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THE EFFECTS OF MONTH OF BIRTH AND GENDER ON ELEMENTARY READING AND WRITING FLUENCY SCORES USING CURRICULUM BASED MEASUREMENT

by

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ABSTRACT

This study used Curriculum Based Measurement data of students' reading and writing fluency to investigate the relationship between scores on these achievement measures, the gender of the students, and the month in which the students were born. The sample consisted of 2,367 elementary school students randomly selected for a school district norming study. The measurements were collected by learning assistance teachers and support teachers in each elementary school. Successive measurements were taken during October, January, and April of the 1995/96 school year. A core group of 1849 was utilized for the gender and birthdate effect study. Scores were analyzed using a two by three analysis of variance. Gender, month of birth and the dependent variables of reading, and written expression scores were analyzed for each of the seven different grade levels. Repeated measures for October, January and April were compared for trends in reading, and written expression fluency over a school year. A consistent gender effect was found at all grade levels. Male students' mean score in reading, writing and spelling was lower than female students' mean score at every grade level. There was not a significant birthdate effect or a significant interaction between gender and month of birth. The month of a student's birth had no effect on the student's ability to read or write for any grade level.

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CHAPTER ONE

INTRODUCTION

Educators are often queried by concerned parents as to whether or not their children appear ready for school. Teachers, principals and school counselors frequently state that the youngest students in any grade level group will experience difficulty in learning to read at the same rate as their older peers. Advice regarding grade retention or learning assistance is given to parents after watching many young students struggle with the demands of literacy learning. The parents' decision to withhold a child from school entry or retain a child in an early grade is based on advice given by school professionals. The question of readiness is a complex one effected by many factors such as birthdate, gender, socioeconomic status, intellectual ability, preschool experience with print, and the child's exposure to different parenting and teaching strategies. In this study, the curriculum based measurement scores for reading and writing of approximately 2000 students were studied and the effects of the birthdate and gender were analyzed. A discussion of how students' birthdates were analyzed and the nature of curriculum based measurement follows.

Relative Age Within Grade

In British Columbia, students are enrolled in school according to the calendar year. This makes students whose birthdays fall in December the youngest in the class. Those born in January of the same calendar year are eleven months older than their December-born classmates. This birthdate effect has been researched with inconclusive and conflicting results (DiPasquale, Moule, & Flewelling, 1980; Gredler, 1980; Badian, 1984). By using data collected through the School District #57 (Prince George) curriculum based measurement norming project, this research investigated the effect of students' gender and month of birth on students' abilities to read and write. Variation in reading and writing

ability according to birthdate and gender for students enrolled in grades one through seven were analyzed.

The knowledge of birthdate and gender relationships to reading and writing fluency is likely to be of interest to parents. It may influence their decisions regarding the best time for school enrollment. This information may be of interest to principals, teachers, school support workers and counselors in providing the best educational program for students. As schools strive to provide better programming to meet the educational needs of their students, data which provide statistical evidence of the relationship of reading and writing to gender and student month of birth will be beneficial to the professionals in the education system.

Curriculum Based Assessment

Within the context of the classroom, teachers have often used the curriculum to devise assessment measures in order to determine if the students have learned what teachers have tried to teach. Formal and informal assessment measures have been used. The use of these types of tests are described as curriculum based assessment (CBA). When a student's learning needs are far greater than those of most other students', special educators are called upon to assess the student. The classroom teacher's initial curriculum based assessments are then replaced by more formal standardized assessment measures. In educational psychology, there has been a move away from a diagnostic formal assessment system towards a more functional assessment of students' skills (Rosenfield & Kuralt, 1990). Results attained by various standardized achievement tests have been found to vary depending upon the test's match to the curriculum being used for teaching (Jenkins & Pany, 1978). This shift is motivating educators to develop assessment methods which link assessment such as curriculum based measurement (CBM), a standardized version of curriculum based assessment, to classroom practice (Fuchs, Fuchs, & Hamlett, 1994).

Curriculum based assessment employs data collection about student progress through the use of informal methods such as observation of student performance and marking of daily student work, or through more formal methods such as teacher designed tests which reflect the curriculum being taught within that classroom. CBA is a measure of whether or not the student is meeting the instructional objectives set by the classroom teacher for the curriculum being taught (Salvia & Ysseldyke, 1991). Curriculum based assessment is the specific measurement of skills learned by students. It has also been referred to as mastery learning, outcome based education, diagnostic teaching or precision teaching (Salvia & Hughes, 1990). It is efficient, effective monitoring of student learning that is practiced by teachers in most classrooms today.

Curriculum Based Measurement

Curriculum based assessment differs from curriculum based measurement in that CBM it is a specific approach applied to the curriculum for measuring students' growth in the basic skill areas of reading, written expression, spelling and mathematical computation. This measurement approach was developed by the Minnesota Institute for Research on Learning Disabilities over a six year period beginning in 1977 (Deno, 1992). Extensive research was done to assure that the measures would be reliable, valid, efficient and able to be used repeatedly to determine growth over time (Deno, Mirkin & Marston, 1980). Curriculum based measurement measures the curriculum being taught to the student. It measures growth in student learning over time. This differs from standardized norm referenced achievement tests where students' learning is measured in relation to a population of students of the same age (Deno, 1992).

Frequent CBM probes of students' skill levels enable teachers to closely monitor and adjust teaching strategies in order to maximize student learning. CBM has been successfully used to monitor reading fluency, written expression, spelling and basic math facts in many school districts in the United States. The need of School District #57 (Prince George) to

establish CBM reading and writing norms necessitated the testing of a random sample of students from grade one through seven throughout the district.

Description of school district. School District #57 (Prince George) is located in the central interior of the province of British Columbia, Canada. The school district serves a geographic area of 51, 599 square kilometres. According to the 1991 census, the district population is 90,515 serving a total of 24,490 families. The school population consists of approximately 19,700 students and 1270 educators. The average annual income is $25,683 with the majority of the people employed in manufacturing (16.5%), retail trade (12.8%) and logging and forestry (7.0%). The majority of the population speak English in the home with 2.7% of the population being First Nations people (Province of British Columbia, Ministry of Education, 1994b).

CBM norming project. The establishment of developmental norms for this school district are being used by the support services department to ascertain whether students need additional interventions such as special programming or learning assistance support. Typical growth patterns in reading and writing fluency throughout the grades have been determined with the establishment of these norms. This norming represents a move towards functional assessment and intervention for students in this school district. It represents an effort to more closely align assessment with local curriculum in order to make program modifications for students who are experiencing difficulty in reading and writing. Typical growth patterns in reading and writing fluency throughout the grades have been determined with the establishment of these norms. Comparison of a student's score to the norms assists school personnel in their programming and teaching practices (School District #57, 1996).

The reading and writing fluency norms established by the district norming project are being used by the district as a means of tracking student progress and monitoring educational interventions. The use of this data has been permitted for educational research (Appendix A),

allowing several research questions to be addressed. The present study focused on the significance of month of birth and gender in the assessment of reading and written expression.

Limitations

Curriculum based measurement was the chosen assessment tool of this school district. The study does not use norms developed from a wider population base than this school district. The curriculum that the teaching materials are taken from is that which is taught in school district #57. The results attained may not be as applicable to other school districts.

The use of CBM as the only method of assessment has the disadvantage of being tied to the local curriculum. Other assessment devices such as standardized tests need to also be used when assessing students (Mehrens & Clarizo, 1991). Limitations for CBM also involve the need to be aware of the subtle differences in test conditions, and rater abilities (Cone, 1992; Derr-Minneci & Shapiro, 1992).

Other factors that may influence reading and writing ability such as race, socioeconomic status, stability of home environment, literacy of the home environment, or variation in teaching methods have not been considered. Other aspects of the curriculum such as mathematics and spelling word lists were not measured in this study.

CHAPTER TWO

LITERATURE REVIEW

This chapter contains four sections discussing relevant literature. The first section discusses Curriculum Based Measurement, its origin and reasons for development. The second section discusses how CBM is being utilized in the education system. The third section discusses gender studies related to reading and writing. The fourth and final section discusses literature which has investigated the birthdate effect on student's reading and writing.

Origin of Curriculum Based Measurement

Curriculum based measurement (CBM) was developed at the University of Minnesota Institute for Research between 1977-1983 (Ysseldyke, Thurlow, Graden, Wesson, Algozzine, & Deno, 1983 ; Deno, 1985, 1992). The original research focused on characteristics of children referred and deemed eligible for special education as well as instructional interventions and evaluations. (Ysseldyke, et al.,1983). Curriculum based measurement was developed as an answer to a search for a measurement approach that was reliable and valid, simple and efficient, easily understood by teachers and inexpensive to administer (Deno, 1985).

The Need for Curriculum Based Measurement

The research findings by Ysseldyke et al. (1983) point out several problems experienced by professionals attempting to identify students eligible for funding as learning disabled. They determined that special education decision making was inconsistent and had little to do with data collection on student learning. Student gender, socioeconomic status, physical appearance, and reason for referral all influenced whether school personnel provided funding. The study also found no distinction being made between students with learning disabilities and low

achieving students. In one study, undergraduate students were often more accurate than psychologists and special education teachers when distinguishing students with learning disabilities from low achieving students. The research also determined that teachers tended to refer students "who bothered them" (Ysseldyke et al.,1983 p. 81). This research points out the need to change from a labeling and referral system of special education to a system in which intervention and improved learning for students is the main focus.

Other researchers have pointed out the need for a similar shift in special education focus. Reschly (1988) states that school psychology in the 1990s is expected to change rapidly in the direction of pre-referral interventions, behavioral consultation, curriculum based assessment and instructional design, and behavioral interventions for academic survival skills (p. 459). Reasons for this change are the influence of the inclusion movement where human rights are considered in the education of all children, the influence of research into the nature of the human brain, and the excessive numbers of students being assessed as having learning disabilities and special education needs. The system is unable to cope with the demands using a referral and special placement approach.

The change of focus from standardized testing is being cited as necessary by several researchers. Gardner (1983) states "Only if we expand our view of what counts as human intellect will we be able to devise more appropriate ways of assessing it and more effective ways of educating it" (p. 4). The notion that knowing the child's intellectual quotient or his or her standardized achievement score will help solve the problem is being questioned. Deno (1990) contends that "we may have reached the limits of our current diagnostic-predictive methodology, but the extent of improvement that can be made in individual programs through formative evaluation is as yet undetermined" (p. 170). Deno (1990) uses the phrase "formative evaluation" to refer to the approach by the individual teacher in making day to day evaluation

decisions (p.170). Slavia and Hughes (1990) suggest that the problem with standardized tests is the lack of match between what is being tested and the curriculum that is being taught (p. 8).

The difference between standardized testing and curriculum based measurement is that standardized testing asks students to perform tasks that are often unrelated to their present curriculum. It describes the students' achievement in standardized scores or percentage points in relation to the student's age peers. A standardized test is usually only administered once a year where as curriculum based measurement can be ongoing measurement of curriculum achievement showing growth over time (Deno, 1985; Fuchs, Fuchs, Hamlett, Walz & Germann, 1993). Standardized tests will continue to have their purpose for special assessments but a more functional performance assessment will serve as the first approach taken by special educators to begin and monitor curriculum interventions for the student. Some jurisdictions in the United States are requiring that a curriculum based appraisal be done before students are referred for formal assessments (Gickling & Thompson, 1985).

Dissenting viewpoints. In contrast, when discussing the merits of standardized testing, Mehrens and Clarizo (1993) state, "The content validity evidence refers to whether the sample of behaviors in the test is representative of the domain to which we wish to infer. This domain is not necessarily the domain of the local curriculum" (p. 243). The authors go on to suggest that curriculum based measurement cannot provide national norms. They feel it would be a mistake to view curriculum based measurement as a replacement for current psychoeducational practices (p. 252). Other studies criticize CBM as being inappropriate for use as the only measure of student achievement (Mehrens & Clarizo, 1993; Taylor, Willis, & Richards, 1988).

Heshusius (1991) criticizes curriculum based assessment as being too quantitative and prescriptive. This author suggests that a third more authentic assessment needs to be developed rather than standardized testing or curriculum based measurement. Deno (1992) states that curriculum based measurement does not focus on subskills but fluent reading and writing for its

measures of student achievement and is therefore more connected to whole language learning. Wesson and King (1992) found that portfolio assessment and curriculum based measurement were similar in that they both document progress over time. Both are direct, authentic, and holistic measures of student achievement. Both strategies increase student motivation. Both have a logical and necessary connection to instruction (p. 31).

Evidence in favour of Curriculum Based Measurement

Fletcher and Satz (1984) conducted a three-year longitudinal study investigating the predictive validity and utility of test based versus teacher based predictions of academic achievement. They suggest prescreening assessments which hold more utility for the classroom teacher need to be utilized prior to more expensive IQ tests. Pugach (1985) found that "the individual teacher's decision to refer a student continues to be the pivotal point in the identification process" (p. 123). Pugach goes on to suggest that as a means of alleviating the backlog of students waiting for costly special education assessments, the special educator's role might be to assist in developing and evaluating appropriate interventions (p. 135). A second suggestion was to support the development of general remedial education programs for students who are not handicapped but need smaller instructional settings to succeed (p. 136).

Concerns about the need for change from standardized measures which are costly and of limited utility are supported by research such as that done by Jenkins and Pany (1978) who analyzed correlations between five reading series and four standardized tests. They found that student achievement in a particular curriculum may not be reflected in that student's standardized test scores. They further suggest that "what educators need is an instrument to measure learning that is sensitive to curricular differences. Some form of criterion referenced or curriculum based assessment may provide the solution" (p.453).

