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Parent Understanding Of K-6 Student Mathematics Performance Using Standards-Based Compared To Traditional Report Cards

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PARENT UNDERSTANDING OF K-6 STUDENT MATHEMATICS PERFORMANCE USING STANDARDS-BASED COMPARED TO TRADITIONAL REPORT CARDS

by

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ABSTRACT

More and more elementary schools are adopting standards-based report cards to report student achievement in an effort to communicate to parents their child's mastery of standards at each grade level. The effect this has on parent understanding of their child's achievement is still uncertain. A survey methodology was used in this quantitative study to examine parents' understanding of their K-6 child's mathematics performance when reported using standards-based compared to traditional report cards. The researcher sought to determine the effect understanding has on parents' probability of providing at-home skill building activities in the areas in which the child is not performing at grade-level. Parents in the upper Midwest region of the United States in two participating elementary schools (one utilizing traditional report cards and the other utilizing standards-based report cards) participated in a survey during 2015-2016 parent-teacher conferences. Results indicated that standards-based report cards more accurately communicate to parents their students' mathematics performance compared to traditional report cards. Additionally, findings showed that as parent understanding increases, so does the probability that parents will provide at-home skill-building activities to their child. The child's grade level was found to significantly contribute to a parent's probability to provide at-home math activities. Results indicated that an increase in grade (age) is associated with a decrease in providing at-home math activities to the child. Final recommendations to schools include initiating or continuing work in developing

and implementing standards-based report cards as well as providing parent training for interpreting new report cards. Recommendations for further research are also presented.

Keywords: standards-based, report cards, elementary school, at-home skill-building, parents, elementary students, mathematics

CHAPTER I

INTRODUCTION

> Schools exist to promote student achievement. In that sense, it is the most valued outcome of schools. If students achieve, schools are seen as working effectively. Grades are supposed to reflect a student's level of success in learning the required material (Stiggins, 1994, p. 369).

Many schools have transitioned from traditional report cards, which report progress as percentages or letter grades from A through F, to the practice of reporting student progress relative to the grade-level standards. The researcher sought to discover parents' level of understanding of their K-6 child's mathematics performance when reported using standards-based versus traditional report cards, as well as factors that may contribute to their understanding. Additionally, the researcher sought to establish if there is a correlation between parents' level of understanding and their probability of providing at-home learning opportunities for their child. For the purposes of this study, standards-based report cards are defined as "an alternative way of reporting student progress which involves assessing student proficiency in alignment with the state/local standards and benchmarks" (Craig, 2011). Throughout this study, parent level of understanding is understood as parents' interpretation of their child's mathematics performance as intended by the teacher.

Statement of the Problem

It may be difficult for today's educators to remember a time before mandated state accountability systems and state standards. In 2001, the No Child Left Behind (NCLB) Act required all states to have one accountability system for all public schools and districts. Each year students are assessed on state grade-level standards in mathematics, reading, English language arts, as well as in science in grades four, eight, and eleven. Results from the mathematics, reading, and English language arts assessments are used to determine schools' and districts' Adequate Yearly Progress (AYP).

The new Every Child Succeeds Act (ESSA) was signed into law on December 10, 2015, by President Obama. ESSA requires states to continue to set high standards and maintain accountability. It differs from No Child Left Behind (NCLB) by "empowering state and local decision-makers to develop their own strong systems for school improvement based upon evidence, rather than imposing cookie-cutter federal solutions" (White House, 2015, p. 1). At the time of this research study, schools were in a transition period. From the researcher's personal experience as an elementary school administrator, schools were advised to continue the programs and services they had in place through this school year and funds were distributed to schools this year based on NCLB guidelines. Under ESSA, states must continue to assess all students on English Language Arts and mathematics in grades three through eight, and once in high school.

Every school receiving Title I, Part A funds must prepare and disseminate an annual school report card. General guidance on this report is provided by the U.S. Department of Education and must include information about public schools related to

student achievement, accountability, and teacher quality. These reports are to be concise and presented in an understandable and uniform format, accessible to persons with disabilities and ideally provided in a language that parents can understand (U.S. Department of Education, 2015). During the school year 2015-2016, schools were in a freeze under the transition to ESSA. This meant that, although schools continued to use a state-mandated test to assess students, results from the assessment did not count for or against a school's Annual Yearly Progress (AYP). States are to identify schools for comprehensive and targeted support for the first time in 2017-2018 (U.S. Department of Education, 2016). Under NCLB and the new ESSA, schools continue to be left on their own to develop standards-based student report cards to report student achievement (Cox, 2011; Munoz & Guskey, 2015). Regardless, more and more schools are developing standards-based report cards as a way to report student progress to parents (Iamarino, 2014). In recent years, researchers have better articulated what constitutes effective standards-based grading and reporting (Marzano & Heflebower, 2011).

Moving away from traditional grading and reporting practices is not without its challenges. Marzano (2000, p. 2) states that "without a doubt, changing the way students are graded alters what people associate with *real school*." Nevertheless, educational researchers and practitioners have been highly critical of traditional grading practices for some time, believing them to be ineffective, antiquated, as well as misaligned with current teaching and learning practices (O'Connor & Wormeli, 2011; Guskey & Bailey, 2010; O'Connor, 2009; Marzano, 2000). Stiggins (2005) describes an outdated system of the past where a student's failure was seen as the student's problem and not the schools; the school's purpose was to provide an opportunity to learn, and students could choose to

take advantage of that opportunity. Under this model, students were the ones truly making the decisions. Those who didn't fare well in the early grades lost motivation as their own perceptions of what they could do decreased. In contrast, students who learned quickly and scored high on assessments increased their confidence and motivation to continue to strive for success. Juxtapose the former system with that of today – schools are held accountable for student achievement (Guskey, Swan, & Jung, 2011; Hamilton, Halverson, Jackson, Mandinach, Supovitz, & Wayman, 2009; McTighe & Brown, 2005). Teachers and administrators have come to realize that students in the bottom rank-order failed to develop the foundational skills in reading, writing, and mathematics necessary to continue to learn, grow, and ultimately compete in a global economy. This understanding is what led to the development of academic achievement standards. Concerns that were already apparent to many teachers and school administrators were brought to the forefront with NCLB legislation. "In asking schools to leave no child behind, society is asking that educators raise up the bottom of the rank-order distribution to a specific level of competence" (Stiggins, 2005, p. 326). Many schools are aligning their reporting practices in an effort to increase parent and student understanding of the child's performance on grade-level standards throughout the school year.

In a comprehensive review of the literature, the researcher was able to find studies examining teachers' and administrators' perceptions and attitudes regarding the implementation of standards-based report cards; however, there was very little research on parents' understanding of their child's report card when reported in a standards-based format. A study conducted in 1994 (Waltman & Frisbie) examined parents' understanding of their children's report card grades at a time before the movement

toward standards-based report cards. The researchers found excessive inconsistency of grade interpretation between parents and teachers. There were also large discrepancies amongst individual teachers regarding the factors that contributed to students' grades. For example, some teachers factored in student effort, work completion, or behavior, while others did not. The study concluded with the statement: "It appears that the typical report card cannot carry enough information to ensure clear communication. It, too, needs transformation" (p. 240). Although this research was conducted prior to standards-based reporting, the study was quite relevant and supports the need to further examine both grading and reporting practices and how those are communicated to parents.

Since the transition from traditional to standards-based reporting, has there been a change in school-to-home communication? This study will contribute to the literature by examining parents' level of understanding of their elementary child's mathematics performance when reported using standards-based compared to traditional report cards.

Purpose of the Study

The purpose of this study was to examine parents' level of understanding of their K-6 child's mathematics performance when reported using standards-based report cards compared to traditional report cards. Furthermore, the researcher sought to determine the effect this has on parents providing at-home mathematics activities for their child. Educators expend extensive time and money to create standards-based report cards to inform both parents and students of student progress along a continuum of proficiency by documenting student mastery of skills within each standard. Administrators, teachers,

students, and parents should be assured that the effort made is having the intended result by providing parents with a clear understanding of their child's academic performance.

Importance of the Study

Increasingly, schools are adopting standards-based report cards to document student achievement in an effort to ensure mastery of standards at each grade level (Cox, 2011; Iamarino, 2014). Schools utilizing standards-based report cards have typically spent considerable time determining the essential (sometimes referred to as "power") standards at each grade level in addition to mapping the curriculum for the school year to make certain critical grade-level information is taught. Standards-based report cards indicate student proficiency of content and skills as they progress through the standards within the grade level (Marzano, 2000). The movement to standards-based report cards is more than just a change of reporting; for some educators, it reflects a completely new way of assessing. Students are no longer graded on a skill or standard once or twice, but rather are given multiple opportunities to show mastery on the standard. Furthermore, standards-based grading has shifted the practice of averaging student work to a model of student growth. Students are able to demonstrate mastery of a skill and not be penalized for earlier work prior to mastery (Ainsworth, 2003; Marzano, 2000). Once a skill is mastered, it is documented as such. For example, a student's report card may indicate a skill was not mastered in quarter one when it was first assessed, but subsequent report cards could show mastery was demonstrated later in the year.

In the age of accountability and commitment to "leave no child behind," educators have turned to standards-aligned reporting to document student achievement (Munoz & Guskey, 2015). One would believe that the movement to standards-based

report cards would subsequently provide parents with a more comprehensive understanding of their child's academic performance. No longer is a parent only seeing the core subject areas such as reading, mathematics, and science listed with letter grades. Instead, a subject such as mathematics may include a list of specific standards with a proficiency scale, identifying the student's academic performance on each standard. A separate scale would be used to identify other factors, such as effort and behavior (Munoz & Guskey, 2015; Marzano, 2000). This type of report provides parents with information about their child's level of understanding of specific standards as well as areas that are in need of improvement. Provided with evidence of where their child is below level, a parent may choose to engage their child in at-home academic activities in those areas.

In many schools today, assessment practices include a number of quick formative assessments and checks for understanding in which students are able to demonstrate their current knowledge of a skill. Opportunities are given to practice the skill(s) before a student is asked to demonstrate mastery through some form of summative assessment. There is a disparity between these measures of student progress to traditional reporting of A's and B's (O'Connor & Wormeli, 2011). The impetus to create standards-based report cards to properly demonstrate student knowledge and skill has increased in recent years (Munoz & Guskey, 2015). To date, 42 states, the District of Columbia, four territories, and the Department of Defense Education Activity (DoDEA) have adopted the Common Core State Standards (CCSS), but state standards have been around long before the Common Core (Achieve, 2013). Furthermore, teachers have used standards-based grading almost as long as there have been standards. Perhaps the CCSS could be said to have aroused a renewed sense of need for educators to assess students' learning progress

towards a performance standard versus comparing them to their peers. Most recent to this study's publication, the Every Child Succeeds Act (ESSA) was signed into law. This bipartisan measure reauthorized the 50-year old Elementary and Secondary Education Act (ESEA). Under ESSA, states are still required to test students in English language arts and mathematics in grades three through eight and once in high school, as well as disaggregate the data for schools, districts, and various subgroups (English language learners, low-income, special education, racial minorities). Each state is required to submit its own accountability plan with goals to address proficiency on reading and mathematics tests, English-language proficiency, and graduation rates (U.S. Department of Education, 2016). While schools will report their school- and district-wide plans and results at the state-level, this research study examines if the way in which schools report individual students' mathematics results affects parents' understanding of their child's achievement. In order to effectively analyze parent understanding, three main research questions were developed.

Research Questions

1. Do standards-based report cards provide parents with a different level of understanding of their child's mathematics performance compared to traditional report cards?
    - Hypothesis 1: Standards-based reporting of student achievement provides parents with a clearer understanding of their child's mathematics performance versus the traditional method of reporting grades as a cumulative grade point average translated to A through F (Guskey & Bailey, 2010; Marzano, 2000).

2. Does parents' level of understanding of their child's mathematics performance predict the amount of at-home mathematics activities they provide their child?
    - Hypothesis 2: Parents receiving their child's mathematics performance data in the form of a standards-based report will utilize it to provide skill-building activities in the areas the child is reported to have not yet mastered (Jeynes, 2012; Green, Walker, Hoover-Dempsey, & Sandler, 2007; Walker, Wilkins, Dallaire, Sandler, & Hoover-Dempsey, 2005).
3. What other parent involvement factors are predictors of parents' probability of providing at-home activities in mathematics (for example, student's success in mathematics, communication with the teacher, volunteering at the school, highest level of education, employment status, and grade of the child)?
    - Hypothesis 3: Parents who believe it is their responsibility to ensure the success of their child's educational growth or who believe their child's academic development is aided by an active partnership with the school are most likely to act upon behaviors that match these beliefs (Reed, Jones, Walker, & Hoover-Dempsey, 2000).

Theoretical Framework

The theoretic framework of this study was developed from a theoretical model of the parental involvement process (Walker et al., 2005). This model examined the factors that motivate parents' involvement practices in their child's education. Their model proposed three major sources of motivation for involvement as seen in Figure 1.

1. Parents' motivational beliefs relevant to involvement, including parental role construction and parental self-efficacy for helping the child succeed in school

2. Parents' perceptions of invitations to involvement, including general invitations from the school (e.g., positive school climate) and specific invitations from teachers and children
3. Personal life context variables that influence parents' perceptions of the forms and timing of involvement that seem feasible, including parents' skills and knowledge for involvement, and time and energy for involvement

(Green et al., 2007)

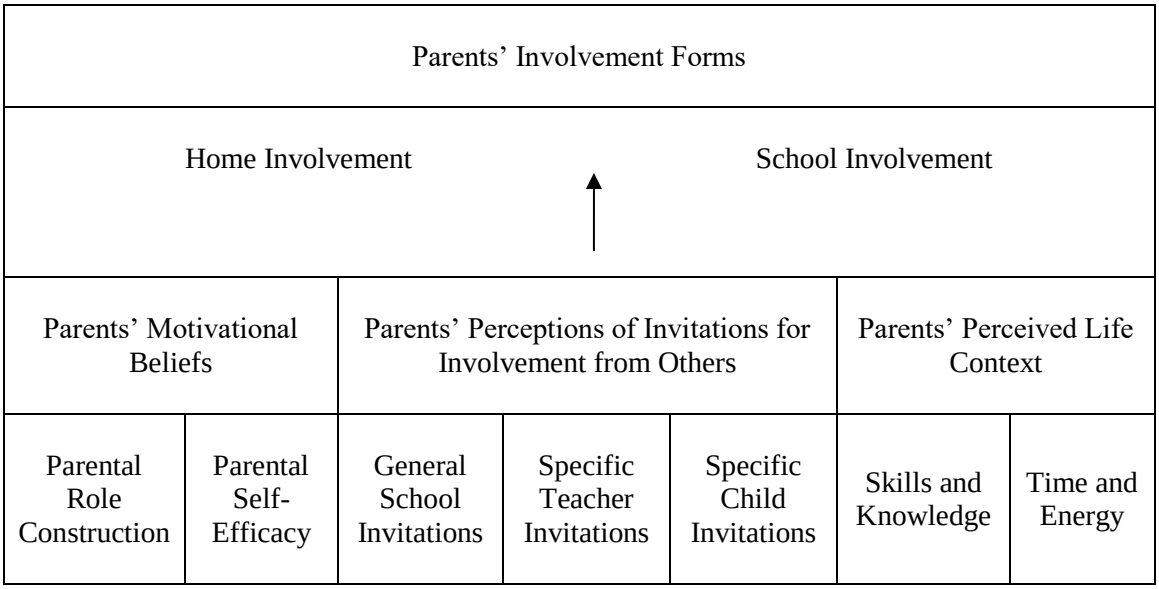

Figure 1. The first level of Hoover-Dempsey and Sandlers' (2005) revised theoretical model of the parental involvement process (Walker et al., 2005).

According to the authors, parents' role in their children's education comes from their own experiences and is subject to social influence (Green et al., 2007). Parents who adopt an active role construction are more involved in their children's education than those with less active role beliefs. Parental-role construction concerns parents' beliefs of what they should do in relation to their child's learning. To act on those beliefs involves parent self-efficacy. When parents believe that their involvement in their children's education is likely to have a positive impact, they are more likely to choose to

become involved (Green et al., 2007). Hoover-Demsey, Battiato, Walker, Reed, DeJong, & Jones (2001) summarized the work of several investigators in regards to why parents become involved in their child's schooling. They found that parents' opinions about homework purposes and their own interest in understanding more effective homework helping strategies were consistent factors. Kay, Fitzgerald, Paradee, & Mellencamp (1994), in their study titled "Making Homework Work at Home: The Parent's Perspective," found that "even where parents have recorded doubts about involvement, their misgivings have been related not to doubts about their capability but often to a lack of adequate information" (as cited in Hoover-Dempsey et al., 2001, p. 201).

Invitations from the school, teacher, and child have been identified as motivators for parental involvement. Likewise, time and energy constraints factor into parents' likelihood to be involved versus parents whose jobs or family responsibilities are more flexible (Green et al., 2007).

According to the theoretical model of the parental involvement process, a parent who is more knowledgeable in a particular content is more likely to assist with homework in that area than in a content area in which they are less knowledgeable. In Hoover-Dempsey and Sandler's 1995 empirical study, they were specifically looking to answer the question, "Why do parents become involved?" (p. 312). The study found three major reasons. Most notably, for this study, is the "[parents'] reaction to the opportunities and demand characteristics presented by both their children and their children's schools" (Hoover-Dempsey & Sandler, 1995, p. 313). Reed et al. (2000) recommend building parents' skills and beliefs to engage in school-based efforts to help children succeed in school. They propose that, in doing so, parents' beliefs that they should be involved in

their children's education increases. However, studies have shown that parent involvement by itself is not enough to create "either sufficient or necessary conditions for children's educational success" (Hoover-Dempsey & Sandler, 1995, p. 322). This is so because children's school-based learning events are much greater indicators of success than home-based or parent-supported activities. Findings from the study (1995) conclude that parental involvement is not necessary or sufficient in itself to ensure positive educational outcomes; yet, the research suggests that some form of parental involvement *is* necessary for school success for many children. Markedly, parental involvement "is most significant in enabling children's accomplishments in skill and knowledge areas where children may be struggling to achieve, and in enabling progress when children come to a roadblock in learning that interferes with continued progress" (p. 322). The authors propose that when typical teaching and learning within the school are not enough for the child to master the concepts, the functions of parental involvement may become crucial to the educational success of the child.

This study aims to establish if there is a link between parents' level of understanding of their child's mathematic performance when communicated through a standards-based report card. Additionally, study findings seek to determine parents' likelihood to provide at-home, skill-building activities in the area(s) in which the child is not at level.

