring methodology, (b) the ability to discriminate the performance of skill levels of a diverse range of students, (c) criterion validity in terms of other, accepted forms of assessment, and (d) a sensitivity to monitor growth of student performance.

Technical adequacy of progress monitoring measures to measure proficiency and growth

Assessments for students must yield technically adequate information about individual student performance and contribute to overall accountability efforts at the district and state level (Johnson & Arnold, 2004). CBM appears promising in meeting the criteria espoused by Tindal and Parker (1991).

In another study, the technical adequacy of CBM measures for written expression was examined by comparing them to ratings-based measurements using the Six Trait Model, an assessment instrument and writing program in use in many schools throughout the United States that assesses writing quality in terms of six domains; ideas, organization, voice, word choice, sentence fluency, and conventions (Northwest Regional Educational Laboratory, 2000). This study was designed to extend previous work by Gansle and colleagues (2002, 2004), examining alternative rate-based measures that can be derived from CBM writing samples. Specifically, the reliability and criterion validity of the CBM measures were tested in a large elementary sample that included 538 students in 28 classrooms in grades 1-5 in a southwestern state (Gansle, VanDerHeyden, Noell, Resetar, & Williams, 2006). The study focused on measures that provided half-sentence story starters. Each student was presented with seven measures, with a

duration of three minutes per measure, collected on two separate occasions. Standardized

administration and scoring procedures were utilized in the study, with scoring derived from total

words written, correct word sequences, words spelled correctly, correct capitalization, correct

punctuation marks, complete sentences, and words in complete sentences (Gansle et al., 2006).

The CBM measures examined in this study provided promising data in areas including.

total words written, words spelled correctly, correct word sequences, complete sentences, and

words in complete sentences (Gansle et al., 2006). This replicated and extended previous

research with alternate CBMs that found them to be reliable and to have validity coefficients

with the Stanford 9 ranging from .26-.99, and validity with the Six Trait Measures, ranging from

.58-.89 (e.g. Espin, De La Pas, Scierka, & Roelofs, 2005; Espin, Scierka, Skare, & Halverson,

1999; Gansle et al., 2002; Gansle et al., 2004; Marston, 1989).

In Ritchey's (2006) study, she examined the technical adequacy of four progress

monitoring measures, Letter Writing, Sound Spelling, Real Word Spelling, and Nonsense Word

Spelling, in order to determine whether they would meet the standards for reliability and validity,

and whether they were useful for progress monitoring of students in kindergarten. This study

included 60 participants in the last quarter of their kindergarten year who received the measures

twice over an eight week period. Reliability analyses included internal consistency with an a

coefficient alpha range of .82 to .94, split-half reliability for Letter Writing and Sound Spelling (r

range=.90 to .92), and alternate form reliability estimates for Real Word and Nonsense Word

Spelling at .84 and .89 respectively (Ritchey, 2006). Criterion validity analyses revealed

coefficients in the range of .50 to .70 with the Test of early Reading Ability (Reid, Hresko, &

Hammill, 2001); Comprehensive Test of Phonological Processing (Wagner, Torgeson, &

Roshotte, 1999); and Woodcock Reading Mastery Test (Woodcock, 1998). These estimates are

lower but within acceptable limits for use by educators for screening and monitoring (Salvia & Ysseldyke, 2004).

In a study closely approximating the methodology of the study presented in this thesis was conducted by researchers in Minnesota (Lembke et al., 2003). Four measures were examined including word copying, sentence copying, word dictation, and sentence dictation. With respect to reliability and validity, Lembke et al. (2003) gave major focus to criterion validity of the probes with other established assessment methods. Significant correlations did exist between the predictor and criterion variables with especially strong correlations existing for the dictation measures and sentence copying with *atomistic* variables which included scoring methods that were the same as those of the writing tasks, with scores taken on students' writing samples taken at the end of the summer program; and *holistic* variables which included ratings of student' writing completed by the summer school teacher (Lembke et al., 2003). Alternate form reliability of the measures was tested and also indicated promise for all measures and strong promise for sentence copying and sentence dictation for use in discriminating performance in early writing (Lemke et al., 2003). Based upon the results of the Lembke et al. pilot study, these progress monitoring measures of early writing appeared to serve as indicators of writing proficiency, thereby allowing educators to monitor student progress in writing and use decision-making rules to individualize instruction for writers that meets their specific learning needs (Lembke et al., 2003).

Summary

Writing is a complex skill that many students find difficult to master. Teachers are not only confronted with the need to find effective methods of teaching writing strategies to their students, but also with meeting increasing benchmarks in an effort to increase accountability relative to federal and state statutes. Educators must decide how they will determine levels of proficiency and how they will monitor student progress toward instructional goals. The major choices appear to be between formal standardized assessments of writing proficiency, and alternative assessments of writing skills. While much attention has been paid to reading and mathematics, little empirical data exists in determining technically adequate tools for the assessment and monitoring of writing skills, especially in the early elementary grades.

Researchers have reported that the advantages of formal standardized assessments such as a large normed population samples is outweighed by their limited value in the area of ease of administration and instructional relevance (Graham & Harris, 2006). Standardized assessments such as the MBA, TOLD-3, and the TEWL-2, are impractical for a teacher to administer due to the need for specialized training in the principles of the assessments, as well as the time requirements to complete the assessments make it difficult administer to students in a classroom setting. The expense of the these assessments can be prohibitive for schools to incorporate into their curriculum budgets. Certain criterion-referenced assessments have been noted for their instructional relevance but fall short in their ability to monitor student progress over time. Assessments such as vocabulary tests and story prompts often used as indicators of mastery rather than indicators of student progress. Educators are routinely involved creating writing assessments for their students on a weekly basis as part of the instructional routine, but frequently these teacher made assessments do not adequately capture the student's general

proficiency in overall writing skill (Lembke et al., 2003; Ritchey, 2006). Researchers have completed studies that sought to develop progress monitoring tools that reflect the targeted skills that teachers address in their writing lessons (Ritchey, 2006; Tindal & Marston, 1990; White & Haring, 1980). One possible alternative assessment and progress monitoring tool examined has been CBM.

Researchers have demonstrated the ability of CBM to measure and monitor student proficiency in a number of academic areas by targeting specific skills (Deno, 1985; Deno & Fuchs, 1987; Hosp et al., 2007). Empirical studies that evaluate CBM in writing have found commonality in addressing important targeted skills that are required for writing competency (Beringer, 2000; Crawford et al., 2006; Graham & Harris, 2005; Ritchey, 2006). But only a few studies have been conducted to examine the technical adequacy of CBM as a progress monitoring tool for writing proficiency in early elementary grades. Research studies such as those completed by Ritchey (2006), Gansle (2006), and Lembke et al. (2003) has sought to find evidence to support the promise of CBM in early writing by seeking to identify indicators within targeted skills of early writing that may provide use in the assessment and monitoring of students in their emerging writing proficiency. Findings from the Lembke et al., (2003) study form the basis for the study initiated in this thesis project.

Statement of Purpose

The purpose of this study was to identify indicators of performance and progress in early writing that are technically adequate for use by educators to assess student proficiency and monitor progress of early writing skills. We investigated alternate form reliability, criterion validity, and the ability of the measures to model growth over time. These analyses were

conducted comparing total correct with correct minus incorrect scoring methodologies for each time increment of each measure.

Research Questions

The questions addressed in this study are:

1. What is the alternate form reliability of each of the four early writing measures; Word Copying, Sentence Copying, Word Dictation, and Sentence Dictation?

2. What is the concurrent, criterion validity of the early writing measures with the Test of Early Written Language II (Hresko et al., 1996)?

3. What is the criterion validity of each of the four early writing measures with teachers' perception of students' overall writing proficiency?

4. Do the early writing measures predict performance across time?

5. Do the four early writing measures adequately model student progress over time?

6. What is the growth rate for each of the four measures across eight administration sessions? Do students show greater growth on one measure as compared to another?

CHAPTER 2

METHOD

<u>Overview</u>

This study investigated the technical adequacy of progress monitoring using curriculum-based measurement in early writing. A correlational design was employed to assess the alternate form validity and criterion validity of each measure by time increment and scoring method. Additionally, comparison of means and establishment of growth rate was utilized to gauge the ability of the measures to show growth in student performance over time and to assess which measures demonstrated the greatest growth. Within the present chapter, an overview of the identification procedures used to select the participants is provided. The independent and dependent variables are described. Additional research procedures including, selection of the appropriate standardized instrument used for comparison with the four progress monitoring instruments, construction rules for the progress monitoring measures, scoring rules and the integrity of the data collection process are described.