Derr-Minneci and Shapiro (1992) investigated the accuracy of curriculum based measurement in different settings and different assessment methods. They found that the

conditions for testing affected the scores for oral reading fluency with the more natural conditions yielding the higher testing results. Stoner (1992) suggests that Derr-Minneci and Shapiro have "misconstrued the concept of accuracy" with their study (p. 20). He also suggests that more research needs to be done studying interventions and outcomes utilizing curriculum based measurement. Cone (1992) stresses the need for establishing the accuracy of measures in studies like the one performed by Derr-Minneci and Shapiro

Salvia & Ysseldyke (1991) state that curriculum based assessment occurs when school personnel evaluate the extent to which the student is profiting from instruction by measuring whether or not specific instructional objectives have been accomplished (p. 35). Hargis (1987) points out that curriculum is the cause of most learning problems and that through effective curriculum based assessment, instructional adjustments can be made to ensure successful learning for students. Hargis contends that curriculum based assessments have both content validity and predictive validity, two factors extremely useful for classroom teachers.

Recently the focus has turned to the utilization of curriculum based measurement as a procedure for determining eligibility for additional support services at the school level. Studies have shown that curriculum based measurement is as effective as standardized testing for determining students' eligibility for additional support services (Dunn, 1991; Shinn, Nolet, & Knutson, 1990).

The technical adequacy of curriculum based measurement has been studied extensively (Marsdon,1989). Fourteen studies on curriculum based measurement reading validity were cited by Marsdon. When compared to criterion tests of reading such as the Stanford Diagnostic reading test (Karlsen, Madden, & Gardner, 1975), the Woodcock Reading Mastery test (Woodcock, 1973), and the Reading comprehension subtest from the Peabody Individual Achievement Test (Dunn & Markwardt,1970); the correlation coefficients ranged from .73 to .91 (p. 33). Reading reliability studies for curriculum based measures of reading had

correlation coefficients that ranged from .82 to .99.(p. 41). Marsdon also cited six validity studies for curriculum based measures of written expression which had correlation coefficients ranging from .45 to .92 for total words written correctly (p. 47). Reliability studies of curriculum based written expression measures ranged from .41 to .96 (p. 49).

Use of Curriculum Based Measurement

Substantial research has been done in the last decade outlining how curriculum based measurement is being utilized in special education. Allinder (1995) found that using curriculum based measurement increased teacher efficacy and student achievement amongst special needs classes. Shinn (1992) suggested that CBM oral reading fluency can be used as a measure of reading achievement that includes reading comprehension.

Marston, Mirkin, & Deno, (1984) found teacher referrals for extra support were similar to curriculum based referrals in number, but that without data, teachers referred more males and more behavior problems for additional support. The use of curriculum based referrals rather than only teacher judgment would put into place a more consistent assessment system for extra support for students. Dunn (1991) suggests a need for further studies which investigate developmental growth patterns of students reading fluency over several elementary grade levels using curriculum based measurement.

The recent move towards whole language learning and holistic assessments has provoked the question of how curriculum based assessments are relevant to the holistic learning movement. In classrooms where traditional basal texts were being used, curriculum based measurement showed greater student growth than classrooms where literature based basals were used (Hintz, Shapiro, Lutz, (1994). This finding is explainable if one considers that there is a greater frequency of word repetitions in traditional basal readers as opposed to literature based textbooks, where each selection brings to the reader its own vocabulary. The strength of whole language and literature based programs is the greater amount of high interest words to motivate

the reader. Greater predictability of vocabulary in a traditional basal text would naturally have an effect on the reader's oral reading fluency.

As more teachers move to whole language instruction the question of the validity of curriculum based measurement becomes a concern. Fuchs and Deno (1994) studied the question of whether or not instructionally useful performance assessments need to be based in the curriculum. They discovered that measurement in the specific curriculum of instruction was not the key variable for ensuring measurement validity or instructional utility (p. 17). The authors go on to suggest that as educators we should be looking at how well the student does on material that is similar to the curriculum but has not been the direct focus of instruction. This is especially important in artificially controlled phonetic reading materials where generalization to other reading materials is necessary to ensure reading success for the student.

Gender Studies Related to Reading and Writing

For many years researchers have been finding a gender difference in school success with reading and writing tasks. Despite a move towards gender equity in society, recent research continues to point to a gender inequity in schools. Bognar, Chapman, Jeroski, Tolsma, & Toutant (1995) state "Female students at all grade levels displayed more effective reading and writing skills and expressed more positive attitudes than their male counterparts (p. 147). Berninger and Fuller (1992) found a gender difference in writing fluency using expository frames. They also state that "considerably more boys than girls were found to have a writing disability (p. 375). Beach and Robinson (1992) tested 145 preschool and primary children on a writing and concepts about print task, similar to tasks found in school settings and an environmental print task, of identifying common print and logos in their environment. They found girls scored higher than boys on school type literacy tasks. On tasks which involved environmental print, that is print which is functional in society like labels, signs, directions, boys scored higher than girls in preschool and kindergarten. In the primary grades the boys and

girls scores on the environmental print task were equal. Many other researchers studied gender differences in reading and writing as part of their birthdate effect studies. These are listed in Table 1. Of the 14 birthdate effect studies only 4 studies did not find a gender difference evident (Wood, Powell & Knight, 1984; Flynn & Rahbar, 1993; Maglicano, 1994; Trapp, 1995).

Birthdate Effect on Reading and Writing

Table 1 outlines the most recent studies which examined birthdate effect on reading and writing. The majority of these studies used ANOVAs or T-tests for a statistical method. The only studieswhich also examined the interaction between gender and birthdate were Cameron and Wilson (1990) and May and Welch (1986) This study will use an ANOVA to examine birthdate and gender differences as well as their interaction.

DiPasquale, Moule, & Flewelling (1980) found larger numbers of males and youngest children were referred for assessment services. They suggest a need for further research into the birthdate effect as well as the effects of grade repetition on students' self image. Using archival data of standardized test scores, Davis, Trimble & Vincent (1980) found a difference in all tests at the first and fourth grade levels. Only a difference in reading scores was noted at the eighth grade level. The authors state "Educational leaders should question policies that allow five-year-olds to enter first grade with no specific indication of readiness" (p. 141). Diamond (1983) also investigated archival data and found more younger children classified as learning disabled. He suggests that the remedy for immaturity may need to be a modification in teaching practices or in teacher expectations of the younger students.

Badian (1984) found that chronological age was not significantly associated with reading achievement. The youngest children were not the poorest readers. Instead she suggests that low socioeconomic status, late position in the family, large family size and male sex are associated with poor reading scores (p. 134). Wood, Powell and Knight (1984) state that

"chronological age of children entering kindergarten within the range of 4 to 6 years is unrelated to eventual success or failure"(p. 11). They suggest that developmental age is more of a predictor of learning difficulties in school. Kinnard and Reinherz (1986) found that teacher ratings suggested more of a difference between boys and girls than did the parent ratings. The issue of self-fulfilling prophecy comes into play where the teachers are expecting the boys to have a lower level of achievement. The authors also found the youngest age group had the lowest scores on information processing. The authors go on to suggest that schools should expand the entrance requirements to consider children's level of functioning as well as their chronological age (p. 371).

Boyd (1989) found an age difference in reading and math in grades one through three but when one considered the variables of gender, race and family income, the older and younger students did not differ in achievement. Breznitz and Teltsch (1989) found that youngest children are at a disadvantage academically and socially when compared to their older peers. Jones and Mandeville (1990) found that although the age at school entry affected achievement, it was a minor factor compared to race, gender or lunch payment status.

Cameron and Wilson (1990) found a small age difference on standardized test scores. More interestingly, they found that students who had been held back from school entry for one year did not gain academic advantage by waiting to begin kindergarten. In contrast, Crosser (1991) found that male students who had postponed kindergarten entrance by one year were more advanced in all areas, especially reading, at the grade five and six level. The difference was not as significant for females who had postponed entrance by one year. Recommendations from Crosser (1991) suggested a need to study students' attitudes towards postponement, the influence of socioeconomic status as well as the type of educational program offered as factors in the achievement of these students who had postponed entry. Shepard and Smith (1986)

Table 1

Research on Birthdate Effect

Date	Author	Measure used	# of Subjects	Grades analyzed	Gender difference found	Age difference found
1980	DiPasquale, Moule & Flewelling	Referral for assessment	363	grades K-6	yes	yes
1980	Davis, Trimble, & Vincent	Comprehensive Test of Basic Skills	17,000	grades 1, 4, & 8	yes	yes
1983	Diamond	WISC-R	74,692	age 5-20	yes	yes
1984	Badian	Stanford Achievement Test (SAT)	550	grades 3-6	yes	no
1984	Wood, Powell & Knight	Gesell readiness Test	84	K		no
1986	May & Welch	Gesell readiness Test & Stanford Achievement Test	152	grades K, 2,4,6	yes	no
1986	Kinard & Reinherz	Preschool screening, Cal. Achievement Test, ratings	488	grades K-4	yes	yes
1987	Sweetland & DeSimone	Comprehensive Test of Basic Skills	152	grades 1-6	yes	yes
1989	Boyd	California & Stanford Achievement Tests	185	grades 1-5	yes	yes
1990	Jones & Mandeville	South Carolina Basic Skills Assessment	190,292	grades 1,2,3, & 6	yes	yes
1990	Cameron & Wilson	Iowa Tests of Basic Skills(ITBS)	313	grades K - 4	yes	yes
1991	Crosser	Test of Cognitive Skills & Cognitive Abilities Test	90	grade 5 & 6	yes	yes
1992	DeMeis & Stearns	Referral for special programs	1,676	grades K-12	yes	no
1993	Flynn & Rahbar	National Standardized Tests	4767	grades 1-3	no	no
1994	Magliacano	Metropolitan Test of Reading Readiness & ITBS	34	grade 2		no
1995	Trapp	California Achievement Test	121	grade 2	no	yes

found that children who were allowed an extra year to develop showed no academic advantage over other equally at risk children who did not have the extra year.

A further study by Flynn and Rahbar (1993) concluded that "age of school entrance and gender predicted less than 1% of the variability in reading achievement in the first three years of school"(p.306). The authors state that delaying school entrance is not warranted. When professionals give advice on school readiness, other factors such as social and emotional maturity as well as precursors to reading readiness should be considered in school entrance and retention decisions.

DeMeis and Stearns (1992) found no greater difficulties with academic achievement among younger students than among their elder classmates. They found that more boys were referred for psycho-educational assessments than girls. May and Welch (1986) found that the age effect tends to disappear in the later grades. They did not feel that delaying school entrance for young boys was an effective option. Kinnard and Reinherz (1986) as well as Shepard and Smith (1986) also suggest that age effect tends to disappear by the third grade. This is in striking contrast to Breznitz and Teltsch (1989) who state that the differences increase over the years.

The age and gender effects may also be attributed to other factors such as socio-economics, readiness skills, race or teacher's preconceived notions about younger male students (Uphoff & Gilmore 1985; Gredler 1980; Shepard & Smith 1986; Knoff & Dean 1994). Gredler (1980) states that psychological referrals are influenced by gender as well as birthdate. Knoff and Dean (1994) conducted research on gender, socioeconomic and racial bias of curriculum based measurement within one school setting. Knoff and Dean articulated that there is a need for further research in this area over a wider geographic area and a larger sample.

Ilg, Ames, Haines and Gillespie (1978) state that many children are placed at a higher grade level than where they could be successful. Other researchers (Smith & Shepard, 1987;

Holmes & Matthews, 1984) contend that retaining children is ineffective. Smith and Shepard (1987) state that children who repeat a grade are consistently worse off than comparable children who are promoted with their age mates (p. 130). They also found that transitional placements such as pre-kindergarten and pre-first grade are no more successful than retention. The authors go on to suggest tutoring and summer school are more effective and less costly than retention. Holmes and Matthews (1984) conducted a meta-analysis on retention research and found that the potential for negative effects consistently outweighs the positive outcomes (p. 232). Leiberman (1980) states that the practice of parents delaying school entry is highly questionable especially for those children who would experience success at their age appropriate grade.

Summary

The majority of the studies on age effect have relied on the scores of standardized achievement tests. Often standardized tests are several years old and not applicable to the reading and writing instruction which is occurring in today's classrooms. The standardized tests also do not relate well to the curriculum being presented in the classroom. Curriculum based measurement has the advantage of being more relevant to the current curriculum which the student is learning each day in school.

A consistent gender difference, showing males scoring lower than females, was found in 12 of 16 studies reviewed in the literature. No gender difference was discovered in 2 studies while 2 other studies did not measure gender differences. An age effect was noted in 10 of the 16 studies while 6 studies did not find a birthdate effect. The studies on age effect did not look at the younger and older students' performance on the actual curriculum that they face each day in school. Only two of the age effect studies investigated the interaction between month of birth and gender. There was no interaction found in these two studies.

This study looks at age and gender effects based on the curriculum by analyzing curriculum based measurement scores. This study also examines the interaction between gender and month of birth on CBM reading and writing scores for all grades from grade 1 to grade 7. Further investigation was also done examining the mean scores of retained students versus the mean scores of appropriate aged students on the CBM tests.

CHAPTER THREE

METHODS

This chapter contains five sections. The first section explains the selection of subjects who were tested for the school district norming project and this study. The second section discusses the test materials used, the relation of this study to the school district project and the inter-rater reliability test undertaken for the purpose of this study. The third section is a description of the procedures undertaken for this thesis study The fourth section is a list of terms defined for this study. The fifth section states the research questions and hypotheses being investigated by this study.

Subjects

The subjects in this study are an intact data set collected by teachers in School District #57 (Prince George). The students were randomly chosen to participate in the testing at each school grade based on the random numbers generated by the project coordinators employing a sample stratified by school (School District #57, 1995). Approximately twenty percent of the students in the school district's elementary schools were tested at three times during the 1995/96 year. The parents were informed of the project in each of the schools' newsletters. Consent forms were judged unnecessary by school officials. There were 2367 students tested for the norming project. Selected students who transferred out of a school attendance area were replaced by another student who had recently moved into the school. This enabled the norming project to retain the full 20% at each testing period.