Assumptions

This researcher assumes that respondents will read each survey question carefully and answer them honestly. A statement verifying such is included in the survey as a participant-response check.

Delimitations

Delimitations encompass the boundaries of this study. The researcher makes no claim that findings should be generalized to a broader extent outside of these boundaries. The delimitations of this study include the following:

1. This research was confined to participating public elementary schools in the upper Midwest region of the United States and does not include any charter or private schools.
2. This research study was limited to grades K-6 in two upper Midwest public elementary schools: one school utilizing traditional report cards and the other utilizing standards-based report cards that meet the definition within this study.
3. The study was limited to one year of data: the 2015-2016 school year.
4. The sample size included survey data from parents in only two elementary schools. The study included one school that was solely using traditional report cards to inform K-6 parents of their child's progress in mathematics and one school that was using standards-based report cards to inform K-6 parents of their child's progress in mathematics.

Definition of Terms and Acronyms

The definitions used in this study are based on cohesive explanations among research experts in the field of standards-based teaching and grading including, but not limited to, Robert Marzano, Richard Stiggins, Ken O'Connor, Larry Ainsworth, Thomas R. Guskey, and Jane M. Bailey. Additionally, research methodology definitions are taken from the text *How to Design and Evaluate Research in Education* by Fraenkel and Wallen (2011).

Adequate Yearly Progress (AYP). The measure by which schools, districts, and states are held accountable for student performance under Title I of the *No Child Left Behind Act of 2001 (NCLB)*, the current version of the Elementary and Secondary Education Act.

At-Home Skill-Building. Merriam-Webster defines "skill" as the ability to do something that comes from training, experience, or practice. This study examines whether parents who have an understanding of the mathematics' skills their child has not mastered may provide at-home activities to improve those skills.

Causal-comparative research. Research to explore the cause for, or consequences of, existing differences in groups of individuals; also referred to as ex post facto research (Fraenkel & Wallen, 2011).

Class "A" School. A school classification defined by the High Schools Activity Association (HSAA), specifically for school sports. It is a term that refers to a school with enrollment numbers of 325 or more in grades 9-12.

Class "B" School. A school classification defined by the HSAA. It is a term that refers to school enrollment numbers fewer than 325 students in grades 9-12.

Common Core State Standards (CCSS). A set of academic standards in mathematics and English language arts/literacy (ELA). These learning goals outline what a student should know and be able to do at the end of each grade.

Every Student Succeeds Act (ESSA). The reauthorization of the Elementary and Secondary Education Act, which was signed into law on December 10, 2015, by President Obama.

PowerSchool. PowerSchool is the leading Student Information System (SIS) in North America with over 40 million users including students, parents, teachers, and administrators. The system was established in 1997.

Standards. Statements that indicate what students are expected to know and be able to do in regards to curriculum-area content.

Standards-Based Report Card. **"**An alternative way of reporting student progress to parents that involves assessing student proficiency in alignment with the state/local standards and benchmarks" (Craig, 2011, p. 15).

Traditional Report Card. Report cards that use letter grades (A-F) by averaging a student's percentage scores in each subject area (O'Connor, 2009).

Organization of the Study

This study is organized into five chapters. Chapter I outlines the problem, purpose, research questions, and importance of the study. The theoretical framework for the study is introduced and the assumptions, delimitations, and definitions for the study are discussed.

Chapter II examines six areas of literature related to standards-based education, student reporting, and parent involvement. These include a history of grading practices, an explanation of standards-based grading and reporting, the parents' understanding of report cards, the types of parent involvement, the reasons for parent involvement, the most impactful forms of parent involvement and an examination of parent characteristics.

Chapter III provides an explanation and context for the methodology, population, and data collection procedures. The chapter also includes a description of the research design and ethical considerations.

Chapter IV provides the empirical analysis of the results as they apply to the research questions outlined in the study. Chapter V provides a discussion of the findings and how they could be used to inform educators of the types of information parents obtain from their child's report card when communicated in a standards-based format versus a traditional format. Additionally, the chapter includes conclusions, limitations of the study, implications for practice, and recommendations for further research.

CHAPTER II

REVIEW OF LITERATURE

Introduction

There is copious research concerning report cards and how schools report student achievement. This chapter includes a general synthesis of the literature regarding report cards by providing a history of grading practices from past to present. Next, an overview of standards-based grading and reporting is presented to afford the reader a context for understanding the difference between traditional report cards and standards-based report cards. This includes a summary of current best practices in grading and reporting. Research on parent understanding of report cards is provided related to the two types of report cards used in this study. Additionally, the chapter offers an examination of the various types of parent involvement, factors that contribute to parents becoming involved in their child's education, which types of involvement yield the greatest results, and examines parent characteristics according research in these areas.

History of Grading Practices – Past to Present

Grades have become so commonplace in American schools that it might be hard to imagine not having them. However, grades did not appear until about the 1850s. Before then, most schools were one-room classrooms with education provided to a wide range of age groups within that setting. Generally, students did not stay in school beyond the elementary grades (Hargis, 2003). Teachers documented student progress through narratives or statements of skills and knowledge. The primary purpose of this

documentation was used to show evidence when a student was ready to move on to the next level. Grades were not issued in the form of A through F.

The number of government-supported elementary schools began to increase with a rise in school attendance in the 1850s. The increase in attendance demanded more classrooms, and gradually, students were grouped according to age. Similarly, attendance bourgeoned in high school due to new compulsory attendance laws. The number of high schools increased from 500 to 10,000 between 1870 and 1910 (Hargis, 2003; Kirschenbaum, Napier, & Simon, 1971). The rapid influx of students necessitated a more streamlined approach for grading students; likewise, teachers needed a way to differentiate students of varying abilities. With students primarily grouped with same-age peers, students could now be compared to their peers. One important purpose of this at the time was to track students for colleges and universities; with the increase in students wanting to attend, they needed a system to screen applicants (Hargis, 2003). The model for grouping and grading students has largely remained unchanged.

> For at least 100 years, teachers at almost every grade level have been using grades of some type—letter grades, percentage scores—as the overall indicator of student achievement. Students, parents, and community members also have assumed that these omnibus grades are reliable measures of student achievement. (Marzano, 2000, p. 1)

Recently, trends in grading have moved away from the traditional model of reporting grades as letters A through F or percentage scores back to narrative descriptions or statements of skills and knowledge as done previously in the early 19th century (Hargis, 2003). In his work titled "Grading Policies that Work Against Standards…and

How to Fix Them," Thomas Guskey (2000) points out some questionable grading practices within the traditional model, which include the following: grading "on the curve," which grades students in reference to normative criteria; using grades as a form of punishment (giving students a failing grade resulting in no educational value); and using zeros in grading for late, missed, or neglected assignments. More than ever, educational researchers and practitioners are asserting the need to focus on a broader range of outcomes of student achievement versus averaging student progress solely on points earned on individual assignments (Iamarino, 2014; Stiggins, 2005). Researchers in this area contend that the traditional assignment of a letter grade or percentage results in a "hodgepodge grade" that includes various factors such as achievement, attitude, effort, and behavior (Cross & Frary, 1999; Brookhart, 1994), instead of solely reporting on students' academic performance in the content areas. Research indicates universal agreement that achievement must be reported separately from other factors such as behavior, attitude, and effort (Guskey & Bailey, 2010; O'Connor, 2009; Ainsworth, 2003; Marzano, 2000). One of the most obvious reasons for grades is to provide students and parents with feedback about student achievement. Reeves (2011) asserts that grading is a form of feedback and "that feedback is a very powerful instructional technique—some would say the most powerful—when it comes to influencing student achievement" (p. 11). With this in mind, many schools have made the transition to grading and reporting student achievement through the use of standards-based report cards.

What is Standards-Based Grading and Reporting?

An author of several books regarding transforming grading practices, Robert Marzano states, "A single letter grade or a percentage score is not a good way to report

student achievement in any subject area because it simply cannot provide the level of detailed feedback necessary for effective learning" (2000, p. 106). For this reason, schools today are increasingly developing standards-based report cards to communicate student learning. In education, standards are defined as general statements of what students need to know and be able to do; they are the goals of teaching and learning (Ainsworth, 2003; Guskey & Bailey, 2010). Standards themselves are not new. In his book titled *Basic Principles of Curriculum and Instruction*, American educator Ralph W. Tyler, wrote that before beginning to teach, one must ask two questions: "1. What do we want students to learn and be able to do? and 2. What evidence would we accept to verify that learning?" (1949, p. 3). These questions remain relevant today, over 65 years later.

With the advancement of educational standards in all states, research continues to evolve, examining best practices in grading. A study by Stiggins, Frisbie, and Griswold (1989) was conducted to investigate grading practices in order to advance teacher training in that area. They concluded that grading practices needed to be reevaluated based on their findings in the classrooms, and additionally, that training in sound grading practices was needed for both teachers and principals. From this study, the researchers identified six recommended grading practices summarized here:

1. Grading practices must be clearly stated and be made public.
2. Underlying measures must be valid and reliable.
3. Grades should reflect only the amount (or percent) of required content and skills the student has mastered (i.e., achievement).

4. Factors such as effort, attitude, and attendance should not be measured separately and factored into grades, as they are already reflected in the amount learned by student (achievement).
5. All students should have an equal opportunity to succeed and attain a high grade; a prior distribution of grades (i.e., grading on a curve) is not generally acceptable.
6. Grades should be objective, i.e., reproducible by others using existing records. (Stiggins, Frisbie, & Griswold, 1989, p. 6)

Marzano (2000) looked at Stiggins et al.'s 1989 research as well as three other well-known studies that also examined grading practices. He concluded that all of the research studies favored academic achievement as the primary factor to include in grades. Marzano defines academic achievement as "competence in 1.) The specific subject-matter content, 2.) Thinking and reasoning skills, and 3.) General communication skills" (Marzano, 2000, p. 39). Factors such as effort, behavior, and attention are appropriate areas in which to provide feedback to students, but should be kept separate from grading on academic achievement (Marzano, 2000). Guskey & Bailey assert that when nonacademic factors such as behavior, attitude, and effort are included along with academic achievement in grades, it leads to discrepancies frequently noted between students' grades and their performance on large-scale accountability assessments (2010).

In order to demonstrate the differences between traditional and standards-based grading systems, O'Connor (2009) created a chart contrasting the two as shown in Table 1. In the traditional system, grades are averaged regardless of when they were collected -- a contrast to the standards-based system where students have the opportunity to work

toward mastery and receive credit for their best work. In a standards-based system, teachers ensure that grading reflects individual scores only so it is clear that the grades are a true representation of the individual's work, not the group. Another noteworthy difference between the two systems is how grading is communicated to students. In the traditional system, grading can be quite ambiguous; whereas, when using a standards-based model, teachers communicate the grading scale or rubric with students when giving the assignment.

Table 1. Traditional Grading Contrasted with Standards-Based Grading

	TRADITIONAL SYSTEMS	STANDARDS-BASED SYSTEMS
1.	Based on assessment methods One grade per subject	Based on learning goals/standards One grade for each learning goal/subject grade if necessary
2.	Often norm-referenced or a mix of norm and criterion referenced Percentage system (101 levels) Criteria often unclear or assumed to be known	Criterion-referenced standards Proficiency based (limited number of levels, usually 2 to 5) Publicly published criteria/targets
3.	Uncertain mix of achievement, attitude, effort, and behavior Penalties and extra credit used Includes group scores	Achievement only No penalties or bonuses Individual evidence only
4.	Everything scored included regardless of purpose Homework major factor	Summative assessments only Homework only included if extension or integration
5.	Everything scored included regardless of when Multiple assessments recorded as average, not best	More recent evidence emphasized Reassessment without penalty

Table 1 cont.

	TRADITIONAL SYSTEMS	STANDARDS-BASED SYSTEMS
6	The mean is the measure Grades calculated	Median and mode also used Grades "determined" using professional judgement
7	Varied quality of assessment Some evidence only in teachers' heads	Quality assessments only Data carefully recorded
8	Teacher decides and announces	All aspects discussed with and understood by students

O'Connor, K. (2009). *How to Grade for Learning, K-12 (3rd ed.).* Thousand Oaks, CA: Corwin Press.

"Standards-based report cards are an alternative way of reporting student progress, which involves assessing student proficiency in alignment with the state/local standards and benchmarks" (Craig, 2011). The purpose of grading is to demonstrate to students and parents how well the student has reached the learning objectives of each subject or class. Standards-based report cards represent performance on a continuum of mastery. The ideal standards-based report card provides "enough detail to allow grading and reporting to serve as a road map of student progress in achieving their learning goals" (Munoz & Guskey, 2015, p. 68).

Parent Understanding of Report Cards

The following section includes a review of parent understanding of report cards which is directly tied to this study's first hypothesis. Hypothesis 1: Standards-based reporting of student achievement provides parents with a better understanding of their child's mathematics performance versus the traditional method of reporting grades as a

cumulative grade point average translated to A through F (Guskey & Bailey, 2010; Marzano, 2000).

Little research has been conducted to address how report cards communicate processes and discourses of schools and how parents understand report card discourse (Tuten, 2007). Nonetheless, it is universally understood that the primary purpose of report cards is to report student achievement to parents (Marzano & Heflebower, 2011; Stiggins, 2005; Marzano, 2000). Traditionally, this is accomplished through a list of subjects (for example, math or science) or characteristics on the report with symbols used to describe the student's progress relative to each subject or characteristic. Whether or not the parent receives the message as intended by the teacher(s) is dependent on how well the subjects or characteristics are described and "how well the meanings of the symbols (grades) are conveyed" (Friedman & Frisbie, 1995, p. 5). The issue of report card understanding is actually two-fold. For parents to interpret report cards based on the meanings intended by the teachers, teachers should also be in agreement about how to report student achievement using the report cards. Through research, there is evidence that the meaning of traditional grades (grades reported as A-F) varies greatly from teacher to teacher (Brookhart, 1994). Waltman and Frisbie (1994) provide an explanation for this: grade symbols actually consist of three separate facets. First, a grade compares a student's performance to either a relative standard—a comparison to his/her peers, or an absolute standard—the performance criteria. Second, the grade represents achievement at a certain point in time or it describes growth in achievement over time. Third, a grade reflects only academic achievement, or factors in other non-academic characteristics such

as behavior, attitude, or neatness. The authors of this study from the mid-90s revealed that the information conveyed through the report card from teacher to parent is jumbled.

> Many schools operate as though the symbols in the A-F system have single universal interpretations. And yet, after looking at the descriptions provided on some of the elementary/middle school report cards, it was apparent that this is hardly the case. (Friedman & Frisbie, 1995, p. 25)

The authors point out that there must be a "clear and consistent" understanding of what report card grades represent for the report to be an effective means of communicating student progress (Waltman & Frisbie, 1994, p. 235). Notably, the researchers found a significant difference between parents' and teachers' views of the distribution of grades. It was revealed that across the 16 schools in the study, teachers' average grade assignment for fourth grade mathematics was a B; however, the average grade as perceived by parents was a C+. Therefore, the parent of a child who received a C on his/her report card is likely to believe the child to be performing average or adequate work, when, in reality, a C was one of the lowest grades assigned. Consequently, a study conducted by Randall & Engelhard (2010) documented substantial differences between teachers' grading practices in elementary and middle schools. For the most part, elementary teachers assigned higher grades than their middle school counterparts. The authors found a significant difference ($p < .01$) in overall mean raw grades between elementary (M = 2.35, SD = 1.17) and middle school (M = 2.27, SD = 1.25) teachers. In a discussion about these differences, the authors concluded that "whatever the reasons, it seems that students may be left confused about the meaning of grades as they transition from one grade level to another" (Randall & Engelhard, 2010, p.

184). Likewise, parents may also be left confused. Furthermore, the authors found support for previous research by Jongsma (1991) who reported that simple letter grades or numerical grades do not accurately reflect a student's true academic performance and may be misleading or deceiving. Conclusive with multiple studies previously mentioned in this report, the teachers in Randall & Engelhard's (2010) study were including student behavior and effort in grades on academic achievement leading to the variance in grading practices reported amongst elementary and middle school teachers. Brookhart (2011) explains that with traditional grading practices, one grade often includes effort and behavior; whereas, with standards-based grading practices, one grade sums up achievement on that standard. The use of standards-based grading typically involves several standards with grades reported per subject with effort and behavior reported separately.

A study by McMillian, Myran, & Workman (2002), examining elementary teachers' classroom assessment and grading practices, also established inconsistencies in traditional grading practices. The authors conducted a study of over 900 third, fourth, and fifth grade teachers from varying school sizes. Their results showed that teachers were using a "hodgepodge" of factors when assessing and grading students. "Along with the variety of factors that go into grading, great variations exist within schools concerning the extent to which teachers emphasize different factors in grading students" (p. 212). A troubling discovery was that teachers used academically enabling behaviors (effort, participation, etc.) to a considerable extent to determine grades when other teachers did not. This resulted in vastly different messages conveyed to the students and parents. Students who may not be proficient at the grade level standards could be rewarded for

effort or involvement versus getting appropriate feedback that more accurately indicates their skills and knowledge (McMillian et al., 2002).

Marzano & Heflebower (2011) suggest four best practices for reporting student achievement. The first is to get rid of the omnibus grade and replace it with scoring specific measurement topics in addition to the use of proficiency scales that delineate both the topic and level of complexity being measured. Their second best practice recommendation involves providing scores on measurement topics in addition to the grade if it's not an option in the district to get rid of the omnibus grade. To do so, scores would be translated to letter grades and parents would receive the scores of the specific measurement topics as well as the translated grade. Third, the authors suggest expanding assessment options available to students. They contend that the use of proficiency scales allows for three powerful assessment practices not possible using the 100-point scale system. These include probing discussions, unobtrusive assessments, and self-generated assessments. Lastly, permitting students to continually update their scores on previous measures is considered, by the authors, the most transformational of all grading practices. This involves allowing students to upgrade their scores as the year progresses versus averaging scores into a letter grade.

The work of educators in Kentucky provide perspective on parent understanding of standards-based report cards compared to traditional report cards. The Commonwealth of Kentucky developed statewide, standards-based report cards in grades K-12. Two types of reports were created: an elementary and a secondary. Guskey et al. (2011) conducted a study during one school year to examine parent, student, and teacher satisfaction with the new standards-based forms, compared to the traditional forms of

reporting student progress. The results of their study revealed that both teachers and parents reflected that standards-based report cards provided more and better quality information and was clearer and easier to understand how students were performing. The teachers reported that although the standards-based reporting process was more time consuming, the value added was worth the additional time, responding almost unanimously that the new reports provided better and clearer information to families (Guskey et al., 2011). Table 2 shows the aggregate scores for items on the perception survey conducted by Guskey, Swan, and Jung.