Participants and Setting

This study took place in an elementary school in a medium sized city in a Midwestern state. Students in two first grade classrooms in a school district were used as participants in the study. Students in both classrooms were given parental consent forms and those whose parents assented to participation were chosen as participants in the study. All students who returned the consent form to the teacher were given a pencil. Consent forms were printed in both English and Spanish so that parents were able to understand the nature of the study via their native language. Twenty-three students were participants in the study. Participants comprised a range of demographic characteristics such as gender, ethnicity, disability, and free or reduced lunch

status. The single student identified as having an IEP was receiving special education services under the classification of speech and language disabilities, specifically, the student had an articulation disability. A detailed analysis of the demographics is displayed in table 1.

Table 1. Demographics of participants

	Gender	Caucasian	African-American	Hispanic	IEP	Free/Reduced Lunch
Male	13	4	6	3	1	10
Female	10	4	6	0	0	8
Total	23	8	12	3	1	18

Instrumentation

Each subject completed an alternate form of four different writing measures each week for a total of eight administration sessions. The measures consisted of Word Copying, Word Dictation, Sentence Copying, and Sentence Dictation given for three minutes each, over eight sessions (see Appendix B). Criterion variables included the Test of Early Written Language-2 (Hresko et al., 1996) and a teacher rating form.

At the beginning of the study and at its conclusion, an assessment using an established standardized instrument was given to each participant. The TEWL was chosen due to its similarities in its sample population with the participants of the study. The TEWL scores have been correlated across a wide population of young children aged 3-0 to 10-11. The authors of the TEWL cite similar benefits of their assessment instrument such as, sensitivity to growth, ability to discriminate among students with differing levels of proficiency, ease of administration and scoring, and instructional relevance (Hresko et al., 1996).

The TEWL-2 is composed of two subtests; the basic writing subtest, used to assess the mechanical aspects of writing, and the contextual writing subtest, used to measure a student's ability to produce quality writing with the use of a writing sample (Hresko et al., 1996). Three possible scores are derived from the administration of subtests, a basic writing quotient, a contextual writing quotient, and a global quotient, that combines both scores which the authors purport to allow a complete understanding of the student's writing abilities. The TEWL-2 was standardized on a sample of 1,479 students aged 3-0 to 10-11 from 41 states and British Columbia, Canada. Reliability of the TEWL-2 was examined with internal consistency, test-retest, and interscorer reliabilities. The coefficients ranged from .90 to .99 (M=.948). The interval between test administrations of the test was 14 to 21 days. Both test forms were used in the determination of the test-retest reliabilities (Hresko et al., 1996). Reliabilities ranged from .82 to .94 (M=.890), and the range of coefficients for the interscorer reliabilities was between .92 and .99 (M=.952) (Hresko et al., 1996).

The TEWL-2 examined issues of validity with respect to content validity, criterion-related validity and construct validity. Test authors assessed both forms for potential bias, utilizing delta values. Any test item with a delta value greater than .10 were modified or removed from the test. Concurrent validity analyses included comparison of the TEWL-2 with the Test of Early Written Language, Comprehensive Scales of Student Abilities, Diagnostic Achievement Battery, Peabody Individual Achievement Test-Revised, Preschool Language Scale-3, Test of Early Language Development-2, Test of Written Spelling-2, Wechsler Individual Achievement Test, and the Woodcock-Johnson Psycho-Educational Battery-Revised (Hresko et al., 1996). The coefficients ranged from .24 to .90 (M=.490).

In summary, the TEWL-2 appears to have reliable and valid scores measuring early written language. It was developed to identify students who are significantly beneath their peers in writing, to determine strengths and/or weaknesses of a student's writing ability, to document change in a student's writing ability as a result of an intervention, and to provide a research vehicle for the assessment of young student's writing abilities (Hresko et al., 1996).

The additional criterion variable was a teacher rating form, where teachers were asked to rate their students' writing proficiency based upon a 10-point Likert type scale (see Appendix A). This rating was completed at the mid-point of the study.

Progress Monitoring Instruments

Students completed alternate forms of four different measures over a period of eight administrations with two weeks per administrations used to complete the measures. The four measures were Word Copying, Sentence Copying, Word Dictation, and Sentence Dictation (please see appendix B). Word Copying consisted of 35 words written on paper with a blank line directly underneath the printed word. The students were asked to copy the word printed on the blank space below it. Sentence Copying consisted of 12 sentences with two lines below each sentence. Each student was asked to copy the sentence printed onto the line below it. Word Dictation consisted of 35 words that were read by the examiner twice, the students were asked to write the word onto the examination sheet. Sentence Dictation consisted of 12 sentences that were read by the examiner twice. Students were asked to write the sentences onto the examination sheet. These measures were chosen as they had been utilized in previous research conducted to establish technically adequate indicators for student growth in early writing skills (Lembke et al., 2003), and because they showed promise as technically adequate measures. It must be noted that for students in the emerging stages of writing proficiency, CBM measures that

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included a story prompt may be too difficult to capture progress in learning to encode speech into written language (Lembke et al., 2003).

The rules governing the construction of the four measures were as follows:

1. Words used in the measures will come from the first 300 words contained Dr. Fry's 1000 Instant Words (Fry, 1993). Each alternative form of word copying and word dictation contained 30 words, a similar number of words used in the Lembke 2003 study. It was decided prior to the sixth administration to add five more words to both measures due to several subjects reaching the maximum possible in each measure in session five.

2. Words consisted of no more than seven letters.

3. Sentences consisted of no more than seven words. Each alternate form of the sentence copying and sentence dictation will consist of 12 sentences.

4. There were eight alternate forms for each measure over the course of the study.

Scoring

The four measures were scored using standardized methods (Deno, Mirken, and Marston, 1980) that included correct letter sequences, correct word sequences, correct minus incorrect letter sequences, and correct minus incorrect word sequences. The methods utilized to score the four measures were used as the predictor variables in this study, with two scoring methods in place, total correct sequences, and correct minus incorrect sequences for each one minute increment of each measure. The word copying and word dictation measures were scored utilizing correct letter sequences and correct minus incorrect letter sequences. Correct letter sequences were defined as two letters adjacent to each other that are correctly placed in the word (Deno et al., 1980). Sentence copying and sentence dictation were scored using correct word sequences, and correct minus incorrect word sequences. Correct word sequences were defined

as any two adjacent correctly spelled words that were semantically acceptable within the context of the sentence according to the native speaker of the English language (Videen, Deno, & Marston, 1982). These scoring methods were chosen because they demonstrated technical adequacy in previous examination (Lembke et al., 2003), and they provided an opportunity to examine differences between scoring for total correct responses, overall proficiency of student performance in a particular task by assessing correct responses in relation to total responses.

The TEWL-2 was scored according to guidelines from the test authors and garnered a basic writing quotient, a contextual writing quotient, and a global quotient. For the purposes of this study only the basic quotient was used in data analyses as the contextual writing quotient resulted in a floor effect for the majority of students in the study. The contextual portion of the TEWL-2 consisted of a story prompt using pictures. The students were asked to write a multiple paragraph story relating details contained in the pictures. Only a few students were able to write one paragraph. The contextual scores were added to the basic scores to create a global quotient. Most students were not able to score enough points on the contextual portion of the test to allow a global quotient. The TEWL-2 was developed that includes an age range of subjects that would have more developed writing skills than the first graders in our study.

Procedures

At the outset of the study, the TEWL-2 Form-A was administered individually to each subject with no time constraints placed upon participants for completion of the test. Prior to the commencement of each administration of the TEWL-2, a youth assent script was read by the examiner to the subjects, with continuation of the process occurring after affirmative assent by each student. One student declined assent at this point in the study and was dropped from the participant list. The test was administered by the student investigator after receiving training in

the administration of the TEWL-2 by the supervising investigator. The student investigator was observed by the supervising investigator and fidelity of administration checklist was completed with 100% accuracy for adherence to standardized administration procedures.

