# A STUDY TO DETERMINE IF THERE IS A RELATIONSHIP BETWEEN PARENTAL PERCEPTIONS AS PERCEIVED BY THE CHILD TOWARD MATHEMATICS AND THE CHILD'S ACADEMIC SUCCESS IN MATHEMATICS

By

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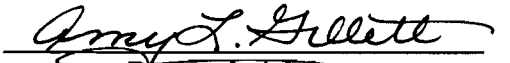
A Research Paper

Submitted in Partial Fulfillment of the
Requirements for the Master of Science in Education

Approved 2 Semester Credits



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December 2004

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# ABSTRACT

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A Study to Determine if There is a Relationship Between Parental Perceptions as Perceived by the Child Toward Mathematics and the Child's Academic Success in Mathematics

(Title)

Master of Science in Education Dr.Amy Gillett 12/04 31

(Graduate Program) (Research Advisor) (Month/Year) (# of Pages)

American Psychological Association, 5th edition

(Name of Style Manual Used in this Study)

The purpose of this study was to determine if there was a relationship between parental perceptions and attitudes, as perceived by the child, toward mathematics, and their academic success in high school mathematics.

The subjects for this study were high school students from Boyceville, Wisconsin. All of the subjects were enrolled in PreAlgebra, Algebra, or Geometry. All subjects were provided with a written overview of the study, which described their involvement in this study. Because all of the subjects were minors, a consent form was signed by the students' parent/guardian before the study began. Their participation was voluntary, with an alternate activity available.

The instrumentation for this study consisted of a questionnaire with ten items. The questionnaire was designed specifically for this study, and included demographic information, as well as information pertaining to the students' perceptions of their parents' perceptions of mathematics.

The data was collected during the fall semester of the 2004-2005 school year, at the Boyceville High School to test the null hypothesis: There will be no relationship in the perception of mathematics given by parents to their children and their children's academic success in mathematics. Kendall's tau was run to address the correlation. To determine significance, the probability level was set at .05 for each item.

Seven of the ten items analyzed supported the null hypothesis and three of the ten items analyzed rejected the null hypothesis

The results show there are tendencies toward a relationship between perceptions conveyed by parents to their children concerning mathematics, and the academic success the children experienced in mathematics. The null hypothesis was mostly supported, and minimally rejected, therefore further research is necessary to truly establish a relationship.

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# CHAPTER ONE

## Introduction

Perceptions are all around us at school, at work, and at home. Some perceptions we can control and some we cannot, some are backed by facts and some are not. When adults perceive a situation, they will most likely use past experiences and knowledge to enhance an awareness of the truthfulness of that perception. Often teenagers do not have that experience yet to draw from, so others easily sway perceptions of their surroundings, and those perceptions play a significant role in their attitudes and performances. To perceive, as defined by Webster's New World Dictionary (Simon & Schuster, 1991), is "to feel, comprehend; to grasp mentally; take note of; observe; to become aware of through sight, hearing, touch, taste or smell" (p. 1002). A high school teacher may define perception in regards to adolescents in school, as one of the strongest barriers to learning and acceptance of things not yet known. Perceptions and attitudes exuded by people close to teenagers greatly influence teenagers' attitudes and decision-making, and therefore their academic performance in high school settings.

Boyceville, Wisconsin, is a village located in the west central part of the state. It is a farming community with a population of approximately 1,100 people. The school district in Boyceville is about 30 miles long and 10 miles wide. According to a pamphlet distributed by the Boyceville School District (n.d.), one statistic stated that roughly 88% of the property in the district lies outside the village, with 85% of its families living in a rural setting. The school system consists of one elementary school, which was built in 1990, one middle school, which was remodeled in 2000, and one high school, which was built in 2000. Within the school district, there were 937 students enrolled at the time of

this study. Three hundred thirty-six students, or approximately 36% of the students in the district, were in the free or reduced lunch program, which indicated this as a low socioeconomic area.

Boyceville High School houses grades nine through twelve. There is an average of 75 students per grade, with a total of 300 students in the high school. In the mathematics department, there are two teachers to facilitate the mathematics curriculum. There are six different courses offered through the mathematics department that the students take in a sequential order. Some students start with Pre-Algebra, others start with Algebra, then both groups go on to Geometry, Advanced Algebra, and Pre-Calculus. Mathematics in high school is one of the four core subject areas, along with English, Science, and Social Studies. At Boyceville High School, as of the graduating class of 2003-2004, three mathematics credits, instead of two, are required for graduation. Therefore students are taking more mathematics classes at Boyceville High School in order to graduate.