Table 2. Aggregate Scores for Items on Perception Survey.

	Teacher Mean & (Standard Deviation) (n=24)	**Parent Mean & (Standard Deviation) (n=117)**
The amount of information offered	3.50 (.51)	3.41 (.60)
The quality of information provided	3.42 (.50)	3.33 (.56)
The clarity of the information included	3.33 (.48)	3.29 (.62)
The ease of understanding the information presented	3.25 (.53)	3.29 (.64)
The time it takes to complete the reporting process	3.08 (.65)	N/A

Guskey, T. R., Swan, G. M. & Jung, L. A. (2010, July). *Developing a statewide, standard based student report card: A review of the Kentucky initiative*. Paper presented at the annual meeting of the American Education Research Association, Denver, CO.

Through a review of the literature, no specific evidence could be found suggesting a direct correlation between report card understanding and a parent's likelihood to provide at-home activities to support lagging skills. The theoretical framework for the study described in Chapter 1 provides a context for why parents choose to become

involved in their child's education as well as the basis for this research. The types of parent involvement and factors that contribute to parent involvement will be discussed before examining parent involvement factors that have the most impact. Lastly, parent characteristics will be explored.

Types of Parent Involvement

There is considerable agreement amongst researchers that parental involvement in a child's education positively correlates with improved academic success of the child (Collier, Keefe, Hirrel, 2015; Ingram, Wolfe, & Lieberman, 2007; Cai, Moyer, & Wang, 1997; Aronson, 1996). Early on in American education, parents were expected to be involved in the school community, participating in governance roles and curriculum and teacher selection (Hiatt, 1994). The pendulum swung the other way in the 80s and 90s with more limited expectations of parents that mainly comprised of academic support at home and participation in groups like parent/teacher organizations (PTO) for fundraising efforts (Barge & Loges, 2003; Zellman & Waterman, 1998). This left curriculum and school-based decision-making in the hands of school professionals. With federal legislation such as Goals 2000, NCLB, Succeed 2020, and most recently ESSA, there remains heavy emphasis on parent and school collaboration. Domina (2005) writes that "policy makers bill parental involvement initiatives as a tool to reform failing schools, improve students' learning, and reduce class- and race-based gaps in skills" (p. 245). In fact, parent involvement is a key component tied to state and federal funding, such as Title I allocations. Schools that receive Title I funding are required to meaningfully involve parents in planning programs, activities, and procedures. Parents are expected to be full team members involved in decision making. These efforts need to be documented

and reported to the state or federal funding agency. Since there are numerous ways in which parents can be involved, it is important to examine each.

Epstein characterized six types of parent involvement:

Type 1. Parenting: Helping all families establish supportive home environments for children.

Type 2. Communicating: Establishing two-way exchanges about school programs and children's progress.

Type 3. Volunteering: Recruiting and organizing parent help at school, home, or other locations.

Type 4. Learning at home: Providing information and ideas to families about how to help students with homework and other curriculum-related materials.

Type 5. Decision making: Having parents from all backgrounds serve as representatives and leaders on school committees.

Type 6. Collaborating with the community: Identifying and integrating resources and services from the community to strengthen school programs.

(Epstein, 2010, p. 86)

"Because there are many possible activities for each type of involvement, schools must choose which partnership practices are likely to produce specific goals and how to implement the selected activities effectively" (Sheldon & Epstein, 2005, p. 197). The authors also note that schools face unique challenges to reach all families. This may include making sure non-English or Limited-English speaking parents can access information and can communicate back and forth with teachers and administrators.

Studies have shown that the six types of parent involvement yield different results (Fantuzzo, Tighe, McWayne, Davis, & Childs, 2002; Dickinson & DeTemple, 1998; Cai et al., 1997; Mantzicopoulos, 1997). Sheldon & Epstein (2005) contend that if researchers can pin-point which types of parent involvement activities are most promising, educators can select and implement those that are most fitting for their specific student goals.

Factors That Contribute to Parent Involvement

Parents' motivation to become involved is Level 1 of Hoover-Dempsey & Sandler's (1995, 1997, 2005) model of the parental involvement process, which establishes the theoretical framework for this study. Level 1 includes the four variables for involvement: motivational beliefs (role and self-efficacy), perceptions of invitations to involvement (teacher, school, or child), and perceived life context (time and energy; skills and knowledge) and family culture (Walker, Shenker, & Hoover-Dempsey, 2010). Green et. al. (2007) examined the potential of this theoretical model to predict types and levels of involvement of parents of elementary and middle school children. The authors sought to evaluate the predictive power of the model's constructs relative to various influences such as socioeconomic status (SES) and child age on parents' involvement. Parents' home-based involvement was predicted by perceptions of specific child invitations, self-efficacy beliefs, and self-perceived time and energy for involvement. Even when parents' income and education level were included, findings showed that parental involvement is more strongly motivated by features of the social context rather than by socioeconomic status. The research suggests that the model of parents' motivation for involvement may be reasonably applied to parents from varying

socioeconomic backgrounds. The researchers identified two significant implications for practice. Parents' interpersonal relationship with children and teachers are the greatest predictors of parents' involvement in their children's education regardless of SES, their personal beliefs, perceptions of invitations from others, and perceived life context. Second, it is important to define types of parental involvement, specifically home-based and school-based, as it reveals crucial information about how parents' participation in their child's education changes as the child progresses through the grades.

Ice & Hoover-Dempsey (2011) examined the relationship between parents' motivation for involvement in their children's learning, parents' home-based involvement activities, and the proximal achievement outcomes of children. Their study involved assessments of students and parents in the late spring semester and again six months later during the fall semester of the following school year. In the spring, students were in the fourth through seventh grade, and in the fall they were in the fifth through eighth grade. Results from both assessment periods showed that parent-reported invitations to involvement from the child were the biggest predictor of both student- and parent-reported home-based parental involvement. The authors suggest that schools can increase parental involvement opportunities and effectiveness by implementing interventions that target specific child invitations and parental self-efficacy. Their results show that "active parents are strongly motivated to be involved in home-based activities by the belief that their involvement will help their children and by specific invitations to involvement from their children" (p. 364). To support this, schools should offer parent information and training opportunities to boost parental involvement. This is reinforced by a recent study that demonstrates that behaviors we know to be motivators of parental

involvement are also motivators of parental involvement beliefs (Whitaker & Hoover-Dempsey, 2013). In their research to determine school influences on parents' role beliefs, the authors found that "parents' perceptions of school expectations of involvement, the school's climate, and student invitations to involvement predicted parental role beliefs about their own involvement in their student's education" (p. 90). The work of these authors show that although parental role construction and parental self-efficacy for helping children succeed in school are different constructs, they are very much related. Parental efficacy motivates higher levels of focused behavior; in turn, focused behaviors within role construction support the parent's sense of efficacy for helping their child succeed in school. If parents hold the belief that they are supposed to take an active role in their child's education, they are more likely to have increased role behavior. Increased role behavior likely will serve to reinforce efficacy. The work of these authors contributes to this current study because it implies that what schools do to encourage parents' involvement behaviors also serve to embolden affirmative parental beliefs about what they are supposed to do in support of their students' learning. This suggests that schools using standards-based report cards should educate parents on their expectation that parents use the report to determine areas in which to provide at-home skill-building opportunities. In doing so, parents' own beliefs about what they should do may increase.

Most Impactful Forms of Parent Involvement

The types of parent involvement that have the largest impact according to research were examined. This topic relates directly to the second hypothesis in this study: Parents receiving their child's mathematics performance data in the form of a

standards-based report will utilize it to provide skill-building activities in the areas the child is not at-level (Jeynes, 2012; Green et al., 2007; Walker et al., 2005).

A significant discovery in reviewing the literature is that at-home activities provided by parents has one of the largest impacts of all types of parental involvement. A study titled "The Role of Parents in High-Achieving Schools Serving Low-Income, At-Risk Populations" by Ingram, Wolfe, & Lieberman (2007) provides critical insight into this research topic. Ingram et al. collected survey data from 220 parents of children attending three Chicago public elementary schools made up largely of minority and low-income populations. Each school scored in the top third of the Illinois State Achievement Tests. The purpose of their study was to "construct a model of parent involvement that could reliably improve student achievement, even in schools considered at-risk" (Ingram, et al., 2007, p. 480). The study examined Epstein's (1987) six typologies of parent involvement to determine which types had the biggest impact. The results of the study showed that Type I – Parenting and Type IV – Learning at Home were the most common practices of parent involvement in the participating schools. The other four of Epstein's typographies of parent involvement (Communicating, Volunteering, Decision Making, and Collaborating with the Community) did not appear to be linked to students' academic success. In regards to learning at home, the findings indicate schools would be well-served by creating parent-involvement programs that help parents teach children at home. The researcher in this current study suggests this finding may indicate that standards-based report cards that provide information to parents regarding specific areas in which the child is not at-level could be used as a roadmap to parents deciding where to focus at-home activities to boost skills. Likewise, in the Ingram et al. study parents were asked

how they defined their role in children's education and how they interpret the impact of parent involvement on the school. Forty-nine percent of the respondents described working with the teacher and providing learning activities at home. These open-ended responses correlated with Type IV – Learning at Home and indicate parents' willingness to provide at-home learning opportunities, especially when there is direction provided by the school. The authors provided implications and recommendations for parents, teachers, schools, and practice. All of the recommendations focused on improving parenting practices and helping parents provide learning opportunities at home.

Froiland, Peterson, & Davidson, (2012) examined the long-term effects of early parent involvement on eighth-grade achievement and found the indirect effect of home literacy in kindergarten on eighth-grade achievement was significant. At-home parent involvement with their kindergarten child predicted parent homework involvement and grade checking in eighth-grade. Interestingly, the study found that parent involvement in homework and grade checking in eighth-grade has a slightly negative effect on achievement. The authors suggest that parents helping with homework in the middle school actually backfires. This is supported by Hill & Tyson (2009), who suggest that a negative relationship between help with homework and student achievement in middle school may be due to excessive parental pressure, differences between how the material is presented in school compared to at home, or parental interference with students' autonomy. Still, Froiland et al. reported that "elevating early parent expectations is important because the indirect effect for early parent expectations on eighth-grade achievement was twice as large as the indirect effect of early parent involvement" (Froiland et al., 2012, p. 12). Getting parents involved early on strongly predicts parental

expectations in eighth-grade. This has a direct correlation to the expectations that children hold for their educational futures and long-term school achievement.

In order to examine parental involvement best practices, Jeynes (2012) conducted a meta-analysis of 51 studies on the relationship between parental involvement and academic achievement of preschool through grade twelve students. He found that parental involvement programs have a significant impact on academic achievement at all levels. The results of the study showed that both voluntary-initiated parent involvement and school-initiated programs have a positive impact on student achievement. In the past half-dozen years, researchers have found that the most powerful aspects of parental involvement are subtle. Because the studies in this meta-analysis primarily took place before this discovery, Jeynes contends that no meta-analysis can provide insight into "the degree to which the subtle aspects of parental engagement are teachable until there is a rubric shift" (p. 731). Regardless, the author maintains it is important for parents and teachers to understand that schools ought to place heavy importance on parent involvement programs in order to improve academic achievement. But, notable to the present study, "parents who initiate high levels of support are more likely to have an ameliorative effect than those parents responding to a particular support initiative" (p. 731). This finding supports that, by providing parents with a report card that lists mathematics power standards in understandable language, parents may initiate skill-building activities in the areas the child is not at-level.

Parent Characteristics

A review of the literature on parent characteristics specifically examined in this study was conducted. This section ties directly to the study's third hypothesis: Parents

who believe it is their responsibility to ensure the success of their child's educational growth or who believe their child's academic development is aided by an active partnership with the school are most likely to act upon behaviors that match these beliefs (Reed et al., 2000). At-home academic involvement consists of the parent interacting with the child in the home in a focused way connected to the child's schooling (Shumow & Miller, 2001). Numerous studies have been conducted examining the effects of parental involvement on academic achievement (Garbacz, McDowall, Schaughency, Sheridan, & Welch, 2015; Galindo & Sheldon, 2012; Stacer & Perrucci, 2013; Zellman & Waterman, 1998). The researcher in this study aims to better understand if there are specific factors or parent characteristics that contribute to a parent's probability to become involved in his or her child's schooling through home-based activities. Following is a review of the literature on the specific parent variables examined in this study.

School Performance

There is contradicting evidence on whether a child's performance in school plays a factor in a parent's probability to become more involved in home-based supports. According to research conducted on the reactive hypothesis, a term used to describe what some researchers have found to be a negative correlation between parent involvement and academic achievement, higher levels of performance tend to encourage greater levels of parent involvement (McNeal, Jr., 2012). This finding contradicts the reactive hypothesis; however, it provides interesting information as it relates to this current study. "When students begin to suffer academically or become more truant, parents on average tend to disengage with their children" (p. 86). According to Hoover-Dempsey and Sandlers'

(2005) theoretical model of parental involvement, invitations from the child may prompt parent involvement. Invitations may be implicit, meaning parents deduct a need to become involved based on "observations of the student's experience with learning" (Hoover-Dempsey, Walker, Sandler, Whetsel, Green, Wilkens, & Closson; 2005, p. 112). If a child is struggling academically, parents are more likely to monitor schoolwork and offer assistance at home. When parents believe that their involvement in their children's education is likely to have a positive impact, they are more likely to choose to become involved (Green et al., 2007). In a study examining parent involvement and academic achievement, Shumow & Miller (2001) found "the more involved the parents were at home, the more important students thought it was to learn and to perform well in school" (p. 84).

Communication with the Teacher

Hoover-Dempsey and Sandlers' (2005) first level of the theoretical model of parent involvement includes invitations from the teacher. Teacher invitations boost parents' confidence that their involvement efforts are helpful and valued and increase their sense of partnership with the school (Hoover-Dempsey et al., 2005). Some teachers believe that in order to be effective, parents need to be involved in learning activities at home (Epstein, 1986). The roles that teachers and parents are expected to fill have changed throughout time. The idea that schools are a natural extension of the community has decreased in modern years with technological and cultural advancements (Adams & Christenson, 2000). Kohl, Lengua, McMahon (2000) suggest that the quality of the relationship between the parent and teacher might influence the parents' level of school involvement. If parents feel comfortable communicating with the teacher, it may influence their willingness to be

involved (Epstein, 2010; Kohl et al., 2000). Kohl, Weissberg, Reynolds, & Kasprow (1994) found that the quality of parent-teacher relationships was more indicative of positive child outcomes than the amount of parent involvement.

Parent Education

There are conflicting findings regarding parent education level and its association with parental academic involvement. A number of studies have shown a positive association between parent education level and increased at-home involvement (Shumow & Miller, 2001; Dauber & Epstein, 1991). An investigation conducted by Manz, Fantuzzo, & Power (2004) found that parents' completion of high school was associated with higher levels of home-based involvement compared to those who had not completed high school. Parents of children who struggle in school are less involved if they have not graduated from high school compared to parents who have either 12 through 15 years or 16 or more years of education (Shumow & Miller, 2001). Parents with more years of education tend to place a greater value on education and thereby are more involved in home educational activities and have greater self-efficacy regarding their children's education (Waanders, Mendez, & Downer, 2007). Parents lacking in education may be less inclined to be involved because they do not feel confident communicating with teachers and staff due to an absence of knowledge about educational terminology or their own negative educational experiences (Stacer & Perrucci, 2013; Lee & Bowen, 2006; Kohl et al., 2000; Hoover-Dempsey & Sandler, 1995).

Employment

Along with education level, work schedules (employment) have been shown to interfere with a parent's ability to participate in their children's education, both at school

and in the home (Mapp, 2003). Research indicates that "low-income parents face greater non-financial barriers to involvement than do high-income parents, especially in regard to time constraints, paid leave, work flexibility, and parents' views of their role in the education of their children" (Stacer & Perrucci, 2013, p. 341). Associated with employment are parents' perceptions of demands on their time and energy related to their views about involvement in their children's education (Hoover-Dempsey et al., 2005).

Volunteering

Volunteering at the school is a form of parent involvement that has little research to support its merit. Involvement in teaching and learning refers to several things, one being parents volunteering in the classroom. Parent participation in the form of volunteering or Parent Teacher Organization (PTO) membership is more heavily influenced by school characteristics (Feuerstein, 2010). That being said, there is evidence to support schools initiating programs to improve parent participation. Volunteering both in and out of the classroom has been found to be positively associated with academic achievement (Domina, 2005). Domina's research revealed that, combined with other parent involvement activities such as attending parent/teacher conferences and checking homework, the effects on academic achievement were quite substantial.

Child's Grade

There are a considerable number of studies examining parent involvement as children move up through the grades (Garbacz et al., 2015; Manz et al., 2004; Eccles & Harold, 1996). Research fairly consistently shows that parents are more involved in their children's education in school and at-home when their children are in lower grades (Stacer & Perrucci, 2012). Studies have shown that parent-child interactions in the home when

children are young strongly influences children's cognitive development (Galindo & Sheldon, 2012). However, "less is known about whether and how family involvement affects young children's math skill development or achievement" (p. 91). Barnard (2003) investigated the association between parent involvement in elementary school and success in high school. The study took place in Chicago and utilized the Chicago Longitudinal Study (CLS) data. CLS is an ongoing study examining the effects of early intervention. The study utilized parent and teacher ratings of school involvement. Teacher ratings of parent involvement at both the lower and upper elementary grades were significantly associated with the student's highest grade completed. "As the years a teacher rates a parent as participating average or better increases, the highest grade a student completed also increases" (Barnard, 2003, p. 56). The study provides significant findings that support that parent involvement in early childhood education is an important factor to foster long-term effects.

Summary

This chapter provided a review of the literature on the history of grading practices and an overview of standards-based grading and reporting. Standards-based and traditional measures of reporting were contrasted. Additionally, the chapter examined the various types of parental involvement and which are shown to yield the greatest results. Variables that contribute to parent involvement were examined. The next chapter will provide a systematic account of the research methodology used in the study and a detailed description of how the study was conducted.

CHAPTER III

RESEARCH METHODS

Introduction

This chapter sets forth the purpose of the study along with the research questions. The survey methodology is introduced and explained. The research procedures are outlined and include an explanation of how the data were collected and a description of the participants. Each category of the survey instrument is explained. A description is provided for the Standards-Based Report Card Product Rating Scale used to select the participating schools: one school utilizing standards-based report cards and one school utilizing traditional report cards. Data analysis of the quantitative data collected in this study were conducted using IBM SPSS Statistics for Windows, Version 23 (IBM Corp., Armonk, NJ). Finally, a timeline is included to address the administration and data analysis.

