Risk Factors for Reading Difficulty: Examining the Impact of Family Structure on Curriculum-Based Measures of Reading

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ABSTRACT

Identifying reading problems in underachieving students early in their education provides the best opportunity to provide interventions (VanDerHeyden, Witt, Naquin, & Noell, 2001). Understanding the risk factors which relate to reading difficulties can help identify those students in need of screening, tracking, and potential intervention. Poverty, family size, family structure, and birth order are risk factors which have been studied to differing degrees in the literature. The current study examines whether students from varying family structures differ in reading achievement and development during their kindergarten and first grade years. Subtest scores from the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) are compared by family structure groupings to determine whether there are differences in reading achievement and development. Results indicate statistically significant higher mean starting and ending scores for children living with both parents and joint custody situations compared to those just living with their mother or father, indicating family structure is a risk-factor for reading difficulty. Rates of growth were similar for all groups, however. Findings are discussed with regard to implications for current and future practice.

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Chapter I: Introduction

According to the National Reading Panel (2004), national longitudinal studies indicated more than 17.5% of children, roughly 10 million, will experience reading difficulty in their first three years of schooling. Evidence suggests successful reading begins early; and, once established, trajectories are difficult to change (National Reading Panel, 2004). VanDerHeyden, Witt, Naquin, and Noell (2001) proposed that early academic performance is likely to influence later academic performance. Therefore, it is essential to identify reading problems and intervene early.

Early intervention has been found to be critical in the prevention and remediation of achievement problems. In 1997, RAND, a nonprofit research organization, published a comprehensive study of the preschool programs in California to better understand achievement difficulties in the early elementary years (Cannon & Karoly, 2007). The RAND study indicated programs which service students prior to entering kindergarten show students increased their school readiness and generated higher achievement test scores in the first few elementary grades. Early intervention has also been proven to reduce the need for special education, reduce grade retention, and produce higher graduation rates (Cannon & Karoly, 2007). Head Start, an organization that has provided low-income students with school readiness skills for the last 40 years, was recently reauthorized by President Bush in 2007 (White House News, 2007). The United States Department of Health and Human Services conducted a study in 2005 to analyze the impacts of Head Start. They found Head Start significantly impacted the pre-reading skills, pre-writing skills, and vocabulary in the 3 and 4 year-olds studied (U.S.

Department of Health and Human Services, Administration of Children and Families, 2005).

A potential link between reading difficulty and certain family factors, such as poverty, family size, birth order, and family structure exists. Adams, Foorman, Lundberg, and Beeler (1998) suggested that proficient phonological awareness distinguished economically disadvantaged preschoolers from more advantaged children. Furthermore, poverty can impact parenting practices and the overall home environment, which can have an indirect influence on academic functioning. Papalia, Olds, and Feldman (2002) indicated that the effects of poverty lead to behavioral, emotional, and academic difficulties in children. Some early research showed that family size influenced children's IQs (Lancer & Rim, 1984; Zajonic, 1976). However, more recent research shows family size might not be the primary factor due to extraneous variables such as parental IQ (Rogers, Cleveland, van den Oord, & Rowe, 2000; Esping, 2003). Past theories by Alfred Adler and Francis Galton proposed birth order differences in achievement and IQ between children within the same family (cited in Prochaska & Norcross, 2003 ; Esping, 2003). However, Rodgers et al. (2000) concluded that birth order does not directly decrease the intelligence of later born children.

Another factor related to family size is family structure. Family structure can be defined as the number of adult caregivers a child lives with and who those caregivers are in relation to the child (Oman, Vesley, Tolma, Aspy, Rodine, & Marshall, 2007). The traditional family of the past, often called the nuclear family, consisted of a mother and father who were married. Today, families can include just one parent, a mother and father who are not married but co-habitate, a homosexual set of parents, a biological parent and

a stepparent, and a wide array of other living structures including those with grandparents (Tarko, 2006).

Varying family structures have been found to impact child development and achievement. Single parent families can have many more disadvantages compared to two-parent households (Kerr & Michalski, 2007). Poverty and health issues are common factors that adversely impact how single parents care for their children (Johner, 2007). Remarriage and the addition of stepparents can have positive effects; but, overall, these additions in the home do not appear to provide more advantages than single parent households (Kerr & Michalski, 2007). A study researching family structure in African American families found that children are often raised by grandparents (Cain & Combs-Orme, 2005). Conclusions of the Cain and Combs-Orme study determined multigenerational family households can be more stressful than even single parent households.

Knowing and understanding the potential risk factors for reading failure is important to educators. As educators understand the influence of these risk factors on reading achievement and development, they will be able to provide at-risk children with appropriate screening measures and early interventions.

One way to measure reading achievement and development is through curriculum-based measures. Curriculum-based measures have been researched thoroughly and have been found to hold high reliability and validity (Deno, 2003). These strong psychometric properties have been achieved through standardized observational procedures in repeated studies of student performance in reading, writing, and mathematical skills (Deno).

DIBELS, a form of curriculum-based measurement (CBM), is a set of individually administered standardized measures that relate to early literacy development. According to Don Sibley, a presenter at the 2005 WSPA conference, DIBELS is designed to measure the development of pre-reading and early reading skills of elementary school children.

According to Manzo (2005), DIBELS has become the national assessment tool for *Reading First*, a federal program adopted under the *No Child Left Behind Act* of 2001. More than 40 states use DIBELS to screen students grades K-3 for potential reading problems. The tests are replicable, take little time, and are simple to administer. These features appeal to many school districts. Manzo reported officials use DIBELS scores to identify children at-risk for reading failure, hold schools accountable for student achievement, and aid educators in informing their teaching instruction. Furthermore, curriculum-based measures such as DIBELS assess the generalization of learning. DIBELS scores can be compared across students or can be used to measure the learning of an individual student over time (Hintze & Silberglitt, 2005). Providing instructors with sensitive indicators of learned skills informs practice and reveals which teaching methods best meet students' learning needs.

Many practitioners believe early intervention is crucial because it prevents students from falling behind peers, thereby preventing intractable reading failure. Understanding the influence of risk factors in reading failure can aid educators in screening and tracking students at-risk. Using well-researched and practical tools to identify struggling readers, such as the DIBELS, provides educators with the opportunity to reduce deficits when students are young (VanDerHeyden et al., 2001).

Summary of Rationale

As previously discussed, many children struggle with reading problems. Research shows that early identification is critical. It is important to know the risk factors related to reading difficulty to screen, identify, and target children early who might be in need of extra assistance. There is research indicating that family structure relates to reading development and achievement.

Statement of the Problem and Purpose of the Study

Although there is a body of evidence indicating that academic outcomes are influenced by family and environmental characteristics, there is limited research examining the impact of family structure on curriculum-based measures of reading. As such, the need for this research is both theoretical and practical. Theoretically, it is important to know whether family structure has an effect on initial measures of reading and the reading progress of early elementary aged children. Practically, it is important for educators to know if they should consider variables such as family structure when identifying children in need of intensive reading interventions.

Given: 1) previous research indicating family structure influences academic outcomes; 2) curriculum-based measurement has been found to be technically adequate for assessing reading levels and progress at the elementary level; 3) educators need timely and accurate information to predict which children are at-risk of reading failure to provide intervention; and 4) a lack of research examining the impact of family structure on reading performance; a need exists to examine the contributing influence, if any, of family structure on levels of reading achievement at the elementary level.

Research Questions

The following research questions guided this study:

1. Is there a difference in reading levels of children from different family structurs during the kindergarten and first grade years?

2. Is there a difference in reading growth and development, from kindergarten to first grade, of children from different family structures?

3. Is there a difference in reading growth and development within the kindergarten year of children from different family structures?

4. Is there a difference in reading growth and development within the first grade year of children from different family structures?

Definition of Terms

The following eleven terms required definition to ensure appropriate reader understanding:

Achievement gap. A disproportionate number of students who perform below educational standards, often linked to social and economic disadvantage (Viadero, 2007).

Birth order. A child's position in the family structure, or the order a child was born into a family (ordinal position) (Prochaska & Norcross, 2003).

Curriculum-based measurement (CBM). A set of standardized procedures for assessing the basic skill areas of reading, computation, mathematics, spelling, and written expression (Graney & Shinn, 2005).

Family structure (as a variable in this study). What adult caregiver(s) the child lives with in the home setting. Groupings for this study include: both parents, joint custody situations, or living with just the father or just the mother.

Family structure (as a concept in the literature). The number of adult caregivers a child lives with and the type of relationships between those caregivers and the children (Oman et al., 2007).

Grapheme. The smallest part of written language that represents a phoneme in the spelling of a word (Armbruster, Lehr, & Osborn, 2003).

No Child Left Behind Act. Legislation adopted in 2001 which claims to increase accountability in states, school districts, and schools. The Act also purports to offer parents and students more choices regarding their education, more flexibility for states in the use of federal education money, and a stronger emphasis on reading (US Department of Education, 2002).

Phoneme. The smallest part of spoken language that makes a difference in the meaning of words (Armbruster et al., 2003).

Phonemic awareness. The ability to hear, identify, and manipulate the individual sounds in spoken words (Armbruster et al., 2003).

Phonics. The understanding that there is a predictable relationship between phonemes and graphemes (Armbruster et al., 2003).

Socioeconomic status (SES). A combination of economic and social factors including income, education, and occupation that describe an individual or family (Papalia et al., 2002).

Family structure (as a concept in the literature). The number of adult caregivers a child lives with and the type of relationships between those caregivers and the children (Oman et al., 2007).

Grapheme. The smallest part of written language that represents a phoneme in the spelling of a word (Armbruster, Lehr, & Osborn, 2003).

No Child Left Behind Act. Legislation adopted in 2001 which claims to increase accountability in states, school districts, and schools. The Act also purports to offer parents and students more choices regarding their education, more flexibility for states in the use of federal education money, and a stronger emphasis on reading (US Department of Education, 2002).

Nonsense word fluency. DIBELS subtest that assesses letter-sound correspondence, blending letters, and the alphabetic principle (Good & Kaminski, 2002).

Phoneme. The smallest part of spoken language that makes a difference in the meaning of words (Armbruster et al., 2003).

Phonemic awareness. The ability to hear, identify, and manipulate the individual sounds in spoken words (Armbruster et al., 2003).

Phoneme segmentation fluency. DIBELS subtest that assesses skills in fluently segmenting words into their individual phonemes (Good & Kaminski, 2002).

Phonics. The understanding that there is a predictable relationship between phonemes and graphemes (Armbruster et al., 2003).

Socioeconomic status (SES). A combination of economic and social factors including income, education, and occupation that describe an individual or family (Papalia et al., 2002).

Chapter II: Literature Review

This chapter will include a discussion examining potential risk factors such as poverty, family size, birth order, and family structure and how they relate to reading achievement. The utility and psychometric properties of curriculum-based measurement will also be discussed. The chapter will additionally cover critical components reading development and instruction based on research from two large reading studies.

The acquisition of reading skills does not happen in isolation. It is a complex process which may be affected by different variables such as environmental influences, within-child conditions, and the quality and type of instruction. In this section, poverty, birth order, family size, and family structure will be examined as they relate to the acquisition of reading skills; and, more broadly, academic achievement and cognitive development.

Poverty

Many studies have shown the effects of poverty often lead to behavioral, emotional, and academic difficulties in children (Adams et al., 1998; Cannon & Karoly, 2007; Papalia et al., 2002). There is a large body of research concerning what is commonly known as the achievement gap. An achievement gap refers to a disproportionate number of students who perform below educational standards, often linked to social and economic disadvantage (Viadero, 2007). Children who have adequate economic resources generally perform better academically than children who are economically disadvantaged, creating a large discrepancy between those who are successful in school and who are not. The *No Child Left Behind Act,* passed in 2001,

attempts to diminish achievement gaps between groups of children and underscores the importance of academic success for all groups of children (Cannon & Karoly, 2007).