The subjects for this thesis work analyzing gender and month of birth were further selected from the norming study population. Students who were not at the appropriate age for their grade level were excluded from the gender and month of birth study. This excluded

students who had enrolled in school a year later than their age mates, students who had been retained for a second year at any of the grade levels and students who had been excelled to a higher grade level. Students who transferred in or out of the study were also excluded from the gender and month of birth study. The number of students in each grade level group were 301 Grade Ones, 266 Grade Twos, 269 Grade Threes, 263 Grade Fours, 238 Grade Fives, 265 Grade Sixes and 247 Grade Sevens making a total of 1849 students analyzed in the gender and month of birth study. The number of students in Grade One, Two and Three are lower for the Words Spelled Correctly data as reporting Words Spelled Correctly was optional for primary students assessed in the norming study. The reason for this was the difference amongst teachers in strategies for teaching spelling and phonics at the lower grade levels.

Students at each grade were assessed on the grade level materials for the grade in which they were enrolled. The first grade students were given reading probes designed from first grade reading material, all second grade students were given second grade reading probes and so on. This matching of grade level probes to student's enrolled grade continued for all grades regardless of what the learning assistance teacher knew about the student's actual reading level or ability. A designated teacher at each school was trained to administer curriculum based measurement reading and writing probes to the selected students. The timeline for testing is outlined in Appendix E.

Test Materials

The reading materials selected for the CBM reading probes represent a sample of reading curriculum materials used in the daily teaching of reading to students in the school district. Teachers in the school district were randomly surveyed to ascertain the type of reading instruction material used in their classrooms. The survey form and related memorandum are

attached in Appendix B. Six reading probes for each grade level were then developed by a school district committee using the four basal reading series taught in the majority of classrooms throughout the school district.

As part of the school district's norming study, research was conducted which concluded there was no difference amongst the difficulty of the reading probes and no difference in difficulty among the writing probes used at each grade level (School District #57, 1996). Based on this information, the reading and writing probes at each grade level will be considered equivalent for the purpose of this study. Further research by Scxhool District #57 found that the variables of Total Words Written (TWW) and Words Spelled Correctly (WSC) were very highly correlated, $.91 < r < .99$, while Words Read Correctly(WRC) and TWW displayed low to moderate correlations, $.31 < r < .48$. Stability coefficients for TWW ranged from .48 to .62 and from .77 to .86 across a six month norming. Results are presented in Appendix C.

Procedures

The data collected for the Prince George School District CBM norming study was used to investigate the effects of month of birth and gender on reading and written expression fluency. After testing the students, scores were recorded on a data recording form that was then forwarded to the school board office through the internal school mail system. This data was forwarded to Dr. P. MacMillan at U.N.B.C. where student identification numbers and school identification numbers were removed. Following this procedure the data was made available to the researcher for this study. The School District #57 approval forms and the U.N.B.C. ethics approval forms are located in Appendix A. Further information on the School District Norming Project is detailed in Appendix E.

As described earlier, the number of students tested was further reduced for this study by excluding students who transferred in or out of the norming project during the school year. In addition students who were a year older or younger than their classmates were removed from the

data. These latter students removed from the norming study because of having been retained at a particular grade level formed another group which was also investigated for its mean scores in reading and writing. These scores were also compared for gender differences. The number of students in the retention group was too small to conduct statistical analysis for month of birth differences.

The resulting sample of 1849 students in grades 1 through 7 was then analyzed with a 3x2 between groups ANOVA (age group by gender) for each grade using the SPSS statistical package to discern if the mean values for WRC, TWW and WSC were different between genders, among the youngest, average and oldest students in a particular grade and if there was any interaction between gender and month of birth in relation to reading and writing fluency. A total of fifty-seven ANOVAs were performed as this study examined the three variables for each grade level at three different times during the calendar year.

In the School District #57 norming project, many different teachers tested students. Although there was a full day training session provided for administering and scoring the reading and writing probes, inter-rater reliability is still affected by the number of different raters employed in the study. In order to determine if scores amongst raters varied, a systematic sampling with a random start was used to select ten raters from the district's fifty two elementary schools. The designated teachers were asked to rate three writing probes, one from a student at each of Grade Two, Grade Five and Grade Seven.. These teachers were also given three audio tapes of oral reading probes from Grade Two, Four and Seven students to rate. These ten raters were then compared for differences of scoring in the reading and written expression probes. The survey letter to selected raters is found in Appendix D. The means and standard deviation for the scores were calculated. These results were compared using a Pearson correlation coefficient.

Definition of terms

Reading fluency is defined as the speed and accuracy with which the student reads words (Shinn, Nolet, & Knutson, 1992). This is operationally defined here as the number of words which students are able to read aloud correctly in one minute from a grade level reading probe.

Writing fluency is defined as the speed and accuracy with which the student writes words (Shinn, Nolet, & Knutson, 1992). This is operationally defined as either the total number of words written or words spelled correctly in a three minute written expression test.

Norms are scores determined for the students at each grade level, established through testing, against which subsequent testing can be analyzed. Elliot & Bretzing (1980) state "norms are percentiles or standard score conversions derived from a distribution of scores earned by an identified group" (p.196).

Probes are a short concise measurement test designed to assess reading and writing fluency. In this study, a reading probe consists of a reading passage from a prescribed grade level reading textbook used in the school district. A writing probe consists of a story starter sentence from which the student is asked to write a story. Examples of probes are found in Appendix E.

Curriculum based assessment (CBA) is defined as any set of measurement procedures that is based on direct observation and recording of a student's performance on the material that has been taught within the curriculum.

Curriculum based measurement (CBM) is one particular variant of curriculum based assessment that has been standardized and developed empirically with clear guidelines and procedures for measurement. CBM is defined as a set of standardized, specific procedures designed to quantify student performance in basic academic skills (i.e. reading, words spelled correctly, written expression and math) (Knutson, & Shinn, 1991).

Total words written (TWW) refers to the total number of words written during a written expression test.

Total words spelled correctly (WSC) refers to the total number of words spelled correctly on a written expression test.

Total words read correctly (WRC) refers to the total number of words a student reads correctly when reading a reading passage selected for a reading probe.

Retained students in this study refers to any student who was born in the previous calendar year to their present grade level peers. The reason for the student's retention is not known to the researcher and therefore could include students held back from beginning school or retained by parents or education system for any number of reasons.

Youngest age group refers to students who were born during the months of October, November and December. They would be the youngest aged students in any given grade level group as the school enrollment cut off date in British Columbia is December 31st.

Average age group refers to students who were born during the months of April , May, June, July, August and September.

Oldest age group refers to students who were born during the months of January, February, and March.

Research Questions and Hypotheses

Questions

1. Are there gender differences in reading fluency or written expression fluency of elementary students as measured by CBM variables? Are any gender differences consistent throughout the elementary grades?

2. Are the reading fluencies or written expression fluencies different for the younger students within a grade than for the other students? Is any effect consistent across all grade levels?

Hypotheses

To investigate the first research question a series of statistical hypotheses were generated.

1. Within a given grade level the mean reading fluency, measured by the number of words read correctly, of male students is equal to that of female students.

a) $H_o: \mu(r)_{gm} = \mu(r)_{gf}$

$H_1: \mu(r)_{gm} \neq \mu(r)_{gf}$.

where g refers to grades 1 through grade 7 and m and f refer to male and female respectively.

The written expression is measured by two highly related variables Total Word Written (TWW) and Words Spelled Correctly (WSC).

b) $H_o: \mu(w)_{gm} = \mu(w)_{gf}$

$H_1: \mu(w)_{gm} \neq \mu(w)_{gf}$.

where g, m, and f are defined as before and where w refers first to a test with the variable TWW and then with the variable WSC.

2. To investigate the second research question the means of the reading and written expression variables are compared for the three relative age groups, youngest, average and oldest.

a) $H_o: \mu(r)_{gj} = \mu(r)_{gj'}$

$H_1: \mu(r)_{gj} \neq \mu(r)_{gj'}$

where j and j' = 1,2,3 for the three age groups and $j \neq j'$. Other symbols defined as before.

b) $H_o: \mu(w)_{gj} = \mu(w)_{gj'}$

$H_1: \mu(w)_{gj} \neq \mu(w)_{gj'}$

where w refers first to a test with the variable TWW and then with the variable WSC.

Ethics

As the researcher was employed within the school district, she was bound by the British Columbia Teacher's Federation code of ethics to respect the confidential nature of any student information. In this study, confidentiality of students' names and school names was assured by the removal of any identifying information and the assigning of numbers to each subject. The assurance of this confidentiality was accomplished by following the stated procedures in the curriculum based testing manuals that each designated teacher received during the in-service training session.

CHAPTER FOUR

RESULTS

This chapter is divided into four sections. The first section discusses the results of the inter-rater reliability test. The second section discusses the results of the inquiry into gender differences with reading and writing at each of the grade levels. The third section discusses the results of the inquiry into month of birth differences with reading and writing at each of the grade levels. The fourth section discusses the results of the inquiry into interactions between gender and month of birth for reading and writing.

Inter-rater Reliability Findings

The ratings of taped reading tests and photocopied writing tests by ten randomly chosen norming study participant teachers were analyzed. Raters were asked to listen to the taped reading tests and score the number of words read correctly (WRC) for the one minute reading probes recorded of a Grade Two, Grade Four and Grade Seven student reading appropriate grade level probes used in the norming study. Raters were asked to score the total words written (TWW) and the words spelled correctly (WSC) for each photocopied writing test from a Grade Two, Grade Five and Grade Seven student. Comparisons were then made of the scores attained by the raters for each of the six students rated. The means and standard deviations for these reading and written expression probes are found in Table 2. A Pearson correlation coefficient was calculated comparing each of the raters' scores to the scores of the other nine raters in the study for the same student tests. Inter-rater reliability coefficients for WRC, TWW and WSC were all high. The correlation coefficients ranged from .97 to .99 (see Table 3). The median correlation was .98.

Table 2

Means and Standard Deviations for Inter-rater Reliability Probes

Rater	2 TWW	5 TWW	7 TWW	5 WSC	7 WSC	2 WRC	4 WRC	7 WRC
1	13	52	44	50	44	104	83	160
2	13	52	42	49	41	106	120	184
3	13	52	44	50	41	102	82	170
4	13	52	42	49	40	109	121	188
5	13	52	42	50	42	101	80	180
6	13	52	42	49	41	106	121	184
7	13	52	44	48	43	105	85	187
8	13	52	42	49	41	104	88	175
9	14	51	42	49	40	100	88	159
10	13	52	44	50	44	105	85	169
Mean	13.1	51.9	42.8	49.3	41.7	104.2	95.3	175.6
SD	0.3	0.3	1.0	0.7	1.5	2.7	17.6	10.7

Table 3

Pearson Correlation Coefficients for Inter-rater Reliability

Raters (n=10)

	R.1	R.2	R.3	R.4	R.5	R.6	R.7	R.8	R.9	R. 10
R. 1	--	.97	.99	.97	.99	.97	.99	.99	.99	.99
R. 2		--	.97	.99	.97	1.0	.98	.98	.97	.97
R. 3			--	.97	.99	.97	.99	.99	.99	.99
R. 4				--	.97	.99	.98	.98	.97	.97
R. 5					--	.97	.99	.99	.99	.99
R. 6						--	.97	.98	.97	.97
R. 7							--	.99	.99	.99
R.8								--	.99	.99
R. 9									--	.99
R. 10										--

An error occurred in timing of the Grade Four reader. The recording was longer than one minute by ten seconds and was scored as one minute by seven of the raters but the error in timing was noticed by three of the raters. The scores or WRC were lower from the three raters who picked up on the timing error. When means and standard deviations were calculated the standard deviation for the grade four reader was 17.6. When the mean and standard deviation was

calculated for the seven raters who relied on the recorder's timing the mean score was 84.4 with a standard deviation of 2.9.

The grade seven reader probe had a greater variation of scores than the other probes. The grade seven student chosen for the sample was quite soft spoken which may have caused a dfifficulty for the raters. Also as the student was a fluent reader,scoring in the above average range, this combination of factors may have caused the scoring to become more difficult for the raters.

Means and Standard Deviations

Means and standard deviations for both genders at each grade level can be found in Table 4 for Words Read Correctly (WRC), Table 5 for Total Words Written (TWW) and Table 6 for Words Spelled Correctly (WSC). The lower numbers of students in Grade One, Two and Three for the Words Spelled Correctly data are due to the fact that data collection for WSC was optional for primary students assessed in the norming study.

The mean Words Read Correctly scores were consistently higher for the female students at all the grade levels for every testing period (Table 4). In writing assessments, the female students consistently scored higher than the male students at all grade levels for every testing period (Table 5). Mean WSC scores for intermediate female students are higher than for intermediate male students at every grade level and testing session (Table 6). The number of students participating in the study is the same for each norming period within every grade level as students who moved during the study were eliminated from the final results.