After completion of the TEWL-2, the progress monitoring measures were administered individually, once over a two-week period to each subject resulting in eight administrations of each measure. Each measure was administered by the student investigator and interrater reliability was attained with the supervising investigator during administration periods one, four, and seven. Each participant was given three minutes to complete each of the four measures. The examiner used a digital timer in order to keep time. At the completion of each administration, the participants received a sticker, pencil, and/or eraser for their participation. At the conclusion of the study, another individual administration of the TEWL-2 Form-B was given to each subject. During the fourth week of the study, teacher ratings were completed by the two 1st grade teachers with students participating in the study.

Independent Variables

The CBM early writing measures served as the independent or predictor variables, with each participant completing an alternative form of the four different writing measures each week for a total of eight sessions. The measures consisted of Word Copying, Word Dictation, Sentence Copying, and Sentence Dictation (see Appendix A). Each measure was scored via two methods, total correct sequences and correct minus incorrect sequences for each one minute increment of the measure.

Dependent Variable

　　Student performance on the TEWL-2 Form-A and Form-B served as the dependent variable in the study, both pretest and posttest. The scores from the teacher ratings also served as a dependent variable in this study.

CHAPTER 3

RESULTS

The major purpose of this study was to examine the technical adequacy of progress monitoring using CBM in early writing. The analyses conducted followed identified criteria needed to find effective assessment; consistent administration and reliable scoring, the ability to discriminate among student at varied skill levels, criterion validity, and sensitivity to growth (Tindal & Parker, 1991). The data analyses focused on the relationship between student performance on the four writing assessments and performance on criterion scores received from standardized assessment and teacher ratings. Analysis was also conducted regarding the potential of these four measures to identify growth in student progress. Results are reported utilizing descriptive statistics and correlational analyses will be reported by research question.

Descriptive Analyses

Descriptive statistical analyses were conducted to derive the mean score, standard deviation, and the range for each measure. Analyses were completed using data from each session, by each time increment, and by two different scoring methods. The analyses revealed that the strongest correlations were obtained from 3 minutes of each measure. Means, standard deviations, and range are presented for each measure for three minutes in Table 2. Mean scores that were obtained by using either correct letter or word sequences, or correct minus incorrect word or letter sequences show little difference in the scoring method, except on the measures of word dictation and sentence dictation where scoring using correct sequences yielded greater means than scoring using correct minus incorrect sequences. Standard deviations were greater for word copying and word dictation measures. The standard deviations were considerable among subjects on each of the four measures with standard deviations ranging from 6.0 to 46.8.

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Given this range there appears to be a large dispersion of students' scores for each of the four early writing measures. Word copying and word dictation measures had the largest standard deviations. The ranges suggest that there was a floor for sentence dictation sessions one through six, but this was due to the performance of one student; otherwise, no ceiling or floor effects are present for any of the four measures.

Table 2. Descriptive Analysis, Mean, Standard Deviation, and Range.

	Word Copying		Word Dictation		Sentence Copying		Sentence Dictation	
	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range
Week 1								
CS	96 (31)	19-146	45.4 (27.1)	0-111	14.6 (7.6)	6-32	6.3 (5.9)	0-26
C-ICS	94. (31.1)	17-146	27.1 (30.1)	-18-106	10.3 (8.4)	0-27	-7.5 (8.6)	-24-13
Week 2								
CS	107.5 (33.7)	51-177	56 (28.8)	7-125	16.8 (8.2)	4-39	8.1 (7.2)	0-34
C-ICS	106.2 (34.4)	34.4	37 (34.7)	-14-125	12 (8.9)	-9-32	12 (8.9)	-9-32
Week 3								
CS	110.7 (36.3)	57-184	49.2 (27)	11-126	15.3 (5)	2-28	8 (4.8)	0-19
C-ICS	110.5 (36.4)	57-184	32.7 (29.7)	4-125	12.2 (5.9)	-4-23	.04 (6.1)	-12-15
Week 4								
CS	109.6 (26.2)	62-157	56.5 (30.1)	3-114	17.7 (7.4)	6-38	8.7 (6.1)	0-26
C-ICS	109.4 (25.9)	62-157	38.5 (33.8)	-4-114	14.6 (8.3)	2-38	-6.3 (8.7)	-26-22
Week 5								
CS	113 (33.7)	64-181	61 (29.1)	10-129	21.1 (6.5)	10-35	13.4 (9.1)	0-33
C-ICS	113 (33.7)	64-181	42.7 (33.1)	0-129	18.2 (6.4)	7-35	.32 (10.1)	-12-26

Week 6								
CS	106.8 (36)	57-190	66.6 (33.3)	9-157	19.2 (8.6)	4-45	13.9 (9.3)	0-41
C-ICS	106.8 (36)	57-190	49.6 (36.9)	2-157	17.5 (9.6)	1-45	3.6 (11.2)	-11-38
Week 7								
CS	115 (36)	60-132	62.8 (28.4)	12-138	20.8 (8.4)	6-49	14.1 (10.3)	1-40
C-ICS	115.1 (36)	46-124	42.9 (33.3)	-4-138	19.4 (9.1)	3-49	5.5 (12.3)	-12-36
Week 8								
CS	120.1 (32.9)	63-184	60.1 (32.6)	1-162	22.9 (7.4)	10-41	15.4 (11.5)	1-45
C-ICS	120 (32.9)	63-184	33.6 (46.8)	-108-162	22.2 (7.8)	8-41	8.5 (12)	-5-45

Note. Wk. 1-6 n=23: Wk. 7-8 n=22. All measures given for three minutes. Items listed are for three minutes. Word Copying and Word Dictation were scored using letter sequences, Sentence Copying and Sentence Dictation were scored using word sequences.

Interrater Reliability

Scoring and data entry were completed by the principal student investigator under the supervision of the advising investigator. Interrater reliability analysis was conducted by comparing scoring results for weeks one, four, and seven by using 20 percent of participant's scores for comparison of scoring results. Interrater reliability from week one required two analyses due to wide variation of scoring results between the principal investigator and the supervising investigator. After additional training and review of standardized rules for scoring reliability analyses were conducted and are reported. Interrater reliability correlations are presented in Table 3

Table 3. Interrater reliability

	Word Copying		Word Dictation		Sentence Copying		Sentence Dictation	
	% Agmnt.	Range	% Agmnt.	Range	% Agmnt.	Range	% Agmnt.	Range
Week 1*	98.30%	98-99%	97.30%	95-100%	98.60%	96-100%	97.60%	96-100%
Week 4	99.70%	99-100%	98%	94-100%	96%	90-100%	98%	92-100%
Week 7	100%	100%	98%	96-100%	100%	100%	100%	100%

Note. *results listed are from the second analysis of week 1 scoring.

<u>Research Question One</u>

What is the alternate form reliability of each of the four early writing measures?

Alternative form reliability is presented in Table 4. Alternate form reliabilities were calculated by correlating scores for each measure, by each time increment, by each scoring method. Correlation coefficients were reported using a range of correlations over the eight sessions. Correlations were obtained that ranged from low to strong for each measure, with 3 minutes realizing the strongest correlations. It should be noted that all correlation coefficients were found to be statistically significant at alpha level of $p<.01$ at 3minutes. In order to examine alternative form reliability from week to week, it must be noted that reliability correlations generally increased in 3 minutes from week one to week two and beyond using both scoring methods.

Table 4. Alternate form reliability

	CS			
	Word Copying	Word Dictation	Sentence Copying	Sentence Dictation
	Range	Range	Range	Range
1 minute	.34-.72**	.55**-.92**	.15-.83**	.63**-.86**
2 minutes	.56**-.86**	.66**-.92**	.39--.81**	.74**-.88**
3 minutes	.71**-.98**	.58**-.97**	.62**-.93**	.76**-.98**

C-ICS

	Word Copying	Word Dictation	Sentence Copying	Sentence Dictation
	Range	Range	Range	Range
1 minute	.30-.74**	.57**-.91**	.10-.78**	.17-.78**
2 minutes	.57**-.86**	.69**-.90**	.21-.76**	.34-.78**
3 minutes	.72**-.98**	.25-.94**	.68**-.93**	.42**-.91**

Note. **p<.01. Ranges for the eight sessions were used.

<u>Research Question Two</u>

What is the concurrent, criterion validity of the early writing measures with the Test of Early Written Language II (Hresko, et al., 1996)?