Discussion of the achievement gap often includes comparisons across racial/ethnic groups as well, but most differences are thought to relate to poverty. Children from poverty stricken families, on average, perform poorer on indicators of academic achievement such as course failure, grade retention, achievement test scores, and completed years of schooling. According to McLoyd (1998), meta-analyses suggested that family income was the highest single correlate of academic achievement.

Research has demonstrated poverty is correlated with other factors such as maternal education and parental IQ. According to a study by Fantuzzo, Rouse, McDermott, and Sekino (2005), maternal education and poverty were significant risk factors for low achievement. Downer and Pianta (2006) found mothers with more education had children who were more academically successful. A study conducted by an Educational Testing Service in Princeton, NJ found by the age of 4, the average child living in a professional family hears more than 20 million more words than the average child living in a working class family, and about 35 million more words than children in families who are on welfare (Viadero, 2007). Nevertheless, research from the Infant Health and Development Program, which accounted for family structure, ethnicity, and maternal education, suggested that family income and poverty status were the primary predictors of IQ scores of five-year-olds (McLoyd, 1998). When low birth rate and parental education were accounted for, it was found that there were still higher rates of grade retention for children living in poverty (Sherman, 1994; Zill, Moore, Smith, Stief, & Coiro, 1995). Research has consistently shown that poverty affects child development

independent of other factors related to poverty, and family income is a powerful predictor of academic achievement regardless of other factors (Fantuzzo, et al., 2005).

Some literature suggests a negative correlation between the duration a child lives in poverty and their academic achievement. In other words, the longer a child lives in poverty, the more difficulties a child will have in school. Furthermore, persistent poverty was found to be more detrimental to a child's IQ, school achievement, and socio-emotional functioning than transitory or infrequent episodes of poverty (McLoyd, 1998). McLoyd also reported that school achievement typically declines as the duration of poverty increases. Other research found the chance that a student will be retained increases by 2-3% for every year the child lives in poverty (Sherman, 1994; Zill et al., 1995).

Not only does the duration of poverty affect children, the age at which a child first experiences poverty also can influence a child's academic difficulties. In a study by Duncan (1994), it was found that poverty throughout the first five years of life was more detrimental to years of schooling completed than poverty in adolescence. An interpretation of this finding is that poverty at a young age inhibits school-readiness skills, which can set in motion a pattern of academic failure. To counter this difficulty, programs such as Head Start have been put into place to compensate for some of the impacts of poverty during the early childhood years. Students of families in economic hardship are chosen for the Head Start program to allow a better chance of entering kindergarten with some school-readiness skills (National Head Start Association, 2007).

Family and Environmental Factors Associated with Poverty. Lower income families often are subjected to situations, events, and cultural norms which differ from

higher income families. Poverty is frequently related to other factors (i.e., parental stress, intense work hours, limited educational enrichment, environmental and neighborhood dangers) which can explain its significant effect on reading achievement.

Parental emotional distress, common with poverty, can impact a child's development behaviorally, emotionally, and academically (Papalia et al., 2002). Papalia et al. contend that when resources are low, parenting practices can suffer, thereby creating a poor home environment. According to Strawser, Markos, Yamaguchi, and Higgins (2000), children living in poverty often have lower self-worth and increased behavior problems, which may be attributed to the child's exposure to chronic family stressors such as overcrowding within the home, homelessness, maternal depression, and parental conflict. Also, the parent-child relationship is often strained in times of parental stress. Maternal sensitivity, especially during play interactions, has been found to strongly predict academic success in kindergarten and first grade, even after controlling for maternal education (Downer & Pianta, 2006). In a study conducted by Downer and Pianta, it was determined that mothers who were warm, sensitive, and responsive had higher achieving children.

Beyond parental stress, poverty also has been related to diminished family time. White (2004) reported that poor parents often work long hours, making them less able to provide their children with assistance in homework and less time to read stories with their children. In high-income families, 62% of kindergartners are read to every day by their parents, compared to 36% of low-income kindergarten children (Viadero, 2007). Furthermore, a family experiencing economic hardship likely has less time to monitor their child's academic performance, which can result in later reading delay.

Not only do most families living in poverty have less time, they also have fewer educational resources beneficial to child development and academic achievement (White, 2004). Families with low socioeconomic status typically have less access to educational books and toys, as well as high quality childcare (Hargrave, 2000). Poor families have less money to provide their children with after-school activities that foster intellectual stimulation such as dance classes, music lessons, summer camps, and sports (White). According to White, lower income families are also less able to access information regarding their child's health, including immunizations and nutrition.

Children living in poverty are not only disadvantaged in terms of family factors, they also experience more disadvantages within their neighborhood environment and culture. When controlling for family resources, the resources of a neighborhood can influence a child's academic growth (Berliner, 2006). Fantuzzo et al. (2005) contended that situations of high poverty and low maternal education correlate strongly with residence in neighborhoods that are not structurally or socially positive. Individuals who live in high-poverty communities are disadvantaged by high unemployment rates, public schools with diminished resources, and poor private services. Chronic stressors that influence poor children's development often include poor housing conditions, such as overcrowding, and poor, dangerous neighborhoods (McLoyd, 1998). These individuals are also exposed to life-threatening environmental stressors such as violence, drugs, homelessness, and negative role models.

As mentioned previously, families living in neighborhoods with fewer resources do not have access or the means to pay for high-quality childcare. Research has shown quality childcare has a positive impact on language development, cognition, and overall

achievement outcomes (Downer & Pianta, 2006). Longitudinal projects such as the NICHD Study of Early Child Care, the Multi-state Study of PreKindergarten, and the Cost, Quality, and Outcomes Study consistently found that high-quality childcare significantly increased children's development of language and school readiness skills, even after controlling for socioeconomic status and parental sensitivity (Downer & Pianta).

Within-Child Factors Related to Poverty. The effects of poverty can change one's view of him/herself and cause internal feelings and thoughts which can affect achievement. Poverty can especially influence children by giving them a diminished view of their potential to attain academic success. Hargrave (2000) concluded that poverty influences a child's ability to learn to read well and generally succeed in school. Children living in poor families often have less motivation and lowered expectations regarding their own abilities (White, 2004). Homeless children, specifically, were found to exhibit more psychological, developmental, and behavioral problems (Strawser et al., 2000). Teachers often share lowered expectations of economically disadvantaged students, resulting in stifled academic enrichment (McLoyd, 1998). Furthermore, these students often have no expectation of receiving financial support for college. McLanahan and Sandefur determined that children who do not expect to ever go to college often do not work as hard in high school (cited in White).

Summary of Poverty. Studies have shown the effects of poverty can lead to behavioral, emotional, and academic difficulties in children (Adams et al., 1998; Fantuzzo et al., 2005; Papalia et al., 2002, Strawser et al., 2000). Research shows that poverty status has been a strong predictor of academic difficulties, even when other

factors such as maternal and paternal education and IQ are controlled (Fantuzzo, et al.). Various explanations of why poverty may be related to low reading achievement exist; these include fewer resources, chronic stressors, and low motivation (Fantuzzo, et al.; McLoyd, 1998; Strawser et al.; White, 2004). Therefore, it is essential to examine poverty as a potential risk factor in the acquisition of reading skills.

Birth Order and Family Size

Birth order and family size are interrelated risk factors to poor reading achievement. The following section outlines historical research on birth order and family size. Contemporary research on the effect on academic achievement, intelligence, and language development is also examined.

According to Prochaska and Norcross (2003), theorist Alfred Adler believed that a child's position in the family structure was very important. Adler was one of the first psychologists to research birth order (Klas, 2002), and he proposed that birth order could predict the lifestyle an individual would choose in adulthood. The oldest child, or firstborn, had the inevitable experience of being dethroned by a younger sibling. Adler concluded that firstborns often enjoy thinking back on the past when there was no rival; therefore, firstborns are more likely to choose a more conservative style of life. A middle child would be more likely to choose an ambitious lifestyle, while the youngest child would be most likely to live like a prince or princess since they always had older siblings who served as peacemakers (Prochaska & Norcross).

According to Klas (2002), Alfred Adler believed that if the family environment allowed it, a child could take on another sibling's birth order position. In the case of a disability, for example, Adler believed a younger child could adopt the firstborn's

characteristics if the firstborn had a disability. Influences such as the social and economic position of the family and the attitudes of parents also played a part in shaping birth order characteristics. Adler also contended that if more than three years separated siblings, a subgroup would form and have a significant impact on birth order influences (Klas).

In 1874, Francis Galton published *English Men of Science: Their Nature and Nurture* which continued the debate concerning intelligence and its relation to birth order (cited in Esping, 2003). Galton collected birth order information on 99 men from various scientific fields. Forty-eight percent of these eminent men were considered firstborn, leading him to believe that firstborns were typically more successful than laterborns. Importantly, Galton did not include any female children in his count for birth order; therefore, a subject could have been considered firstborn even if he was the fifth child, as long as the older four siblings were female (Esping).

Studies, many from the 1970s and 1980s, have supported Galton's conclusions. Firstborns have been overrepresented among prominent psychologists (Terry, 1989), classical music composers (Schubert, Wagner, & Schubert, 1977), and Nobel Peace Prize recipients (Clark & Rice, 1982). Later born children have been reported to be more creative than their firstborn siblings and more likely to become revolutionary leaders and scientists (Sulloway, 1999; Simonton, 1999). Interestingly though, more current cross-sectional studies have supported the notion that as birth order increased and more children were born into a family, those children born later would exhibit lower intelligence quotients (IQ), whereas longitudinal studies often found no relationship between intelligence and birth order (Berbaum & Moreland; Retherford & Sewell; Rodgers et al.; Schooler; cited in Esping, 2003; Rodgers et al., 2000).

In a more recent study by Paulhus, Trapnell, and Chen (1999), students and adults were asked to rate themselves and their siblings on dimensions of achievement and personality. Across data sets, it was found that firstborns were rated as highest achieving, whereas laterborns were rated as more rebellious and agreeable. These results seem to support conclusions made by researchers from the earlier 1900s. However, the Paulhaus et al. study does not necessarily indicate that firstborns are smarter or have greater intelligence, but rather were perceived as having higher achievement.

Although some studies have suggested birth order and intelligence are related (Esping, 2003; Rodgers et al., 2000), it has not been determined whether the relationship is direct or indirect. According to Rodgers et al., birth order does not directly decrease the intelligence of later born children. Previous research that claimed there was a direct relationship between intelligence and birth order had fundamental problems with methodology, thus yielding mistaken correlations between birth order and IQ (Rodgers et al.). Therefore, birth order may indirectly relate to academic success or difficulty. There are various explanations.

According to Francis Galton, firstborn sons are more likely to gain financial resources; consequently, they have a greater ability to continue their education, thereby raising IQ scores (cited in Esping, 2003). Another explanation, reported by Galton, is that firstborns are often more eminent because they are more likely to be treated as companions by parents, which often instills responsibility in children. Also, firstborn children frequently gain more attention and nourishment in families with limited resources than their younger siblings (Esping).