Table 4

Mean Words Read Correctly Scores for Each Testing Period by Grade and Gender

	October		January		April		
Grade and Gender	M	SD	M	SD	M	SD	n
Grade 1							
Females					39	33	158
Males					34	27	143
Total					37	30	301
Grade 2							
Females	51	34	68	32	83	35	130
Males	34	28	50	33	63	34	136
Total	43	32	59	34	73	35	266
Grade 3							
Females	89	42	103	42	111	42	118
Males	80	42	91	42	102	39	151
Total	84	42	96	42	106	41	269
Grade 4							
Females	103	40	113	39	118	41	134
Males	87	41	99	44	108	41	129
Total	95	41	106	42	113	41	263
Grade 5							
Females	126	43	130	40	135	39	106
Males	100	45	111	46	115	43	132
Total	111	45	119	44	124	42	238
Grade 6							
Females	120	41	127	40	132	39	155
Males	110	40	113	39	119	41	110
Total	116	41	121	40	127	41	265
Grade 7							
Females	137	41	139	41	145	42	128
Males	127	34	133	35	134	36	119
Total	132	38	136	38	140	40	247

Table 5

Mean Total Words Written Scores for Each Testing Period by Grade and Gender

	October		January		April		
Grade and Gender	M	SD	M	SD	M	SD	n
Grade 1							
Females					14	8	158
Males					12	7	143
Total					13	7	301
Grade 2							
Females	15	9	23	9	29	10	130
Males	12	7	18	8	23	9	136
Total	14	8	20	9	26	10	266
Grade 3							
Females	27	10	35	12	41	13	118
Males	23	10	29	11	34	11	151
Total	25	10	32	12	37	12	269
Grade 4							
Females	34	12	42	14	49	15	134
Males	28	11	35	13	39	14	129
Total	31	12	38	14	44	15	263
Grade 5							
Females	44	13	56	14	57	13	106
Males	35	11	43	14	47	15	132
Total	39	13	46	14	52	15	238
Grade 6							
Females	52	14	57	15	62	14	155
Males	50	13	48	14	52	14	110
Total	48	14	53	15	58	15	265
Grade 7							
Females	58	15	62	15	68	16	128
Males	49	13	54	14	58	15	119
Total	54	15	58	15	63	16	247

Table 6

Mean Words Spelled Correctly Scores for Each Testing Period by Grade and Gender

	October		January		April		
Grade and Gender	M	SD	M	SD	M	SD	n
Grade 1							
Females					11	7	104
Males					8	5	98
Total					10	6	202
Grade 2							
Females	12	7	19	9	26	10	84
Males	8	5	14	7	20	9	78
Total	10	6	16	9	23	10	162
Grade 3							
Females	23	9	32	11	36	12	81
Males	20	10	29	24	30	11	89
Total	21	10	30	19	33	12	170
Grade 4							
Females	30	13	39	15	45	15	134
Males	24	11	32	13	35	14	129
Total	27	12	35	14	40	15	263
Grade 5							
Females	41	13	48	14	54	14	106
Males	32	11	40	14	44	16	132
Total	36	13	43	15	48	16	238
Grade 6							
Females	49	14	55	15	60	14	155
Males	40	13	45	14	49	14	110
Total	45	14	51	16	56	15	265
Grade 7							
Females	56	15	59	15	66	16	128
Males	47	13	52	14	56	14	119
Total	52	15	56	15	61	16	247

Analysis of Gender, Month of Birth and their Interaction

A 3x2 between groups ANOVA (birth group by gender) was performed for each testing period for each of the three variables; WRC, TWW, and WSC. The degrees of freedom, F values and significance of F values are reported in Tables 7, 8 and 9 respectively. A total of fifty-seven analyses of variance were calculated. Summaries of these analyses can be found in Table 7, 8, and 9 for birth month, gender and the interaction of birth month and gender (BxG).

Gender Differences

Gender differences were evident in all the TWW and WSC analyses for every grade level. In 14 of the 19 ANOVAs for WRC, significant gender differences were found ($p<.05$). The gender differences occurred in both primary and intermediate grade levels.

The analyses which did not have a significant gender difference did not follow a predictable pattern. A significant gender difference was not detected for the April grade one reading analysis: $F(1, 301) = 1.42, p < .05$. The grade four January and April reading analyses did not indicate a significant gender difference: $F(1, 263) = 3.17, p < .05$; $F(1, 263) = 1.28, p < .05$. At the grade seven level, analyses for reading in October and January did not indicate a significant gender difference : $F(1, 247) = 2.75, p < .05$; $F(1, 247) = .83, p < .05$. All other reading analyses indicated a significant gender difference. As 52 of the ANOVA results indicated significant gender differences and in only 5 cases were no significant gender differences found, these results provide evidence of a gender difference across all grades for the reading measure and for both measures of written expression. In order to examine the possibility of a type 1 error occurring with so many Anova's, effect sizes were calculated for the TWW, WSC and WRC analyses for each grade level and testing period. The effect sizes ranged from .15 to .78 with most effects being considered medium as outlined by Kirk(1996). These effect sizes are outlined in tables 10, 11, and 12 respectfully.

Table 7

Analysis of Variance for Birthgroup and Gender Differences in Words Read Correctly

	October			January			April		
Source	df	F	Sig of F	df	F	sig of F	df	F	sig of F
Grade 1									
Birth							2	0.46	.630
Gender							1	1.42	.235
B x G							2	0.60	.551
Grade 2									
Birth	2	0.27	.767	2	0.12	.869	2	0.027	.973
Gender	1	18.69	.000*	1	17.070	.000*	1	18.000	.000*
B x G	2	0.24	.790	2	.73	.486	2	1.22	.298
Grade 3									
Birth	2	3.24	.041*	2	1.36	.258	2	1.52	.222
Gender	1	4.00	.046*	1	4.90	.028*	1	4.08	.044*
B x G	2	0.63	.535	2	0.58	.564	2	1.38	.253
Grade 4									
Birth	2	0.81	.445	2	0.91	.402	2	0.96	.385
Gender	1	5.12	.024*	1	3.17	.076	1	1.28	.258
B x G	2	1.02	.362	2	2.11	.124	2	1.65	.194
Grade 5									
Birth	2	0.34	.714	2	0.161	.851	2	0.28	.759
Gender	1	16.91	.000*	1	6.11	.014*	1	8.23	.004*
B x G	2	0.03	.970	2	0.58	.562	2	0.38	.672
Grade 6									
Birth	2	1.03	.357	2	1.52	.221	2	0.31	.734
Gender	1	4.08	.044*	1	6.04	.015*	1	7.84	.006*
B x G	2	0.21	.211	2	0.29	.752	2	1.98	.140
Grade 7									
Birth	2	0.93	.395	2	0.72	.489	2	1.68	.189
Gender	1	2.75	.099	1	0.83	.365	1	4.15	.043*
B x G	2	0.66	.520	2	1.71	.183	2	1.24	.299

Note. * $p < .05$

Table 8

Analysis of Variance for Birthgroup and Gender Differences in Total Words Written

	October			January			April		
Source	df	F	Sig of F	df	F	sig of F	df	F	sig of F
Grade 1									
Birth							2	4.64	.010*
Gender							1	4.98	.026*
B x G							2	0.86	.425
Grade 2									
Birth	2	0.27	.762	2	0.68	.509	2	0.26	.772
Gender	1	11.90	.001*	1	22.63	.000*	1	30.58	.000*
B x G	2	0.07	.933	2	1.35	.261	2	0.54	.583
Grade 3									
Birth	2	1.67	.191	2	1.66	.191	2	3.00	.024*
Gender	1	10.156	.002*	1	11.05	.001*	1	16.71	.000*
B x G	2	0.07	.937	2	2.37	.096	2	0.70	.500
Grade 4									
Birth	2	4.16	.017*	2	3.97	.020*	2	3.69	.026*
Gender	1	11.06	.001*	1	9.41	.002*	1	18.27	.000*
B x G	2	0.73	.485	2	0.35	.704	2	2.24	.108
Grade 5									
Birth	2	1.66	.192	2	1.52	.221	2	1.65	.194
Gender	1	22.79	.000*	1	17.37	.000*	1	23.50	.000*
B x G	2	0.19	.824	2	0.43	.649	2	0.49	.611
Grade 6									
Birth	2	0.39	.681	2	1.94	.146	2	0.92	.399
Gender	1	26.48	.000*	1	29.72	.000*	1	31.11	.000*
B x G	2	0.57	.564	2	1.53	.218	2	1.44	.239
Grade 7									
Birth	2	1.99	.139	2	1.33	.267	2	2.03	.133
Gender	1	20.51	.000*	1	13.26	.000*	1	19.50	.000*
B x G	2	0.19	.831	2	0.50	.609	2	0.96	.386

Note. * $p < .05$

Table 9

Analysis of Variance for Birthgroup and Gender Differences in Words Spelled Correctly

	October			January			April		
Source	df	F	Sig of F	df	F	sig of F	df	F	sig of F
Grade 1									
Birth							2	1.33	.268
Gender							1	7.65	.006*
B x G							2	0.43	.651
Grade 2									
Birth	2	0.54	.584	2	0.31	.737	2	0.88	.419
Gender	1	8.17	.005*	1	10.36	.002*	1	15.69	.000*
B x G	2	2.86	.061	2	0.61	.545	2	1.02	.364
Grade 3									
Birth	2	1.53	.219	2	1.32	.270	2	2.69	.071
Gender	1	4.51	.035*	1	7.69	.006*	1	11.19	.001*
B x G	2	0.05	.950	2	1.37	.257	2	0.12	.889
Grade 4									
Birth	2	3.51	.032*	2	3.31	.038*	2	3.56	.030*
Gender	1	11.51	.001*	1	8.65	.004*	1	17.30	.000*
B x G	2	1.058	.349	2	0.65	.521	2	2.91	.057
Grade 5									
Birth	2	1.360	.259	2	1.54	.217	2	1.78	.168
Gender	1	30.10	.000*	1	21.04	.000*	1	24.99	.000*
B x G	2	0.30	.744	2	0.71	.493	2	0.28	.756
Grade 6									
Birth	2	0.86	.423	2	1.64	.196	2	1.20	.304
Gender	1	27.31	.000*	1	31.06	.000*	1	38.14	.000*
B x G	2	0.66	.520	2	1.59	.206	2	1.76	.175
Grade 7									
Birth	2	1.82	.164	2	1.08	.343	2	2.18	.115
Gender	1	19.80	.000*	1	12.36	.001*	1	19.69	.000*
B x G	2	0.28	.760	2	0.41	.663	2	1.27	.283

Note. * $p < .05$

Table 10

Effect sizes for Total Words Written by Gender for Each Testing Period and Grade Level

Grade and Testing Period	Female Mean TWW score	Male Mean TWW score	Mean Square Within	Effect size
Grade 1				
April	14	12	54	1.27
Grade 2				
October	18	12	63	1.75
January	24	18	79	1.67
April	27	22	92	1.52
Grade 3				
October	27	23	101	1.40
January	35	29	130	1.52
April	40	33	133	1.60
Grade 4				
October	34	28	133	1.52
January	42	35	189	1.50
April	49	39	206	1.70
Grade 5				
October	43	35	152	1.64
January	50	43	196	1.50
April	57	47	205	1.70
Grade 6				
October	51	43	178	1.55
January	57	48	212	1.62
April	62	52	206	1.70
Grade 7				
October	58	49	199	1.63
January	62	54	206	1.55
April	68	58	234	1.65

Table 11

Effect sizes for Words Spelled Correctly by Gender for Each Testing Period and Grade Level

Grade and Testing Period	Female Mean WSC score	Male Mean WSC score	Mean Square Within	Effect size
Grade 1				
April	15	12	36	1.50
Grade 2				
October	12	8	35	1.67
January	19	14	69	1.60
April	26	20	91	1.62
Grade 3				
October	23	20	96	1.30
January	32	29	134	1.26
April	36	30	137	1.52
Grade 4				
October	30	24	140	1.50
January	39	32	197	1.49
April	45	35	208	1.69
Grade 5				
October	41	32	148	1.73
January	48	39	195	1.64
April	54	44	218	1.67
Grade 6				
October	49	40	182	1.67
January	55	45	217	1.68
April	60	49	199	1.78
Grade 7				
October	55	47	203	1.56
January	59	52	206	1.48
April	66	56	228	1.66

Table 12

Effect sizes for Words Read Correctly by Gender for Each Testing Period and Grade Level

Grade and Testing Period	Female Mean WRC score	Male Mean WRC score	Mean Square Within	Effect size
Grade 1				
April	39	34	920	1.16
Grade 2				
October	51	34	948	1.55
January	68	50	1063	1.55
April	83	63	1164	1.58
Grade 3				
October	89	80	1740	1.21
January	103	91	1738	1.28
April	111	102	1633	1.22
Grade 4				
October	103	87	1665	1.39
January	113	99	1708	1.34
April	118	108	1663	1.24
Grade 5				
October	125	100	1935	1.57
January	129	111	1896	1.41
April	134	115	1712	1.45
Grade 6				
October	120	110	1682	1.24
January	127	113	1578	1.35
April	132	119	1606	1.32
Grade 7				
October	137	127	1440	1.26
January	139	133	1453	1.15
April	145	134	1527	1.28

Month of Birth Differences

To determine month of birth differences, students were divided into month of birth groups. Group one contained all of the students having birthdates in January, February and March of the calendar year for that particular grade level. These would be the oldest students in a grade level group. Group two contained all of the students having birthdates in April, May, June, July, August, and September. These are referred to as the average age students in the grade level group. Group three contained all the students having birthdates in October, November, and December. These students are referred to as being the youngest students in a grade level group.

As previously described, the ANOVA results can be found in Tables 7, 8, and 9, for Words Read Correctly, Total Words Written and Words Spelled Correctly respectively. A total of fifty-seven analyses of variance were calculated. A birthgroup difference was detected in only nine cases. These occurred in the April grade one writing test: $F(2, 301) = 4.633$, $p < .05$, the October grade three reading test: $F(2, 269) = 3.236$, $p < .05$, the April grade three writing test: $F(2,269) = 3.00$, $p<.05$, and the grade four writing and words spelled correctly tests: October writing $F(2, 263) = 4.162$, $p < .05$; October words spelled correctly $F(2, 263) = 3.505$, $p < .05$; January writing $F(2, 263) = 3.917$, $p < .05$; January words spelled correctly $F(2, 263) = 3.313$, $p < .05$; April writing $F(2, 263) = 3.69$, $p < .05$. and April Words Spelled Correctly $F(2, 263) = 3.561$, $p < .05$. As 48 of the ANOVA results indicated no significant differences and in only 9 cases were significant differences found, these results provide evidence that there is no significant month of birth difference for the reading measure and for both measures of written expression at any grade level. Students who are born at any particular month of the year do not appear to have a significant difference in reading and written expression scores than students born during other months of the year. Students born in the later three months of the calendar year scored equally as well as students born during other months of the year.

Interactions between Gender and Month of Birth

Of the fifty-seven analyses of variance calculated, all indicated that there were no significant interactions between gender and month of birth for reading or writing fluency at the .05 probability level. Results are located in the BxG rows of Tables 7, 8 and 9.