Purpose of the Study

The purpose of this study was to examine parents' level of understanding of their K-6 child's mathematics performance when reported using standards-based report cards compared to traditional report cards. Furthermore, the researcher sought to determine the effect this has on parents providing at-home mathematics activities for their child.

Survey Method

This study used a survey methodology, a common method in quantitative research attributable to a survey's ability to gather information from a large target population. A survey is used to study a population (in this case, parents), to describe opinions, attitudes, or trends (Creswell, 2014). The researcher used survey data to draw inferences about the parents' understanding of their child's academic performance when reported using standards-based compared to traditional report cards. A survey methodology was selected as the best way to gather information from a large sample of parents. A sample is known as a subset of a population representative of the whole population (Fowler, 2014). The survey was made up of primarily Likert-type (Likert, 1932) statements that asked respondents to rate their level of agreement or disagreement.

Research Questions

1. Do standards-based report cards provide parents with a different level of understanding of their child's mathematics performance compared to traditional report cards?
    - Hypothesis 1: Standards-based reporting of student achievement provides parents with a clearer understanding of their child's mathematics performance versus the traditional method of reporting grades as a cumulative grade point average translated to A through F (Guskey & Bailey, 2010; Marzano, 2000).
2. Does parents' level of understanding of their child's mathematics performance predict the amount of at-home mathematics activities they provide their child?
    - Hypothesis 2: Parents receiving their child's mathematics performance data in the form of a standards-based report will utilize it to provide skill-building

activities in the areas the child is reported to have not yet mastered (Jeynes, 2012; Green et al., 2007; Walker et al., 2005).

3. What other parent-involvement factors are predictors of parents' probability of providing at-home activities in mathematics (for example, student's success in mathematics, communication with the teacher, volunteering at the school, highest level of education, employment status, and grade of the child)?
    - Hypothesis 3: Parents who believe it is their responsibility to ensure the success of their child's educational growth or who believe their child's academic development is aided by an active partnership with the school are most likely to act upon behaviors that match these beliefs (Reed et al., 2000).

Participant Selection

The first step in participant selection involved collecting report cards from various schools in the upper Midwest. The collected report cards were then rated according to an ordinal rating scale developed by Teresa Craig (2011) in her study examining the effects of standards-based report cards on student achievement. The rating scale is shown in table 3 and was used to categorize report cards as standards-based or traditional. The researcher was granted written permission to use Craig's rating scale (see Appendix A). Traditional report cards are those that use letter grades (A-F) by averaging students' percentage scores in each subject area (O'Connor, 2009). Whereas, standards-based report cards are "an alternative way of reporting student progress to parents that involves assessing student proficiency in alignment with the state/local standards and benchmarks" (Craig, 2011, p. 15). This rating scale was selected by the researcher since it had been

utilized successfully in a previous research study, and it provided clear descriptors based on research.

After applying the standards-based report card product rating scale, two schools were selected for participation in the study. The standards-based report card school met level 4 ratings in each of the four descriptors. The traditional report card school solely used letter grades to identify student performance on the report card.

Table 3. Standards-Based Report Card Product Rating Scale.

	Rating			
	1	**2**	**3**	**4**
Performance Levels	1 overall grade or level, or more than 5 levels are used to indicate progress; Language is ambiguous or unclear on levels	3 levels: Progress levels are limited to only 1 level below proficiency; Language requires more definition or uses comparative language such as below average or superior	4 or 5 levels: Levels indicate progress toward proficiency, proficiency, and above proficiency; Parent friendly language	4 levels: 2 levels to indicate progress towards proficiency, 1 for proficiency and 1 for advanced or excels; Parent friendly language
Failing Grades	Displays an F, zero or other failing designation	Displays indications of no growth or minimal growth in terms that may deter motivation	Language depicts a progression of learning that supports motivation	All language depicts a progression of learning that promotes high achievement as a possibility for all students
Separation of Learner and Social Behaviors	One amalgamated grade/level for student Learner and Social Behaviors	Learner and Social Behaviors are reported as comments on conduct and effort	Multiple Learner and Social Behaviors are reported separately from academics	Learner and Social Behaviors are reported within each content level separately from academics

Table 3. cont.

	Rating			
	1	**2**	**3**	**4**
Standards and Indicators	One content area reported for mathematics	Mathematics reported as strands only, or as more than 12 indicators	Mathematics reported as 4-12 power standards that target critical focus areas for each grade level	Mathematics reported as 7-12 power standards that feature action words and understandable indicators for students and families

(Craig, 2011, p. 132)

Variables

Independent Variable

The independent categorical variable for this study was the type of report card used by each elementary school. The two types of report cards in the study are standards-based and traditional.

Dependent Variable

This study has three dependent variables: parents' understanding of their child's performance in mathematics, parental role construction, and parental self-efficacy. The last two variables are examined together to predict parents' probability to provide at-home mathematics activities.

Survey Development

Construct and Survey Item Development

The development of constructs came from extensive research on parent understanding of report cards and parent involvement at school and in the home. The primary motivation of the researcher was to determine if parents understand standards-

based report cards differently than traditional report cards. This topic was of personal interest to the researcher as an elementary school administrator. In order to best determine "parent understanding," survey items were developed with the purpose of comparing understanding of one type of report card to another. Therefore, the use of the words report card were repeated in each of the six statements related to parent understanding so that survey participants would consider the type of report card used in their respective school while responding to each item. This study focused specifically on mathematics; therefore, the term math was also repeated in each survey item. Bearing in mind the research on information parents would seek to obtain regarding their child's math performance, six survey items were ultimately developed and pilot tested. Information regarding the pilot study follows in the next section.

The second and third constructs, parental role construction and parental self-efficacy, were developed in an effort to determine parents' probability to provide at-home math activities to their child. In chapter two of this study, research was provided on the topics of parental role construction and parental self-efficacy. These two constructs were developed based on Level 1 of Hoover-Demsey and Sandler's (1995, 1997, 2005) model of the parental involvement process. Parental role construction and self-efficacy come from motivational beliefs. Research in these areas shows that although parental role construction and parental self-efficacy are different constructs they are very much related (Whitaker & Hoover-Dempsey, 2013; Ice & Hoover-Dempsey, 2011). Reviewing the literature on these two constructs, the researcher was able to develop and pilot test survey items designed to measure parental role construction and parental self-efficacy. A pilot

study was conducted to test the strength of the survey items to accurately measure the constructs.

Pilot Study

Reliability

A good measure should yield consistent results to be considered reliable (Warner, 2013; Creswell, 2012). A pilot study was conducted by the researcher in October 2015. Seventeen parents participated in the survey at one school in the upper Midwest. The school utilized standards-based report cards in grades kindergarten and first and traditional report cards in grades second, third, and fourth. Internal consistency was sought by determining if parent respondents consistently answered closely related items in the same way. This was examined through percent of agreement results as shown in table 4. Reliability was assessed using Cronbach Alpha. Survey items were created to be continuous (strongly agree to strongly disagree) in order that the alpha (shown in table 6) provided a coefficient to estimate consistency of scores (Creswell, 2012). Construct two was found to have inadequate reliability. This factor was reviewed and improved for the main study which showed evidence of strong internal consistency for all three of the constructs.

Validity

A measure is valid if it accurately provides information about the construct that it is intended to measure (Warner, 2013). In conducting a pilot study, the researcher aimed to determine whether the items used to assess parent understanding, parental role construction, and parental self-efficacy accurately measured parent understanding of report cards and parents' probability to provide at-home skill building activities. The

development of a theoretical framework for the study was the first step in attempting study validity. The theoretical model of the parental involvement process (Walker et al., 2005) examined factors that motivate parents' involvement practices in their children's education. When parents believe that their own involvement in their children's education is likely to have a positive impact, they are more likely to choose to become involved. This research was used as a basis for developing an instrument with face validity in an effort to accurately measure the constructs of parent understanding, parental role construction, and parental self-efficacy.

"Content validity refers to the extent in which the items in an instrument address the full range of the important aspects of the domain being addressed" (Marzano, 2004, p. 2). Empirical studies examining the three constructs were reviewed and survey items were subsequently created to measure these constructs. Another measure the researcher used to achieve content validity was her doctoral advisor and committee. These members periodically reviewed the project and provided specific feedback relative to construct development and the instrument used to measure the constructs.

Finally, a pilot study was used to confirm construct validity. The researcher aimed to determine if scores on items were related in a way that was expected and to test the theoretical model to see if the scores supported the theory as would be expected for valid measures.

Pilot Study Demographics

Of the 17 parents who participated in the pilot survey, 88% were female and 12% were male. Parents' ages ranged from 31 to 46 years old with a mean age of 35 years. Fifty-nine percent of parents work full-time, thirty percent work part-time, and the

remaining eleven percent do not work outside of the home. White parents made up 88%, while Mexican American and American Indian each made up 6%.

Percent of Agreement, Mean, and Standard Deviations for Pilot Study

Table 4 shows the three constructs used as a basis for developing the parent survey and the percent of agreement for each report card type – traditional and standards-based. Construct 1: Parent Understanding results showed all statements in the standards-based category receiving 100% agreement; whereas, 77.8% was the highest form of agreement for traditional report cards and on only one statement. The lowest form of agreement for traditional report cards was statement 6: *Based on my child's report card, I have a good understanding of how he/she is performing in math*. Construct 2: Parental Role Construction results showed all statements in the standards-based category receiving 100% agreement. Statement 7 also received 100% agreement from parents regarding traditional report cards. Statement 8, *I want to know exactly what my child is learning in math*, received the lowest form of agreement (77.8%) in regards to the traditional report card type. Construct 3: Parental Self-Efficacy results showed all statements regarding the standards-based report card having a much higher percentage of agreement. The lowest forms of agreement were on statements 10 and 11 for traditional report cards. Each received only 11.1% agreement.

Table 4. Pilot Study Percentage of Some Form of Agreement by Participants.

Question	% Some Form of Agreement	
C1. Parent Understanding	Traditional	Standards-based
q1. My child's report card tells me how he/she is doing in math.	77.8	100.0
q2. When reading my child's report card, I understand what my child has mastered in math.	33.3	100.0

Table 4 cont.

Question	% Some Form of Agreement	
C1. Parent Understanding	Traditional	Standards-based
q3. I use the report card as a basis for how well my child is doing in math.	55.6	100.0
q4. After reading my child's report card, I understand where he/she is growing in math.	33.3	100.0
q5. My child's report card helps me understand what my child still needs to work on in math.	11.1	100.0
q6. Based on my child's report card, I have a good understanding of how he/she is performing in math.	22.2	100.0
C2. Parental Role Construction	Traditional	Standards-based
q7. I would like to know how to help my child improve his/her math skills.	100.0	100.0
q8. I want to know exactly what my child is learning in math.	77.8	100.0
q9. If I know what my child needs to work on in math, I will provide at home learning opportunities in math.	88.9	100.0
C3. Parental Self-Efficacy	Traditional	Standards-based
q10. My child's report card helps me understand which skills my child needs to improve upon in math.	11.1	100.0
q11. Based on my child's report card, I am able to provide him/her with learning opportunities at home in math.	11.1	100.0
q12. My child's math report card motivates me to work with him/her on math.	55.6	87.5

Table 5. Pilot Study Mean and Standard Deviation for Traditional and Standards-Based Report Card Types.

Statement	Mean & (Standard Deviation)	
C1. Parent Understanding	Traditional	Standards-based
q1. My child's report card tells me how he/she is doing in math.	4.7 (1.1)	5.4 (.5)
q2. When reading my child's report card, I understand what my child has mastered in math.	2.4 (1.2)	5.6 (.5)
q3. I use the report card as a basis for how well my child is doing in math.	3.8 (1.1)	5.0 (.8)
q4. After reading my child's report card, I understand where he/she is growing in math.	2.7 (1.3)	5.3 (.7)

Table 5 cont.

Statement	Mean & (Standard Deviation)	
C1. Parent Understanding	Traditional	Standards-based
q5. My child's report card helps me understand what my child still needs to work on in math.	2.3 (.9)	5.5 (.5)
q6. Based on my child's report card, I have a good understanding of how he/she is performing in math.	3.6 (1.5)	5.3 (.5)
C2. Parental Role Construction	Traditional	Standards-based
q7. I would like to know how to help my child improve his/her math skills.	5.7 (.5)	5.1 (.6)
q8. I want to know exactly what my child is learning in math.	4.4 (1.2)	5.4 (.5)
q9. If I know what my child needs to work on in math, I will provide at home learning opportunities in math.	5.1 (1.6)	5.6 (.5)
C3. Parental Self-Efficacy	Traditional	Standards-based
q10. My child's report card helps me understand which skills my child needs to improve upon in math.	2.2 (1.0)	5.1 (.6)
q11. Based on my child's report card, I am able to provide him/her with learning opportunities at home in math.	2.3 (.9)	5.0 (.5)
q12. My child's math report card motivates me to work with him/her on math.	3.4 (1.2)	4.8 (1.4)

Table 6 shows the correlation between each of the constructs and measures of internal consistency of survey statements addressing each construct. Column 1 lists each construct and Column 2 lists survey statements meant to address each construct in Column 1. Alpha scores for Constructs 1 and 3 indicate high levels of internal reliability among survey statements. The correlations between parents' understanding of their child's progress in mathematics and their likelihood to provide at-home skill-building activities in mathematics (construct 3) was $r = .85$.

Table 6. Pilot Study Correlation of Subscale Constructs and Measures of Internal Consistency for Survey Data.

Construct Number	Subscale Constructs	Question Numbers	C1.	C2.	C3.	α
C1.	Parent Understanding	q1, q2, q3, q4, q5, q6		.13	.85*	.93
C2.	Parental Role Construction	q7, q8, q9			.41	.004
C3.	Parental Self-Efficacy	q10, q11, q12				.86

*$p < .05$

Independent *t*-tests and calculation of Cohen's *d* were conducted using IBM's SPSS, Version 23. The mean of the construct: Parent Understanding for standards-based report cards was higher (5.33) compared to traditional report cards (3.24). $t(15) = .608$, $p < .05$, $d = 3.53$, which is statistically significant.

The mean of the construct: Role Construction for standards-based report cards was higher (5.37) compared to traditional report cards (5.07). $t(15) = .329$, $p > .05$, $d = .66$, which is not statistically significant. The alpha for this construct was also significantly low at $\alpha = .004$. Details on how this construct was further developed for the final instrument is discussed later in this chapter.

The mean of the construct: Self-Efficacy for standards-based report cards was higher *(*4.95) compared to traditional report cards (2.67). $t(15) = .555$, $p < .05$, $d = 3.36$, which is statistically significant.

Pilot Study Factor Analysis

A factor analysis was conducted to assess the construct validity of survey statements. Statements prog_math1, 2, 3, 4, 5, and 6 were high and correlated in Component 1. Statements selfefficacy1, 2, and 3 had a close correlation in Component 2. Statements roleconstruct1 and 3 had a close correlation in Component 3; whereas

roleconstruct2 did not correlate. Roleconstruct2 (q8) did not appear to fit with the construct.

Pilot Study Discussion

Research Question 1. *Do standards-based report cards provide parents with a different level of understanding of their child's mathematics performance compared to traditional report cards?* The percentage of some form of agreement for parents' understanding of their child's progress in mathematics (construct 1) was conducted and displayed in Table 4. Results indicated that parents who receive their child's mathematics performance in the form of a standards-based report card have a better understanding of the child's mathematics performance compared to traditional report cards. All six statements received higher forms of agreement in regards to standards-based report cards and there was statistical significance.

Research Question 2. *Does parents' level of understanding of their child's mathematics performance predict the amount of at-home mathematics activities they provide their child?* The statements in Constructs 2 and 3 were designed to measure parents' probability of providing at-home mathematics activities to their child. The results showed that construct 2 needed further development. Whereas, self-efficacy (construct 3) statements did have a high correlation to parent understanding of report cards and may indicate that parents' understanding of their child's mathematics performance in the form of a standards-based report card predicts the amount of at-home mathematics activities they provide their child.

Revisiting the literature on parental role construction, the researcher revised this entire construct to accurately measure what it was intended to measure for the final

survey conducted in February and March. Revised role construction items can be seen in Figure 2. Additionally, statements were revised, as well as added to, the parental self-efficacy construct in order to ensure enough valid measures of the construct. The pilot study process and findings assisted in the design of the final instrument used in this study shown in Appendix B.

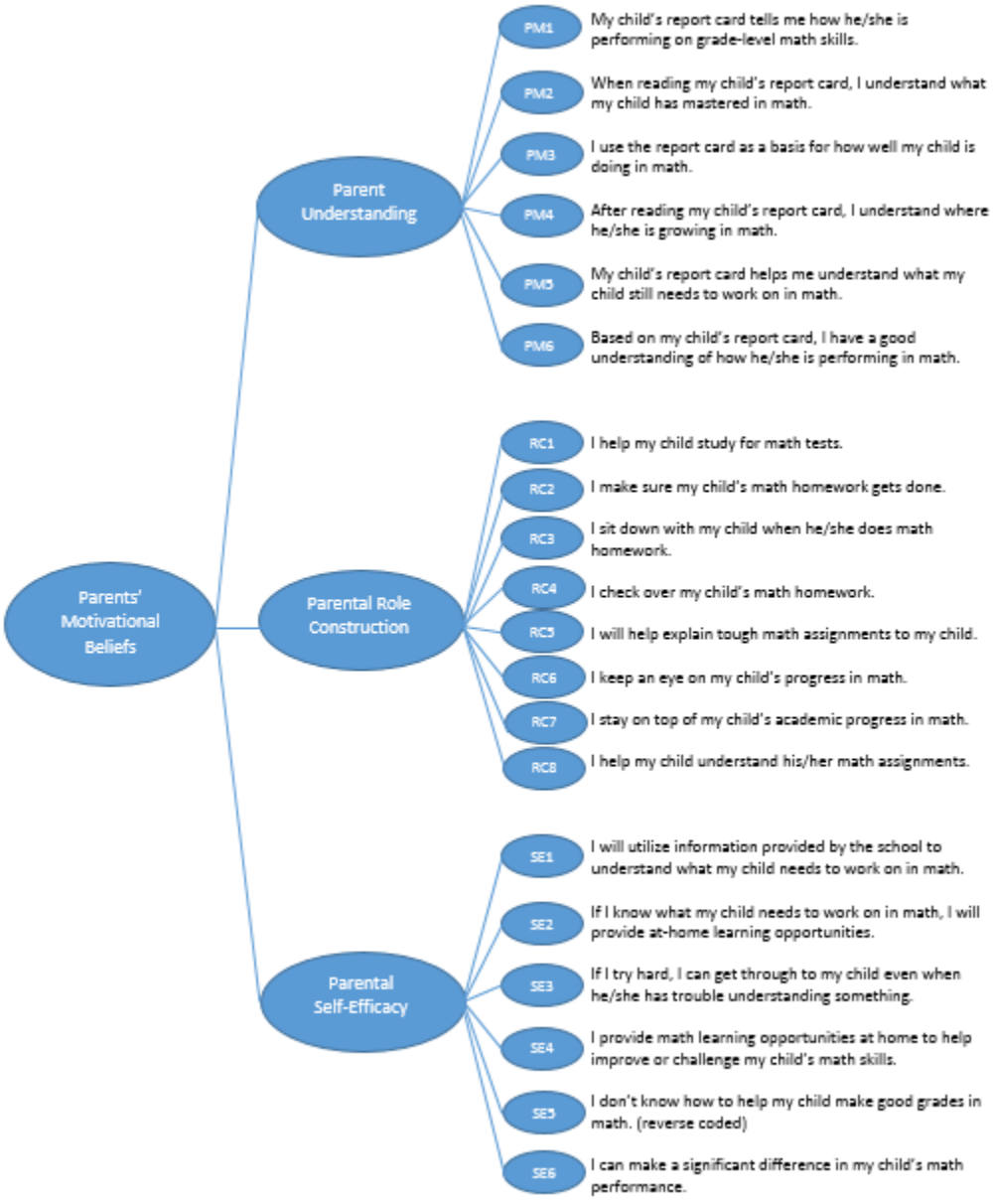

Figure 2. Diagram of Study Constructs. Survey measures developed for the final instrument.