More modern explanations include the Resource Dilution Model, proposed by Blake in 1981 and elaborated by Downey in 2001, and The Confluence Model, proposed by Zajonic and Markas in 1975 and Zajonic in 1976 and 2001 (cited in Esping, 2003). The Resource Dilution Model assumes that firstborns have the luxury of accessing 100% of their parents' resources until their siblings arrive. When families grow, the financial resources are divided accordingly, reducing the parental resources received by any one child (Blake, 1981). The Confluence Model attributes a changing intellectual environment within the family as the connection between birth order and IQ. Firstborns do not have to share the attention of their parents and are typically exposed to more adult language. Zajonic (2001) reported that the linguistic environment often becomes less mature as more children are introduced to the family. Furthermore, firstborns often assist parents in teaching and raising later born children. Teaching has been known to increase verbal abilities and helps firstborns cognitively process information. Factors such as socioeconomic status and parental IQ may also be responsible for the link between birth order and IQ (Zajonic).

Birth order and family size are interrelated concepts. As birth order increases, so does family size. A classic study by Belmont and Marolla (1973), using scores from a Dutch version on the Raven Progressive Matrices, a tool designed to measure an individual's ability to form perceptual relations and to reason by analogy, determined that firstborns not only scored higher than laterborns, but a slight gradient of declining scores occurred as birth order and family size increased. It was reported that, as family size increased, scores decreased within any birth order position. The study also determined

that children from larger families obtained lower scores on measures of intelligence as well as on educational measures, even when measures of social class were controlled. The Belmont and Marolla study revealed that academic success is not only impacted by birth order, family size is also a factor.

Although research has demonstrated that family size is related to lower achievement, other research indicates that increased family size has no affect on achievement. According to Rodgers et al. (2000), the National Longitudinal Study of Youth determined that large family size does not necessarily result in children with lower IQs. The study examined a large national sample of families for 22 years. Children's academic performance was reviewed several times throughout each year. It was determined that many of the links between birth order/family size and intelligence might be due to problems with research methodology. The authors concluded it is simply wrong to believe that birth order acts directly to decrease the intelligence of later born children. The study suggests that parental IQ, family environment, and genetic heritage likely contribute to the relationship between family size and IQ (Rodgers et al.).

The possibility that parents with lower IQs tend to have more children than parents with higher IQs has been discussed; however, that would suggest that the mean IQ score for the population would be declining over time. Instead, IQ scores have been rising (Esping, 2003). Despite various explanations, the trend for larger families to bear children with lower IQs seems to remain consistent regardless of the research approach (Rodgers et al., 2000).

Summary of Birth Order and Family Size. The debate regarding birth order and family size and their relation to development, achievement, and intelligence has a long

history. According to Esping (2003), firstborns have been overrepresented among prominent individuals in many occupational areas. Further, Rodgers et al. (2000) reported the trend for larger families to bear children with lower IQ has been confirmed. Various explanations may help to explain this link. For example, children from smaller families may have more financial and emotional resources, children from smaller families may have a more sophisticated linguistic environment, and parents with lower IQ may have more children (Esping). Nevertheless, studies reveal that directly or indirectly, birth order and family size can be predictors of academic achievement in children, but controversy remains.

Family structure

Varying family structures are also important to examine as potential risk factors for poor achievement. Family structure, in the literature, is defined as the number of adult caregivers a child lives with and the relationship of those caregivers to the children (Oman et al., 2007). A traditional family structure would encompass a biological mother and father who are married. Today's family can be very different. Currently, around 36% of all marriages in the United States end in divorce (National Center for Health Statistics). According to data from the U.S. Census Bureau, the annual national divorce rate has dropped recently to 3.6 per 1,000 people, which is the lowest rate since 1970 ("The State of Divorce," 2007). Nevertheless, many marriages end in divorce; and, of those that do, it is likely those families will experience failed subsequent marriages (Chiappori & Weiss, 2007). Further, the number of couples who are not married but living together has increased, diversifying living arrangements in many families ("The State of Divorce," 2007). This trend is also true across other western countries.

According to research conducted by the Economic and Social Research Council in the United Kingdom, the rise of divorce rates, rise in re-parenting, decline in marriages, rise in cohabitation, and increase in births to unmarried parents results in children living in a variety of familial situations (Tarko, 2006).

Numerous studies provide evidence that family structure has significant effects on child development (Harper & McLanahan; Henry, Tolan, & Gorman-Smith; Wiesner & Capaldi; Wiesner & Windle cited in Kerr & Michalski, 2007). In fact, parenting is one of the strongest predictors of general academic performance in children (Bradley, Corwyn, Burchinal, McAdoo, & Garcia Coll cited in Burchinal, Roberts, Zeisel, Hennon, & Hooper, 2006). Single parents, remarriage, and stepparents will be discussed in detail below.

Single parents. Research has determined advantages exist for children living in stable, two-parent households (Kerr & Michalski, 2007). Studies have indicated that single parents suffer from considerably more stress than two-parent households (Johner, 2007). Parents under large amounts of stress would conceivably have less time to devote to their child's academic and socioemotional needs. Stress can cause other health issues which can be compounded by the fact that being single has other health-related drawbacks. Depression and poverty are two common disadvantages often associated with single parenting. According to Burchinal et al. (2006), single mothers often have poorer mental health than mothers from two-parent households. Poor mental health can often result in chronic conditions, such as depression. Maternal depression has been correlated with poorer cognitive, academic, and socio-emotional development. Furthermore, poor

health overall is more prevalent with single parents than with two-parent families (Burchinal et al.).

Poor health is especially common for single parents who live in poverty. Research indicates the higher one's socioeconomic status, the better one's overall health (Johner, 2007). As may be expected, poor physical health is more common for single parents with little financial resources than for other single parents with stable resources. In addition, poverty and depression are often interrelated. Single mothers who have little financial resources often experience depressive symptoms, such as hopelessness and powerlessness (Johner).

Single parents are typically more financially burdened than households with two parents. Children born to unmarried parents are especially prone to living in poverty for numerous reasons. Not only do single parents lack the potential of two incomes, single parents typically do not have another individual to share the cost of childcare (Coontz & Folbre, 2002). A study, conducted by Cain and Combs-Orme (2005), found that poverty had a greater impact on caregiving than did family structure, but that single parents with low SES were at high-risk for poor parenting practices. Since single parents often find themselves closer to poverty status, the implications of poverty on children's academic achievement, as discussed previously, are relevant.

The health and economic issues associated with single parenting have effects on children. Literature indicates that children from single parent families had significantly lower academic aspirations than children from two-parent families (Garg, Melanson, & Levin, 2007). Research also suggests that children will have higher achievement when their caregiving environments are stimulating and responsive and provide learning

opportunities (Burchinal et al., 2006). Parents who experience high levels of stress and adversity, as many single parents do, will be less likely to provide stimulating and responsive parenting. Three studies (cited in Burchinal et al.) reported that children who had greater support and responsiveness in the home demonstrated more advanced language and early reading skills through the second grade.

Supervision is another issue in single parent households. According to numerous studies cited in Kerr and Michalski (2007), children in single parent households receive less parental supervision than two-parent households. Not only is supervision important, but parental involvement in the child's life and education is critical to academic success. Two parents are more likely to find the time, resources, and energy to care for their children and be involved in aspects of their lives (Kerr & Michalski). In situations of separations or divorce, the extent that both parents can remain involved in the child's life can impact the child's overall functioning.

Although the research appears to favor two-parent households, it is not completely obvious why children living with single parents are directly disadvantaged. Perhaps the difficulties single parents report (e.g., stress, mental health issues, poverty, etc.) are not necessarily the result of being single, but rather the by-product of experiences that led to the configuration of the one-parent family (Kerr & Michalski, 2007). It could also be argued unstable and potentially violent two-parent homes would not be more advantageous than single parent households without these risk factors.

Remarriage/Stepparents. Single parenting is typically a short term situation considering that two thirds of divorced women and three fourths of divorced men remarry at some point (Bray & Hetherington, 1993). However, the likelihood that subsequent

remarriages will last is minimal. Remarriage divorce rates exceed the divorce rates for first marriages, meaning even more remarriages result in divorce than do first marriages (Chiappori & Weiss, 2007).

Research indicates that remarriage and the addition of another parental figure in a child's life can have positive effects. One benefit to remarriage is the overall financial situation in the home typically improves. Another benefit was established in a study conducted by Turner (2006). Turner determined that single mothers who had been living alone when initially interviewed reported increases in mental well-being if they had gained an adult household member prior to the next interview. However, the living arrangements had no direct effects on depression or emotional well-being when emotional support was accounted for (Turner). These results indicate that in situations where remarriage does not provide increased emotional support, the child would not have the advantage of increased emotional well-being for their custodial biological parent.

According to Kerr and Michalski (2007), although the family's financial situation typically improves with remarriage, it does not necessary translate into increased supervision and harmony in the home. Non-biological parents tend to be less involved in their step-children's lives than are biological parents. Stepparents can also cause conflict between the child and the non-custodial biological parent. Families that result in remarriage are typically more problematic, less cohesive, and more stressful than intact first marriage families (Bray & Hetherington, 1993). There is also the possibility that another divorce could disrupt the family environment. Statistics from 1995 show that before reaching the age of 16, half of children whose parents remarry will experience another divorce (Benson, 1995). Considering the current divorce rates as well as the

number of remarriages that occur (Chiappori & Weiss, 2007; National Center for Health Statistics), the divorce rates of previously divorced parents has likely increased in more recent times. Bray and Hetherington suggest that children from divorced and remarried families exhibit more issues in the areas of achievement, social relationships, and internalizing and externalizing behaviors. A study that researched the effects of family structure on families in Northern Finland determined that children living in reconstructed families and in single parent families exhibited more behavioral problems than those living in two-parent households (Taanila, Ebeling, Kotimaa, Moilanen, & Jarvelin, 2004). Another study, by Harper and McLanahan (2004), used incarceration rates to compare the effects of family structure. It was concluded that even when financial stability was accounted for, children raised in stepparent families typically manage about as well as children in single parent households.

Summary of Family Structure. Research indicates that children living in two-parent households have more advantages than single parent households (Kerr & Michalski, 2007). Single parents have higher rates of poverty and health issues which adversely affect the care they can provide their children (Burchinal et al., 2006; Johner, 2007). Supervision is also less available for children in single parent households (Kerr & Michalski). Remarriage can have positive effects, such as increased financial security and emotional well-being for the biological custodial parent, but overall does not appear to be more advantageous than single parent households (Kerr & Michalski). On average, children function better in two-parent families, but the literature suggests that what may matter most is what happens within the family. Families with the skills and ability to minimize conflict, provide consistency, enforce appropriate boundaries, and support and

nurture children are going to be more successful than any family structure that cannot (Benson, 1995). Single parent families often utilize other support systems such as extended family, schools, neighbors, friends, and church to achieve this ideal.

Curriculum-Based Measurement

As previously discussed, curriculum-based measurement (CBM) is a tool which can be used to directly measure student competency and progress in the basic skills areas in education. Defining features of curriculum-based measures include the focus on direct, repeated measurement of student skills, as well as the capability of determining student performance based on the curriculum taught in the classroom. Often, curriculum-based measures are in the form of probes that can be used to quickly and efficiently assess and monitor student progress (VanDerHeyden et al., 2001).

Utility of Curriculum-Based Measures. Curriculum-based measurement (CBM) began as a tool used by special education teachers to monitor the progress of their students (Deno, 2003). It was used primarily to test the effectiveness of special education interventions. The data was used by special education teachers to evaluate and modify their instruction in an effort to improve their overall effectiveness with students who received special education. As CBM got more popular, criteria were established that made it possible to measure technical adequacy, treatment validity, and the viability of educational programs (Deno).