Comparison of Age Appropriate and Retained Students

In order to sort the data for examining the month of birth and gender differences, students who were a year older than their classmates and students who were a year younger than their classmates were removed frcm each grade level group. The mean scores for the students who were at the age appropriate grade level could then be compared to the mean scores for the students who had been accelerated or retained. This additional examination of data was considered useful in terms of analyzing for gender differences and retention. There was not a large enough number of students to warrant statistical analysis. There were very few students who had been accelerated. The means for accelerated students were not analyzed as there were only a few of these cases at each grade level. The mean reading, writing and words spelled correctly scores were compared for the retained students to the students who were at the appropriate age for their grade. Retained students refers to those students who were a year older than their classmates. The reason that the students were older and had been retained was unknown to the researcher. They could have been required to spend two years at one grade level or they may have been held back before beginning school due to parental concerns.

These older students had a reading mean that was below the mean score for others in their grade level in thirty-one of thirty-six comparisons as illustrated in Table 13. (Note: M R indicates mean score for retained students and M A. age indicates the mean score for appropriate age students) The mean reading scores for males was consistently lower than for females among the retained students at each grade level. This indicates that students who are held back for whatever reason do not perform as well as the students with whom they are placed.

For writing fluency, gender differences were noted in the research. Only in the Grade 2 October and the Grade 2 April writing fluency scores did the retained male students have a higher mean score than the retained female students. In all other comparisons the retained males mean TWW score was lower than the retained females mean TWW score. All average age male students had mean TWW scores that were lower than the female mean TWW scores except for one test where they were equal for January grade six students. When analyzing Words Spelled Correctly, a gender difference was found with males showing a lower mean WSC score than females in 31 of the 36 comparisons.

Written expression fluency is higher amongst students who are placed with their age level peers than for students who are a year older than their classmates. Retained students had a writing score that was below the mean score for others in their grade level in 26 of 36 comparisons as illustrated in Table 14. For Words Spelled Correctly, retained students in the upper intermediate grades had a WSC score that was below the mean score for others in their grade level group as illustrated in Table 15. This indicates that retention of students does not necessarily bring their scores in reading and written expression up to the same level as classmates who are a year younger than they are. The reasons for retention are many and varied but the results indicate that it is not an effective practice for solving reading and written expression fluency weaknesses.

Table 13

Mean WRC Scores for Appropriate Age and Retained Students by Grade and Gender

	October				January			April		
Grade and Gender	M A. age	n	M R	n	M A.age	M R	n	M A. age	M R	n
Grade 2										
Females	51	130	39	10	68	63	10	83	79	9
Males	34	136	62	7	50	69	5	63	81	6
Total	43	266	49	17	59	65	15	73	80	15
Grade 3										
Females	89	118	87	7	103	102	7	111	97	7
Males	80	151	44	9	91	59	8	102	75	8
Total	84	269	63	16	96	79	15	106	85	15
Grade 4										
Females	103	134	58	9	113	80	10	118	81	10
Males	87	129	84	9	99	95	9	108	108	8
Total	95	263	71	18	106	87	19	113	93	18
Grade 5										
Females	126	106	119	9	130	123	9	135	125	9
Males	100	132	87	9	111	81	9	115	102	9
Total	111	238	103	18	119	102	18	124	114	18
Grade 6										
Females	120	155	95	6	127	104	5	132	95	5
Males	110	110	95	22	113	97	22	119	107	21
Total	116	265	95	28	121	98	27	127	104	26
Grade 7										
Females	137	128	111	14	139	106	14	145	120	13
Males	127	119	95	20	133	111	19	134	104	19
Total	132	247	104	34	136	109	33	140	110	32

Table 14

Mean TWW Scores for Appropriate Age and Retained Students by Grade and Gender

	October				January			April		
Grade and Gender	M A. age	n	M R	n	M A. age	M R	n	M A. age	M R	n
Grade 2										
Females	15	130	10	10	23	18	10	29	24	9
Males	12	136	15	7	18	18	5	23	26	6
Total	14	266	12	17	20	18	15	26	25	15
Grade 3										
Females	27	118	21	7	35	35	7	41	37	7
Males	23	151	19	9	29	23	8	34	31	8
Total	25	269	20	16	32	28	15	37	34	15
Grade 4										
Females	34	263	36	9	42	43	10	49	48	10
Males	28	134	32	10	35	41	9	39	47	8
Total	31	129	34	19	38	42	19	44	47	18
Grade 5										
Females	44	106	43	9	56	52	9	57	70	9
Males	35	132	28	9	43	40	9	47	43	9
Total	39	238	35	18	46	46	18	52	57	18
Grade 6										
Females	52	155	50	7	57	44	5	62	53	5
Males	50	110	39	21	48	44	22	52	45	22
Total	48	265	41	28	53	44	27	58	46	27
Grade 7										
Females	58	128	53	14	62	53	14	68	62	13
Males	49	119	40	20	54	49	18	58	52	20
Total	54	247	45	34	58	51	32	63	56	33

Table 15

Mean WSC Scores for Appropriate Age and Retained Student by Grade and Gender

	October				January			April		
Grade and Gender	M A. age	n	M R	n	M A. age	M R	n	M A. age	M R	n
Grade 2										
Females	12	84	6	5	19	16	5	26	27	5
Males	8	78	9	2	14	16	2	20	27	2
Total	10	162	7	7	16	16	7	23	27	7
Grade 3										
Females	23	81	17	5	11	29	5	36	32	5
Males	20	89	19	5	24	23	5	30	30	5
Total	21	170	18	10	19	26	10	33	31	10
Grade 4										
Females	30	263	30	9	39	37	10	45	42	10
Males	24	134	27	10	32	40	9	35	44	8
Total	27	129	28	19	35	38	19	40	43	18
Grade 5										
Females	41	106	36	9	48	48	9	54	67	9
Males	32	132	23	9	40	34	9	44	35	9
Total	36	238	30	18	43	41	18	48	51	18
Grade 6										
Females	49	155	46	7	55	38	5	60	49	5
Males	40	110	34	21	45	40	22	49	42	22
Total	45	265	37	28	51	39	27	56	43	27
Grade 7										
Females	56	128	50	14	59	51	14	66	60	13
Males	47	119	37	20	52	46	18	56	49	20
Total	52	247	42	34	56	48	32	61	53	33

CHAPTER FIVE

DISCUSSION AND CONCLUSIONS

This final chapter is divided into four sections. The first section provides a summary of the study. The second section discusses conclusions found in inter-rater reliability, gender differences, birth group differences as well as the interaction between gender and month of birth. This section also discusses the results found when examining the reading and writing scores of students who took part in the study who had been retained at a particular grade level. The third section examines implications of the conclusions for inter-rater reliability, gender differences, birth group differences and the retention results. The fourth section contains additional comments related to the study and points to some areas which will require additional research to fully explore.

Summary

In this study, the question of whether month of birth and gender affect reading, writing and spelling ability as measured by Curriculum Based Measurement variables was analyzed. A total of 1849 students were tested during the fall, winter, and spring of the school year. The test results were analyzed using a 2x3 analysis of variance (age group by gender) to estimate the effects of each of the gender and birth month groups and the interaction between gender and month of birth. The students' scores were analyzed as to whether there were differences in the CBM variables, WRC, TWW, and WSC. In order to investigate month of birth differences, students were categorized into the youngest birth group; those whose birth date was in the months of October, November and December, the average age group; those whose birthdates occurred in April, May, June, July, August or September, and the oldest birthdate group; those whose birthdate occurred in January, February or March of one calendar year.

The research found that female students scored higher in reading, writing and spelling ability at every grade level, indicating a definite gender difference in abilities at every grade level. The research also found that there was not evidence to support the notion that a child's reading or written expression is contingent upon the relative age of the child in comparison to the grade level peers, that is, the student's month of birth did not have an impact on the student's scores in reading, and written expression using CBM reading and writing probes. The study also found that there was no interaction between gender and month of birth as measured by Curriculum Based Measurement. There was no evidence that any combination of age and gender perform differently than expected.

Conclusions

Inter-rater Reliability

The Pearson Correlation coefficient scores for inter-rater reliability indicate a strong correlation (.97 to .99) between the scores given to the same tests by different raters who were trained at the district level prior to the commencement of the school district norming study. This shows that the scores in this study are reliable despite the fact that there were fifty-two different raters. Effective special services training workshops and the relative ease with which the Curriculum Based Measurement test procedures can be assimilated by practicing teachers likely had an impact on the high correlation scores. This result supports previous studies of inter-rater reliability (Shinn, Good, Knutsen, Tilly, Collins, 1992; Allinder, 1995). The results are in agreement with others who have extensively studied reliability and validity of CBM (Deno, 1985, 1992; Shinn, 1992; Deno, Mirkin,
Marsdon, 1980).

The scores for the above average grade seven who was rated for reading were different between the ten raters having a standard deviation of 10.7. This difference in scores is not

noticed when one examines inter-rater reliability. As students read more fluently it becomes more difficult for the rater to mark the probe as quickly as the student reads. This may account for the dseviation in the student scores. The CBM test is measuring reading fluency therefore it becomes an assessment that is no longer needed to be used as the student becomes a fluent reader. The use of words read correctly count in CBM is more appropriate with readers. who are struggling with reading fluency.

Gender differences

This study found a definite gender difference in the reading, and written expression fluencies when using CBM measurement probes. The female students consistently scored higher than the males in all three subject areas across all of the grade levels during the three testing periods. Further examination of the data revealed that the gender difference is also evident amongst students who were retained and advanced from their age level peers. This definite gender difference result corresponds to other studies which confirm a gender difference in ability of males and females on literacy tasks (Beach & Robinson, 1992; Berninger & Fuller, 1992; Bognar, Chapman, Jeroski, Tolsma, & Toutant, 1995). This similar finding to that of the literature indicates CBM to be a valid measurement device for assessing student reading and written expression abilities.

Birthgroup differences

This study found that the month of birth had no effect on reading, and written expression fluencies as measured by CBM across all of the grade levels. Students who are born in the last three months of the year did not have lower ability scores than students born during the other months of the year. This result concurs with other studies in the literature (Badian, 1984; DeMeis & Stearns, 1992; Flynn & Rahbar, 1993; Magliancano, 1994; May & Welch, 1986; Wood, Powell & Knight, 1984).

Interactions between Gender and Month of Birth

There were no significant interactions between month of birth and gender when reading and written expression fluencies were measured. The fact that a student is both male and youngest in his class does not put him at a greater risk for reading and writing difficulties than if he were to be male and oldest in his grade level. This result is similar to other studies which investigated interactions between gender and month of birth (May & Welch, 1986; Cameron & Wilson, 1990).

Retained Students

The research extended to include an examination of the reading and writing fluencies of students who were a full year older than their classmates as compared to the students who were appropriately placed with their age peers. In most cases students who were placed at their appropriate age had higher mean scores than students who had been retained. In other words, the retained students are not reading at the level of their younger classmates. The conditions for each retained individual are unique and require more research to fully explain the effect of retention on students' reading and writing scores.

Limitations of this Study

Curriculum Based Measurement is a set of standardized, specific procedures designed to quantify student performance in basic academic skills (Knutson & Shinn, 1991). The findings in this study are limited to the specific measurement of total words written, words spelled correctly in a written expression probe and total number of words read correctly in a reading probe. Generalization of these results to other aspects of reading, writing or spelling ability has not been proven at this time.

Implications of this Study

This section will discuss the implications for inter-rater reliability, gender differences, birthgroup differences and retention results. The final comments discuss how this study can affect best practices for educators in our school system today.

Inter-rater Reliability

Information from this study shows a strong correlation amongst raters using CBM probes indicating that this measurement device is reliable amongst raters. The use of Curriculum Based Measurement devices for assessing literacy tasks among elementary students is a transferable skill, easily learned and utilized by practicing teachers. This enables districts to consider the CBM device as a reliable screening tool for special education assessment. The knowledge of inter-rater reliability enables teachers to be confident in scores attained by other teachers which is essential as students transfer from class to class or school to school.

The differences noted between the raters when scoring the above average grade seven student need to be further examined as the use of Curriculum Based Measurement for advanced readers may require more practice and skill on the part of the trained rater. Further testing of readers by different raters would be warranted. Once students reach a certain level of reading and writing fluency, continued emphasis on assessing fluency to the exclusion of other means of evaluating reading and writing is ineffective.

Gender differences

The gender difference found in this study is the same as the gender difference discussed in the many studies cited in Table 1. Males were consistently scoring lower in reading, and written expression abilities. It is important to note that the gender differences did

not disappear in the older grades. The differences occurred both in the primary and the intermediate grades. The uniqueness of this study is that it was not based on standardized testing but rather on curriculum based measures which more closely mirror the daily tasks in the students' classes.

Could curriculum or teaching strategies be modified to assist male students in their acquisition of literacy throughout the grade levels? Beach and Robinson (1992) suggest an emphasis on environmental print for reading skills teaching to male students in kindergarten and grade one. This would mean more curricular emphasis placed on reading for a functional reason through reading signs, schedules, directions, and other non-fiction material found in the students' daily environment. There is a need for further research into effective gender equity in education of students at all grade levels. The question of whether there is a gender differences in reading and writing abilities has been determined by several research studies. The challenge now is to implement strategies to reduce this gender difference and educate males as effectively as female students.

Birthgroup differences

This study found no evidence of a difference in ability to read or write based on month of birth of the students. This finding is similar to those of Badian, 1984; DeMeis & Sterns, 1992; Flynn & Rahbar, 1993; and May & Welch, 1986. The implications for this study are that teachers need to be aware that the youngest students will not necessarily have difficulty with literacy tasks and should not be labeled because of their birthdates.