Survey Design

Parent Demographics

Six survey items were related to demographics of the parent respondents. These included gender, age, ethnicity, grade level of his/her child, his/her current employment status, and the parents' level of education.

Parent Variables

Eight survey items were related to parent variables: how closely he/she has read the latest report card, whether or not the parent works in a school, if the parent does work at a school if he/she is a teacher, how often he/she attends parent/teacher conferences, frequency of communication with his/her child's teacher, the most common method used to communicate with his/her child's teacher, if the parent has volunteered at the school in the past year, and most common method of receiving his/her child's academic standing. These variables were established to measure question three of the study. Question three investigates whether there are other parent variables that are predictors of parents' probability to provide at-home activities in mathematics.

Students' Success

Respondents were asked to rate their child's performance in mathematics on a 5-point Likert-type scale with 1 (=significantly below level), 2 (=slightly below level), 3 (=at level), 4 (=slightly above level), 5 (=significantly above level) as anchors.

Parents' Perceptions about Usefulness of Information Regarding Their Child's Progress

Five survey items included the following: report cards, the teacher talking about the student's progress, standardized test results, seeing graded samples of his/her child's

work, and power school to view the student's current grades. All responses were based on a 6-point Likert-type scale with 1(=very useless) to 6 (=very useful) as anchors.

Parents' Understanding of Their Child's Progress in Mathematics

Six survey items were related to parents' understanding of their child's progress in mathematics. These were designed to measure the construct: parent understanding (specifically, how report cards factor into parents' understanding of their child's progress in mathematics). All responses were based on a 6-point Likert-type scale with 1 (=strongly disagree) to 6 (=strongly agree) as anchors.

Parents' Providing At-Home Mathematics Skill-Building Activities

Fourteen survey items were related to this variable. Eight statements were designed to measure the construct *parental role construction*, and six statements were designed to measure the construct: *parental self-efficacy*. The items in this variable were created to determine a correlation between report card understanding results and parents' probability to provide their child at-home mathematics skill-building activities. All responses were based on a 6-point Likert-type scale with 1 (=strongly disagree) to 6 (=strongly agree) as anchors.

Participant-Response Check

One survey item asked respondents whether they have read the questions in the survey carefully and answered them honestly. This statement was based on a 6-point Likert-type scale with 1 (=strongly disagree) to 6 (=strongly agree) as anchors.

Data Collection

Written permission from district administrators to conduct this research project in School B: traditional report card school was obtained on September 28, 2015, and from School A: standards-based report card school on October 10, 2015. The University of North Dakota's Institutional Review Board granted permission for the research on January 6, 2016. The project number is IRB-201601-191. Approval by the researcher's doctoral committee to continue with this research was granted on January 12, 2016.

Report Card Coding

Report cards were rated using the Standards-Based Report Card Product Rating Scale shown in Table 3. Each school's report card type was coded as one of the following: 1 for standards-based and 2 for traditional. The researcher selected a total of two schools to participate in the study – a standards-based report card school and a traditional report card school.

Measures

A criterion group design was used for the coding of the independent variable in this study. A product rating scale (see Table 3) developed by Teresa Craig (2011) was applied in order to sort report cards to establish membership of each school to one of the two categories of report cards types: standards-based and traditional. One school from the traditional category and one school from the standards-based category was selected for participation in the study. A survey instrument was utilized to gather data for the study. The full survey can be seen in Appendix B.

Participants

Participants in this study were parents of elementary school students in kindergarten through sixth grade during the 2015-2016 school year. Parents who participated in this study were those with children attending one of two elementary schools in the upper Midwest region of the United States. Specific information about the parents, including age, gender, race, and other factors is provided in the following chapter.

The standards-based report card school had a K-6 population of approximately 233 students at the time of the study. The district superintendent reported an estimated 80% participation rate in parent/teacher conferences based on typical attendance. This amounts to an estimation that the parents of 186 students were anticipated to attend conferences. Bartlett II, Kotrlik, & Higgins (2001) state that "estimating response rates is not an exact science" (p. 47). They created a sample size determination table with values appropriate for many common sampling problems. Assuming alpha levels of .05, with a population size of 150, the goal sample size would be 65 respondents. The researcher collected surveys from 59 parents the evening of conferences. This equals a response rate of about 32%. Considering that not all parents who attended conferences were guaranteed to pass by the survey distribution table, the researcher was satisfied with the number of completed surveys collected. The researcher was set up in a high traffic area at a main elementary school entrance, but other entrances were also utilized during the evening.

The traditional report card school had a K-6 population of approximately 125 students at the time of the study. The school superintendent also reported an estimated

80% participation rate in parent/teacher conferences based on typical attendance. Thus, it was estimated that the parents of 100 students would attend conferences. Using the same table with an alpha rate of .05, the sample size goal would be 55 respondents. The researcher collected 53 completed surveys from parents during parent/teacher conferences. In this case, the target was narrowly missed. As was true in the standards-based school, the researcher was set up at the main entrance to the elementary school; however, other entrances were utilized during the evening. This school is also connected to the high school, so parents who had children attending grades higher than sixth may have entered the high school door with a potential they may have missed the survey distribution. The authors of the table for determining sample size write that while it is not unusual for researches to have different opinions about targeted sample sizes and the calculation of such, it is important to report on the process so the reader can make his or her own judgement regarding generalizability (Bartlett II et al., 2001).

Procedure

Parents of students attending participating elementary schools in the upper Midwest region of the United States with students in kindergarten through sixth grade were administered the survey instrument during spring 2015-2016 conferences in their respective school. Prior to conferences, parents received a letter asking them to arrive 15 minutes before their scheduled conference if they would like to complete a voluntary survey on report cards. The letter included a brief explanation of the survey (Appendix D) as well as instructions to pick up the survey and their child's report card in the office when they arrived at the school. The researcher sat at a table near the main entrance of each elementary school and handed out surveys to interested parents. Parents who chose

to participate were asked to complete the survey after they had read their child's report card, but before they attended their child's conference. At each school, the researcher was able to verbally explain this to each parent as they picked up a survey. There was no need for written permission; none of the respondents were under the age of 18. To avoid the problem of perfectly correlated data on the family variables, parents were asked to complete only one survey on one of their children (if they had more than one child in grades K-6). Additionally, a survey was completed by only one parent regardless of whether both parents attended conferences. In the school utilizing traditional report cards, large tables were set up near the survey pick-up location to allow parents to sit down and complete the survey. There was never more than one parent or set of parents (parents of the same child) at a table at one time. In the school utilizing standards-based report cards, a classroom just off the main entrance and survey pick-up location was made available to parents to complete the survey. The classroom afforded ample privacy as desks were spread out throughout the room. Similarly, there was never more than one parent or set of parents completing the survey at one time. Parents returned completed surveys to an anonymous drop-box in the same location in which they received the survey. In an effort to increase parent-response rate, an incentive was provided. K-6 parents who completed a survey were able to enter their name into a drawing to win one of ten $10 Subway Restaurant gift cards. The gift card drawing was kept separate from the survey drop box so there was no way to match surveys to parent names. All results and respondents' identity remained confidential.

The rating scale (shown in Table 3) was developed and used previously by Teresa Craig (2011, p. 132) in a study titled *Effects of Standards-Based Report Cards on Student*

Learning. Craig developed the rating scale in order to sort the report cards used in her study into independent variable groups. This study aimed to have a clear delineation of standards-based report cards and traditional report cards. The standards-based report card product rating scale was used for this function.

For the purpose of this study, identical to Craig's (2011) study, inclusion in the standards-based report cards group required that a report card have standards specific to grade-level mathematics curriculum frameworks, eliminate grading language that indicates failure, separates grading for learning behavior and social behavior from academic behavior, and include at least three levels of performance reporting (p. 65).

Data Analysis

Data analysis was completed by the researcher using IBM's SPSS, Version 23. First, report cards were categorized into two groups: standards-based and traditional. From this, two schools were selected to participate in the study. Several statistical treatments and tests were applied to the parent survey data using SPSS, including descriptive statistics, reliability analysis, factor analysis, *t*-tests, regression, and construct correlations. Findings from these treatments are presented in Chapter IV, along with descriptive tables.

Quantitative data were tested for significances between the two independent variables of report card types: standards-based and traditional. Differences between groups are explored by testing demographic data against constructs, as well as, against individual questions. Correlations are used to test for construct independence.

In addition, correlation statistics are used to demonstrate the strength of the relationships between parent demographics and their understanding of their child's academic performance and providing at-home activities in mathematics.

Protection of Human Subjects

This study complies with the University of North Dakota protection of human subjects through approval by the University's Institutional Review Board (IRB). A non-obtrusive survey was disseminated to parents at parent-teacher conferences. A letter explaining the study and informing parents that participation in the survey is voluntary was attached to the front page of the survey. The survey included a statement of assurance of anonymity of participants. No individual school is named in the study.

Timeline

Report cards were collected from participating schools by September 8, 2015, and were rated by September 15, 2015. The two schools that participated in the study were selected at that time. The researcher made contact with the school district superintendents to seek final permission to conduct this study in their schools during spring 2015-2016 parent/teacher conferences. The researcher obtained written permission from the participating schools. The survey instrument was administered to parents during spring 2015-2016 parent/teacher conferences which took place during the months of February and March, 2016. Responses were catalogued as they were collected. Data fields were entered into IBM's SPSS, Version 23 in April 2016. Data analysis was conducted using SPSS in May 2016.

Summary

Chapter III described procedures used in this study, including a description of the pilot project, participants, procedure used to collect data, survey instrument, and data analysis. The following pages will provide the reader with a presentation of findings in narrative form found in Chapter IV. Finally, Chapter V is comprised of discussion, conclusions, limitations, implications for practice, recommendations, and recommendations for further study.

CHAPTER IV

PRESENTATION OF FINDINGS

Purpose of the Study

The purpose of this study was to examine parent understanding of K-6 mathematics performance using standards-based report cards compared to traditional report cards. Quantitative measures were utilized in an effort to determine whether parents receiving their child's mathematics performance scores in the form of a standards-based report card have a different level of understanding of their child's academic performance in mathematics compared to parents who receive their child's scores in the form of a traditional report card. In addition, the researcher aimed to discover whether there is a correlation between parent understanding of their child's performance in mathematics and their probability to provide at-home skill-building activities in areas the child has not yet mastered. Furthermore, the researcher sought to determine factors that might contribute to parents providing at-home skill-building activities. This chapter presents the key findings of the study. The selection and description of schools is detailed along with demographics of the population surveyed. Data results are provided in tabulated and narrative form in relation to the research questions.

Selection and Description of Participating Schools

School A is a PK – 6 school in the upper Midwest region of the United States. It has a K-6 enrollment of approximately 230 students. School A is considered a Class B school with a district enrollment of approximately 415 students, not including preschool enrollment. The elementary school is housed in one building and is one city block from the district's middle school and high school which are housed under one roof. This school has a full-time elementary principal with three years of administrative experience. School A was selected to participate in this study to represent the standards-based report card demographic based on the alignment of the school's report cards to the standards-based report card product rating scale used in this study (Craig, 2011, p. 132; see Table 3). School A's report card received a rating of four (4) in all areas of the four-point rating scale: performance levels, failing grades, separation of learner and social behaviors, and standards and indicators (sample report card shown in Appendix E). The researcher determined this school an appropriate representative of the standards-based report card demographic.

School B is a PK-6 school in the upper Midwest region of the United States. It has a K-6 enrollment of approximately 125 students. This school is also considered a Class B school with a district enrollment of approximately 200 students, not including preschool enrollment. The school is housed under the same roof as grades 7-12; however, the elementary school is located on one side of the building separate from the upper grades. The elementary school has a full-time principal with dual teaching assignments. The elementary principal has 10+ years of administrative experience. School B was selected to participate in the study due to its long history of traditional

report card use. The district superintendent commented that the same report card had been in place "since the stone age." For the purposes of this study, the researcher found it favorable that School B's parents did not have any exposure to a report card that did anything other than report progress in the form of letter grades (A-F). Although, School A is larger in student numbers, both participating schools fit the definition of Class B schools in the state and are considered average in size. Neither district high school is the smallest nor the largest Class B school in the state.

Table 7. School Comparison Information.

		School A: Standards-Based Report Cards	School B: Traditional Report Cards
Number of Students Per Grade Level	K	31	16
	1	39	20
	2	33	17
	3	38	19
	4	34	19
	5	38	20
	6	20	14
School Type		Elementary PK-6	Elementary PK-6
Percentage of Parents Who Typically Attend P/T Conferences		80%	80%
Percentage of Families Who Qualify for Free/Reduced Lunch		30%	51%
Number of Elementary Principals		1 full-time	1 full-time with teaching duties
Number of Assistant Elementary Principals		0	0
Approximate City Population		1,625	900
Did Your School Make AYP in 2014-2015?		Yes	Yes
How many years has the current report card been in use?		2 years	10 + years

Demographic Information

Parents in each of the two schools participated in the pencil/paper survey during spring Parent/Teacher Conferences in their respective schools. A total of 59 parents in School A: Standards-Based Group completed the survey. Of those 59 parents, 52 completed the question on age. The mean age of respondents was 40 years. The youngest parent respondents were 27 years old and the eldest was 56 years. The school's elementary principal informed the researcher that this age range would be typical of the parent population within his school. The majority of respondents completed the survey on their child in the fourth grade (23.7%). The highest levels of education for respondents in School A were as follows: bachelor's degree (27.1%), high school diploma (25.4%), associate's degree (25.4%), master's degree (10.2%), other (6.8%), doctoral degree (6.8%), and GED (1.7%).

A total of 53 parents in School B: Traditional Group completed the survey. Of those 53 parents, 45 completed the question on age. The mean age of respondents was 39 years. The youngest parent respondent was 25 years old and the eldest respondent was 57 years. The school's superintendent stated that this age range was a typical representation of her school. In School B, the majority of respondents completed the survey on their child in grades one (20.8%) and three (20.8%). The highest levels of education for respondents in School B were as follows: high school diploma (32%), bachelor's degree (28%), associate's degree (20%), GED (8%), other (6%), did not complete high school (4%), doctoral degree (2%). Three parent respondents did not answer the question on highest level of education.

Table 8. Participant Demographics (n=112).

School A: Standards-Based	Count	% Mean	School B: Traditional	Count	% Mean
Gender			**Gender**		
Male	10	16.9	Male	14	26.4
Female	49	83.1	Female	39	73.6
Ethnicity			**Ethnicity**		
White/Caucasian	58	98.3	White/Caucasian	44	83.0
African American	1	1.7	African American		
American Indian			American Indian	2	3.8
Mexican American			Mexican American	7	13.2
Age of Respondent			**Age of Respondent**		
27	3	5.8	25	1	2.2
28	1	1.9	26	1	2.2
29	3	5.8	28	1	2.2
30	3	5.8	29	1	2.2
32	1	1.9	31	2	4.4
33	2	3.8	32	1	2.2
34	3	5.8	33	2	4.4
35	6	11.5	34	3	6.7
36	3	5.8	35	3	6.7
37	3	5.8	36	3	6.7
38	4	7.7	37	2	4.4
39	3	5.8	38	1	2.2
40	1	1.9	40	5	11.1
41	2	3.8	41	5	11.1
42	1	1.9	42	2	4.4
43	1	1.9	43	4	8.9
44	2	3.8	44	1	2.2
45	2	3.8	45	3	6.7
48	1	1.9	47	2	4.4
49	1	1.9	48	1	2.2
50	2	3.8	57	1	2.2
52	2	3.8			
53	1	1.9			
56	1	1.9			
Child's Grade Level			**Child's Grade Level**		
K	8	13.6	K	7	13.5
1	10	16.9	1	11	21.2
2	7	11.9	2	6	11.5
3	9	15.3	3	11	21.2
4	14	23.7	4	9	17.3
5	10	16.9	5	5	9.6
6	1	1.7	6	3	5.8

Table 8 cont.

School A: Standards-Based	Count	% Mean	School B: Traditional	Count	% Mean
Parent Highest Level of Education			**Parent Highest Level of Education**		
High School	15	25.4	High School	16	32.0
GED	1	1.7	GED	4	8.0
Did not complete HS	0	0.0	Did not complete HS	2	4.0
Associate's Degree	15	25.4	Associate's Degree	10	20.0
Bachelor's Degree	16	27.1	Bachelor's Degree	14	28.0
Master's Degree	6	10.2	Master's Degree	1	2.0
Doctoral Degree	2	3.4	Doctoral Degree	0	0.0
Other	4	6.8	Other	3	6.0

Parents in School A: Standards-Based Group reported that email (39.7%) was their most common method used to communicate with their child's teacher followed by face-to-face (36.2%). In School B: Traditional Group, face-to-face contact (50%) was the most common method followed by texting (17.3%). In School A, 22.4% of parents reported they had volunteered in the past year, whereas 37.7% of parents in School B reported volunteering in the past year. The frequency of communication between parent and teacher in each school was very similar with each school reporting that about 37% of parents communicate with their child's teacher once a month. Similarly, approximately 15% of parents in each school reported not communicating at all with their child's teacher. The most common method used by parents in each school to determine how their child is performing academically is the report card, 59.3% in School A and 47.2% in School B. This is a significant finding as it relates to this study. Additionally, both schools' results showed that PowerSchool was the second most common method used by parents (in School B PowerSchool tied with "Other"). PowerSchool is an online reporting warehouse used by parents to view their child's grades and academic standing. This is also significant as it demonstrates that parents are utilizing another measure, other

than report cards, to inform themselves of their child's grades. Parents are able to access this information at any time from an online device. Each school had four parent respondents who worked in a school. Approximately 94% of respondents in each school reported that they attend every parent/teacher conference that is scheduled during the school year.