Currently, CBM is used to assess the growth of students' skills and to effectively gather data to support educational decisions including screening, pre-referral evaluation, placement in special education programs, and formative evaluation. CBM is often used as part of the referral process for students in potential need of special education services

(Deno, 2003). Many schools use teachers as the main referral source for special education, relying on them to be the best judge of student performance. By using CBM as part of the pre-referral and referral process, the practice of referring has become more objective and measurable (Deno).

More recently, CBM data has been used to predict success on high-stakes testing and to measure growth in secondary school programs (Deno, 2003). Hintze and Silberglitt (2005) conducted research looking at the diagnostic accuracy and predictive validity of reading curriculum-based measures (R-CBM) and high-stakes testing. The Minnesota Comprehensive Assessment (MCA) was chosen to represent high-stakes testing in this study. The predictive validity of R-CBM to MCA was significant at all time periods and for all grade levels. The results of this study suggest that R-CBM does have strong validity in predicting high-stakes testing performance. An R-CBM benchmark was also established and led to the ability to predict who would pass the MCA. The findings support the use of R-CBM to predict success in global measures of reading, such as the MCA. The researchers concluded that R-CBM was a proficient method of predicting which students were likely to pass reading portions of high-stakes testing. Furthermore, R-CBM was found to be a successful screener to alert instructors of students at-risk of failing high-stakes tests, which could directly influence intervention and instructional decisions (Hintze & Silberglitt).

A study conducted by Greenwood, Tapia, Abbott, and Walton (2003) used R-CBM to assess reading fluency growth during the early elementary years over a three year period. Greenwood et al. found that students considered high-risk of reading failure progressed more slowly in reading fluency acquisition than typical students. Teachers

determined what students were at highest risk, most of whom received special education programming, had limited English proficiency, or were overall considered to be lowest achieving. It was determined all students increased their reading fluency over time; however, the trajectory of growth slowed the least over the three year period for high-risk students, even though their mean level of growth was lower relative to average and low-risk students (Greenwood et al.). It could be assumed based on these research findings then, that at some point, the growth rates of students at-risk and of typical students would diverge and all students would be at the same level.

Another study used R-CBM to explore differences in growth rates based on student risk factors. Silberglitt and Hintze (2007) concluded that expectations for growth should differ based on the students' initial performance level. Their research determined that the growth rate of students who performed below the 30th percentile in second grade was significantly lower than the average rate of second grade students. This underscores the notion that the gap between the lowest and highest performing students may continue to grow without intensive intervention, at least in the early grades, as it was also established that the real difference in growth was much larger in the earlier grades (2-3) than in later grades (4-6) (Silberglitt & Hintze, 2007).

Psychometric Properties of Curriculum-Based Measurement. As the previously discussed studies show, the reliability and validity of curriculum-based measures have been established through standardized observational procedures (Deno, 2003). The technical adequacy of the measures are rare compared to most informal measures of performance, which make the concepts of reliability and validity hallmarks of CBM. According to Deno, curriculum-based measures are not only easy to teach, score, and

administer, they are also time efficient and can be derived from instructional materials obtained directly from the school. Since curriculum-based measures are standardized, they can be used to compare individual performance to that of a group (Deno).

VanDerHeyden et al. (2001) cautioned that the value of curriculum-based measures relies on the adequacy of their technical properties, as well as the educational and social consequences they have for students. Curriculum-based measures are not free from error; therefore, it may also be helpful for practitioners to implement interventions with students identified by parents and teachers, rather than just those students identified with CBM probes (VanDerHeyden et al.).

Summary of Curriculum-Based Measures. Although CBM began as a tool used primarily by special education teachers, curriculum-based measures are currently used by many personnel in the school setting. The use of CBM is increasing as a tool for screening and identifying students in need of remedial reading instruction, assessing academic achievement, and monitoring academic progress. CBM has often replaced teacher reporting in the pre-referral process for special education, making the practice of referring more objective (Deno, 2003). Curriculum-based measures can also be a useful way for general education teachers to track the progress of their students.

Reading Development and Instruction

To identify children with reading difficulties and to successfully intervene, it is necessary to understand the foundations of reading development. Two reading research initiatives, the National Reading Panel and Big Ideas in Beginning Reading, contributed to knowledge of early reading development and instruction. The contributions of these reading research projects will be discussed below.

Big Ideas in Beginning Reading. Reading specialists at the University of Oregon used over fifty scholarly research articles to identify five factors in reading development: phonemic awareness, alphabetic principle, fluency with text, vocabulary, and comprehension (Big Ideas in Beginning Reading). These factors are interrelated, frequently influence one another; and, in many studies, have high correlations (Juel, Griffith, & Gough, 1986; Kaminski & Good, 1996; Molfese et al., 2006; Morrow, 1999; Peebles, 2007). According to Yop (1992), many of these factors are both prerequisites and consequences for learning how to read. Children must have some of these skills to learn to read, but on the other hand, reading instruction strengthens their knowledge of letters and language; and, these skills therefore, are a consequence of learning to read. Each of the five critical factors is discussed below.

Phonemic awareness refers to the knowledge that words can be broken into smaller units, called phonemes (Juel et al., 1986). When children have developed phonemic awareness, they understand that sounds blended together create words and can segment words using each letter sound (Morrow, 1999). The ability to rhyme words is also a phonemic awareness skill. Wood and Terrel (cited in Molfese, et al., 2006) found that preschool children with solid rhyming skills had significantly stronger reading skills while in grade school.

Print awareness refers to the awareness and recognition of alphabet letters and the sounds of letters, also referred to as decoding or phonics (Whitehurst & Lonigan, 2002). According to Big Ideas in Beginning Reading, knowledge of alphabet letters, letter sounds, and decoding skills are prerequisites for reading words. Further research has determined that letter knowledge in kindergarten strongly predicts first grade reading

achievement (Muter & Diethelm cited in Molfese et al., 2006). Juel (1991) suggests that as letter knowledge and print awareness become more automatic or fluent, so does subsequent reading.

Fluency with text refers the automatic ability to read words connected in text (Big Ideas in Beginning Reading). Reading fluency not only involves the ability to read accurately and automatically, but also the ability to read with expression (Peebles, 2007). Reading research has indicated that reading fluency is a critical factor in overall reading because it is known to affect reading ability and comprehension (Peebles, 2007). Once a reader can effortlessly decode words within text, more energy can be devoted to the higher order skill of comprehension (Big Ideas in Beginning Reading).

Vocabulary, a component of language development, is the understanding of words and what words mean. Vocabulary grows at a rapid rate in early years. Kindergartners and first graders typically know around 2,500-5,000 words, and the rate keeps increasing (Kaminski & Good, 1996). According to Kaminski and Good, the development of language skills is strongly related to later reading skills. Further, vocabulary contributes to fluency, comprehension, and achievement. Vocabulary is both the outcome and precursor to comprehension, since word meanings comprise 70 to 80% of comprehension (Bromley, 2007). Individuals with larger vocabularies understand text better, thus having higher overall achievement.

Comprehension, in relation to reading, refers to an understanding of what has been read. Reading comprehension is a complex cognitive process that involves a connection between the reader and the text that ultimately conveys meaning (Big Ideas in Beginning Reading). According to Juel et al. (1986), the quality of reading depends

exclusively on the quality of reading comprehension. Comprehension is the ultimate goal of reading. Good reading comprehension results in an understanding of the material, which ultimately is the purpose of successful reading (Big Ideas in Beginning Reading). Reading comprehension has come to be known as the "essence of reading" and is critical for both academic learning as well as lifelong learning (Durkin cited in National Reading Panel, 2004).

The National Reading Panel. The National Reading Panel was requested by the United State's Congress in 1997 to conduct research on the development of reading and reading instruction. The National Reading Panel conducted scientifically based research which indicated that both phonemic awareness instruction and phonics instruction are critical in the acquisition of reading skills (National Reading Panel, 2004). This section will discuss each type of instruction.

Phonemic awareness hinges on the premise that children can be taught how to hear, identify, and manipulate the individual sounds in spoken words (Armbruster et al., 2003). Phonemic awareness instruction involves teaching students how to treat speech as an object and shift focus away from the content of speech to the form of speech. It also involves teaching students how to analyze and manipulate the components of speech (Yop, 1992). Phonemic awareness differs from phonics in that it is auditory and does not involve words in print (Big Ideas in Beginning Reading).

Phonemic awareness instruction has been found to be important to the development of reading skills. According to the National Reading Panel (2004), phonemic awareness instruction improved children's ability to read words and

comprehend reading passages. All children, even those at different reading levels benefited from phonemic awareness instruction (National Reading Panel).

Because research shows that phonemic awareness instruction is important to reading development, the Reading Panel published recommendations. One suggestion was for students to be screened to determine their level of sophistication for phonemic awareness. For those with strong phonemic awareness skills, less time can be spent on phonemic awareness instruction (Armbruster et al., 2003). Children who need more instruction in phonemic awareness might benefit from starting with simpler types of phoneme manipulation (Armbruster et al.). The Reading Panel also recommended that phonemic awareness instruction be conducted in small groups of students, rather than individually or to the whole classroom (Armbruster et al.). Small groups are beneficial because children can learn from hearing each other use and manipulate phonemes and can hear one another respond and get feedback from the teacher. It should also be noted that phonemic awareness instruction should not be considered a complete reading program, but rather a beginning or remedial reading program that is a part of the literacy curriculum (Armbruster et al.).

Phonics instruction is teaching the predictable relationship between sounds and letters in print (Armbruster et al., 2003). Through phonics instruction, children understand how different letters make different sounds and also learn the rules that guide these sounds. Understanding the relationships that exist between letters, sounds, and words allows children to automatically and accurately decode new words.

Even though there has been a debate regarding the teaching of phonics in the field of education, the National Reading Panel contends that knowledge of phonics is critical

in learning to read. Without phonics instruction, children lack a system of recognizing new words, thus limiting their ability to read complex texts (Armbruster et al., 2003). Critics argue that English spellings do not have enough consistencies for phonics instruction to aid in successful reading; however, according to The National Reading Panel, teaching phonics helps students learn to identify words, which leads to meaning attribution. Automatically identifying words and attributing meaning to them is, in essence, reading comprehension (Armbruster et al.).

The National Reading Panel also indicated that phonics instruction be systematic, explicit, and introduced early (Armbruster et al., 2003). Systematic instruction indicates some type of specific plan and sequence of instruction and involves the direct teaching of letter-sound relationships. Explicit instruction refers to phonics instruction that is fully and clearly demonstrated (Armbruster et al.). Both types of phonics instruction have been significantly more effective than no phonics instruction, especially in helping prevent reading difficulties for groups of children at-risk of developing reading problems. Furthermore, systematic phonics instruction was effective for children from all socioeconomic backgrounds (Armbruster et al.).

The Report of the National Reading Panel indicated phonics instruction significantly improved word reading skills for children of low socioeconomic status (SES). A lack of focus on teaching phonics was proven less efficient. Further, phonics instruction is most effective when a student has developed phonemic awareness, which is the ability to understand that the sounds of spoken language work together to create words (Armbruster et al., 2003).

Summary of Reading Development and Instruction. Two large research projects have provided insight into reading development and successful reading instruction. Big Ideas in Beginning Reading determined that phonemic awareness, the alphabetic principle/print awareness, fluency with text, vocabulary, and comprehension are critical factors in reading development. These interrelated skills are the basic foundation of reading development; and, without them, children lack the ability to attribute meaning to letters, use sounds of letters to figure out new words, and ultimately read fluently (Big Ideas in Beginning Reading). According to the National Reading Panel (2004), phonemic awareness instruction and phonics instruction are essential in the process of learning to read. Phonemic awareness and its subsequent instruction has been found to improve children's ability to read words and comprehend reading passages at all different levels of reading (Armbruster et al., 2003). Further, the National Reading Panel indicated that phonics instruction significantly improved word reading skills for children of low socioeconomic status. Instruction less focused on phonics was less effective. Therefore, these two types of instruction may be beneficial in improving the reading skills for all children.