Assumptions regarding students' ability based on month of birth are prejudicial and unacceptable in discussions by education professionals. Many other factors contribute to student success in literacy tasks, such as heredity, motivation, environmental exposure to print, as well as parenting and teaching methods. Continued discussion of month of birth as a factor

in reading readiness has lead to parents and teachers retaining students inappropriately which widens the range of age and abilities in every classroom and has not been proven effective as an educational practice (Lieberman, 1980; Shepard & Smith, 1986; Smith & Shepard, 1987). The lack of significant interaction between gender and month of birth indicates that students' birth month should have no relevance to success in reading and writing regardless of students' gender.

Retention Results

Students who were retained scored lower on the CBM tests than their age mates in the next grade and their younger classmates. Retention does not appear to have been an effective intervention for these students. This is similar to the findings by Smith and Shepard (1987). Lower mean scores for males who were retained than for females who were retained was found at every grade level. Retention of students does not necessarily bring their scores in reading and written expression up to the level of classmates who are a year younger than they are. The decision to retain students based on their month of birth and gender has been common practice in the past and is not a sound reason for justifying failure in the school system.

Best Educational Practice

The findings in this study are twofold. Firstly that the reading and writing fluency of male students is consistently less than that of female students. As this continues to be proven in several studies, educators will need to address this discrepancy and look towards interventions which will enable male students to equal females in reading and writing fluency. Secondly, the common belief that later born students in the calendar year will have difficulty in literacy tasks

is not substantiated by the results of this study. Both of these investigations consider the notion that one's ability can be predetermined by his or her group membership. In the first instance, group membership in a particular gender should not prejudice success in a subject area. In the second instance, a student's birthdate is insufficient reason to modify his or her educational program.

As we seek to find patterns to help us explain complex notions such as literacy it is tempting to find ways to judge and label students' abilities. The enormity of the task of teaching gives rise on the part of educators to seek a system that is efficient, cost effective and accurate in assessing students' learning. In our haste to label students we often overlook student potential and move to classify students based on a particular group membership.

> "We are not all equal in endowment, and we do not enter the world as blank slates, but most deficiencies can be mediated to a considerable degree, and the palling effect of biological determinism defines its greatest tragedy - for if we give up (because we accept the doctrine of immutable inborn limits), but could have helped, then we have committed the most grievous error of chaining the human spirit"(Gould, 1996, p. 389).

The British Columbia Royal Commission on Education (Sullivan, 1988) called for flexibility in terms of using developmental criteria to place children in school (p. 93). It suggested chronological age and rigid lock step reading levels are not appropriate for decisions on placement of children in programs. At the same time, the Royal Commission called for a common curriculum which involved the development of abilities, attitudes and global knowledge for all students.

The use of an outcome based measurement system such as curriculum based measurement seems opposed to the direction towards global knowledge and abilities espoused

by the Royal Commission. CBM procedures by School District #57 would be misused if they were the only method of assessment, as measurement of minute skills may cause teachers to lose sight of the global goal of nurturing knowledge and learning over the long term. Curriculum Based Measurement is a performance assessment which measures a specific skill. The findings in such a measure cannot be interpreted as a measure of attitude or knowledge. In this way it is critical to separate basic skill acquisition of reading and writing from student desire to read and write and students' knowledge about reading and writing as communication mediums. Curriculum based assessment of writing fluency does not measure the quality of student writing. To assess quality, teachers need a holistic assessment device such as the Writing Reference Set (Province of British Columbia, 1993).

The accurate measurement of reading and writing abilities is only the first step towards authentic assessment which includes analysis of skill development and the growth towards a more global perspective of how flexibly we can intervene to teach and assist students to learn literacy and numeracy skills through various mediums. As schools work towards inclusion and effective education for all students, educators are moving from a system which relies on standardized testing to determine a student's eligibility for special programs to an assessment system which monitors students' progress and helps teachers to devise modifications in teaching and learning tasks for the students. The desire to assess for the purposes of labeling, sorting and tracking students to meet the needs of the system veers towards a desire to assess for appropriate curriculum intervention in order to meet the needs of the students. It is critical that educators judiciously interpret scores as mere indicators of difficulties which they must remediate for their students not as a means to dismiss students. As Gould states "Moreover, Binet feared that if teachers read the IQ number as an inflexible inborn quality, rather than (as he intended) a guide for identifying students in need of help, they would use the scores as a cynical excuse for expunging, rather than aiding troublesome students"(p. 386).

Our education system begins to stagnate when we feel it is the child who is the problem not the curriculum or the teaching strategies. As Hargis (1987) states "Failing grades mean that there is a mismatch between the curriculum and the student. It really means a failure in the system. Our system should be providing an opportunity to achieve to the individual potential of all students....Failure is not only unproductive in regards to achievement, it has many negative behavioral consequences as well"(p. 91). The awareness that students have diverse abilities as an entering characteristic into schools is critical to keep in mind as we foster the attainment of a common curriculum. The process of individual goal setting and evaluation by students and teachers is paramount to excellence in education. Ongoing assessments and individual interventions will lead to greater success for all students. CBM has the potential to assist teachers to modify their approaches towards methods which value individual uniqueness while at the same time commit to effective global and basic education for all.

The practical simplicity of Curriculum Based Measurement makes it a first step in assessment but it should not become the only method of assessment nor the end of the assessment/intervention sequence for teachers and students. CBM is a simple assessment measure of growth in student learning. It differs from standardized assessment in that it is more relevant to the curriculum and can be readily administered by the learning assistance teachers. If teachers use CBM scores for labeling and funding purposes only, the critical intervention stage is forgotten. In order for students and teachers to excel at the assessment /intervention sequence, criteria for evaluation must be established and understood by both student and teacher. Further assessments can then impact on learning by having an effective common understanding of the goals to be attained by the learner. Standardized tests and curriculum based tests are only a part of a comprehensive assessment package which should also include student portfolios, self-assessments, and goal setting by both the student and the teacher. Educators must understand the strengths and limitations of each measurement device. No one

assessment system should be used in isolation to determine student programming. Ideas for assessment can be incorporated through the use of the British Columbia Ministry of Education Assessment Handbooks. (Province of British Columbia, Ministry of Education, 1994a).

Teacher training has to promote the skills of analysis of student weaknesses and curriculum modification in order that teachers may teach to needs presented by individual students. The usage of CBM for monitoring and adjusting programs is one tool for assisting teachers to monitor and adjust teaching to meet student needs. Making adjustments to programs to provide age-appropriate learning activities rather than moving towards more structured curriculum driven programs is crucial to meeting individual needs (Gredler, 1980; May & Welch, 1986; Uphoff & Gilmore, 1985). The learning needs of the student should dictate the method and pace of delivery of the curriculum.

The strategies to train teachers in the use of Curriculum Based Measurement as a testing device should also be used to train teachers in the modification of the learning environment to incorporate effective interventions for students who are consistently falling below the expected grade level norms for CBM. Further research on curriculum based intervention strategies would be beneficial to educators embarking on new assessment and intervention techniques.

Curriculum based measurement of success on specific tasks for ranking or reporting is no better than the use of standardized testing (Marston & Magnusson, 1988). CBM increases educational value when it is used to assist teachers in effective instruction and remedial interventions for individuals. The full implementation of CBM as an assessment tool involves considerable district level training in assessment procedures and intervention strategies. Yell, Deno and Marston (1992) found teachers and administrators most concerned about time management, organizational strategies and anxiety related to changing practices when considering implementing curriculum based measurement. These concerns are very real and in

order for a true change to occur in the way we view assessment and intervention, then training and ongoing discussion is critical for many years to come.

Further research needs to be done to explore effective intervention strategies based on the usage of Curriculum Based Measurement. Additional research in the area of pro-active approaches to early intervention, changing curriculum and instructional approaches to meet the needs of the male gender in their quest for attaining literacy skills is also warranted.

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Appendix A

Approval Forms

Learning For Life!

CENTRAL ADMINISTRATION OFFICE
SCHOOL DISTRICT NO.57 (PRINCE GEORGE)

1894 Ninth Avenue, Prince George, B.C. V2M 1L7 Tel: (604) 561-6800 • Fax (604) 561-68(

96.06.17

Lynn Hedekar
Central Fort George Elementary

Dear Lynn,

Last week you requested permission to utilize curriculum based normative data currently being collected for School District No. 57. It is my understanding that access to this data is for the purpose of completing your masters thesis. I have spoken with the chairperson of the CBM norming committee and he agrees that you may have access and utilize this data for the purpose of completing your thesis. Access and utilization is limited to the raw numerical data by age/grade. You are not permitted access to names of subjects and individual schools.

Sincerely,

Carl Anserello, Ed.D.
School Services Administrator

CA/sbp

UNBC Research Ethics Committee
Certificate of Ethics Approval

Name of Researcher: Lynn Hedaker

Title of Research Project: The effects of Month of Birth and Gender on Elementary Reading and Writing Fluency Scores using Curriculum Based Measurement

I certify that this project was given ethics approval by the UNBC Research Ethics Committee

Signed: _____ **Date:** 24 Jun 96

Dean of Research and Graduate Studies

Appendix B

Reading materials survey

SCHOOL DISTRICT NO. 57 (PRINCE GEORGE)

95.04.21

MEMORANDUM

TO: John McLay, Principal, Mackenzie Elementary
Kerry Bergeron, Principal, Salmon Valley Elementary
John Deevy, Principal, Austin Road Elementary
Maurice Vignal, Principal, Pineview Elementary
Bruce Ballantyne, Principal, Red Rock Elementary
Bruce Wiebe, Principal, McBride Centennial
Ray Giffin, Principal, Malaspina Elementary
Donna Dojack, Principal, Westwood Elementary
Rusty Rustemeyer, Principal, Highland Elementary
Geoff Eacott, Principal, Heritage Elementary
Rob McIntosh, Principal, Ron Brent Elementary
Wayne Giesbrecht, Principal, North Nechako Elementary

FROM: Bendina Miller, Director of School Services

SUBJECT: DISTRICT NORMS FOR CURRICULUM BASED MEASUREMENT

As you may be aware, the School Services Department has proposed that norms for curriculum based measures of achievement be constructed next year. In order to select appropriate reading passages for the assessment materials, we need to know which sources are typically used at each grade level. We are therefore asking for help from you and your staff in completing the attached brief survey.

Would you kindly ask one experienced teacher at each grade level to fill out the survey. He/she is welcome to consult with colleagues in this process. Would you kindly collect the surveys and send them, all together, to me before May 12, 1995.

Thank you for your help in this enterprise. If you have any questions please do not hesitate to call.

/sbp

READING MATERIALS SURVEY

Teacher Name: _____

School: _____

Grade (circle one): 1. 2. 3. 4. 5. 6. 7 (If you are completing the survey for grade 1, please read note #2 below.)

Would you please name five titles which you have used in the last two years for reading instruction at the above grade level. These may be readers, novels, anthologies, etc. **The sources should be at an appropriate level for the average student at mid-year.**

1. _____
2. _____
3. _____
4. _____
5. _____

Which (if any) of the following anthologies have you used: (tick and fill in title)

		Title
1. Journeys	☐	_____
2. Impressions	☐	_____
3. Ginn 720	☐	_____
4. Language Patterns	☐	_____
5. Other	☐	_____

Note (1) Please feel free to consult with colleagues.
(2) If you are completing the survey for grade 1, the sources should be suitable for use **in the last 3 months** of the school year.
(3) Please return this form to your principal within one week.

Thank you for your help

Appendix C

Correlation Coefficients Calculated for Norming Project

Equivalence and Stability Correlation Coefficients

Pearson Correlation between Total Words Written and Words Spelled Correctly			
Grade	OCTOBER	JANUARY	APRIL
1	—	—	.92
2	.92	.91	.95
3	.96	.96	.96
4	.96	.97	.98
5	.96	.97	.96
6	.97	.98	.98
7	.99	.99	.99

Pearson Correlation between Total Words Written and Words Read Correctly			
Grade	OCTOBER	JANUARY	APRIL
1	—	—	.45
2	.31	.40	.48
3	.40	.42	.38
4	.38	.38	.38
5	.32	.32	.34
6	.32	.32	.38
7	.39	.39	.37

Correlations across Norming Periods

Pearson Correlation for Total Words Written Scores between Norming Periods			
Grade	$r_{Oct\text{-}Jan}$	$r_{Jan\text{-}Apr}$	$r_{Oct\text{-}Apr}$
1	—	—	—
2	.55	.68	.48
3	.63	.67	.53
4	.67	.69	.61
5	.59	.62	.57
6	.64	.68	.62
7	.60	.64	.61

Pearson Correlation for Words Read Correctly Scores between Norming Periods			
Grade	$r_{Oct\text{-}Jan}$	$r_{Jan\text{-}Apr}$	$r_{Oct\text{-}Apr}$
1	—	—	—
2	.85	.84	.81
3	.89	.89	.86
4	.81	.80	.77
5	.85	.84	.83
6	.88	.85	.81
7	.86	.86	.86

Appendix D

Inter-rater Reliability Survey

Lynn Hedekar
c/o Central Fort George Elementary,
School District #57 ,
Prince George, B.C.

Dear

I am presently completing the masters program at UNBC . As part of my thesis work I am investigating the inter-rater reliability of curriculum based measurement reading and writing probes.

Your school has been selected at random to complete the inter-rater reliability probes for this study. Could you please score the attached three writing probes for grades two, five and seven. Also the enclosed cassette tape contains three one minute reading probes for grades two, four and seven. Please score each of these reading probes on the enclosed reading probe papers.

When the scoring is completed, please forward the scored papers and cassette to Lynn Hedekar, c/o Central Fort George School through the school district mail.

Your assistance with this project is greatly appreciated.