Correlation coefficients were calculated between the mean of weeks one and two of students' scores and the criterion variable, the TEWL-2 basic quotient for the pre-study administration. Pre-study correlations show that word copying resulted in a strongest correlation of weak moderately .40 for 3 minutes scoring with C-ICLS. Word dictation resulted in the strongest correlation of moderate .61** for 3 minutes scoring with CLS. Sentence copying revealed the strongest correlation to be a moderate .51** for 3 minutes scoring with C-ICWS. Sentence dictation show the strongest pre-study correlation to be a moderate .51** for 3 minutes scoring with C-ICWS. Correlation coefficients were calculated between the mean of weeks seven and eight of students' scores and the criterion variable, the TEWL-2 post-study administration. Post-study correlations revealed that word copying resulted in the strongest correlation of a weak .39 for 3 minutes with both scoring methods. Word dictation revealed the strongest post-study correlation to be a moderate .59** with C-ICLS scoring method. Sentence copying showed the strongest correlation to be a moderate .61** for three minutes with C-ICWS scoring method. Sentence dictation showed the strongest correlation to be a moderate .53** for

3 minutes with scoring by CWS. Means of weeks one and two, and weeks seven and eight were

calculated because they serve as a more stable indicator of performance over means of each

week. Results of the criterion validity analysis are presented in Table 5.

Table 5. Criterion Validity of measures with TEWL-2

	Word Copying		Word Dictation		Sentence Copying		Sentence Dictation	
	CLS	C-ICLS	CLS	C-ICLS	CWS	C-ICWS	CWS	C-ICWS
1 minute								
Pre(1&2)	0.33	0.34	.60**	.56**	0.34	0.4	.49**	0.21
post(7&8)	0.39	0.39	.52**	.58**	.45**	.43**	.54**	.51**
2 minutes								
Pre(1&2)	0.36	0.37	.60**	.58**	.43**	.51**	0.38	.53**
post(7&8)	0.37	0.37	.54**	.55**	.53**	.48**	.49**	0.39
3 minutes								
Pre(1&2)	0.38	0.4	.61**	.60**	.43**	.51**	.50**	0.38
post(7&80	0.39	0.39	.56**	.59**	.60**	.61**	.53**	.46**

Note. **p<.01.

<u>Research Question Three</u>

What is the criterion validity of each of the four early writing measures with

teachers' perception of students' overall writing proficiency?

Correlation coefficients were calculated between the students' scores on the four early

writing measures for week eight and the TEWL-2 post-study administration, and the criterion

variable, teacher rating. The teacher rating was completed during session four and five of the

data collection phase of the study. Teacher rating was conducted by the classroom teacher and

was based upon a 10-point Likert scale (Appendix B). Correlation coefficients appear stable and

moderate to moderately strong across scoring method with the exception of word dictation and

sentence dictation, where correct word sequences revealed a stronger correlation. Means for

sessions four and five with both scoring methods were used because they provide a more stable

indicator over the means of individual weeks. Results of the criterion validity analysis are

presented in Table 6.

Table 6. Criterion Validity of measures, TEWL-2, and Teacher Ratings.

TEWL-2 (post)	Word Copying		Word Dictation		Sentence Copying		Sentence Dictation	
	CLS	C-ICLS	CLS	C-ICLS	CWS	C-ICWS	CWS	C-ICWS
.59*	.59*	.59*	.81**	.76**	.61**	.62**	.73**	.44*

Note. *p<.05, **p<.01.

Research Question Four

Do the early writing measures predict performance over time?

Correlation coefficients were calculated between the students' mean of weeks 1 and 2

scores on the four early writing measures, and with the TEWL-2 post-study basic quotient score.

Predictive validity as presented using the described analyses suggest weak to moderate

correlations, with correct minus incorrect receiving stronger correlation coefficients. With

moderate significant correlations during 3 minutes, all four early writing measures may serve as

predictors of performance using the scoring method of correct minus incorrect. Results of the

criterion validity analysis are presented in Table 7.

Table 7. Predictive validity between means of wks. 1 &2 and TEWL-2 post.

	Word Copying		Word Dictation		Sentence Copying		Sentence Dictation	
	CLS	C-ICLS	CLS	C-ICLS	CWS	C-ICWS	CWS	C-ICWS
				1 minute				
Mean 1&2	0.39	0.4	.50**	.50**	0.39	.46**	.50**	0.32
				2 minutes				
Mean 1&2	0.39	0.4	.48**	.49**	.47**	.55**	.49**	.48**

| Mean 1&2 | 0.44 | .47** | .48** | .50** | .50** | .57** | .49** | .53** |

Note. **p<.01.

Research Question Five and Six

Do each of the four early writing measures adequately model student progress over time? What is the growth rate for each of the four measures across eight administration sessions? Do students show greater growth on one measure as compared to another?

One of the core purposes of this study was to determine if these early writing measures could provide evidence to suggest sensitivity to growth in student performance over time. Much discussion and investigation was conducted to determine the most effective method of measuring the growth rates for each of the measures. Multivariate analyses, specifically, Hierarchical Linear Modeling (HLM) was considered. Due to the limited time and the extensive requirements needed to undertake HLM analyses such as learning the theoretical and application processes, building appropriate data sets, and evaluation requirements, a more basic method of determining growth rates was used. To determine growth rates for each of the four measures, the Tukey Method (Bartz, 1999) was used. The sessions were divided into three sections with sessions one, two, and three in the first section, weeks four and five in the second section, and weeks six, seven and eight in the third section. The median score from section one was subtracted from the median score of section three and then the result was divided by the number of sessions minus one in the study. Results were obtained and are presented in the graphs illustrated below in Tables 8-15. Growth was evidenced for each of the measures, with students growing most on word copying and students growing least on sentence copying. A trend line was created to determine a line of best fit using the Tukey Method (Bartz, 1999) in which data was divided into

three sections, the median score and median week from the first and third section was

determined, and these two points were connected to provide a trend line.

Table 8. Word Copying-Correct Letter Sequences.

WC-CLS
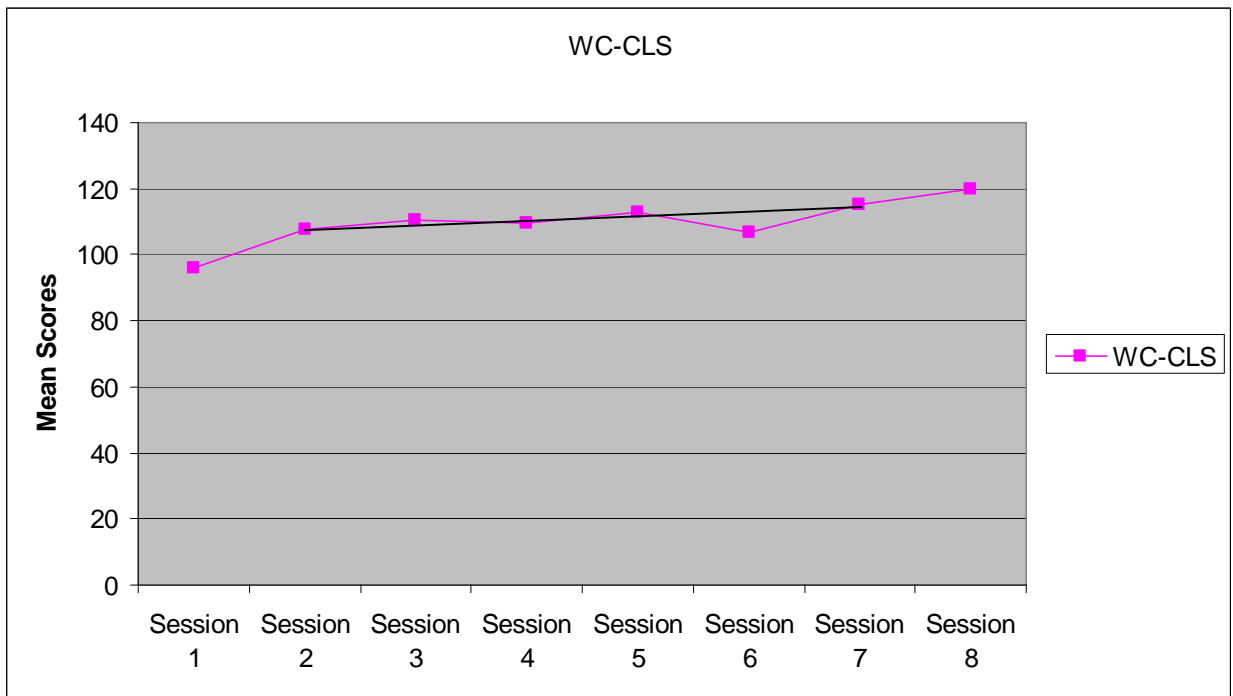
Note. Growth rate of 1.1CLS per session.