Chapter III: Methodology

The purpose of this study was to determine whether there are differences in reading development between students from different family structure groupings. This chapter will include information regarding how the sample was selected and a description of the sample. In addition, there is a description of the data collection methods and instruments used. Finally, the data analyses will be described.

Subject Selection and Description

A total of 299 students who attended a large school district located in northwestern Wisconsin during the academic years of 2005/2006 and 2006/2007 were participants in this study. The subjects were from six elementary schools within the same district. The study was limited to one set of students who were assessed in kindergarten in 2005/2006 and again in first grade in 2006/2007 using the Dynamic Indicators of Early Literacy Skills (DIBELS). The total elementary student population in 2005/2006 was 4,809 and 4,983 in 2006/2007.

Wisconsin's Information Network for Successful Schools provides demographic information about the elementary population of the district (Wisconsin's Information Network for Successful Schools [WINNS]). The overall elementary population in 2005/2006 was 85.7% Caucasian, 2.1% Hispanic, 2.4% Black, 8.5% Asian, and 1.3% American Indian. In 2006/2007 the student population breakdown by race/ethnicity was as follows: 86% Caucasian, 2.2% Hispanic, 2.2% Black, 8.4% Asian, and 1.1% American Indian. In 2005/2006, 31.8% of students were eligible for the subsidized lunch program. In 2006/2007, 33.2% of students were eligible for the subsidized lunch

program. In 2005/2006, 13% of students were identified as having disabilities. In 2006/2007, 13.2% of students were identified as having disabilities (WINNS.).

Data Collection and Instrumentation

All data for this study was collected by the school district. Permission to utilize the school district's data was obtained from the school district's administration after approval from UW-Stout's IRB committee. Data was coded so no student-specific identifying information was available to the investigator.

In this study, two variables were used. The first variable was *family structure* (i.e., who the student lives with). To gather data on this variable, the school district's registration card was used. When enrolling their children in school, parents were asked about their family structure. They were asked to identify who the child lived with in the home. Options included: both parents, just the father, foster home, joint custody, just the mother, or other. For the purpose of this study, only students who were identified as being in one the following four family structure groupings were used: both parents (both), joint custody situation (joint), just the father (father), or just the mother (mother). Each student's demographic information was coded with a research-specific student ID number to protect student identity. The student ID number was used to match family structure to other variables for data analysis.

The second variable analyzed in this study was *reading level and growth*. The Dynamic Indicators of Early Literacy Skills (DIBELS) was used to assess early literacy skills with this group of students. DIBELS, a form of curriculum-based measurement (CBM), is a set of individually administered standardized measures that relate to early

literacy development (WSPA conference, October 28, 2005). DIBELS probes have been shown to differentiate less skilled students from more skilled students (Manzo, 2005).

DIBELS measures phonemic awareness fluency, the cornerstone for developing successful reading skills (Armbruster et al., 2003). As with all CBMs, DIBELS not only measures a student's phonics and fluency skills at one point in time, but is meant to be administered at different benchmarks over time. By administering at multiple benchmarks, a student's reading growth and development can be measured. Therefore, DIBELS can be helpful in monitoring students' reading skills and alert the need for early intervention, when necessary (VanDerHeyden et al., 2001).

Two DIBELS subtest scores were used in this study: phoneme segmentation fluency (PSF) and nonsense word fluency (NWF). Both were given to the students in the middle and end of kindergarten and in the beginning, middle, and end of their first grade year. Therefore, in total, five benchmarks were used in this study to determine the reading skills of students at different points in time. In addition, the growth of reading levels over these five benchmarks was analyzed.

Phoneme segmentation fluency (PSF) assesses a student's skills in segmenting three- and four-phoneme words into their individual phonemes fluently (Good & Kaminski, 2002). The benchmark goal is 35 to 45 correct phonemes per minute in the spring of kindergarten and fall of first grade. Students who obtain scores below 10 at either benchmark may require intense academic support to achieve benchmark goals. It has been determined that PSF is a good predictor of later reading achievement (Good & Kaminski).

Nonsense Word Fluency (NWF) is an assessment of letter-sound correspondence, the ability to blend letters into words, and generally of the alphabetic principle. Students are asked to read or produce the individual phonetic sounds for each letter for several nonsense words. The benchmark goal is 50 correct letter sounds per minute by the middle of first grade. Students who obtain scores below 30 in the middle of first grade may require intense academic support to achieve benchmark goals (Good & Kaminiski, 2002).

Data Analysis

Several methods were used to analyze the impact of family structure on the DIBELS data. The following is a description of the methods for each research question.

Research Question 1. Is there a difference in reading levels of children from different family structures during the kindergarten and first grade years? The first research question assessed whether there was a difference in reading levels (DIBELS scores) at the five benchmarks between students from different family structure groupings. Using the Statistical Program for Social Sciences, Version 15.0 (SPSS), a one way ANOVA was implemented to compare the mean reading scores of the family structure groups at each of the five data points for both phoneme segmentation fluency (PSF) and nonsense word fluency (NWF). Therefore, comparisons between the family structure groupings were done at 10 reading benchmarks total. Testing for this data analysis used an alpha of .05. Post hoc tests were also used when the F-statistic revealed statistical significance. The post hoc tests further examined which specific family structure groupings were statistically significant from each of the other groupings. Post hoc tests allow individual family structure groups to be compared with each other to determine differences.

Research Question 2. Is there a difference in reading growth and development, from kindergarten to first grade, of children from different family structures? The second research question assessed whether there was a difference in DIBELS scores from the first data point to the last data point between students from different family structures. Statistical comparisons and visual inspections were used to examine this question.

The statistical method involved two steps. First, the average beginning and average end data points were compared for PSF and NWF within each family structure to determine the gain scores for each group. Then, a one way ANOVA, with an F-statistic significance value of .05, was used to determine if the levels of growth were different between the family structure groupings.

Another method for analyzing growth is visual inspection. Visual inspection is a non-statistical method in which trendlines are analyzed to determine the rate of growth. Trendlines summarize the direction and rate of change to allow for the visual understanding of growth (Franklin, Gorman, Beasley, & Allison, 1996). Data points for each benchmark were graphed according to family structure grouping and subtest using Microsoft Excel. Linear trendlines also were added to visually display trends in growth across the benchmarks by family structure.

Research Question 3 and 4. Is there a difference in reading growth and development within the kindergarten year of children from different family structures? To answer this question, the data were analyzed to determine if there was a difference in growth for each family structure during each grade. The average beginning data point for kindergarten and average end data points for kindergarten were compared for PSF and NWF using a paired sample t-test. The significance value of the t-statistic was .05. Then a

one way ANOVA, with an F-statistic significance value of .05, was used to determine if the levels of growth were different between the family structure groupings. The same analysis was done for the first grade data points.

Summary

To determine whether there was a difference in reading development in children from different family structures, both statistical methods and visual inspection were used to analyze the DIBELS data. Data from five benchmarks taken during the kindergarten and first grade years of 299 children who attended school in a large northwestern Wisconsin community were analyzed.

Chapter IV: Results

In order to conclude whether certain family structures can be considered risk factors for low reading achievement, the purpose of the study was to determine whether there were differences in reading development among students from different family structure groupings. Growth in reading achievement from kindergarten to first grade was explored by family structure. Two hundred ninety nine elementary students comprised the sample for this research study. At the start of the year, parents indicated what *family structure* their child was a part of on registration cards. The categories used in this study consisted of the child living with both parents (both), living in a joint custody situation (joint), living with just their mother (mother), or living with just their father (father). Reading level and growth was measured by two subtests from the DIBELS, phoneme segmentation fluency (PSF) and nonsense word fluency (NWF). The data were collected at five benchmark periods. Table 1 reports the cumulative descriptive statistics from these two subtests by family structure group.

Table 1

Descriptive Statistics for PSF and NWF by Family Structure

Test	Family Structure	*N*	Mean	*SD*
PSF-K-Middle	Both	150	24.15	15.345
	Father	7	12.57	11.717
	Joint	14	23.57	16.630
	Mother	48	21.08	18.150
NWF-K-Middle	Both	150	21.80	17.967
	Father	7	10.43	10.596
	Joint	14	18.21	14.176
	Mother	47	14.43	12.047
PSF-K-End	Both	165	35.59	17.223
	Father	7	24.14	21.683
	Joint	14	37.07	14.510
	Mother	55	30.60	16.531
NWF-K-End	Both	164	26.84	20.479
	Father	7	7.43	7.254
	Joint	14	24.93	14.248
	Mother	55	16.02	13.750
PSF-1-Beginning	Both	179	40.80	16.250
	Father	7	27.86	18.925
	Joint	20	43.20	14.311
	Mother	71	34.83	18.138
NWF-1-Beginning	Both	179	35.45	25.001
	Father	7	13.14	12.799
	Joint	20	30.35	17.355
	Mother	71	21.35	16.859
PSF-1-Middle	Both	181	47.28	12.588
	Father	7	42.71	22.194
	Joint	24	47.83	10.965
	Mother	73	39.77	18.436
NWF-1-Middle	Both	181	48.74	27.261
	Father	7	35.00	17.156
	Joint	24	42.50	17.840
	Mother	73	36.70	23.309

PSF-1-End	Both	181	46.43	13.086
	Father	7	41.57	9.947
	Joint	24	50.96	11.292
	Mother	73	39.73	17.026
NWF-1-End	Both	181	59.02	32.077
	Father	7	37.43	18.564
	Joint	24	50.71	23.013
	Mother	72	40.89	22.574

Note. PSF = Phoneme Segmentation Fluency subtest.
NWF = Nonsense Word Fluency subtest

Research Question One

Research question number one asked whether there was a difference in reading achievement scores (DIBELS scores) at five benchmarks between students from different family structures. The two subtests were examined independently by family structure groupings. This question was examined using a one way ANOVA and post hoc tests, as needed.

Table 2 reveals no statistically significant differences between family structure groupings during the kindergarten benchmarks in phoneme segmentation fluency. Yet, there were statistically significant differences for all three first grade benchmarks across family structure groupings for the phoneme segmentation fluency subtest.

Table 2

Analysis of Variance for PSF for Kindergarten and First Grade Benchmarks

Test		Sum Squares	*df*	Mean Square	*F*	*p*
PSF-K- Middle	Between Groups	1140.548	3	380.183	1.486	.219
	Within Groups	54988.283	215	255.759		
PSF-K-End	Between Groups	1856.847	3	618.949	2.127	.097
	Within Groups	68960.780	237	290.974		
PSF-1- Beginning	Between Groups	3031.514	3	1010.505	3.626	.014*
	Within Groups	76072.789	273	278.655		
PSF-1-Middle	Between Groups	3142.416	3	1047.472	5.013	.002*
	Within Groups	58717.991	281	208.961		
PSF-1-End	Between Groups	3335.248	3	1111.749	5.657	.001*
	Within Groups	55223.580	281	196.525		

Note. PSF = Phoneme Segmentation Fluency subtest. *$p < .05$.