Table 9. Participant Variables (n=112).

School A: Standards-Based	**Count**	**% Mean**	**School B: Traditional**	**Count**	**% Mean**
Most Common Method of Communication			**Most Common Method of Communication**		
Face-to-face	21	36.2	Face-to-face	26	50
Email	23	39.7	Email	4	7.7
Text	3	5.2	Text	9	17.3
Other form of tech	2	3.4	Other form of tech	1	1.9
Phone	0	0.0	Phone	1	1.9
P/T Conferences	8	13.8	P/T Conferences	8	15.4
Other	1	1.7	Other	1	1.9
No communication	0	0	No communication	2	3.8
Have You Volunteered at School in the Past Year?			**Have You Volunteered at School in the Past Year?**		
Yes	13	22.4	Yes	20	37.7
No	45	77.6	No	32	60.4
Frequency of Parent Communication with Teacher			**Frequency of Parent Communication with Teacher**		
Daily	2	3.5	Daily	2	3.9
2-3 x per week	2	3.5	2-3 x per week	1	2.0
Once a week	3	5.3	Once a week	6	11.8
2-3 x per month	21	36.8	2-3 x per month	15	29.4
Once a month	21	36.8	Once a month	19	37.3
No communication	8	14.0	No communication	8	15.7
Most Common Method Used to Determine How Child is Performing Academically			**Most Common Method Used to Determine How Child is Performing Academically**		
Report card	35	59.3	Report card	25	47.2
Power School	10	16.9	Power School	10	18.9
Email from teacher	7	11.9	Email from teacher	1	1.9
Weekly report	5	8.5	Weekly report	7	13.2
Phone call	2	3.4	Phone call	3	5.7
Other	5	8.5	Other	10	18.9

Table 9 cont.

School A: Standards-Based	Count	% Mean	School B: Traditional	Count	% Mean
How Closely Have You Read Your Child's Latest Report Card?			**How Closely Have You Read Your Child's Latest Report Card?**		
I have not seen it	4	7.1	I have not seen it	0	0.0
I have skimmed it over	15	26.8	I have skimmed it over	2	3.9
I have read it thoroughly	37	66.1	I have read it thoroughly	49	96.1
Do You Work in a School?			**Do You Work in a School?**		
Yes	4	6.8	Yes	4	7.5
No	55	93.2	No	49	92.5
How Often Do You Attend P/T Conferences?			**How Often Do You Attend P/T Conferences?**		
At least once a year	4	6.9	At least once a year	3	5.9
Every conference that is scheduled	54	93.1	Every conference that is scheduled	48	94.1

Discussion of Constructs

Following the questions on demographics and parent variables, parents were asked to evaluate 20 statements pertaining to the three research questions and three constructs defined in this study. Respondents rated each statement using a Likert-type scale score ranging from 1-6. Six represented the highest score possible on the survey indicating strong agreement. One was the lowest score possible and indicated strong disagreement with the statement. All survey participants (n = 112 parents) responded to every statement in each of the three constructs (q1 – q20).

Correlations indicated statistically significant relationships between parent understanding and parental role construction (r = + .39, n = 112, p < .01, two-tails), parent understanding and parental self-efficacy (r = + .36, n = 112, p < .01, two-tails), and parental role construction and parental self-efficacy (r = + .70, n = 112, p < .01, two-tails). Cronbach alpha scores for each of the three constructs indicated high levels of

internal consistency among survey statements as shown in table 10. It must be noted that the researcher chose to eliminate the last role construction statement, q6, from the results. The statement itself was essentially a rewording of the first statement, q1. Q1 asked respondents to rate their level of agreement from strongly agree to strongly disagree on the following: My child's report card tells me how he/she is doing in math. Q6 asked respondents to rate their level of agreement from strongly agree to strongly disagree on the following: Based on my child's report card, I have a good understanding of how he/she is performing in math. When determining Cronbach's alpha, a considerably higher alpha was attained ($\alpha = .91$) by eliminating q6 compared to an alpha ($\alpha = .64$) when including q6. Alpha can be used to confirm whether or not a sample is, or items are, unidimensional. Acceptable values of alpha range from 0.70 to 0.95 (Tavakol and Dennick, 2011). Tavakol and Dennick (2011) suggest that if a low alpha is attained, it indicates a poor correlation between items and recommend revising or discarding items. Bland and Altman (1997) advise that for comparing groups, alpha values of 0.7 to 0.8 are satisfactory. Whereas, for clinical application, much higher values of alpha are necessary. For the purposes of this research study, the researcher thus chose to delete q6 from the study. Q6 is not included in any further results reported in this study.

Table 10. Correlation of Subscale Constructs and Measures of Internal Consistency.

Construct Number	Subscale Constructs	Question Numbers	C2.	C3.	α
C1.	Parent Understanding	q1, q2, q3, q4, q5	.399**	.369**	.91
C2.	Parental Role Construction	q7, q8, q9, q10, q11, q12, q13, q14		.707**	.87
C3.	Parental Self-Efficacy	q15, q16, q17, q18, q19, q20			.78

**$p < .05$

Research Question 1

Research Question 1 asked: Do standards-based report cards provide parents with a different level of understanding of their child's mathematics performance compared to traditional report cards? Construct 1: Parent Understanding was made up of six questions. The purpose of these questions was to identify if there is a difference in parent understanding of their child's mathematics performance based on the report card used to report progress. Percent of agreement on each construct, mean score responses, and standard deviations are listed in Table 11.

To test the relationship between the constructs, a *t*-test of means was conducted comparing results from the standards-based report card responses to the traditional report card responses. Independent *t*-tests and calculation of Cohen's *d* were conducted using IBM's SPSS, Version 23. The researcher chose an independent samples *t*-test to compare the mean difference between the two independent groups (type of report card) for the purpose of answering this research question. The mean of the construct: Parent Understanding for standards-based report cards (4.68) was higher compared to traditional report cards (4.07), which is statistically significant ($t(102) = 3.24$, $p < .05$, $d = .64$).

An independent samples *t*-test was also conducted comparing results from the standards-based report card responses to the traditional report card responses for the remaining two constructs. The mean of the construct: Role Construction for standards-based report cards (5.08) was higher compared to traditional report cards (4.81), ($t(110) = 1.8$, $p = .069$, $p > .05$, $d = .35$). Although this isn't statistically significant, the magnitude of the difference indexed by Cohen's *d* (.35) is in the medium range. A medium range is between .20 - .79, small being less than .20 and large being greater than .80 (Warner,

2013). The mean of the construct: Self-Efficacy for standards-based report cards (4.89) was higher compared to traditional report cards (4.66), which also is not statistically significant but falls in the medium range ($t(110) = 1.68$, $p = .096$, $p > .05$, $d = .32$).

Table 11. Parent Survey Percentage of Some Form of Agreement (strongly agree, agree, slightly agree), Mean, and Standard Deviation for Each Report Card Type.

C1. Parent Understanding

Question Number	Question	Report Card Type	% of Agreement	M	SD
q1.	My child's report card tells me how he/she is doing in math.	S-B	98.3	5.0	.7
		Traditional	88.7	4.7	1.0
q2.	When reading my child's report card, I understand what my child has mastered in math.	S-B	88.1	4.7	1.2
		Traditional	62.3	3.9	1.4
q3.	I use the report card as a basis for how well my child is doing in math.	S-B	84.7	4.6	1.1
		Traditional	75.5	4.4	1.1
q4.	After reading my child's report card, I understand where he/she is growing in math.	S-B	89.8	4.6	1.0
		Traditional	64.2	3.9	1.4
q5.	My child's report card helps me understand what my child still needs to work on in math.	S-B	84.7	4.5	1.2
		Traditional	49.1	3.5	1.4
q6.	Based on my child's report card, I have a good understanding of how he/she is performing in math. *(This item was dropped from the study.)*	S-B	89.8	4.6	1.1
		Traditional	66.0	4.8	5.4

C2. Parental Role Construction

Question Number	Question	Report Card Type	% of Agreement	M	SD
q7.	I help my child study for math tests.	S-B	70.2	4.2	1.3
		Traditional	64.7	3.9	1.5
q8.	I make sure my child's homework gets done.	S-B	98.3	5.5	.7
		Traditional	94.3	5.1	1.0
q9.	I sit down with my child when he/she does math homework.	S-B	93.2	5.1	1.0
		Traditional	86.5	4.8	1.3
q10.	I check over my child's math homework.	S-B	87.9	4.9	1.2
		Traditional	89.8	4.9	1.2

Table 11 cont.

Question Number	Question	Report Card Type	% of Agreement	M	SD
q11.	I will help explain tough math assignments to my child.	S-B	98.3	5.4	.7
		Traditional	94.2	5.0	1.0
q12.	I keep an eye on my child's progress in math.	S-B	94.9	5.2	.9
		Traditional	94.3	4.9	.9
q13.	I stay on top of my child's academic progress in math.	S-B	93.2	5.1	.9
		Traditional	92.5	4.9	1.0
q14.	I help my child understand his/her math assignments.	S-B	98.3	5.2	.8
		Traditional	90.6	4.9	1.0
C3. Parental Self-Efficacy					
Question Number	Question	Report Card Type	% of Agreement	M	SD
q15.	I will utilize information provided by the school to understand what my child needs to work on in math.	S-B	91.5	4.9	1.0
		Traditional	88.7	4.8	1.0
q16.	If I know what my child needs to work on in math, I will provide at-home learning opportunities.	S-B	91.5	5.1	1.0
		Traditional	90.4	5.0	1.0
q17.	If I try hard, I can get through to my child even when he/she has trouble understanding something.	S-B	94.9	5.2	.9
		Traditional	92.5	4.9	1.0
q18.	I provide math learning opportunities at home to help improve or challenge my child's math skills.	S-B	88.1	4.7	1.1
		Traditional	84.9	4.5	1.0
q19.	I don't know how to help my child make good grades in math. *(reverse-coded)*	S-B	81.4	4.7	1.3
		Traditional	67.9	4.3	1.4
q20.	I can make a significant difference in my child's math performance.	S-B	91.5	4.8	1.0
		Traditional	88.7	4.6	.9

Research Question 2

Research Question 2 asked: Does parents' level of understanding of their child's mathematics performance predict the amount of at-home mathematics activities they provide their child? In this question, it was hypothesized that parental role construction

(C2) and parental self-efficacy (C3) would be positively associated with parent understanding of their child's academic performance in mathematics. In order to determine what effect, if any, parent understanding of their child's performance in mathematics has on parents' probability to provide at-home skill building activities to their child, a standard linear regression analysis was performed. The purpose of this was to obtain a formula to predict values of one variable from another. Method of ordinary least squares linear model regression to predict RoleConstSelfEfficacy from Parent_Understanding yielded RoleConstSelfEfficacy = 3.639 + 0.282 times Parent_Understanding and initial regression analysis, *(F* (1,110) = 22.88, $p<.05$), indicated a statistically significant prediction equation. Meaning, for every unit increase in Parent_Understanding, a 0.282 increase in RoleConstructSelfEfficacy is predicted, holding all other variables constant. $R^2 = .172$ (17.2% of variability in the two variables is shared) implies a moderate level of practical significance (Sheskin, 2011). Further regression analysis indicated that the y-intercept, 3.6, is different than 0, $t(110) = 13.66$, $p<.05$, and the Parent_Understanding coefficient, 0.3, is also different than 0, $t(110) = 4.784$, $p<.05$; later confirms Parent_Understanding makes a significant contribution to predicting RoleConstSelfEfficacy. The plot of the residual score shown in Figure 3 indicated symmetrical distribution, meaning the regression assumption was met.

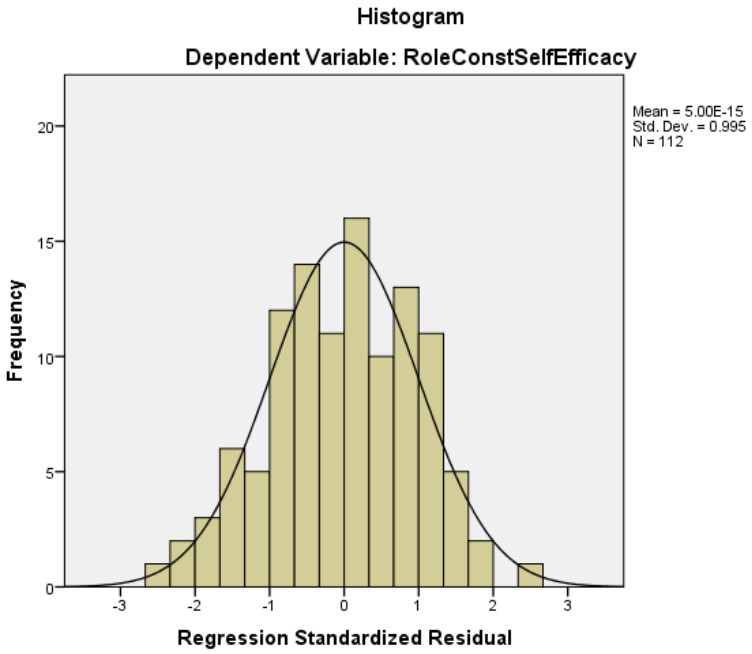

Figure 3. Regression Analysis.

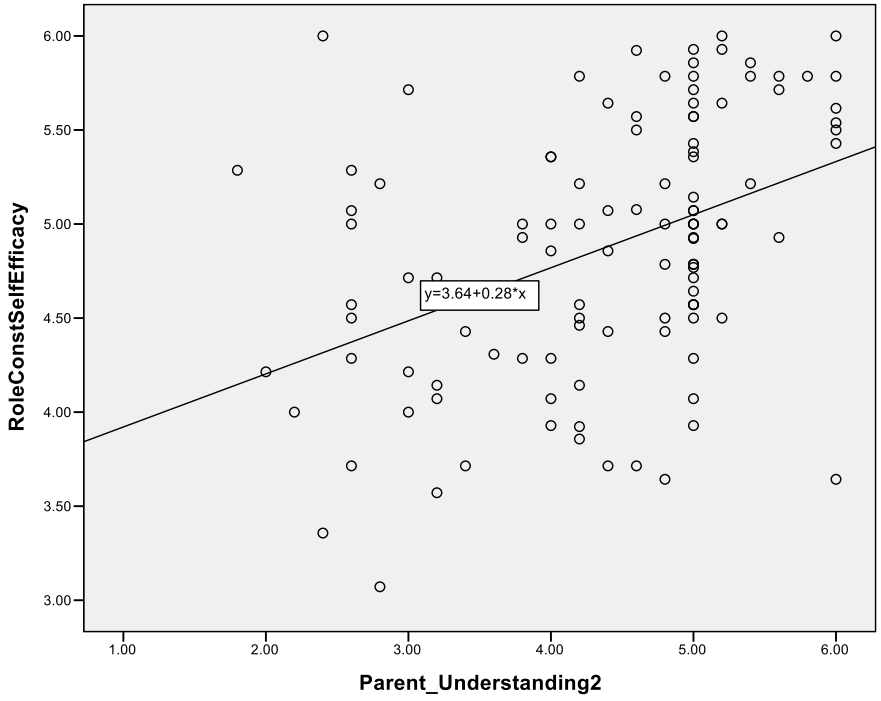

Figure 4. Scatterplot with Best Fit Line. As parent understanding of their child's performance in mathematics increases so does a parents' probability of providing at-home skill building activities.

Research Question 3

Research Question 3 asked: What other parent involvement factors are predictors of parents' probability to provide at-home activities in mathematics (for example, student's success in mathematics, communication with the teacher, volunteering at the school, highest level of education, employment status, and grade of the child)? This question aimed to explore other factors besides report card type that might predict parents' probability to provide at-home activities in mathematics. In analyzing this question, parents from both school types (standards-based and traditional) were grouped together. Mean and standard deviations for each variable are shown in table 12.

Table 12. Sample Size, Mean, and Standard Deviation for Parent Variables

Variable	*n*	M	SD
Child's Math Performance	110	3.49	0.92
Communication with the Teacher	108	4.42	1.15
Highest Level of Education	109	3.75	2.11
Employment Status	112	2.96	0.62
Volunteered in the Past Year	111	2.15	4.79
Child's Grade	111	2.68	1.76

Method of ordinary least squares linear model was used to predict RoleConstSelfEfficacy from the six variables. RoleConstSelfEfficacy from Child's Math Performance yielded RoleConstSelfEfficacy = 5.032 + .053 x Child's Math Performance and initial regression analysis indicated the predication equation is not statistically significant (F (1,97) = 1.85, p > .05). RoleConstSelfEfficacy from Communication with the Child's Teacher yielded RoleConstSelfEfficacy = 5.032 + -.020 x Communication with the Child's Teacher and initial regression analysis indicated the predication equation is not statistically significant, F (1,97) = 1.85, p > .05. RoleConstSelfEfficacy from Highest Level of Education yielded RoleConstSelfEfficacy = 5.032 + -.005 x Highest

Level of Education and initial regression analysis indicated the predication equation is not statistically significant (F (1,97) = 1.85, p > .05). RoleConstSelfEfficacy from Employment Status yielded RoleConstSelfEfficacy = 5.032 + .039 x Employment Status and initial regression analysis indicated the predication equation is not statistically significant (F (1,97) = 1.85, p > .05). RoleConstSelfEfficacy from Volunteered in the Past Year yielded RoleConstSelfEfficacy = 5.032 + .000 x Volunteered in the Past Year and initial regression analysis indicated the predication equation is not statistically significant (F (1,97) = 1.85, p > .05). RoleConstSelfEfficacy from Child's Grade = 5.032 + -.121 x Child's Grade and initial regression analysis indicated the prediction equation is statistically significant (F (1,97) = 1.85, p < .001).

Table 13. Standardized β Coefficients for Variables Regressed to Predict Parent Role Construct Self-Efficacy.

Predictor	**Standardized** β	***SE***	***p***
RoleConstSelfEfficacy (R^2 = .103)			
Child's Math Performance	.068	.078	.50
Communication with the Teacher	-.033	.060	.73
Highest Level of Education	-.014	.032	.88
Employment Status	.035	.362	.72
Volunteered in Past Year	-.003	.014	.98
Child's Grade	-.294	.040	.00

R^2 = .103 (10.3% of variability with the variables is shared) implies a low level of practical significance (Sheskin, 2011). Only 10% of parent involvement is due to these independent variables. RoleConstSelfEfficacy = (.053) x Math Performance + (-.020) x Communication + (-.005) x Education + (.039) x Employment + (.000) x Volunteer + (.121) x Child's Grade – 5.032.