Table 9. Word Copying- Correct minus Incorrect Letter Sequences.
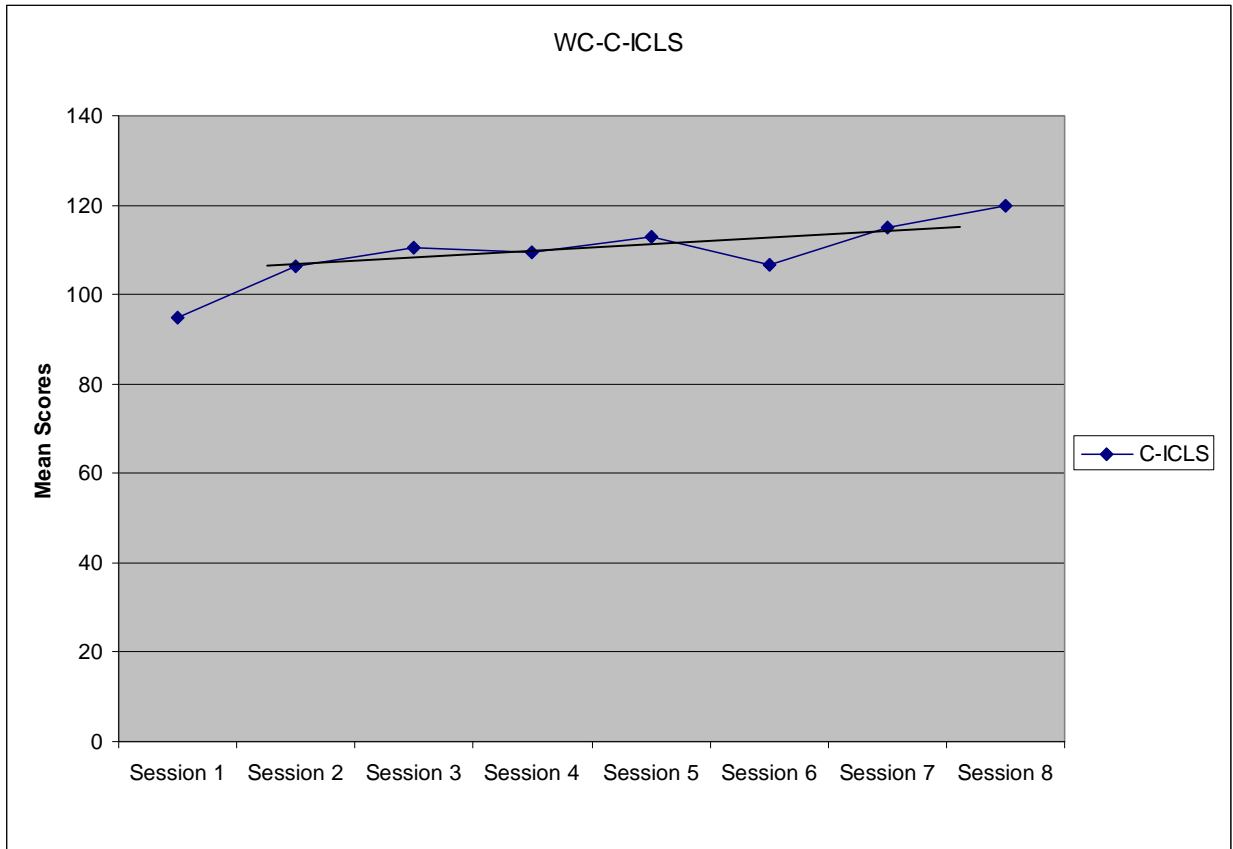
Note. Growth rate of 1.2 C-ICLS per session.

Table 10. Word Dictation-Correct Letter Sequences.
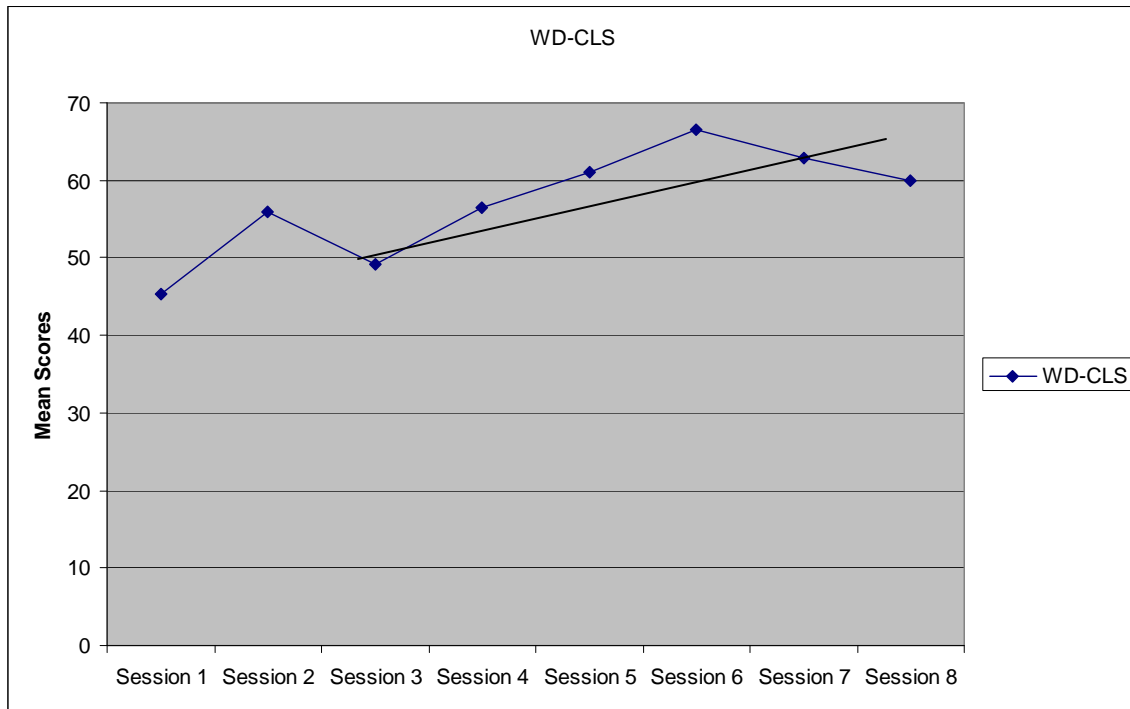
Note. Growth rate is 1.9 CLS per session.

Table 11. Word Dictation-Correct minus Incorrect Letter Sequences.

Note. Growth rate is 1.5C-ICLS per session.

Table 12. Sentence Copying-Correct Word Sequences.

Note. Growth rate is .8 CWS

Table 13. Sentence Copying-Correct minus Incorrect Word Sequences.

Note. Growth rate is 1.1 CWS per session.

Table 14. Sentence Dictation-Correct Word Sequences.

Note.

Growth rate is .9 CWS per session.