For those benchmarks with statistical significance, post hoc testing was conducted to determine which groups were different from each other. Table 3 reports the post hoc analysis for the phoneme segmentation fluency subtest. Results indicated that for the beginning benchmark in first grade, the family structure grouping "both" was statistically significantly higher than "father," with a mean difference of 12.9 points ($p = .045$) and was statistically significantly higher than "mother," with a mean difference of 6.0 points ($p = .011$). The family structure grouping "joint" was also statistically significantly higher than "father" ($p = .037$) and "mother" ($p = .049$) at the beginning of first grade, with 15.3 and 8.4 mean point differences, respectively. For the middle of first grade, the family structure grouping "both" was statistically significantly higher than "mother," with a mean difference of 7.5 points ($p = .000$). At the same benchmark, the family structure

grouping "joint" was also found to be statistically significantly higher than "mother," with an 8.1 mean point difference (p = .018). For the end of first grade benchmark, post hoc tests revealed that the family structure grouping "both" was statistically significantly higher than "mother," with a 6.7 mean point difference (p = .019). The family structure grouping "joint" was also found to be statistically significantly higher than "mother" for the end first grade benchmark, with an 11.2 mean point difference (p = .003).

Table 3

Post-hoc Analysis for PSF

Dependent Variable	Family	Family	Mean Difference	Std. Error	*p*
PSF-1-Beginning	Both	Father	12.942	6.432	.045*
		Joint	-2.401	3.936	.542
		Mother	5.968	2.341	.011*
	Father	Both	-12.942	6.432	.045
		Joint	-15.343	7.331	.037
		Mother	-6.974	6.613	.293
	Joint	Both	2.401	3.936	.542
		Father	15.343	7.331	.037*
		Mother	8.369	4.226	.049*
	Mother	Both	-5.968	2.341	.011
		Father	6.974	6.613	.293
		Joint	-8.369	4.226	.049
PSF-1-Middle	Both	Father	4.562	5.568	.413
		Joint	-.557	3.140	.859
		Mother	7.509	2.004	.000*
	Father	Both	-4.562	5.568	.413
		Joint	-5.119	6.210	.410
		Mother	2.947	5.720	.607
	Joint	Both	.557	3.140	.859
		Father	5.119	6.210	.410
		Mother	8.066	3.401	.018*

		Both	-7.509	2.004	.000
	Mother	Father	-2.947	5.720	.607
		Joint	-8.066	3.401	.018
		Father	4.860	3.884	.825
PSF-1-End	Both	Joint	-4.527	2.502	.393
		Mother	6.705	2.217	.019*
		Both	-4.860	3.884	.825
	Father	Joint	-9.387	4.410	.296
		Mother	1.845	4.255	.999
		Both	4.527	2.502	.393
	Joint	Father	9.387	4.410	.296
		Mother	11.232	3.047	.003*
		Both	-6.705	2.217	.019
	Mother	Father	-1.845	4.255	.999
		Joint	-11.232	3.047	.003

Note. PSF = Phoneme Segmentation Fluency subtest. *$p < .05$.

Table 4 reveals statistically significant differences in reading levels for all five benchmarks, all kindergarten and first grade scores, across family type for the nonsense word fluency subtest.

Table 4

Analysis of Variance for NWF for Kindergarten and First Grade Benchmarks

Test		Sum Squares	*df*	Mean Square	*F*	*p*
NWF-K-Middle	Between Groups	2600.072	3	866.691	3.194	.024*
	Within Groups	58061.561	214	271.316		
NWF-K-End	Between Groups	6738.431	3	2246.144	6.502	.000*
	Within Groups	81521.503	236	345.430		
NWF-1-Beg	Between Groups	12386.518	3	4128.839	8.176	.000*
	Within Groups	137861.850	273	504.988		
NWF-1-Middle	Between Groups	8400.621	3	2800.207	4.324	.005*
	Within Groups	181976.165	281	647.602		
NWF-1-End	Between Groups	18926.375	3	6308.792	7.496	.000*
	Within Groups	235638.734	280	841.567		

Note. NWF = Nonsense Word Fluency subtest. *$p < .05$.

Since statistical significance occurred at all benchmarks, post hoc testing was conducted on all benchmarks to determine where the differences occurred between groups. Table 5 reports the post hoc analysis for the nonsense word fluency subtest. Post hoc tests revealed that for the middle of kindergarten benchmark, the family structure grouping "both" was statistically significantly higher than "mother," with a 7.4 mean point difference ($p = .008$). At the beginning of first grade, the family structure grouping "both" revealed statistically significantly higher scores than both "father" ($p = .011$) and "mother" ($p = .000$), with 22.3 and 14.1 mean point differences, respectively. At the middle and end first grade benchmarks, the family structure grouping "both" continued to display statistically significantly higher scores than "mother," with a 12.0 mean point difference ($p = .001$) at the middle benchmark and with a mean point difference of 18.1

(p = .000) at the end benchmark. There were no statistically significant differences between the average scores of the other groups.

Table 5

Post-hoc Analysis for NWF

Dependent Variable	Family	Family	Mean Difference	Std. Error	p
NWF-K-Middle	Both	Father	11.371	6.369	.076
		Joint	3.586	4.603	.437
		Mother	7.374	2.753	.008*
	Father	Both	-11.371	6.369	.076
		Joint	-7.786	7.625	.308
		Mother	-3.997	6.673	.550
	Joint	Both	-3.586	4.603	.437
		Father	7.786	7.625	.308
		Mother	3.789	5.015	.451
	Mother	Both	-7.374	2.753	.008
		Father	3.997	6.673	.550
		Joint	-3.789	5.015	.451
NWF-K-End	Both	Father	19.413	7.173	.007*
		Joint	1.913	5.175	.712
		Mother	10.823	2.896	.000*
	Father	Both	-19.413	7.173	.007
		Joint	-17.500	8.604	.043
		Mother	-8.590	7.458	.251
	Joint	Both	-1.913	5.175	.712
		Father	17.500	8.604	.043*
		Mother	8.910	5.564	.111
	Mother	Both	-10.823	2.896	.000
		Father	8.590	7.458	.251
		Joint	-8.910	5.564	.111
NWF-1-Beginning	Both	Father	22.304	8.658	.011*
		Joint	5.097	5.298	.337
		Mother	14.095	3.152	.000*

		Both	-22.304	8.658	.011
	Father	Joint	-17.207	9.869	.082
		Mother	-8.209	8.902	.357
		Both	-5.097	5.298	.337
	Joint	Father	17.207	9.869	.082
		Mother	8.998	5.689	.115
		Both	-14.095	3.152	.000
	Mother	Father	8.209	8.902	.357
		Joint	-8.998	5.689	.115
		Father	13.740	9.803	.162
NWF-1-Middle	Both	Joint	6.240	5.528	.260
		Mother	12.042	3.528	.001*
		Both	-13.740	9.803	.162
	Father	Joint	-7.500	10.932	.493
		Mother	-1.699	10.069	.866
		Both	-6.240	5.528	.260
	Joint	Father	7.500	10.932	.493
		Mother	5.801	5.988	.333
		Both	-12.042	3.528	.001
	Mother	Father	1.699	10.069	.866
		Joint	-5.801	5.988	.333
		Father	21.588	7.411	.120
NWF-1-End	Both	Joint	8.308	5.268	.547
		Mother	18.128	3.572	.000*
		Both	-21.588	7.411	.120
	Father	Joint	-13.280	8.444	.601
		Mother	-3.460	7.504	.998
		Both	-8.308	5.268	.547
	Joint	Father	13.280	8.444	.601
		Mother	9.819	5.399	.380
		Both	-18.128	3.572	.000
	Mother	Father	3.460	7.504	.998
		Joint	-9.819	5.399	.380

Note. NWF = Nonsense Word Fluency subtest. *$p < .05$.

Research Question Two

Research question number two asked whether there is a difference in reading achievement growth over time by family structure. This question was answered with both a statistical method and visual inspection. For both phoneme segmentation fluency and nonsense word fluency subtests, the difference between mean beginning and end data points for each student was calculated, and then the differences were compared by family structure. Table 6 reports the growth statistics by phoneme segmentation fluency subtest and nonsense word fluency subtest.

Table 6

Descriptives for Growth Measured from Kindergarten to First Grade for PSF and NWF

		N	Mean Growth	*SD*	Std. Error
Growth-PSF	Both	146	22.164	17.273	1.430
	Father	7	29.000	10.198	3.854
	Joint	14	25.428	17.225	4.604
	Mother	47	21.553	19.556	2.853
Growth-NWF	Both	146	37.383	26.583	2.200
	Father	7	27.000	17.010	6.429
	Joint	14	39.357	20.481	5.474
	Mother	45	28.777	18.300	2.728

Note. PSF = Phoneme Segmentation Fluency subtest. NWF = Nonsense Word Fluency Subtest.

The mean growth for family structure groupings were compared to determine whether the growth of reading achievement between the different family structure groupings varied. This part of the question was examined by using a one way ANOVA. Table 7 reveals no statistically significant differences in growth for either the phoneme segmentation fluency subtest or the nonsense word fluency subtest. Because no statistical differences in growth were found, no post hoc testing was conducted.

Table 7

Analysis of Variance in Growth from Kindergarten to First Grade for PSF and NWF

		Sum of Squares	df	Mean Squares	*F*	*p*
Growth-PSF	Between Groups	474.171	3	158.057	.508	.677
	Within Groups	65339.100	210	311.139		
Growth-NWF	Between Groups	3260.351	3	1086.784	1.817	.145
	Within Groups	124397.513	208	598.065		

Note. PSF = Phoneme Segmentation Fluency subtest. NWF = Nonsense Word Fluency Subtest. $*p < .05$.

In addition, visual inspection summarizes the direction and rate of change of growth for each subtest and each family structure grouping. Figure 1 is a visual representation of mean scores by each family structure grouping at each benchmark for the phoneme segmentation fluency subtest. Figure 2 shows these means with linear trendlines from Excel. These figures indicate that all family structure groupings had a positive rate of growth as time progressed for the phoneme segmentation fluency subtest. Although the family structures of "both" and "joint" groupings displayed the highest scores overall, the family structure grouping "father," appeared to have the highest rate of growth as can be seen by the slopes of the linear trendlines in figure 2. However, earlier statistical tests did not find this apparent difference in trendlines to be significant.

Figure 1.

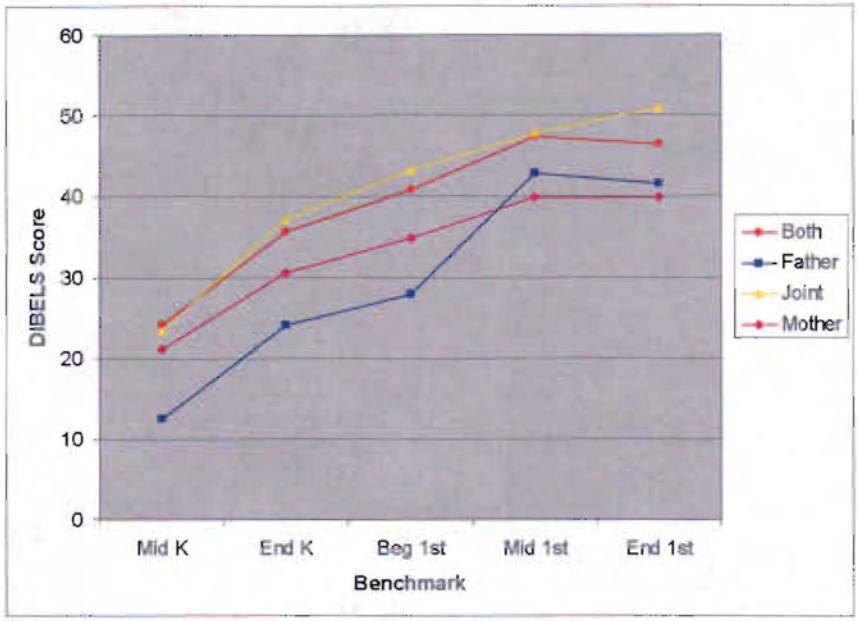

Figure 1. Visual inspection for phoneme segmentation fluency subtest at the five benchmarks.