Table 14. Parents' Probability to Provide At-Home Math Activities.

Variables	**Equation Results**
Child's Math Performance	$t(97) = .674$, $p > .05$
Communication with the Child's Teacher	$t(97) = -.342$, $p > .05$
Parents' Level of Education	$t(97) = -.150$, $p > .05$
Parents' Employment Status	$t(97) = .362$, $p > .05$
Parents' Volunteering at the School	$t(97) = -.027$, $p > .05$
Grade of the Child	$t(97) = -2.99$, $p < .05$

The child's performance in math, parent communication with the child's teacher, parents' level of education, parents' status of employment, and parent volunteering in the past year do not make a significant contribution to parents' probability to provide at-home math activities to their child. Whereas, the child's grade does significantly contribute to a parent's probability to provide at-home math activities. Further regression analysis indicated the y-intercept, 5.032 is different than 0, $t(97) = 8.901$, $p < .001$. Thus, all of these variables combined make a significant contribution to predicting RoleConstSelfEfficacy.

Summary

The results indicated statistical significance at a $p < .05$ value, when comparing the standards-based report card parents' mean responses to the traditional report card parents' responses in the parent understanding construct. The standards-based recipients indicated a higher mean level of agreement.

Regression analysis results indicated statistical significance at the $p < .05$ value. These results confirmed that parent understanding makes a significant contribution to predicting parents' probability to provide at-home mathematics activities to their child.

Regression analysis results indicated statistical significance at the $p < .05$ value indicating a child's grade (age of the child) to be a significant factor in predicting a parents' probability to provide at-home math activities to their child. Other factors did not contribute or show statistical significance. However, when totaling all six factors (child's math performance, communication with the teacher, highest level of parent education, employment status, volunteerism, and child's grade), results indicated statistical significance at $p < .001$, indicating together, these factors make a significant contribution to predicting parents' probability to provide at-home math activities to their child.

Chapter V offers a discussion, summary, and conclusions regarding the specific findings in this study. Implications for practice, recommendations, recommendations for further study in the area of parent understanding of report cards and factors contributing to understanding are also provided.

CHAPTER V

DISCUSSION, CONCLUSIONS, LIMITATIONS, AND RECOMMENDATIONS

Chapter V is divided into seven sections. These include: a summary of the findings, conclusions, limitations, implications for practice, recommendations, recommendations for additional study, and concluding remarks.

Summary of Findings

The purpose of this research was to ascertain whether standards-based report cards provide parents with a different level of understanding of their child's mathematics performance compared to traditional report cards. The researcher was motivated to determine whether the efforts expounded by educators to develop standards-based grading and reporting practices have effectively increased parent understanding of their child's progress. Furthermore, the researcher sought to determine if parent understanding of their child's mathematics performance had any effect on parents providing at-home mathematics activities to their child and identify any particular factors associated with this probability.

With this in mind, a survey was developed around three central constructs. These constructs were *Parent Understanding*, *Parental Role Construction,* and *Parental Self-Efficacy*. The questions on parent understanding were designed to determine parents' level of understanding of their child's report card in their respective school. This allowed the researcher to compare the results from the standards-based report card school to the

traditional report card school. The questions on parental role construction and parental self-efficacy were developed based on research in those areas. The two constructs together were designed to measure parents' probability of providing at-home skill-building activities to their child.

Research Question 1

Do standards-based report cards provide parents with a different level of understanding of their child's mathematics performance compared to traditional report cards? Standards-based grading and reporting is designed to give feedback and evaluate students' performance on clearly defined learning standards. The shift from traditional to standards-based grading practices takes a significant amount of time and often requires stakeholders to reframe their existing beliefs about grading. Nonetheless, there is substantial researched-based evidence to suggest that the benefits to all stakeholders is worth the time and effort (Heflebower, Hoegh, Warrick, 2014). Parents have a vested interest in their child's academic performance and progress in mathematics. The hypothesis for question one was standards-based reporting of student achievement provides parents with a better understanding of their child's mathematics performance versus the traditional method of reporting grades as a cumulative grade point average translated to A through F (Guskey & Bailey, 2010; Marzano, 2000). To test this hypothesis, survey questions were designed to determine parent understanding of their child's performance in mathematics based on the report card used to report progress. Comparisons were made between survey results of the two schools using a *t*-test of means. Parent perception of understanding for standards-based report cards was higher (4.68) compared to traditional report cards (4.07), with an effect size of $d = .64$. This

result indicates a statistically significant difference in parent understanding of report cards. This supports the hypothesis that standards-based reporting of student achievement provides parents with a better understanding of their child's mathematics performance compared to traditional report cards. Vacha-Haase (2001) states that statistical significance alone doesn't guarantee practical significance; effect sizes are also needed. It's useful to have an index of effect size that is standardized, such as Cohen's *d*, which describes the difference between two means relative to a number of standard deviations and independent of the size of *N* (Warner, 2013). In this particular study, *N* equaled 112 parents total from the two participating schools. The difference in parent understanding of standards-based versus traditional report cards indexed by Cohen's *d* was .64, which indicates a medium effect with statistical significance.

Results from this study aimed to determine if there is a difference in parent understanding of report cards without including or taking into account professional development or parent outreach and training on the topic of reporting student performance relative to grade-level standards. It is the researcher's belief that the traditional report card demographic in this study had little to no background knowledge on the various forms of reporting student progress. The superintendent of the school commented that the school has used the same report card since "the stone age." It is reasonable to assume that many of the parents who completed the survey received the same type of omnibus A-F report card when they themselves were an elementary student (possibly in the same school district). These parents may hold the belief that a grade of C in math, for example, indicates their child is performing average work. These parents would likely not know about research that tells us that "huge differences exist among

teachers in the criteria they use when assigning grades (Guskey et al., 2011). Thus, when presented with the survey item, "My child's report card tells me how he/she is doing in math," a parent from the traditional report card school may have indicated slight to strong agreement with this statement, not knowing there is a different way to receive his or her child's math progress. In fact, this question received 88.7% of some form of agreement from traditional report card parents.

The traditional report card school was characteristic of a Class B school. It would be typical that parents in a school utilizing a traditional report card would have little to no knowledge of standards-based reporting. Survey items were designed to drill down by asking survey respondents to rate statements such as, "My child's report card helps me understand what my child still needs to work on in math." That particular statement showed the largest difference in some form of agreement (35.6) under the parent understanding construct, with only 49.1% of traditional report card parents indicating some form of agreement. Although, this group of parents believe they have a good understanding of their child's math performance based on the letter grades used to report progress, these survey results show that this same group of parents do not find letter grades as useful in determining specific areas in need of improvement.

Research Question 2

Does parents' level of understanding of their child's mathematics performance predict the amount of at-home mathematics activities they provide their child? The overall multiple regression analysis is judged significantly predictive of parent probability to provide math activities to their child. It was hypothesized that parental role construction (C2) and parental self-efficacy (C3) would be positively associated with

parent understanding of his or her child's academic performance in mathematics. Results indicate that as parent understanding of his or her child's progress in mathematics increases, so does the likelihood that the parent will provide at home skill-building activities in mathematics.

These results have practical implications for schools. As stated earlier, this study did not take into account parent outreach and training on report cards. Hoover-Dempsey & Sandler (1995) discuss how general demands of parent involvement from the school may influence the emergence of active parental involvement; however, they alone are not necessary or sufficient to induce parent involvement. Parents who have a strong sense of self-efficacy for helping their child succeed in school are likely to do so regardless of demands or invitations from the school. Findings from this study show that by simply providing parents with a more detailed description of their child's progress in math, parents may initiate at-home skill-building activities. Results from this study could also imply that what schools do to involve parents in the understanding and interpretation of report card results could assist parents in knowing on what areas to focus when providing at-home supports. There are two types of parental involvement related to at-home instruction: direct closed-ended and direct open-ended (Hoover-Dempsey & Sandler, 1995). Closed-ended instruction involves things like helping a child with multiplication facts and deriving correct answers on homework. Open-ended instruction involves asking a child to explain how he/she derived the answer to a math problem, or asking the child to expand on an idea. Both types are likely to have positive effects on a child's learning.

Research Question 3

What other parent involvement factors are predictors of parents' probability to provide at-home activities in mathematic (for example, student's success in mathematics, communication with the teacher, volunteering at the school, highest level of education, employment status, and grade of the child)? Individually, the child's performance in math, communication with the child's teacher, parents' level of education, parents' employment status, and volunteering at the school do not make a significant contribution to a parent's probability to provide at-home math activities. However, when grouping all of these variables together (to include child's grade) results indicate a significant correlation with parents' providing at-home skill building activities to their child (10% of parent involvement is due to these independent variables).

Additionally, the child's grade significantly contributes to a parent's probability to provide at-home math activities $t(97) = -2.99$, $p < .05$. The negative correlation coefficient indicates that an increase in child's grade (age) is associated with a decrease in providing at-home math activities to the child. A study conducted by Garbacz et al. (2015) specifically aimed to answer the question, "To what degree does child school year predict parent involvement?" (p. 388). The researchers desired to examine the parent involvement literature in a New Zealand context. They hypothesized that the child's school year would be negatively associated with home-based involvement (but not school-based involvement). Their findings indicated that child school year predicted home-school communication ($p < .05$) and home-based involvement ($p < .001$). Their results showed an inverse relation between child school year and home-based involvement. Specifically, home-based involvement scores were on average lower by

approximately 0.08 units as the child moved up in school years. This current study confirms previous researcher findings that as a child moves up in grades, parents tend to become less involved in providing at-home supports. This could be attributed to parents' self-perceived knowledge and skills as the child progresses from primary to intermediate grades. Parents' help with homework and at-home academic supports tend to decline as the academic rigor increases and meets or surpasses the parents' knowledge (Hoover-Dempsey et al., 2005).

Conclusions

The statistical analysis in the study indicated that parents receiving their child's mathematics progress in the form of a standards-based report card have a higher level of agreement with statements on parent understanding. The largest range in percent of some form of agreement (35.6) was on q5: My child's report card helps me understand what my child still needs to work on in math. The second largest range in percent of some form or agreement (25.8) was on q2: When reading my child's report card, I understand what my child has mastered in math. The smallest range in percent of some form of agreement (9.2) was on q3: I use the report card as a basis for how well my child is doing in math. The results indicate that a report card with mathematics reported as power standards that feature action words and understandable indicators for students and families does promote increased parent understanding of areas in mathematics in need of improvement and skills the child has mastered. These results also indicate that as a whole, parents utilize their child's report card to inform them of how their child is performing in mathematics, regardless of report card format.

The findings in the study indicated there was a positive association between parent understanding of their child's performance in math and their probability to provide at-home skill building activities to their child. Parents' involvement in home learning opportunities provide children with multiple chances to observe and learn from their parents and to receive feedback and reinforcement (Hoover-Dempsey et al., 2001). This study asked questions specific to parental role construction and parental self-efficacy to measure parents' probability to engage in providing at-home mathematics learning activities. A regression analysis was performed including a scatterplot with best fit line (Figure 4). The scatterplot showed that as parent understanding increased, so did parental role construction and self-efficacy. Green, Walker, Hoover-Dempsey, & Sandler (2007) suggest that "parents are motivated to engage in involvement activities if they believe they have the skills and knowledge that will be helpful in specific domains of involvement activities" (p. 534). Research conducted by Waanders et al. (2007) found that parents who perceived themselves playing an important role in their child's education were more likely to be involved in education outside the school. This present study contributes to the literature by adding that increased parent understanding of student progress may be positively associated with parents' probability to provide at-home skill-building activities to their child.

Additionally, findings from this study showed that all of the factors (a child's performance in math, parents' communication with the child's teacher, parents' level of education, parents' employment status, volunteerism at the school, and child's grade) grouped together make a significant contribution to a parent's probability to provide at-home math activities to their child (10% of the variance in role construction and self-

efficacy). The only variable that had any stand-alone significance was the child's grade (age).

Limitations of the Study

While every effort was made to reduce limitations, it's important to identify those that exist as well as what the researcher did in an attempt to counteract the impact. The possibility of a subject-characteristics threat is the most common type of threat in this kind of study (Fraenkel & Wallen, 2011). It's impossible to guarantee that the comparison groups are equivalent on all variables. To reduce or control for this, the researcher made certain that both sets of participants were parents of K-6 elementary students who attended a public elementary school in the upper Midwest. Additionally, parents reported on only one child so that the researcher would avoid perfectly correlated data on the family variables. In order to reduce the loss of subjects' threat, participants from each school were eligible to win one of ten $10 gift cards to a local restaurant.

This study included several covariates as an additional method to control for causal relationship that may impact results in order to increase internal validity. The impact of employment status, gender, age, educational background, ethnicity, and communication with teachers was included as a covariate in the data analysis to reduce the likelihood that the causal relationship of each factor may influence the results for the independent variable.

Participants

Demographics and geographical location was a limitation of this study. Two schools in the upper Midwest region of the United States were selected to participate in the study. Both were elementary schools serving grades K-6 and met the definition of a

Class B school within the state, meaning the district's high school enrollment numbers were less than 325 students. The results of this study might be more indicative of a Caucasian population due to the small number of minority participants. Similar research conducted at more diverse elementary schools has the potential to reveal different results. However, the lack of diversity within these two schools is typical of surrounding Midwest Class B schools.

A second participant limitation might be sample size. As stated above, both schools were considered Class B, meaning they had a relatively small population of students, and therefore, parents. Additionally, the study was restricted to two schools.

Timeline

The study is limited to one year of data: the 2015-2016 school year and from one point in time: spring 2016 parent/teacher conferences in each of the respective schools (standards-based and traditional). This study did not take into account how long standards-based report cards had been in practice at the participating standards-based school.

Contributing Factors

Additional factors such as standards-based instructional practices or professional development in the areas of standards-based grading and reporting within the schools and amongst parents was not taken into account. Rather, this study focused solely on reporting practices and how the report card used to report students' performance in mathematics affects parents' understanding of their child's mathematics achievement.

Implications for Practice

The most significant finding in this study is that parents' perception of understanding of standards-based report cards is higher than traditional report cards. This is a real call to educators to invest in the time and energy it takes to transition to standards-based report cards. It is time to change our traditional approaches for grading and reporting. As superintendents, principals, and teachers, it is our obligation to inform parents of their child's academic performance. The results of this study clearly indicate that there is a better way to do this than the traditional method of reporting grades as A-F.

Not only did results of this study determine standards-based report cards promote increased parent understanding, findings also showed that as understanding increases so does the probability that parents will provide at-home skill building activities. The level of involvement parents have in their children's education has a direct effect on the expectations that children hold for their educational futures and long-term school performance (Froiland et al., 2012). Parent involvement in their child's education positively correlates with increased student academic achievement (Collier, Keefe, Hirrel, 2015; Ingram, Wolfe, & Lieberman, 2007; Cai, Moyer, & Wang, 1997; Aronson, 1996). Standards-based grading and reporting has much more to offer than traditional methods.

Recommendations

The researcher has provided recommendations for school administrators, teachers, and parents, based on the findings in the study. Additionally, recommendations for further study are suggested.

Recommendations for School Administrators

Results of this study showed that parent understanding of students' progress in mathematics is higher at a statistically significant level compared to traditional report cards. Also, as parent understanding of their child's progress in mathematics increases, so does the probability that parents will provide at-home skill building activities to their child. The following includes recommendations for school administrators as it relates to these findings.

1. School administrators should initiate or continue to facilitate the development and implementation of standards-based report cards that report student progress relative to their proficiency in alignment with the state/local standards and benchmarks. The report card should clearly separate learner behaviors (effort, attitude) from academic performance.
    a. The first step in this process is to develop a team of educators to complete this work (Heflebower, Hoegh, & Warrick, 2014). Guskey and Jung (2006) suggest that even before choosing a reporting format, careful attention needs to be given to the purpose. If the purpose is to better inform parents of their child's achievement, then parents should be included from the start as part of the team.
        i. The administrator should assist the team in determining the role of parents.
        ii. The administrator should determine at which points during report card development parents will be involved.

b. The team should develop the reporting standards (Guskey & Bailey, 2010). This consists of establishing criteria for prioritizing standards followed by writing proficiency scales (Heflebower et al., 2014).

2. School administrators should provide specific parent training when implementing standards-based report cards. Training should be ongoing and tied directly to the district report cards.
    a. When schools communicate an expectation of parent involvement, parents are more likely to become involved. Part of the parent training should include an explanation that parents may utilize the report card to provide at-home learning opportunities to their child.
    b. Ongoing training should be developed as part of the school or district's annual parent involvement plan. Parents with students new to the district as well as parents of students previously attending will benefit from frequent opportunities to learn about the process the school/district uses to report student achievement.
3. Training opportunities for the school board and community members should also be conducted to educate all stakeholders on the new report card as a means to better inform parents of their child's performance.

Recommendations for Teachers

Teacher quality is a large predictor of student success (Marzano, 2000). Teachers play a crucial role in how students are graded and how this information is conveyed to students and parents. The researcher provides several recommendations for teachers as it relates to study findings.

1. Adopt a mindset that your job is to develop talent versus select talent. When you develop talent you clarify to your students what you want them to learn and be able to do. Your purpose then is to ensure that all students learn those standards well (Guskey, 2011).
2. Develop a deep understanding of the student learning standards. This will aid in the process of establishing criteria for prioritizing standards and writing proficiency scales.
3. Make certain that grades are based on specified measures of learning. Grades should clearly communicate what students know and are able to do.
4. Separate learner behaviors such as responsibility, effort, and work habits from reports on academic achievement and performance.
5. Stay abreast of research on best practices in grading in order that you can communicate effectively with your principal, superintendent, school board, and parents regarding practices that support student learning and parent understanding of their child's progress.
6. Communicate to parents your expectation that they continue the learning process at home by providing at-home skill building activities to their child in areas the child may not be performing at grade level based on standards. The standards-based report card can be used as a tool for parents to determine areas in need of improvement.

Recommendations for Parents

Parents are the primary stakeholders in the school setting. As a parent, you entrust your children to the care of school professionals each school day. It is your right

as a parent to play an active role in the education of your child and in the partnership between home and school. The following are the researcher's recommendations to parents.