Thank-you

Yours truly

(Mrs) Lynn Hedekar

Appendix E

School District #57

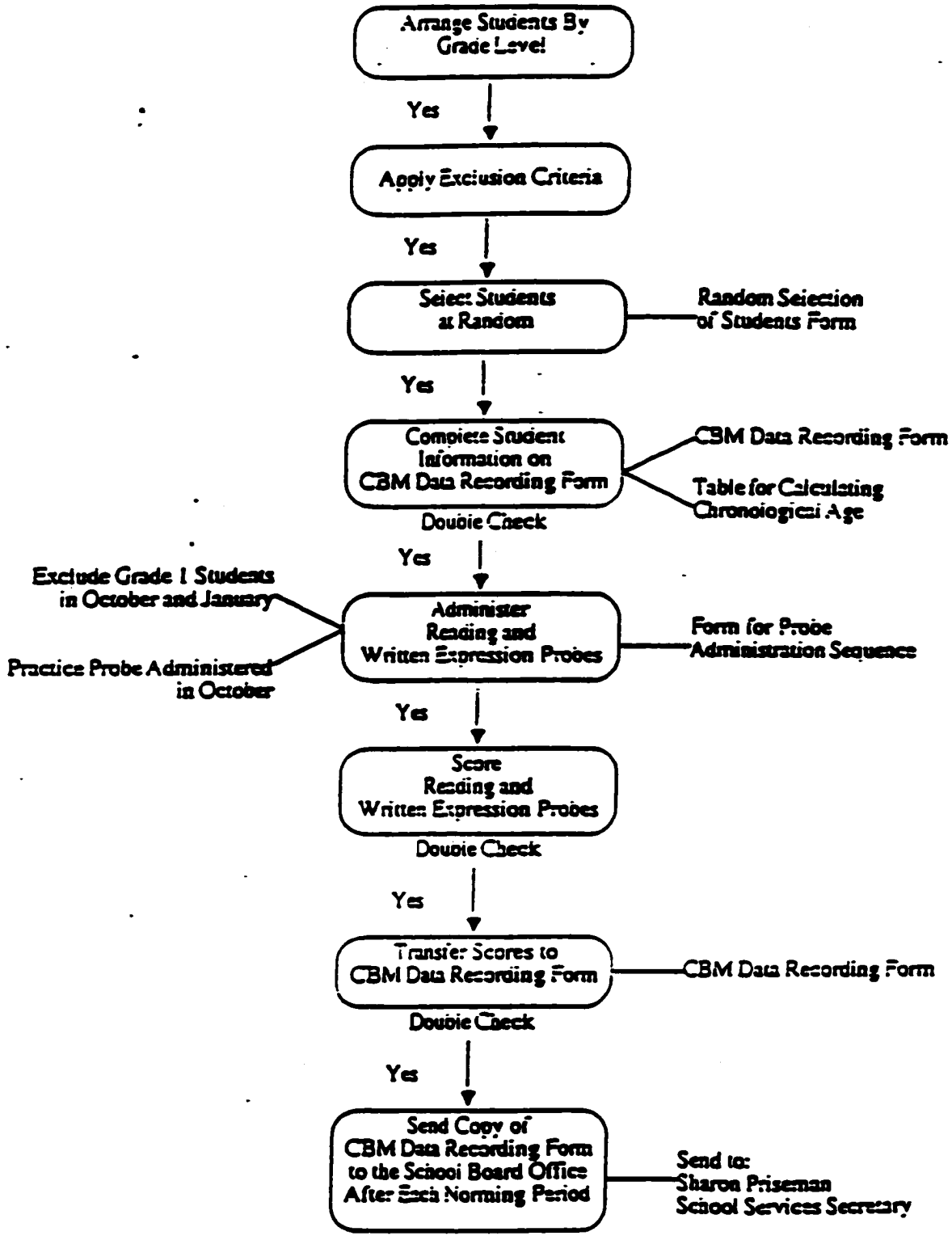
CBM Norming Project Information

School District #57
Curriculum Based Measurement Norming Project

TIMELINE

SEPTEMBER 7, 8, 1995	Inservice for Administrators and Support/Learning Assistance Teachers
Norming Period #1	
SEPTEMBER 28, 1995	Random Selection of students for project,Grade 2 - 7
OCTOBER 2 - 13, 1995	Do reading probes, Grades 2 - 7 * * *First* complete practice probe, *then* administer norming probe *two days later* Do written expression probes, Grades 2 - 7
OCTOBER 20, 1995	Deadline for submitting Data Recording Form to School Services
Norming Period #2	
JANUARY 15 - 26, 1996	Do reading probes, Grades 2 - 7 * * *Do not do practice probes* Do written expression probes, Grades 2 - 7
FEBRUARY 2, 1996	Deadline for submitting Data Recording Form to School Services
Norming Period #3	
APRIL 18, 1996	Random Selection of students for project,Grade 1
APRIL 22 - MAY 3, 1996	Do reading probes, Grades 1 - 7 * * *Administer practice probe to grade 1's*, then administer norming probe two days later Do written expression probes, Grades 1- 7
MAY 10, 1996	Deadline for submitting Data Recording Form to School Services

Flow Chart of Norming Procedures



1. Arrange Students by Grade Level

1.1 On September 28, 1995, list the names of students in each grade (2 - 7).

1.2 For each grade arrange the list of names in alphabetical order

Note: *Exclude Grade 1 students* during the October and January norming periods. Perform the above steps with Grade 1 students on *April 18, 1996*

2. Apply Exclusion Criteria

2.1 Exclude students from the lists who fit under the following categores:

a) Level 1 & 2 ESL students
b) Students with mental disabilities (SLR program)
c) Other "hard labeled" students (hearing impaired, visually impaired, autistic, multiply disabled)
d) Students attending Programme Cadre
e) Students enrolled in French Immersion

3. Select Students at Random

3.1 For each list of names, use the *Random Selection of Students Form* to determine which students from the list correspond with the random numbers generated for that particular grade level at your school.

3.2 If the *random number is greater than the number of names on a list:*

3.2.1 Count all the names on the list

3.2.2 Go to the beginning of the list and continue counting until the number in question is reached - the student name which corresponds with this number is the student selected.

3.3 If the *random number corresponds with a student already selected for the norming sample:*

3.3.1 Roll a die

3.3.2 If the number on the die is even, the next available student higher on the list is selected.

3.3.3 If the number on the die is odd, the next available student lower on the list is selected.

4. Complete Student Information on CBM Data Recording Form

4.1 Provide the information requested on each student selected in the appropriate columns of the *CBM Data Recording Form*.. Each grade level is to be on a separate *CBM Data Recording Form*..

4.2 Determine each student's chronological age by using the *Table for Calculating Chronological Age.*

4.3 After writing this information down on the forms, it should be double checked for accuracy.

5. Administer Reading and Written Expression Probes

5.1 At each grade level, use the *Form for Probe Administration Sequence* to *determine the sequence of probe administration for each student selected.*

5.2 *Norming Periods*

Refer to the *Timeline* for information about the timing and number of reading and written expression probes to be administered during the three norming periods.

5.3 *Grade 1 students*

5.3.1 Grade 1 students are excluded from norming activities during the October and January norming periods. They are included during the April norming activities

5.3.2 During the April norming period, administer a practice probe to Grade 1s, then administer a District Norming probe two days later. Do written expression probes as well. (see *Timeline*)

5.4 For all reading and written expression probes administered, use the reading and written expression administration and scoring procedures included in this manual. These scoring procedures are selected from the CBM Training Workbook edited by Mark shinn, Nancy Knutson, and David Tilly.

6. **Score Reading and Written Expression Probes**
   - 6.1 Use the procedures mentioned in the preceding section for scoring all reading and written expression probes.
   - 6.2 For each *reading probe*, calculate the total number of words read correctly (WRC).
   - 6.3 For each *written expression probe administered in grades 1 - 3*, calculate the total number of words written (TWW).
   - 6.4 For each *written expression probe administered in grades 4-7*, calculate the total number of words written (TWW) *and* the total number of words spelled correctly (WSC).

7. **Transfer Scores to CBM Data Recording Form**
   - 7.1 After writing this information down on the *CBM Data Recording Form*, double check it for accuracy.
   - 7.2 Make a photocopy of the *CBM Data Recording Form*.

8. **Send a Copy of CBM Data Recording Form to the School Board Office After Each Norming Period**
   - 8.1 After each norming period has ended (see *Timeline* for deadline dates), send a completed copy of the *CBM Data Recording Form* to Sharon Priseman, School Services.
   - 8.2 After the April norming period has ended, send all test forms used in this norming project to *Jordan Sim, School Psychologist, Area Support Team #5* at Pineview Elementary. Organize the test forms by grade level.

READING PROBE PROCEDURES

WHAT TO TELL THE STUDENTS ABOUT THE PROJECT:

Tell students that School District #57 is collecting reading samples from 300 children in grade ... three times this year,once in October, once in January, and once in April. These reading samples will provide information about how children in this district read. All children are chosen at random (explain this if necessary) and will remain anonymous (explain this if necessary).

WHAT TO DO IF...

DURING A READING PROBE, A STUDENT LOSES HIS/HER PLACE:

Wait 3 seconds, point to the next word. Count that word as 1 error.

DURING A READING PROBE, A STUDENT SKIPS A LINE:

Each word omitted counts as 1 error.

DURING A READING PROBE, A STUDENT SPEED READS:

Tell the student, "This is not a speed reading test. Begin again, and be sure to do your best reading.

YOU HAVE A QUESTION THAT ISN'T ANSWERED HERE:

Phone:

Jordan Sim (963-7020) Martha Ottesen (562-8051) Tony Sweet (562-2737)

HOW TO READ PROBE CODES:

L P . O B S . 2 1 8 5

\ \ \ \

Anthology Title Page Readability level

Anthologies used: Ginn 720, Impressions, Journeys, Language Patterns, Sense and Feeling

Directions for 1-Minute Administration of Reading Passages

Materials:

1. Unnumbered copy of passage (student copy)
2. Numbered copy of passage (examiner copy)
3. Stopwatch
4. Tape recorder[a]

Directions:

1. Place the unnumbered copy in front of the student.

2. Place the numbered copy in front of you but shielded so the student cannot see what you record.

3. Say these specific directions to the student for each passage:

   When I say 'begin,' start reading aloud at the top of this page. Read across the page (DEMONSTRATE BY POINTING). ***Try to read each word. If you come to a word you don't know, I'll tell it to you. Be sure to do your best reading. Are there any questions?"*** (Pause)

4. Say ***"Begin"*** and start your stopwatch when the student says the first word. If the student fails to say the first word of the passage after 3 seconds, tell them the word and mark it as incorrect, then start your stopwatch.[b]

5. Follow along on your copy. Put a slash (/) through words read incorrectly (see scoring procedures).

6. If a student stops or struggles with a word for 3 seconds, tell the student the word and mark it as incorrect.

7. At the end of 1 minute, place a bracket ( ]) after the last word and say, ***"Stop."***

[a]Tape recorders facilitate error analysis.

[b] On rare occasions the student may "speed read" (i.e., read the passage very fast and without expression). If this occurs, tell the student, ***"This is not a speed reading test. Begin again, and be sure to do your best reading."***

Scoring Procedures

What is a "Word" and What is a "Correctly Read Word?"

Ex. 1

cat — TW = 1

read as:

"cat" — WRC = 1

Ex. 2

I sat. — TW = 2

read as:

"I sat." — WRC = 2

What is a "Correctly Read Word?"

Rule 1. *Correctly Read Words Are Pronounced Correctly.* A word must be pronounced correctly given the context of the sentence.

Ex. 1. The word "r-e-a-d" must be pronounced "reed" when presented in the context of:

He will read the book. — WRC = 5

not as:

"He will red the book." — WRC = 4

Ex. 2. The word "l-e-a-d" must be pronounced "led" when presented in the context of:

She picked up a lead pipe. — WRC = 6

not as:

"She picked up a leed pipe." — WRC = 5

Rule 2. *Self-Corrected Words Are Counted As Correct.* Words misread initially but corrected within 3 seconds are counted as correctly read.

Ex. 1.

The river was cold. — WRC = 4

read as:

"The river was could...(2 sec)...cold." — WRC = 4

Ex. 2.

Matt cleaned the house for Mom. — WRC = 6

read as:

"Matt cleaned the house of...(1 sec).
cleaned the house for Mom." — WRC = 6

Rule 3. *Repeated Words Are Counted As Correct.* Words said over again correctly are ignored.

Ex. 1.

Ted ran swiftly.	WRC = 3
read as:	
"Ted ran...Ted ran swiftly."	WRC = 3

Ex. 2.

Sally saw a cat.	WRC = 4
read as:	
"Sally saw a...a cat."	WRC = 4

Rule 4. *Dialect.* Variations in pronunciation that are explainable by local language norms are not errors.

Ex. 1.

They washed the car.	WRC = 4
read as:	
"They warshed the car."	WRC = 4

Ex. 2.

Let's go to the park.	WRC = 5
read as :	
"Let's go to the pawk."	WRC = 5

Rule 5. *Inserted Words Are Ignored.* When a student adds extra words, they are not counted as correct words nor as reading errors.

Ex. 1.

Sue was happy.	WRC = 3
read as:	
"Sue was very happy."	WRC = 3

Ex. 2.

Kelly played the flute.	WRC = 4
read as:	
"Kelly played a the flute."	WRC = 4

What is an "Incorrectly Read Word?"

Rule 6. *Mispronounced or Substituted Words* are counted as incorrect.

Ex. 1.

The dog ate a bone.	WRC = 5
read as:	
"The dig ate a bone."	WRC = 4

Ex. 2.

Lynne has many hats.	WRC = 4
read as:	
"Lynne has many hat."	WRC = 3

Ex. 3.

He wanted a new car.	WRC = 5
read as:	
"She wants a new car."	WRC = 3

Rule 7. *Omitted Words* are counted as errors.

Ex. 1.

Mario climbed the oak tree.	WRC = 5
read as:	
"Mario climbed the tree."	WRC = 4

Ex. 2.

The king fought with an alligator in the moat.	WRC = 9
read as:	
"The king fought in the moat."	WRC = 6

Ex. 3.