Figure 2.

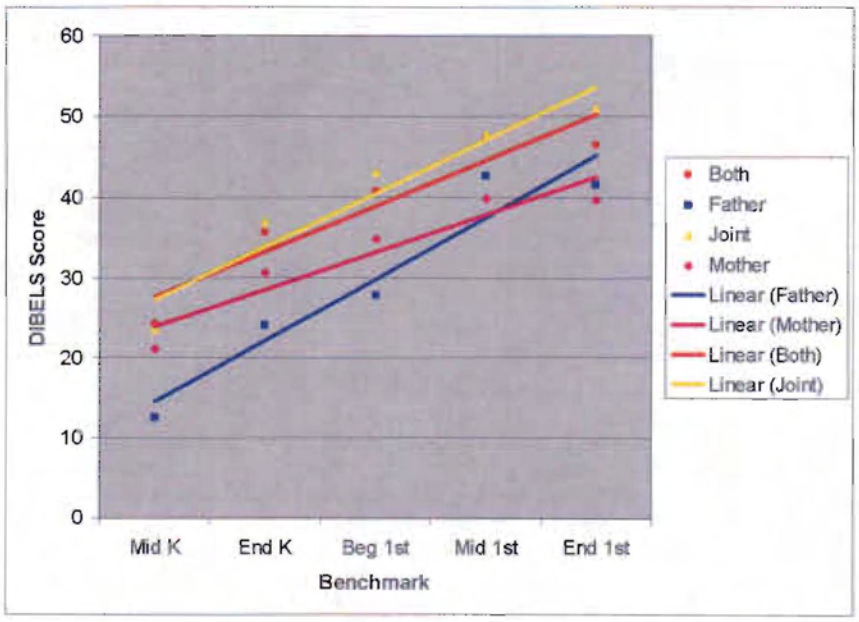

Figure 2. Linear trendlines summarize the direction and rate of change for phoneme segmentation fluency.

Figure 3 is a graph of the mean scores by each family structure grouping at each benchmark for the nonsense word fluency subtest. Figure 4 shows these means with linear trendlines from Excel. The figures indicate that all family structure groupings have a positive rate of growth as time progresses for the nonsense word fluency subtest. Figure 4 indicates that all family structures show very similar trendlines, indicating similar rates of growth for each family structure grouping, from kindergarten to first grade in nonsense word fluency.

Figure 3.

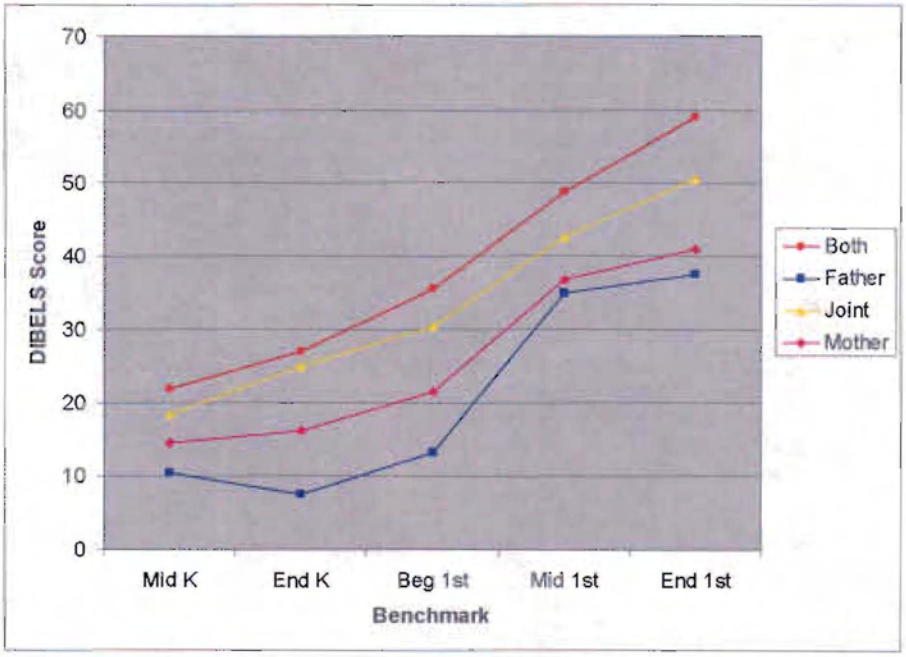

Figure 3. Visual inspection for nonsense word fluency subtest at the five benchmarks.

Figure 4.

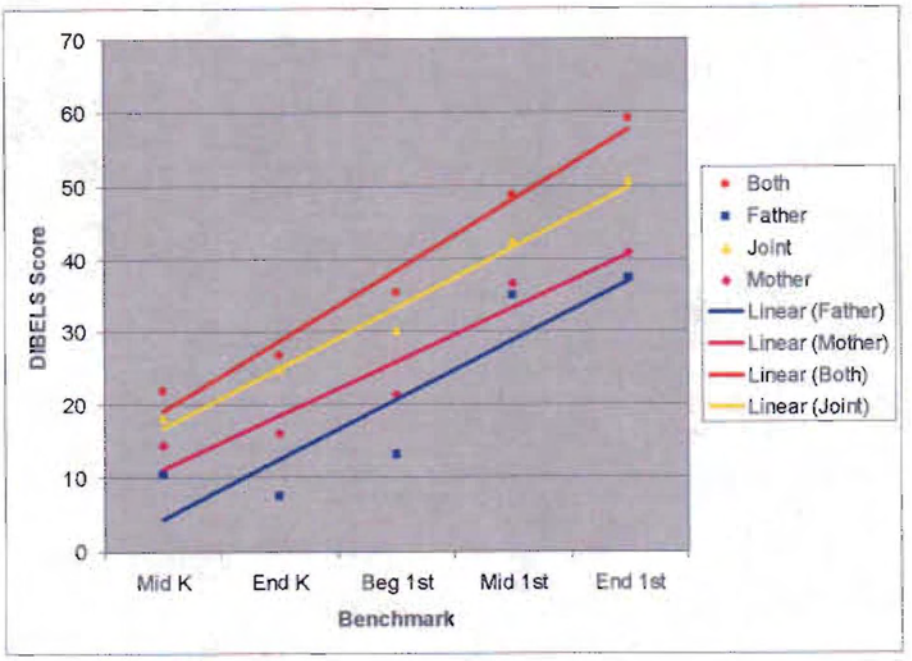

Figure 4. Linear trendlines summarize the direction and rate of change for nonsense word fluency.

Research Question Three

Research question number three asked if there was a difference in reading growth and development within the kindergarten year by different family structures. This question was examined by using a one way ANOVA. Table 8 reports the growth statistics for the kindergarten year by the phoneme segmentation fluency subtest and nonsense word fluency subtest.

Table 8

Descriptives for Growth Measured in the Kindergarten Year by PSF and NWF

		N	Mean	*SD*	Std. Error
Growth-K-PSF	Both	145	12.255	11.626	.965
	Father	7	11.571	18.338	6.931
	Joint	14	13.500	15.230	4.070
	Mother	46	8.587	14.108	2.080
Growth-K-NWF	Both	144	6.181	11.143	.929
	Father	7	-3.000	11.860	4.483
	Joint	14	6.714	9.101	2.432
	Mother	45	1.778	9.414	1.403

Note. PSF = Phoneme Segmentation Fluency subtest. NWF = Nonsense Word Fluency Subtest.

Table 9 reveals no statistically significant differences for the growth in the kindergarten year for the phoneme segmentation fluency subtest, but there were statistically significant differences for the nonsense word fluency subtest.

Table 9

Analysis of Variance in Growth in the Kindergarten Year for PSF and NWF

		Sum of Squares	*df*	Mean Squares	*F*	*p*
Growth-K-PSF	Between Groups	528.999	3	176.333	1.096	.352
	Within Groups	33455.952	208	160.846		
Growth-K-NWF	Between Groups	1156.826	3	385.609	3.369	.020*
	Within Groups	23575.940	206	114.446		

Note. PSF = Phoneme Segmentation Fluency subtest. NWF = Nonsense Word Fluency Subtest. *$p < .05$.

Post hoc testing was used to analyze the difference of growth by family structure for the nonsense word fluency subtest. Table 10 reveals that the family structure grouping "both" was statistically significantly higher than "father," with a mean point difference of

9.18 points (p = .028) and "mother," with a mean point difference of 4.40 (p = .017). "Both" was the same as "joint," with .533 mean point differences.

Table 10

Post-hoc Analysis for Growth in Kindergarten for NWF

	Family	Family	Mean Difference	Std. Error	p
		Father	9.181	4.141	.028*
Growth-K-NWF	Both	Joint	-.534	2.995	.859
		Mother	4.403	1.827	.017*
		Both	-9.181	4.141	.017*
	Father	Joint	-9.714	4.952	.051
		Mother	-4.778	4.347	.273
		Both	.533	2.995	.859
	Joint	Father	9.714	4.952	.051
		Mother	4.937	3.274	.133
		Both	-4.403	1.827	.017*
	Mother	Father	4.778	4.347	.273
		Joint	-4.937	3.274	.133

Note. NWF = Nonsense Word Fluency subtest. *$p < .05$.

Research Question Four

Research question number four asked if there was a difference in reading growth and development within the first grade year by different family structures. A one way ANOVA was used to examine this question. Table eleven reports the descriptive statistics of growth from the beginning to the end of first grade for each subtest.

Table 11

Descriptives for Growth Measured in the First Grade Year by PSF and NWF

		N	Mean	*SD*	Std. Error
Growth-1-PSF	Both	176	5.403	15.960	1.203
	Father	7	13.714	18.936	7.157
	Joint	20	7.750	13.026	2.913
	Mother	71	5.493	13.876	1.647
Growth-1-NWF	Both	176	23.335	23.678	1.785
	Father	7	24.286	11.398	4.308
	Joint	20	23.500	19.568	4.375
	Mother	70	19.842	20.894	2.497

Note. PSF = Phoneme Segmentation Fluency subtest. NWF = Nonsense Word Fluency Subtest.

Table 12 reveals that the growth from the beginning of first grade to the end of first grade is not statistically significant different for either the phoneme segmentation fluency subtest or the nonsense word fluency subtest. Therefore, no post hoc testing was conducted.

Table 12

Analysis of Variance in Growth in the First Grade Year for PSF and NWF

		Sum of Squares	*df*	Mean Squares	*F*	*p*
Growth-1-PSF	Between Groups	548.848	3	182.949	.779	.507
	Within Groups	63429.283	270	234.923		
Growth-1-NWF	Between Groups	659.174	3	219.725	.434	.729
	Within Groups	136294.922	269	506.673		

Note. PSF = Phoneme Segmentation Fluency subtest. NWF = Nonsense Word Fluency Subtest. $^*p < .05$.

Chapter V: Discussion

The purpose of this study was to determine whether there was a difference in reading achievement and development by family structure. Two hundred ninety nine students, during their kindergarten and first grades years, from a Wisconsin school district comprised the sample for this study.

The literature review provided information on how reading acquisition occurs, what tools may be useful in monitoring reading development, and what potential risk factors may impact reading development and achievement. Research indicated that various aspects of the home environment, socioeconomic status, family size, birth order, and family structure can have an impact on reading achievement.

In this study, differences between the reading achievement scores for children living within certain family structure groupings were explored. This study addressed four research questions. A restatement of each research question is followed by a discussion of the results for that question.