1. If your child's school is using traditional reporting measures as a way to communicate to you your child's performance, discuss with the teacher(s) and school administrators questions you may have regarding your child's mastery and areas in need of improvement on specific grade level standards. If the traditional report card does not adequately inform you of your child's progress, share your concerns with school personnel.
2. Participate in training opportunities on grading and reporting as provided by your school district.
3. Participate in parent/teacher conferences. Ask questions regarding your child's growth on the grade level standards. If your child has not met certain expectations, ask for specific things that you can do at home.
4. If your child's school uses standards-based report cards as a tool to communicate to you your child's progress, utilize the report card to pinpoint areas that may be in need of improvement. Consider providing at-home learning opportunities to your child to increase skills in those areas. Discuss ideas with and ask for suggestions from your child's teacher(s).
5. Volunteer, as you are able, in your child's classroom. Seeing and hearing lessons taking place in the classroom will better equip you to provide at-home learning opportunities to your child.

Recommendations for Additional Research

The research presented in this study sets a foundation for parent understanding of their child's mathematics performance when reported using a standards-based report card. Upon completion of the survey and examining the results, it is evident there are areas appropriate for further study. Recommendations for additional research in the area of parent understanding of their child's mathematics performance are as follows:

1. A qualitative study to examine parents' understanding of their K-6 child's mathematics performance when reported using standards-based report cards compared to traditional report cards. This type of study might pinpoint specific details that parents perceive as positive and/or negative about standards-based reporting. Parents may also reveal specific factors they feel contribute to their probability to provide at-home skill-building activities to their child. These results could have a significant impact on schools as they make important decisions regarding the development and implementation of new grading and reporting practices.
2. The child's grade was found to be the only variable, aside from parent understanding of the report card, to correlate with parents' probability to provide at-home skill-building activities to their child. Further study in this area could be conducted to examine at what grade level parents are more likely to be involved in providing at-home learning activities, and to investigate factors that contribute to the variances in involvement based on the child's grade (age). Specifically, at what point in a child's life does at-home involvement decline and for what reasons? There is conflicting research on how parent involvement at-home is

associated with the child's academic performance and reasons for declining involvement as the child increases in age (Garbacz et al., 2015; McNeal Jr., 2012; Froiland et al, 2012; Hill & Tyson, 2009).

3. Further, the researcher recommends examining parents' understanding of their child's English Language Arts, Reading, Science, Social Studies, or other content area performance when reported using standards-based report cards compared to traditional report cards. This study could be replicated to determine if findings are similar when examining a content area other than mathematics.

Concluding Remarks

This study provides educational professionals with current practical research on parent understanding of standards-based compared to traditional report cards. The researcher found that parents' perception of understanding of their child's mathematics performance was higher when reported using a standards-based format compared to a traditional report card. In addition, the probability that parents will provide at-home skill building activities in the areas the child is not at-level increases as understanding increases. It is the expectation of the researcher that this study better equips administrators and teachers to make educated decisions regarding grading and reporting practices in their schools.

APPENDICES

APPENDIX A

PERMISSION TO USE STANDARDS-BASED REPORT CARD RATING SCALE

Dr. Theresa A. Craig
37 Stone St., Middleborough, MA 02346
Email: tcraig@readscollab.org

September 16, 2016

To Whom It May Concern:

I grant permission to Jill Olson to use the *Standards-Based Report Card Rating Scale* for her doctoral dissertation. The rating scale was developed as a tool for my dissertation titled *Effects of Standards-Based Report Cards on Student Learning* in October of 2011.

If I can be of any further assistance please feel free to contact me at tcraig@readscollab.org.

Sincerely,

Theresa A. Craig

Theresa A. Craig, Ed.D.

APPENDIX B

PARENT SURVEY

This survey concerns your beliefs and opinions regarding your child's progress in mathematics and the report cards used to report student progress. There are no right or wrong answers. Your responses are completely confidential. This information will be used for research purposes to better understand how report cards convey student progress to parents.

PLEASE COMPLETE THIS SURVEY AFTER YOU HAVE LOOKED OVER YOUR CHILD'S REPORT CARD, BUT BEFORE YOU ATTEND HIS/HER CONFERENCE THIS EVENING.

The survey consists of 41 questions which are to be answered on the following pages. Although some of the items are similar, there are differences between them, so you should treat each one as a truly separate question. In total, completion of the survey should take you less than 10 minutes. If you have more than one child in grades K-6, please only keep one child in mind while you answer the survey questions.

Please return your completed survey into the survey drop-box in the elementary school office. When you return the survey, you may enter your name into a drawing for a $10 Subway gift card (10 chances to win). The drawing will be separate from the survey drop box and there will be no way to match up survey responses to parent names.

The time you have given to answer this survey is very much appreciated. Thank you for your support.

Jill Olson, Century Elementary Principal
PhD Student
Department of Educational Leadership
University of North Dakota

ELEMENTARY K-6 PARENT SURVEY

Demographics:

Names	Items
gender	What is your gender? (1) Female, (2) Male
age	What is your age in years? [In text box, enter exact number]
ethnic	I am (check all that apply): ___ (1) White/Caucasian ___ (2) African American ___ (3) Black ___ (4) American Indian ___ (5) Mexican American/Chicano ___ (6) Asian American/Asian ___ (7) Pacific Islander ___ (8) Puerto Rican American ___ (9) Other Latino ___ (10) Other
child	I am the parent of a: (If you are a parent of more than one child, please select one child's grade level and keep that child in mind while you answer all of the questions in this survey)… ___ (1) Kindergarten student ___ (2) First grade student ___ (3) Second grade student ___ (4) Third grade student ___ (5) Fourth grade student ___ (6) Fifth grade student ___ (7) Sixth grade student
employ	What is your current employment status? (1) Unemployed (2) Working part-time outside of the home (3) Working full-time outside of the home (4) Stay at home parent
pa_educ	What is your highest level of education? ___ (1) High School ___ (2) GED ___ (3) Did not complete High School ___ (4) Associate's Degree ___ (5) Undergraduate (Bachelor's) Degree ___ (6) Graduate (Master's) Degree ___ (7) Graduate (Doctoral) Degree ___ (8) Other

Parent variables:

Names	Items
close	How closely have your read your child's latest report card? ___ (1) I have not seen it ___ (2) I have skimmed it over ___ (3) I have read it thoroughly

pa_field	Do you work in a school (teacher, para, administrator, bus driver, office, etc.)? ___ (1) Yes ___ (2) No
pa_teach	If you answered yes to working in a school, are you a teacher? ___ (1) Yes ___ (2) No
pa_conf	How often to you attend parent/teacher conferences? ___ (1) I attend at least once a year ___ (2) I attend every conference that is scheduled ___ (3) I rarely attend conferences ___ (4) I never attend conferences
pa_comm	How often do you communicate with your child's teacher(s)? ___ (1) daily ___ (2) two to three times a week ___ (3) once a week ___ (4) two to three times a month ___ (5) once a month ___ (6) I do not communicate with my child's teacher(s)
pa_comm2	What is the most common method you use to communicate with your child's teacher about your child? ___ (1) face-to-face communication ___ (2) email ___ (3) text ___ (4) phone conversation(s) ___ (5) some other form of technology (social media, class dojo…) ___ (6) parent/teacher conferences ___ (7) other ___ (8) I don't communicate with my child's teacher(s)
pa_vol	Have you volunteered at your child's school in the past year? ___ (1) Yes ___ (2) No
pa_perf	What is the most common method you use to find out how your child is performing academically? Choose One: ___ (1) report card ___ (2) Power School ___ (3) email from teacher(s) ___ (4) weekly progress report ___ (5) phone call to/from school ___ (6) other; please specify _____

Students' Success

Respond to the following statement by circling the number that best represents how your child performs in mathematics. (1 = Significantly Below Level, 2 = Slightly Below Level, 3 = At Level, 4 = Slightly Above Level, 5 = Significantly Above Level)

	Significantly Below Level	Slightly Below Level	At Level	Slightly Above Level	Significantly Above Level
st_success	1	2	3	4	5

Parents' Perceptions about usefulness of different types of information regarding their child's progress

Rate the helpfulness of the following information sources for your child's academic progress. 1 (=very unhelpful), 2 (=unhelpful), 3 (=somewhat unhelpful), 4 (=somewhat helpful), 5 (=helpful), 6 (=very helfpul)

Name	Items
use1	Report cards
use2	My child's teacher talking about his/her progress
use3	Standardized test results
use4	Seeing graded samples of my child's work
use5	Power school to view his/her current grades

Parents' understanding of their child's progress in mathematics variable. CONSTRUCT: Parent Understanding

Respond to the following statements by circling the number that best represents your level of agreement or disagreement: 1 (=Strongly Disagree), 2 (=Disagree), 3 (=Slightly Disagree), 4 (=Slightly Agree), 5 (=Agree), 6 (=Strongly Agree)

		Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
progmath1	My child's report card tells me how he/she is performing on grade level math skills.	1	2	3	4	5	6
progmath2	When reading my child's report card, I understand what my child has mastered in math.	1	2	3	4	5	6
progmath3	I use the report card as a basis for how well my child is doing in math.	1	2	3	4	5	6
progmath4	After reading my child's report card, I understand where he/she is growing in math.	1	2	3	4	5	6
progmath5	My child's report card helps me understand what my child still needs to work on in math.	1	2	3	4	5	6
progmath6	Based on my child's report card, I have a good understanding of how he/she is performing in math.	1	2	3	4	5	6

Parents providing at-home mathematics skill-building activities variable.
CONSTRUCT: Parental Role Construction

Respond to the following statements by circling the number that best represents your level of agreement or disagreement: 1 (=Strongly Disagree), 2 (=Disagree), 3 (=Slightly Disagree), 4 (=Slightly Agree), 5 (=Agree), 6 (=Strongly Agree)

		Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
roleconstruct1	I help my child study for math tests.	1	2	3	4	5	6
roleconstruct2	I make sure my child's math homework gets done.	1	2	3	4	5	6
roleconstruct3	I sit down with my child when he/she does math homework.	1	2	3	4	5	6
roleconstruct4	I check over my child's math homework.	1	2	3	4	5	6
roleconstruct5	I will help explain tough math assignments to my child.	1	2	3	4	5	6
roleconstruct6	I keep an eye on my child's progress in math.	1	2	3	4	5	6
roleconsruct7	I stay on top of my child's academic progress in math.	1	2	3	4	5	6
roleconstruct8	I help my child understand his/her math assignments.	1	2	3	4	5	6

Parents providing at-home mathematics skill-building activities variable.
CONSTRUCT: Parental Self-Efficacy

Respond to the following statements by circling the number that best represents your level of agreement or disagreement: 1 (=Strongly Disagree), 2 (=Disagree), 3 (=Slightly Disagree), 4 (=Slightly Agree), 5 (=Agree), 6 (=Strongly Agree)

		Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
selfefficacy1	I will utilize information provided by the school to understand what my child needs to work on in math.	1	2	3	4	5	6
selfefficacy2	If I know what my child needs to work on in math, I will provide at-home learning opportunities.	1	2	3	4	5	6

selfefficacy3	If I try hard, I can get through to my child even when he/she has trouble understanding something.	1	2	3	4	5	6
selfefficacy4	I provide math learning opportunities at home to help improve or challenge my child's math skills.	1	2	3	4	5	6
selfefficacy5	I don't know how to help my child make good grades in math. (reverse coded)	1	2	3	4	5	6
selfefficacy6	I can make a significant difference in my child's math performance.	1	2	3	4	5	6

Participant-Response Check:

Respond to the following statement by circling the number that best represents your level of agreement or disagreement: 1 (=Strongly Disagree), 2 (=Disagree), 3 (=Slightly Disagree), 4 (=Slightly Agree), 5 (=Agree), 6 (=Strongly Agree)

Name	Items
respcheck	I have read the questions in the survey carefully and answered them honestly. (1 = Strongly Disagree, 2 = Disagree, 3 = Slightly Disagree, 4 = Slightly Agree, 5 = Agree, 6 = Strongly Agree

APPENDIX C

PARENT/TEACHER CONFERENCE LETTER FROM SCHOOL

Parent/Teacher Conferences
Thursday, March 3

Dear Parent/Guardian,

You are encouraged to attend Parent/Teacher Conferences on Thursday, March 3rd! Please plan to arrive 15 minutes prior to your scheduled conference to pick up your child's report card in the Elementary Office. We are asking parents to complete a short survey on report cards at that time. Parents who complete a survey may put their name into a drawing for one of ten $10 Subway gift cards!

Parents/Guardian of: _____

Teacher: Room Number:

Date: Thursday, March 3, 2016 Time of Conference:

Please pick up report card and complete survey 15 minutes prior to your conference time.

Please return this portion to the school

I can come to conferences at the assigned time: YES NO

*If NO, please call (*701-636-4711*) or email your child's teacher for another time.*

Child's Name: _____

Parent/Guardian's Name: _____

Parent/Teacher Conferences
Monday, February 1, 2016

Dear Parent/Guardian,

You are encouraged to attend Parent/Teacher Conferences on Monday, February 1st! Please plan to arrive 15 minutes prior to your scheduled conference to pick up your child's report card in the Elementary Principal's Office. We are asking parents to complete a short survey on report cards at that time. Parents who complete a survey may put their name into a drawing for one of ten $10 Subway gift cards!

Parents/Guardian of: _____

Teacher: Room Number:

Date: Monday, February 1, 2016 Time of Conference: _____

Please pick up report card and complete survey 15 minutes prior to your conference time.

Please return this portion to the school

I can come to conferences at the assigned time: YES NO

If NO, please call (701.248.3479) or email your child's teacher for another time.

Child's Name: _____

Parent/Guardian's Name: _____

APPENDIX D

UNIVERSITY OF NORTH DAKOTA

Institutional Review Board

Informed Consent Statement

Title of Project:	**Parent Level of Understanding of K-6 Student Mathematics Performance Using Standards-Based Compared to Traditional Report Cards**
Principal Investigator:	*Jill Olson, 701.379.2000, jill.olson@k12.nd.us*
Co-Investigator(s):	*Not Applicable*
Advisor:	*Dr. Pauline Stonehouse, Education Building, Rm 374, 231 Centennial Drive Stop 7189, Grand Forks, ND 58202-7189*

Purpose of the Study:

The purpose of this study is to examine parents' level of understanding of their kindergarten – sixth grade child's reading and mathematics performance when reported using standards-based report cards compared to traditional report cards, and furthermore determine the effect this has on parents' providing at-home reading and mathematics activities for their child.

Procedures to be followed:

Surveys will be administered during parent/teacher conferences during the 2015-2016 school year). Jill Olson has received permission from the district superintendent to conduct a survey of K-6 parents during 2015-2016 parent/teacher conferences. Ethical permission to conduct the survey was obtained from the Institutional Review Board (IRB) at the University of North Dakota (UND).

School personnel will provide you with a paper survey along with your child's report card. Seating with privacy shields will be provided in the elementary foyer. You will complete the survey using a pen. The survey has 41 questions and should take less than ten minutes to complete.

Parents who complete a survey will be entered into a drawing for one of ten $10 Subway gift cards. When you complete the survey please return it to the anonymous drop box just outside of the elementary school office. At that time, you may enter your name into a drawing for a $10 Subway gift card. The drawing will be kept separate from the survey drop box and there will be no way to match surveys to parent names.

Risks:

There are no risks in participating in this research beyond those experienced in everyday life.

Benefits:
This study is intended to inform our district how parents understand their child's report card.

Duration:
The survey should take less than 10 minutes to complete.

Statement of Confidentiality:
The survey does not ask for any information that would identify who the responses belong to. Therefore, your responses are recorded anonymously. If this research is published, no information that would identify you will be included since your name is in no way linked to your responses.

Right to Ask Questions:
The researcher conducting this study is Jill Olson. You may ask any questions you have now. If you later have questions, concerns, or complaints about the research please contact Jill Olson at 701.352.1930 or Dr. Pauline Stonehouse at 701.777.4163.

If you have questions regarding your rights as a research subject, you may contact The University of North Dakota Institutional Review Board at (701) 777-4279. You may also call this number with problems, complaints, or concerns about the research. Please call this number if you cannot reach research staff, or you wish to talk with someone who is an informed individual who is independent of the research team.

General information about being a research subject can be found on the Institutional Review Board website "Information for Research Participants" http://und.edu/research/resources/human-subjects/research-participants.cfm

Compensation:
You will not receive compensation for your participation.

Voluntary Participation:
You do not have to participate in this research. You can stop your participation at any time. You may refuse to participate or choose to discontinue participation at any time without losing any benefits to which you are otherwise entitled.

You do not have to answer any questions you do not want to answer.

You must be 18 years of age older to consent to participate in this research study.

Completion and return of the survey implies that you have read the information in this form and consent to participate in the research.

Please keep this form for your records or future reference.

APPENDIX E

SCHOOL A: THIRD GRADE SAMPLE MATHEMATICS PORTION OF STANDARDS-BASED REPORT CARD

4 – Advanced Proficient – Exceeds grade level standards
3 – Proficient – Meets grade level standards
2 – Partially Proficient – Student is making progress and developing toward grade level standards
1 – Novice – With help, student produces work that is below grade level expectations

MATH – OPERATIONS & ALGEBRAIC THINKING	**T1**	**T2**	**T3**
Interpret products of whole numbers			
Interpret whole-number quotients of whole numbers			
Use multiplication and division within 100 to solve word problems			
Determine the unknown whole number in a multiplication or division equation			
Apply properties of operations as strategies to multiply and divide			
Understand division as an unknown-factor problem			
Fluently multiply and divide within 100			
Solve two-step word problems using the four operations			
Identify arithmetic patterns and explain them using properties of operations			
MATH – NUMBERS & OPERATIONS			
Round whole numbers to the nearest 10 or 100			
Fluently add and subtract within 1000			
Multiply one-digit whole umbers by multiples of 10			
Understand a fraction 1/b as the quantity form by 1 part of b equals parts			
Understand a fraction as a number on the number line			
Represent fraction 1/b on a number line between whole numbers 0 to 1			
Represent fraction a/b on a number line by marking off lengths 1/b from 0			
Recognize and generate simple equivalent fractions			
MATH – MEASUREMENT & DATA			
Tell time to the nearest minute			
Measure and estimate liquid volumes and masses of objects			
Generate measurement data by measuring with rulers			
Recognize area as an attribute of plan figures			
Understand a square with side length of 1 unit has “one square unit” of area			
Understand a plane figure of n unit squares has an area of n square units			
Measure areas by counting unit squares			
Find the area of a rectangle with whole-number side lengths tiling it			
Multiply side lengths to find areas of rectangles with whole-number polygons			
Solve real-world mathematical problems involving perimeters of polygons			
MATH - GEOMETRY			
Understand that shapes in different categories may share attributes			
Partition shapes into parts with equal areas			

Attendance	**T1**	**T2**	**T3**	**TOTAL**
Days Absent				
Tardy (AM/PM)				

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