Table 15. Sentence Dictation-Correct minus Incorrect Word Sequences

Note. Growth rate is .8 C-ICWS per session

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CHAPTER 4

DISCUSSION

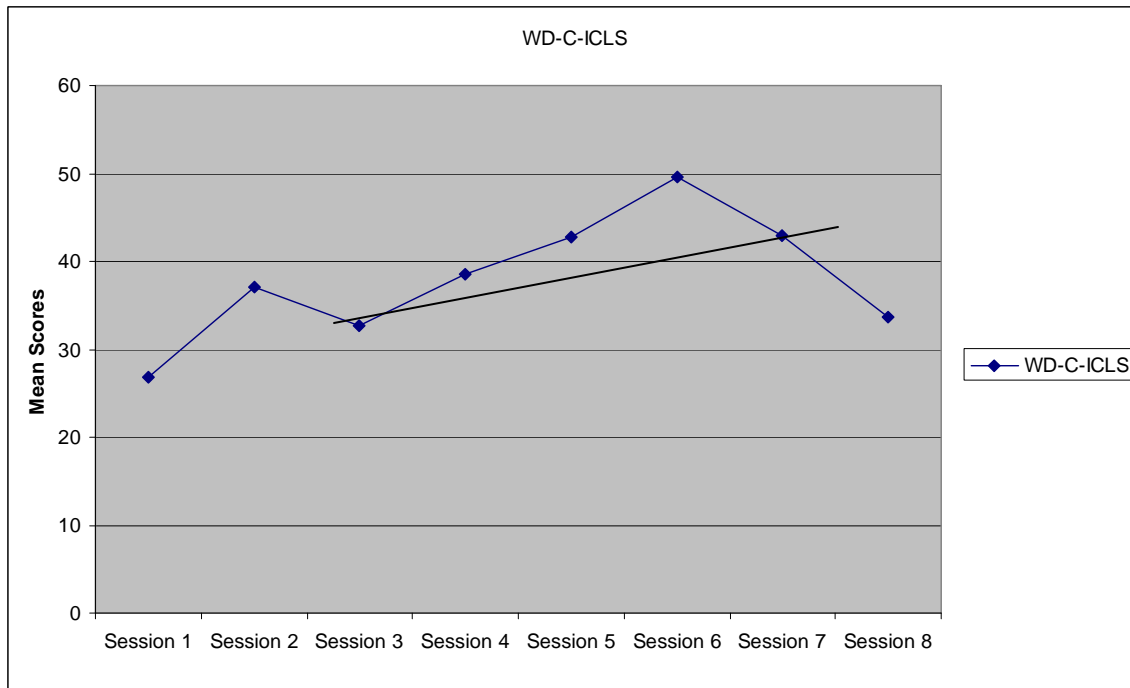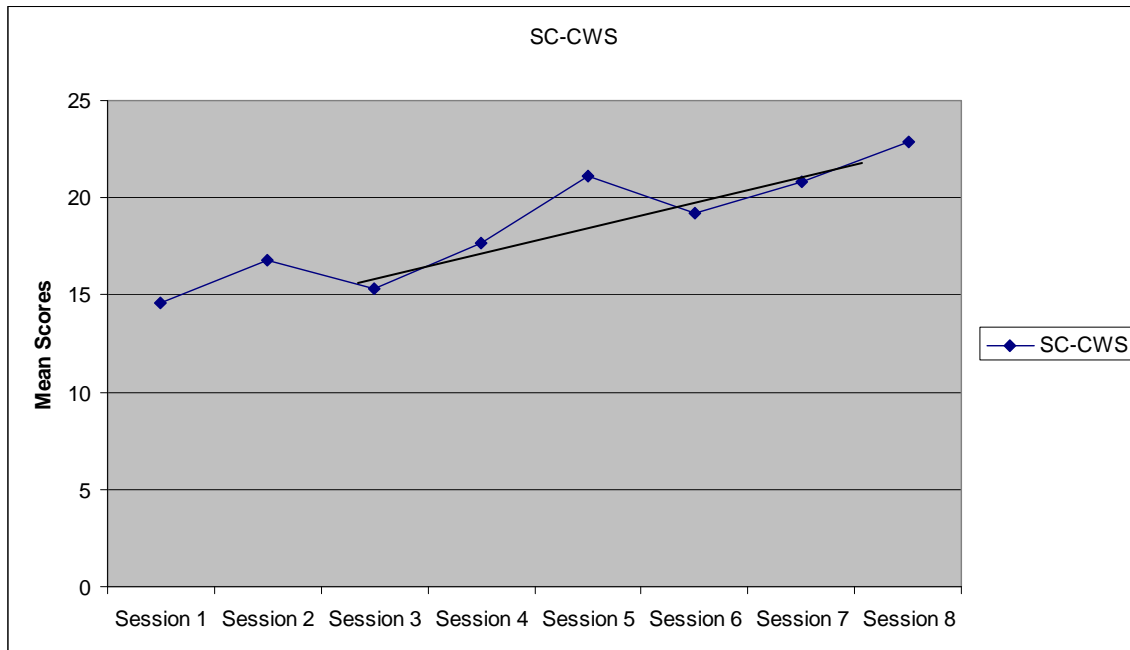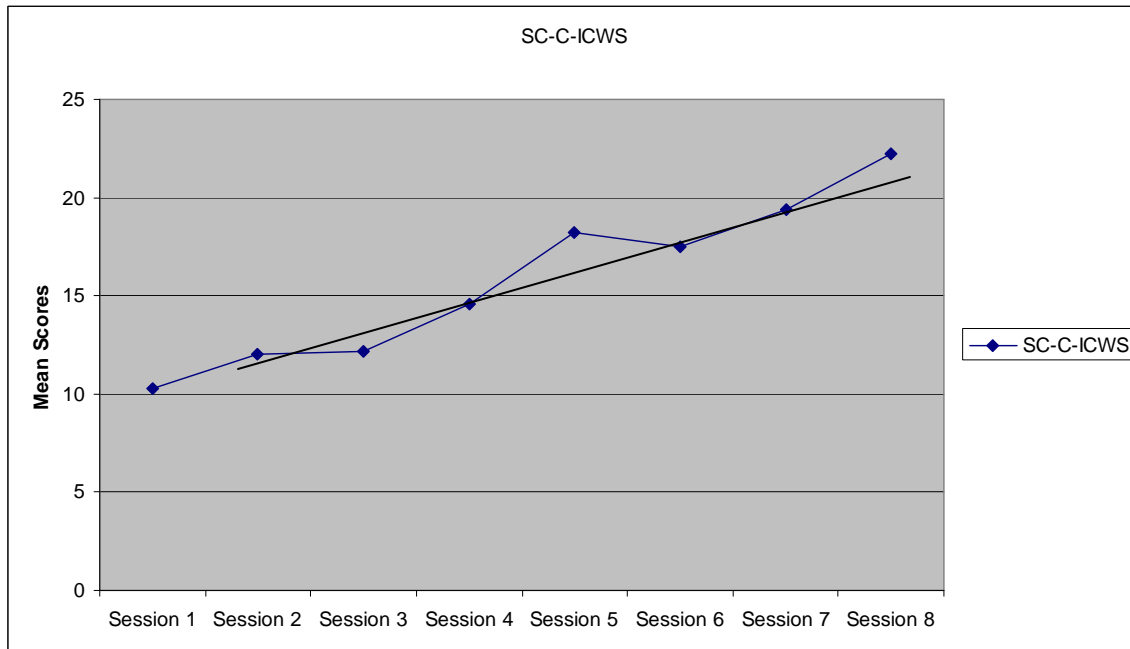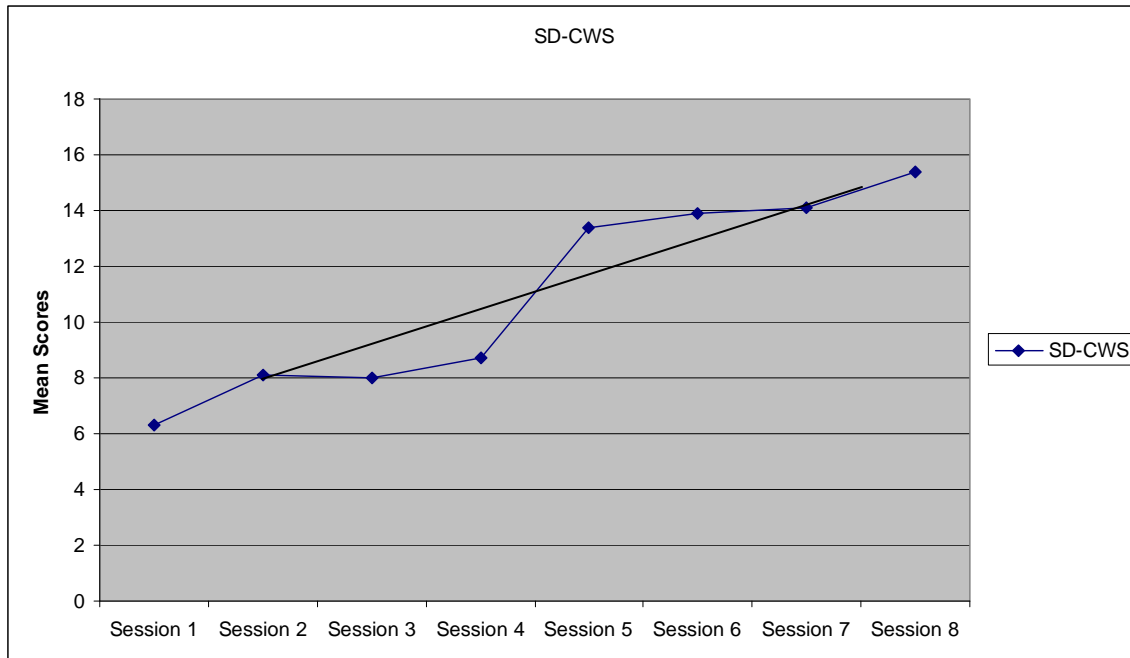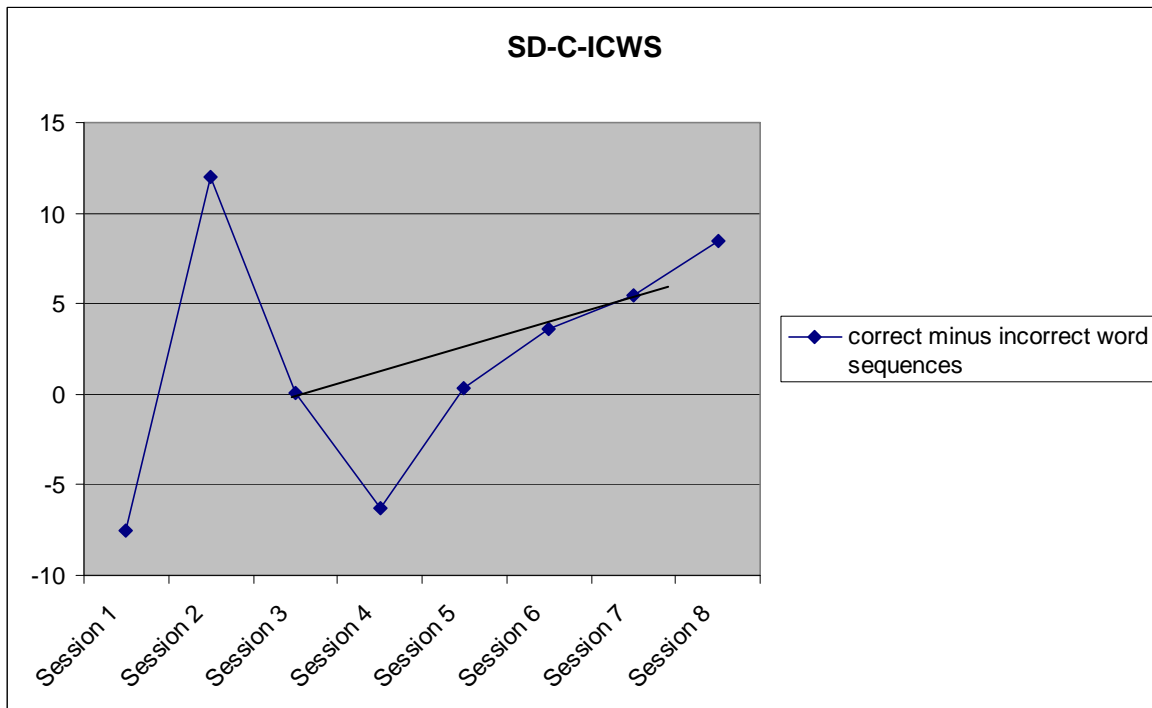The purpose of this study was to identify potential measures in early writing that may serve as indicators of performance and student progress. It was important to determine if these measures were technically adequate for use by educators to assess student proficiency and monitor progress of early writing skills. We investigated alternate form reliability, criterion validity, and the ability of the measures to model growth over time. These analyses were conducted by comparing total correct and correct minus incorrect letter or word sequences as scoring methodologies for each of the three time increments for each measure.