Sewing is my favorite hobby. I enjoy sewing dresses and suits. What is your favorite hobby?	WRC = 16
read as:	
"Sewing is my favorite hobby. What is your favorite hobby?"	WRC = 10

Rule 8. *Hesitations.* When a student hesitates or fails to correctly pronounce a word within 3 seconds, the student is told the word and an error is scored.

Ex. 1.

Mark saw an elephant.	WRC = 4
read as:	
"Mark saw an ...(3 sec)"	WRC = 3
or read as:	
"Mark saw an elll-eee ...(3 sec)"	WRC = 3

Rule 9. *Reversals.* When a student transposes two or more words, those words not read in the correct order are errors.

Ex. 1.

Charlie ran quickly.	WRC = 3
read as:	
"Charlie quickly ran."	WRC = 1

Ex. 2.

Shelly bought a beautiful sweater.	WRC = 5
read as:	
"Shelly bought a sweater beautiful."	WRC = 3

Special Scoring Rules

Rule 10. *Numbers Written As Numerals* are counted as words and must be read correctly within the context of the passage.

Ex. 1.

May 5, 1989.	WRC = 3
should be read as:	
"May fifth, nineteen eighty-nine."	WRC = 3
not as:	
"May five, one nine eight nine."	WRC = 1

Ex. 2.

He was in grade 3.	WRC = 5
should be read as:	
"He was in grade three."	WRC = 5
not as:	
"He was in grade third."	WRC = 4

Rule 11a. *Hyphenated Words*. Each morpheme separated by a hyphen(s) is counted as an individual word if it can stand alone.

Ex.

Fifty-seven	WRC = 2
Daughter-in-law	WRC = 3

Rule 11b. *Hyphenated Words*. If one or more of the morphemes separated by a hyphen(s) cannot stand alone, the entire sequence is counted as one word.

Ex.

re-evaluate	WRC = 1
Spic-n-span	WRC = 1
Bar-b-que WRC = 1	

Rule 12. *Abbreviations* are counted as words, and must be read correctly within the context of the sentence.

Ex. 1.

Dr. Adams received a promotion.	WRC = 5
should be read as:	
"Doctor Adams received a promotion."	WRC = 5

not as:
"D-R Adams received a promotion." **WRC = 4**

Ex. 2.

Jan lives on Fifth Ave. **WRC = 5**
should be read as:
"Jan lives on Fifth avenue" **WRC = 5**
not as:
"Jan lives on Fifth a-v-e" **WRC = 4**

Ex. 3.

Jan lives on Fifth Ave. **WRC = 5**
also should not be read as:
"Jan lives on Fifth ave" **WRC = 4**

Ex. 4.

John watched T.V. **WRC = 3**
can be read as:
"John watched tee-vee" **WRC = 3**
or as:
"John watched television." **WRC = 3**

Ex. 5.

John watched television. **WRC = 3**
should be read as:
"John watched television." **WRC = 3**
not as:
"John watched tee-vee." **WRC = 2**

WRITTEN EXPRESSION PROBE PROCEDURES

WHAT TO TELL THE STUDENTS ABOUT THE PROJECT:

Tell students that School District #57 is collecting story samples from 300 children in grade ... three times this year,once in October, once in January, and once in April. These reading samples will provide information about how children in this district write stories. All children are chosen at random (explain this if necessary) and will remain anonymous (explain this if necessary).

WHAT TO DO IF...

DURING A WRITING PROBE, A STUDENT STOPS WRITING BEFORE 3 MINUTES:

Quietly say to the student "Tell more about the story. Keep writing until I tell you to stop."

DURING A WRITING PROBE, A STUDENT WRITES A STORY THAT IS NOT RELATED TO THE STORY STARTER:

Ignore the content. Follow normal scoring procedure.

WHEN SCORING A WRITING PROBE, YOU CANNOT READ THE STUDENT'S WRITING :

Count each cluster of letters as a word for the total words written. If it is not possible to determine words spelled correctly, WSC score is 0.

WHEN SCORING A WRITING PROBE, YOU CANNOT DETERMINE WHERE WORDS BEGIN OR END:

Count any obvious clusters of letters as a word. If there are *no* spaces between any letters written, total words written = 1.

YOU HAVE A QUESTION THAT ISN'T ANSWERED HERE:

Phone:

Jordan Sim (963-7020) Martha Ottesen (562-8051) Tony Sweet (562-2737)

Directions for 3-Minute Administration of Written Expression

Materials:

1. Story starter.
2. Stop watch

Directions:

1. Select an appropriate story starter.

2. Provide the student with a pencil and a sheet of lined paper.

3. Say these specific directions to the students:

   "You are going to write a story. First, I will read a sentence, and then you will write a story about what happens next. You will have 1 minute to think about what you will write, and 3 minutes to write your story. Remember to do your best work. If you don't know how to spell a word, you should guess. Are there any questions? (Pause). ***Put your pencils down and listen.***

   For the next minute, think about ... (insert story starter)."

4. After reading the story starter, begin your stopwatch and allow 1 minute for students to "think." (Monitor students so that they do not begin writing).

   After 30 seconds say: ***"You should be thinking about*** (insert story starter)."

5. At the end of 1 minute say: ***"Now begin writing."*** Restart your stopwatch.

6. Monitor students' attention to the task. Encourage students to work only if they are looking around or talking.

7. After 90 seconds say: ***"You should be writing about*** (insert story starter)."

8. At the end of 3 minutes say: ***"Stop. Put your pencils down."***

Written Expression Scoring Rules

What Is A Word?

Any letter or group of letters separated by a space is defined as a word even if the word is misspelled or is a nonsense word.

The sky was blue. TWW = 4

The sky was blew. TWW = 4

I tuk a baf. TWW = 4

I tuka baf. TWW = 3

Rule 1. ***Hyphenated Words.*** **Each morpheme separated by a hyphen(s) is counted as an individual word if it can stand alone.**

My daughter-in-law had a baby boy. TWW = 8

Rule 2. ***Hyphenated Words.*** **If one or more of the morphemes separated by a hyphen(s) cannot stand alone, the entire sequence is counted as one word.**

We had to re-evaluate the case. TWW = 6

Rule 3. ***Abbreviations.*** **Commonly used abbreviations are counted as words.**

Chris watched T. V.. TWW = 3

Rule 4. ***Story Titles or Endings.*** **Words written in the title or as an ending are counted as words written.**

The Big Run TWW = 15

On the fourth of July, I
ran the Boston Marathon.
The End.

Rule 5. ***Numbers.*** **With the exception of dates, numbers that are not spelled out are not counted as words.**

3 men ran. TWW = 2

Three men ran. TWW = 3

2 went 2 a party. TWW = 4

It is June 10 1989. TWW = 5

Rule 6. ***Unusual Characters.*** **Symbols used in writing such as (%, &, $, #, @), that are not spelled out are not counted as words.**

Kim spoke @ the conference TWW = 4

What Is A Correctly Spelled Word?

A word is spelled correctly if it can stand alone as a word in the English language. Contextual clarity is not an issue.

Bill will reed the book. WSC = 5

and can rat pake WSC = 3

dog ran down the rode WSC = 4

Rule 1a. ***Hyphenated Words.*** Each morpheme separated by a hyphen(s) is counted as an individual word if it can stand alone and is spelled correctly.

My dauta-in-law had a babygirl. WSC = 7

Rule 1b. ***Hyphenated Words.*** If one or more of the morphemes separated by a hyphen(s) cannot stand alone, the entire sequence is counted as one word if it is spelled correctly.

I had to re-evluate the case. WSC = 5

Rule 2. ***Abbreviations.*** Commonly used abbreviations (Dr., Mrs., Blvd.) are counted as words.

Jan lives on Sunset Blvd. WSC = 5

Rule 3. ***Story Titles.*** Words written as part of the title, if spelled correctly, are included in the correctly spelled word count.

WSC =

Rule 4. ***Capitalized Words.*** Proper nouns must be capitalized to be considered as correct. Capitalization of the first word in a sentence is not required for the word to be spelled correctly.

Mary saw the book. WSC = 4

we crossed the Mississippi. WSC = 4

Probe 3
G.MAFC.2437

STUDENT _____

One afternoon when I arrived at the Brick House,	9
Grandfather Connor was standing out on the front	17
porch. I was startled, because he was not wearing	26
his great bear coat. He wore no coat at all, only	37
his dingy serge suit, although the day was fifteen	46
below zero. The blown snow had sifted onto the porch	56
and lay in thin drifts. He stood there by himself,	66
his yellowish-white hair plumed by a wind which he	75
seemed not to notice, his bony and still-handsome	83
face not averted at all from the winter. He looked	93
at me as I plodded up the path and the front steps.	105
"Vanessa, your grandmother's dead," he said.	111
Then as I gazed at him, unable to take in the	122
significance of what he had said, he did a horrifying	132
thing. He gathered me into the relentless grip of	141
his arms. He bent low over me, and sobbed against	151
the cold skin of my face.	157

Total words read:_____

errors:_____

Words Read Correctly:_____

Write a story that begins with:

I was playing outside when a spaceship landed and...

SCHOOL DISTRICT # 57
C.B.M. NORMING PROJECT

TWW _____

WSC _____

RANDOM SELECTION OF STUDENTS FORM

SAMPLE

	Students to be used in Norming Sample
Grade 1	10. 11. 15. 18. 19. 23. 27. 28. 30. 34
Grade 2	4. 5. 7. 8. 16. 18. 20. 22. 23. 45
Grade 3	2. 3. 16. 22. 26. 27. 33. 37. 41. 45
Grade 4	4. 11. 12. 13. 25. 26. 30. 39. 40. 43
Grade 5	4. 5. 7. 18. 20. 21. 23. 28. 34. 36
Grade 6	7. 8. 12. 13. 15. 19. 23. 28. 30. 39
Grade 7	5. 8. 9. 13. 21. 26. 37. 39. 41. 45

TABLE FOR CALCULATING CHRONOLOGICAL AGE

Date of Birth	Age as of April
89 Dec.	6 yrs., 4 mo.
89 Nov.	6 yrs., 5 mo.
89 Oct.	6 yrs., 6 mo.
89 Sep.	6 yrs., 7 mo.
89 Aug.	6 yrs., 8 mo.
89 Jul.	6 yrs., 9 mo.
89 Jun.	6 yrs., 10 mo.
89 May	6 yrs., 11 mo.
89 Apr.	7 yrs., 0 mo.
89 Mar.	7 yrs., 1 mo.
89 Feb.	7 yrs., 2 mo.
89 Jan.	7 yrs., 3 mo.

Date of Birth	Age as of October
88 Dec.	6 yrs., 10 mo.
88 Nov.	6 yrs., 11 mo.
88 Oct.	7 yrs., 0 mo.
88 Sep.	7 yrs., 1 mo.
88 Aug.	7 yrs., 2 mo.
88 Jul.	7 yrs., 3 mo.
88 Jun.	7 yrs., 4 mo.
88 May	7 yrs., 5 mo.
88 Apr.	7 yrs., 6 mo.
88 Mar.	7 yrs., 7 mo.
88 Feb.	7 yrs., 8 mo.
88 Jan.	7 yrs., 9 mo.
87 Dec.	7 yrs., 10 mo.
87 Nov.	7 yrs., 11 mo.
87 Oct.	8 yrs., 0 mo.
87 Sep.	8 yrs., 1 mo.
87 Aug.	8 yrs., 2 mo.
87 Jul.	8 yrs., 3 mo.
87 Jun.	8 yrs., 4 mo.
87 May	8 yrs., 5 mo.
87 Apr.	8 yrs., 6 mo.
87 Mar.	8 yrs., 7 mo.
87 Feb.	8 yrs., 8 mo.
87 Jan.	8 yrs., 9 mo.
86 Dec.	8 yrs., 10 mo.
86 Nov.	8 yrs., 11 mo.
86 Oct.	9 yrs., 0 mo.
86 Sep.	9 yrs., 1 mo.
86 Aug.	9 yrs., 2 mo.
86 Jul.	9 yrs., 3 mo.
86 Jun.	9 yrs., 4 mo.

Date of Birth	Age as of October
86 May	9 yrs., 5 mo.
86 Apr.	9 yrs., 6 mo.
86 Mar.	9 yrs., 7 mo.
86 Feb.	9 yrs., 8 mo.
86 Jan.	9 yrs., 9 mo.
85 Dec.	9 yrs., 10 mo.
85 Nov.	9 yrs., 11 mo.
85 Oct.	10 yrs., 0 mo.
85 Sep.	10 yrs., 1 mo.
85 Aug.	10 yrs., 2 mo.
85 Jul.	10 yrs., 3 mo.
85 Jun.	10 yrs., 4 mo.
85 May	10 yrs., 5 mo.
85 Apr.	10 yrs., 6 mo.
85 Mar.	10 yrs., 7 mo.
85 Feb.	10 yrs., 8 mo.
85 Jan.	10 yrs., 9 mo.
84 Dec.	10 yrs., 10 mo.
84 Nov.	10 yrs., 11 mo.
84 Oct.	11 yrs., 0 mo.
84 Sep.	11 yrs., 1 mo.
84 Aug.	11 yrs., 2 mo.
84 Jul.	11 yrs., 3 mo.
84 Jun.	11 yrs., 4 mo.
84 May	11 yrs., 5 mo.
84 Apr.	11 yrs., 6 mo.
84 Mar.	11 yrs., 7 mo.
84 Feb.	11 yrs., 8 mo.
84 Jan.	11 yrs., 9 mo.
83 Dec.	11 yrs., 10 mo.
83 Nov.	11 yrs., 11 mo.
83 Oct.	12 yrs., 0 mo.
83 Sep.	12 yrs., 1 mo.
83 Aug.	12 yrs., 2 mo.
83 Jul.	12 yrs., 3 mo.
83 Jun.	12 yrs., 4 mo.
83 May	12 yrs., 5 mo.
83 Apr.	12 yrs., 6 mo.
83 Mar.	12 yrs., 7 mo.
83 Feb.	12 yrs., 8 mo.
83 Jan.	12 yrs., 9 mo.