Research question number one states the following: Is there a difference in reading levels of children from different family structures during the kindergarten and first grade years? When comparing mean reading scores on two DIBELS subtests at five data points throughout the kindergarten and first grade years by each family structure, each subtest yielded different results. For the phoneme segmentation fluency subtest, no differences were found in the kindergarten year. However, the phoneme segmentation fluency scores were found to be different by family structure grouping at all first grade benchmarks. Further, all benchmarks, in both grades, found statistically significant scores by family structure grouping for the nonsense word fluency subtest. Post hoc analyses

generally indicated that children living with both parents or in joint custody situations fared better in reading than children living with just their mother or father.

This finding is consistent with the literature that suggests children living with both parents generally perform better academically than children living with single parents (Kerr & Michalski, 2007). There is no way to know what consequences of single parenthood account for this difference due to the contributing effects of associated variables (e.g., stress, poverty, lack of supervision, etc.), but there was a stark contrast in the reading scores of children from different family structure groupings, as the literature would predict.

Certain findings pertained specifically to children living with just their mother. For both subtests, children living with just their mothers had statistically significantly lower reading scores than children living with both parents or in joint custody situations, on certain benchmarks. Despite this finding, the differences in scores for children living with the just their father compared to those living with both parents or in joint custody situations were not significant. As indicated earlier, previous research found some disadvantages for children living with just their mother. For example, poor mental health (Burchinal et al. 2006) and poverty (Johner, 2007) were found to be more common for single mothers, both of which have been found to have devastating impacts on achievement and overall well-being of children (Fantuzzo et al., 2005; Papalia et al., 2002).

Research results from this study found evidence that children living in joint custody situations achieved at similar rates as those living with both parents and typically higher than children living in single parent households. These results, too, are consistent

with previous research (Kerr & Michalski, 2007). Literature suggests that two involved parents, which is plausible for dual parent homes and joint custody situations, would have more time, energy, and resources to devote to children than one parent alone. Further, as was found in Kerr and Michalski, positive impacts were noted when both parents remain involved in the child's life after a separation or divorce.

Research question number two stated the following: Is there a difference in reading growth and development, from kindergarten to first grade, of children from different family structures? For both the phoneme segmentation fluency and nonsense word fluency subtests, the beginning and end data points for each child were compared between each family structure grouping to determine growth. When comparing the average overall growth of each family structure grouping to another, no statistically significant differences existed. These results indicated that children from the different family structure groupings had similar rates of growth in reading during their kindergarten and first grade years.

However, results also found children living with both parents or in joint custody situations consistently preformed better at different benchmarks than those living with just their mother or father. This indicates that, although there was the same amount of progress for each family structure grouping, children with both parents involved still performed better by entering with higher scores and finishing with higher scores. These results have implications for practice that will be discussed in detail later.

When examining the data using visual inspection, trendlines revealed that for the phoneme segmentation fluency subtest, children living with both parents and in joint custody situations had the highest end scores overall. Interestingly, however, children

living with just their father appeared to display the sharpest increase in growth. For the nonsense word fluency subtest, all family structure groupings showed similar trendlines, indicating similar rates of growth for children living in different family structures.

Research question three stated the following: Is there a difference in reading growth and development within the kindergarten year of children from different family structures? No significant differences were found for the phoneme segmentation fluency subtest. For the nonsense word fluency subtest, however, children living with both parents had significantly higher growth rates of reading than children living with just their mother or just their father during the kindergarten year. At least for the phoneme segmentation fluency subtest, these findings are somewhat contrary to the literature suggesting growth rate differences are more pronounced in the earlier grades when comparing at-risk students to typical students (Silberglitt & Hintze, 2007).

Research question four: Is there a difference in reading growth and development within the first grade year of children from different family structures? Contrary to the kindergarten results, no significant differences in growth were found during the first grade year. Similarly, this research finding conflicts with the literature on growth rate differences (Silberglitt & Hintze, 2007).

Limitations

This study examined existing data; and, therefore, there were certain inherent limitations. The integrity of the assessment administration, the effort students put into the assessment, and factors that may impact the student on the assessment day (e.g., stress, health, time of day) may have influenced the quality of the data.

The sample size of children living with just their father (n = 7) was very small and may have impacted the comparisons made throughout. When examining the median scores versus the mean scores for statistics involving the family structure grouping "father," there were some differences in scores. As such, the small sample size with one or two outliers suggests that the statistical significance for comparisons made for "father" are not as strong as would be ideal. In addition, this study did not account for situations involving stepparents. It cannot be assumed that just because the parent indicated on the enrollment form that the child lived with only his father or only his mother, there was not another adult in the home. As stated previously, research indicates that family structure and single-parenthood is often associated with poverty (due to the lack of two incomes) and added stress (raising children without the other parent). Since there was no way to determine which children were truly being raised by one parent, those risk factors associated with single parenting may not relate to all children in the "mother" or "father" family structure groupings.

Furthermore, utilizing data from only one school district in the state of Wisconsin limits the generalizability of these results to other parts of United States. The effects of parental education and parental support for education were not evaluated in this study. Knowing these variables would have provided a richer understanding of the climate for education within each family structure environment.

Implications for Current Practice

Research suggests that children function better in two parent families (Kerr & Michalski, 2007), and the results of this study confirm that children living with both parents and in joint custody situations had significantly higher reading achievement

scores than those living with just one parent. However, despite the differences in reading levels, most results indicated all family structures had similar growth rates in reading. These results are encouraging because they indicate that given decent instruction, family structure does not have a negative impact on rate of learning.

The results of this study and others like it are beneficial to the field of education, because being knowledgeable about what students' risk factors are for reading failure can aid early identification. In such, intervention strategies can be employed. The National Reading Panel (2004) and numerous other studies have determined that early intervention is critical in the remediation of reading problems, and programs such as Head Start have eligibility criteria that underscore the importance of certain risk factors that relate to low achievement (National Head Start Association, 2007). One goal of the program is to give children at-risk for school failure a "head start" so they can enter school at the same achievement level as others without certain risk factors. However, because Head Start is a program designed to target at-risk students, it operates differently than public school systems. The difference is that the goal of Head Start is to target populations that have historically had academic struggles, rather than targeting children based on academic performance, as is done within most public school systems (National Head Start Association, 2007).

This study calls into the question the role of public schools. Results indicated no differences in the growth of children from different family structure groupings in the first grade year. Therefore, even though children living with just one parent showed lower achievement at different benchmarks, their growth was similar to that of children living with both parents or in joint custody situations. It is positive that all students made similar

amounts of progress; however, an achievement gap still existed between those with differing family structures at different benchmarks. Without emphasis placed on at-risk students, it seems plausible that the gap between children from single parent families and children that live with both parents will continue unless interventions are put into place at an early stage. Obviously, it is the role of the public school to help all students make progress. But beyond that, is it the role of the school system to close the gap between disadvantaged and advantaged students? If so, school personnel would need to focus on certain students who are at a disadvantage from the start. It benefits schools and society when each student has the opportunity to reach their full academic potential and not be hindered by the disadvantages that create and sustain the achievement gap.

Family structure and other risk factors could be useful indicators to determine which students may be at-risk for developing reading problems. Although time consuming for school districts, screening students who show risk factors could be helpful in determining which children are in need of more intensive interventions. Certainly, all children are broadly monitored for reading achievement and underachievement, yet educators who focus their screening efforts on specific children could offer efficiency and ensure schools are serving those who are most at-risk at an earlier stage of development.

Utilizing screening tools, such as the DIBELS, is a starting point. DIBELS, a form of curriculum-based measurement, has been shown to effectively differentiate less skilled students from more skilled students (Manzo, 2005). DIBELS specifically measures phonological awareness and phonics skills and can therefore be a critical tool to screen and monitor reading failure and progress. Currently, more than 40 states use DIBELS to screen K-3 students for potential reading problems and to monitor their

progress (Manzo). More schools could get involved to have their teachers and other school personnel trained in the DIBELS to target those students at-risk for poor reading achievement. Even though the DIBELS appears to be a good screening tool for identifying those with low achievement in reading, according to Manzo, critics of curriculum-based measures claim that teachers often "teach to the test" and that DIBELS has been over-promoted by the federal government. Debate also has ensued regarding whether or not children are learning to read faster and comprehend better as a result of early screening measures such as DIBELS (Manzo).

Although focusing on children who exhibit risk factors for poor achievement will allow for efficient screening, caution needs to be used with this approach. Considering the controversy over whether poverty, family size, birth order, and family structure influence academic achievement, educators need to be cautious in assuming that the purported risk factors are directly linked to reading difficulty. It may not only be difficult for a public school system to target students with risk factors, it could be interpreted as discriminatory when variables such as family structure are included in the screening process. Lower teacher expectations could contribute to the "self-fulfilling prophesies" of children with risk factors for low achievement. There are also other factors of the home environment that can positively or negatively influence reading achievement and therefore, it cannot be assumed that a child is at-risk necessarily just based on family structure. The aforementioned factors could be useful indicators of at-risk students; however, educational decisions should not be based solely on these factors.

Although it may be unrealistic and unfair to screen and target interventions for children from certain family structure groupings, schools could put programs into place

to assist single parents and families with low SES. After-school programs with homework assistance and/or reading remediation services could be helpful in raising achievement scores. Book donation programs and other enrichment resources for single parents could help to compensate for the risk factors typically associated with family structure and other environmental factors.

Implications for Future Research

Future research should further assess risk factors for reading difficulty. A comprehensive analysis of the factors related to poverty would be helpful in determining what aspects of poverty may directly contribute to academic achievement. Research examining how and why family size often relates to poverty would be beneficial in determining if family size alone contributes to reading failure. Birth order and family size research seems to be somewhat biased and outdated. The current research does not seem to indicate a strong conclusion about how birth order and family size affect reading achievement.

In terms of family structure, more research is needed to better understand the impact of living with both, joint, or just one parent. Other factors should be explored such as overall parental involvement, parenting skills, a focus on education in the home environment, socioeconomic status as it relates to family structure, blended families, the impact of divorce, remarriage, cohabitation, and stepparents. These results can assist families and the courts in making the best decisions for children, should divorce occur in a family unit.

Additional research should focus on the implementation of DIBELS and other curriculum-based measures to further assess their adequacy and usefulness in screening

and monitoring students. The feasibility of this instrument for the use in schools by teachers needs be examined. Interviews could be conducted with educators to better understand the strengths and limitations curriculum-based measures might have in the school setting.

For schools focusing on diminishing achievement gaps, implementing and funding public school programs to provide early intervention to at-risk students would be beneficial in examining the effects and feasibility of such interventions. Developing better initiatives that involve and assist parents might also solve many of the problems that exist with underachievement, or at least begin to do so. Studying the effects of these initiatives would be imperative to determining their success.

Summary

Identifying reading problems in underachieving students early in their education provides the best opportunity to provide interventions (VanDerHeyden, Witt, Naquin, & Noell, 2001). Understanding the risk-factors which relate to reading difficulties can help identify those students in need of screening, tracking, and potential intervention. Poverty, family size, family structure, and birth order are risk-factors which have been studied to differing degrees in the literature.

The current study examines whether students from varying family structures differ in reading achievement and development during their kindergarten and first grade years. Subtest scores from the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) were compared by family structure groupings to determine whether there are differences in reading achievement and development. Results indicate statistically significant higher mean starting and ending scores for children living with both parents

and joint custody situations compared to those just living with their mother or father, indicating family structure is a risk factor for reading difficulty. Rates of growth were similar for all groups, however. Findings were discussed with regard to implications for current and future practice.

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