First, an examination of the descriptive data for each of the four measures revealed that all of the measures resulted in a wide dispersion of participant scores. The largest standard deviations occurred in the sentence copying measure, similar to the Lembke et al. (2003) study. Scoring using correct letter sequences (for word copying and word dictation) and correct word sequences (for sentence copying and sentence dictation) resulted in larger standard deviations. When examining the range of possible scores, the results reveal that there were no ceiling or floor effects on any of the early writing measures. In another similarity to the Lembke et al. (2003) study, participant scores on sentence copying and sentence dictation were low compared to the total possible. These results seem to suggest that sentence copying and sentence dictation show the greatest potential as indicators of early writing performance when considering the ability to discriminate between individuals.

What is the alternate form reliability of each of the four early writing measures?

Alternative form reliability is an important component of analysis as it relates to technical adequacy, as it assures the user that differing forms of a measure can reliably measure the same

skill as originally intended. In this study, the alternate form reliability was examined by looking

at the ranges of each correlation coefficient for each measure, by each time increment, and

further by each scoring method. While the coefficient in minute 1 of the each measure was

lowest, the ranges of correlation coefficients were moderate to strong for 2 minutes and strong

for 3 minutes, on both scoring methods. Using correct letter or word sequences revealed the

strongest correlation coefficients for 3 minutes, with .98 being attained for word copying and

sentence dictation, .97 for word dictation, and .93 for sentence copying. Using the correct minus

incorrect scoring method yielded similarly strong correlation coefficients. This suggests that the

four measures do appear to have a high level of alternate form reliability for use for 3 minutes.

    <u>What is the concurrent, criterion validity of the early writing measures with the Test of Early

Written Language II (Hresko, et al., 1996)?</u> Criterion validity of a measure should be considered

one of the most important characteristics (Lembke, et al., 2003) because in order to make

predictions regarding the rate of student growth, and to evaluate and adapt instruction, it is

necessary to establish an evidence-based rationale to make decisions. The four measures of early

writing were compared to a criterion variable of the TEWL-2 on a pre-study administration and

post-study administration. High correlations would indicate that a particular measure can

function as an adequate measure of early writing skill. Again, results of the present study were

similar to that of the Lembke et al. (2003) study, in that the word dictation and sentence dictation

measures correlated with the criterion variables. Generally, the 3 minutes provided the strongest

correlations across the measure, with correct letter or word sequences yielding strongest

coefficients with word dictation resulting in the highest correlations of the four measures on the

pre-study and post study analyses, .60** for the 1st minute, .60** for the 2nd minute, and .61**

for the 3rd minute. Sentence dictation correlations were .54** for the 1st minute, .49** for the 2nd

minute, and .53** for the 3rd minute. All correlation coefficients were noted to be statistically

significant at **p<.01. It must be noted that the word copying measure yielded no significant

correlations at any time increment or with either scoring method.

What is the criterion validity of each of the four early writing measures with teachers'
perception of students' overall writing proficiency? Comparing the four early writing measures

with the teacher's perception of their students' writing proficiency were completed. Correlation

coefficients were strongest for sentence dictation .66 for correct word sequences, and .64 for

correct minus incorrect word sequences, and sentence copying with .60 for correct word

sequences, and .65 for correct minus incorrect word sequences. The TEWL-2 post-study

administration correlated with .61 using correct sequences, and .59 using correct minus incorrect

sequences. All of these alpha were noted to be significant at p<.01. These results suggest that

sentence copying and sentence dictation were more closely aligned with the teachers' criteria for

writing proficiency. This might be explained by the notion that sentence building skills versus

word skills are an area of focus for writing instruction in these first grade classrooms.

Do the early writing measures predict performance over time? The ability of the four early
writing measures to make predictions about the anticipated performance of particular students is

considered to be useful for teachers in the evaluation of instructional practices (Deno, 2003;

Lembke, et al., 2003). Using the mean of scores for weeks one and two as predictor variables,

the post study administration of the TEWL-2 was used as the criterion variable. Correlation

coefficients were strongest, but yielded only moderate strength correlations for sentence copying

with .50 for correct word sequences and .57 for correct minus incorrect word sequences, and

sentence dictation (.49 for CWS, and .53 C-ICWS). This means that sentence copying scored

using correct or correct minus incorrect word sequences at sessions one and two predicts 25-32%

(r squared) of the variance in how students will do on a post test given following session eight.

Similarly, for sentence dictation using correct or correct minus incorrect word sequences at

sessions one and two, we can predict 24-29% (r squared) of the variance in how students will do

on a post test given following session eight. Word copying and word dictation yielded

correlation coefficients with a range of .44-.50. For word copying and word dictation using

correct or correct minus incorrect letter sequences at sessions one and two predicts 19-25% (r

squared) of the variance in how students will do on a post test given following session eight.

Again, sentence measures seem to be stronger indicators of performance for these participants.

Although, given the strength of the correlations, it would be wise to temper the endorsement of

these measures as adequate predictive tools in measuring early writing proficiency.

Do each of the four early writing measures adequately model student progress over time?

What is the growth rate for each of the four measures across eight administration sessions? Do

students show greater growth on one measure as compared to another?

Methods to illustrate growth over the period of the study involved examining the differences of

median score for section one from the median score of section three. Through the Tukey

analysis it was determined that each of the measures did provide evidence of student growth over

the period of the study. The largest growth rate was observed to be in the area of word dictation

with a growth rate of 1.9 correct letter sequences per session and 1.5 correct minus incorrect

letter sequences per session. Word copying had a growth rate of 1.1 correct letter sequences per

session, and 1.2 correct minus incorrect letter sequences per session. Sentence dictation had a

growth rate of .9 correct word sequences, and .8 for correct minus incorrect word sequences.

Sentence copying displayed a growth rate of .8 for CWS and 1.1 for C-ICWS. All of the

measures displayed a trend line that illustrated growth over the period of the study.   While

subjecting the data to HLM or other multivariate analyses would most likely produce more reliable rates of growth over time, we can still assert the presence of growth across the measures, and that these four measures are adequate to measure growth over time for the participants in this study.

On a general examination, the correlations coefficients for all analyses increased in all areas from session one to session eight, with three minutes consistently yielding the strongest correlations across all measures and both scoring methods.

<div align="center">Limitations of the Study</div>

There are some limitations that should be considered in evaluating the results of this study. First, this study included only two first grade classrooms in one small-sized elementary school. The participants gathered from this sample population provide only limited opportunities to generalize to other first grade students (e.g. populations from higher SES, different ethnicity status, larger school size, etc.). Likewise, the results may not generalize to other early elementary grades such as later kindergarten or early second grades.

Another limitation can be found in the use of the standardized assessment as a criterion variable, the TEWL-2. While this assessment has received widest acceptance for use in assessing early writing skills, there are a number of different assessments available. In addition, there is a belief of many prominent researchers in writing performance that standardized assessments are of little utility in measuring the complex combination of skills required for writing proficiency.

The limitation of time for this study is of importance when attempting to provide evidence of technical adequacy of these measures. Given that there was only one data collector available meant that it took two weeks to complete one administration of a round of the measures

limits the generalization abilities of the measures. Increasing the length of the study to encompass an entire school year, with frequent opportunities to assess different forms of the measures would increase the ability to draw logical conclusions regarding the technical adequacy of the measures.

One final but significant limitation of this study was the unavailability of applying the data to a higher-level of statistical analyses in the area of growth modeling inhibits the ability to examine growth of the measures with respect to significance, growth rates, and predictability of performance.

<center>Implications for Future Research and Instruction</center>

This study provides much needed data to extend the research base for using CBM in early writing. Based on the results of this study, it would appear that these four measures of early writing can be identified as indicators of early writing proficiency. These measures can be used further to monitor growth in emerging writing skills. The results obtained in this study should provide a rationale for continued future research in the area of utilizing CBM in writing instruction. Based upon this study, teachers can use all four measures, as each measure shows evidence of being able to discriminate among students performance with either scoring method. However, it must be noted that during concurrent criterion validity analysis, Word Copying did not yield any significant correlations in 3 minutes with either scoring method; while the other three measures yielded moderate significant correlations with the criterion variables. Another promising result that provides evidence that the four measures could be helpful for teachers is that the measures did exhibit moderate significant correlation for predictive validity, enabling teachers to have a tool that could predict their students' future performance on standardized writing tests such as the TEWL-2. Finally, based upon this study, teachers can use all four

<center>46</center>

measures because each of the four measures did show evidence of growth over time. For teachers, having a measure that can monitor progress of student performance is helpful in making instructional decisions and adaptations.   Future studies that seek to apply the measures to larger sample populations and over extended time frames would increase the knowledge base for guiding teachers in assessing student proficiency and growth utilizing progress monitoring tools in the area of writing as has been done in the area of reading and math. With the limited research literature available in the area of early writing proficiency, more research could provide for the future development of standards that will aid teachers to articulate the skills needed for writing proficiency, but also to adjust instructional strategies to more effectively meet the needs of students in early elementary grades by using evidenced-based strategies for writing.

This study could serve to improve instructional implications by increasing the knowledge base of CBM in early writing. This study has served to assist in the identification of indicators of early writing proficiency. Teachers could use these measures to assess their students' present level of performance, allows the teacher to adapt instruction to suit the needs of their students, and to monitor student progress over the course of an academic year. With further study we could aid in the development of normative benchmarks that teachers can use to discover their students' writing proficiency and to guide instruction toward improving student performance in meeting benchmark standards. This would ultimately assist educators in improving their instruction in early writing, and thereby improving the performance of their students.

APPENDICES

Teacher Rating Scale for Students' Writing Proficiency

For each student below, please rate his or her *general proficiency in writing* relative to other students in your class.
Try to spread student ratings across the *full range of the scale*, not clustering students only in the middle or toward one end.
Thank you for your help!

Student Name	1 *(least proficient)*	2	3	4	5	6	7	8	9	10 *(most proficient)*
	1	2	3	4	5	6	7	8	9	10
	1	2	3	4	5	6	7	8	9	10
	1	2	3	4	5	6	7	8	9	10
	1	2	3	4	5	6	7	8	9	10
	1	2	3	4	5	6	7	8	9	10
	1	2	3	4	5	6	7	8	9	10
	1	2	3	4	5	6	7	8	9	10
	1	2	3	4	5	6	7	8	9	10
	1	2	3	4	5	6	7	8	9	10
	1	2	3	4	5	6	7	8	9	10
	1	2	3	4	5	6	7	8	9	10
	1	2	3	4	5	6	7	8	9	10
	1	2	3	4	5	6	7	8	9	10
	1	2	3	4	5	6	7	8	9	10
	1	2	3	4	5	6	7	8	9	10

Appendix B. Early Writing Measures

Teacher's Copy

Student Name:_____

Date:_____

1. I like to play ball.

2. My dad is tall.

3. Mom has red hair.

4. The rabbit jumps.

5. You and I are friends.

6. We are in line to eat lunch.

7. I like to eat pie.

8. I will run home today.

9. I can count to ten.

10. My apple is red.

11. Can you come out today?

12. You are his brother.

1. My dog runs fast.

_____

2. We will walk to school today.

_____

3. I like to smell the flowers.

_____

4. My friend has blue eyes.

_____

5. I watched a movie today.

_____

6. This cake tastes good.

_____

7. We are going on a picnic.

_____

8. I like to sing that song.

_____

9. The picture is on the next page.

_____

10. Your dress is pretty.

_____

11. I like to pet the cat.

_____

12. I hope that you like the toy.

1. day	16. stop
2. tell	17. next
3. like	18. food
4. up	19. story
5. all	20. part
6. more	21. take
7. want	22. when
8. door	23. did
9. book	24. the
10. list	25. at
11. can	26. care
12. what	27. home
13. kind	28. page
14. car	29. picture
15. took	30. learn
	31. many
	32. under
	33. state
	34. girl
	35. enough

1. near   last   said

_____   _____   _____

2. got   the   of

_____   _____   _____

3. my   also   home

_____   _____   _____

4. sound   and   in

_____   _____   _____
5. large   go   take

_____   _____   _____

6. hard   few   later

    _____   _____   _____

7. miss   song   all

    _____   _____   _____

8. end   water   made

    _____   _____   _____

9. in   part   same

    _____   _____   _____

10. girl   show   work

    _____   _____   _____

11. much   if   change

_____   _____   _____

12. that   he   little

_____   _____   _____

13. use   number   try

_____   _____   _____

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