Mathematics, as recognized by school systems through increasing the requirements for students, is very important for every student to learn and understand. It will prepare students to deal with the mathematics that they will see everyday in newspapers, magazines, on television, on any job, as well as in school. Mathematics teaches students how to problem solve, and different problem solving techniques can be applied to many different disciplines. It also teaches students to analyze situations logically. All technology is based on mathematical principles, so understanding mathematics will help them understand technology. Students need a firm mathematics

background to help them decide if and where they will attend post-secondary education, as well as open up career possibilities. Mathematics is an essential subject to understand.

Teaching mathematics in high school has its challenges, as does teaching any subject. But mathematics seems to have one strike against it that other subjects do not. The perception that many people believe to be fact is that you either "get" math, or you "don't get" math. This idea is fostered by many different factors, but the one factor that the researcher would like to explore is parental perceptions and attitudes affecting their child's academic success in mathematics. During parent conferences, the researcher was guaranteed to hear from different parents, comments like, "Oh, I could never do math," or "I never got math when I was in school." Their child would always be sitting right beside them listening to these statements, absorbing what he/she heard. Through these statements, the parents seem to condone mathematic inability, laziness, and inadequate grades of their children because they could never "get" math themselves. This in turn would seem to justify to the child that it's all right not to try to succeed in math. The child may think that he/she is destined not to "get" math – it must be a "family thing" because mom or dad could never "get it" either. From these statement there would seem to be no expectations coming from the parent(s) as to the attitude and work ethic for the child in his/her mathematics class. The perception of math as being too hard for them no matter what the material, is put forth and reinforced. Instead, parents need to encourage their children to succeed, to do homework, and to hold them to high academic expectations. This is an important factor in the improvement of students' achievement (Tokar,1999). The expectations and aspirations held by parents for their child's educational achievement has been shown to influence children's aspirations and

expectations positively, which in turn affects their academic performance and achievement (Singh et al., 1995). An important factor in the improvement of student achievement is for parents to verbalize these expectations through encouragement. Perceptions and attitudes expressed by people close to teenagers greatly influences their attitudes and decision making in school settings.

**Statement of the Problem**

The purpose of this study is to determine if there is a relationship between parental perceptions, as perceived by the child, toward mathematics, and their academic success in high school mathematics in Boyceville, Wisconsin during the 2004-2005 school year. Data will be collected through the use of a survey given to high school students presently enrolled in mathematics classes during the fall semester.

**Hypothesis**

There will be no relationship in the perception of mathematics given by parents to their child and their child's academic success in mathematics.

**Definition of Terms**

For clarity of understanding, the following terms used within this study must be defined.

Academic success – grades of above average or higher (B, A) in mathematics.

Mathematics classes – classes offered at Boyceville High School, which include: Pre-Algebra, Algebra, Geometry, Advanced Algebra, and Pre-Calculus.

**Assumptions**

It is assumed that the survey will be answered honestly and returned in a timely manner.

**Limitations**

This study only looks at one small high school in west central Wisconsin, in a low socioeconomic area, therefore generalizability to other similar schools should be used with caution.

# CHAPTER TWO

## Literature Review

### Introduction

The purpose of this literature review is to examine the high school mathematics requirements and the mathematics standards. This review will also look at the role of mathematics in the workforce and in everyday life and perceptions of mathematics.

### High School Mathematics Requirements

Mathematics is a required course in most of the public high schools in the United States. Two states do not explicitly impose mathematics as a requirement for a high school diploma. In Colorado, there are no state course-specific requirements, but for schools to be accredited, they must require thirty units among the core subjects and other specific areas. In Nebraska, the state sets a requirement for total core courses as a group, but the local boards set subject-specific requirements. According to the National Center for Education Statistics (2002) in Iowa in 1991, the only state mandated requirement was physical education/health for every year the student was in attendance. The local school districts determine the remaining requirements. That mandate was changed in 1998 when the requirement was changed to include three credits of mathematics, as reported by the Iowa Department of Public Instruction (2002). In Wisconsin, according to the State of Wisconsin Department of Public Instruction (1998), a minimum of two credits of mathematics successfully completed in grades nine through twelve is required to earn a high school diploma. The Wisconsin Department of Public Instruction also stated that the minimum credit requirement in any area may be exceeded by an individual school district if it sees fit to do so. In Boyceville, Wisconsin, the graduation requirement for

mathematics was changed from two to three credits starting for the graduating class of 2004. Most school districts in Wisconsin require two or three mathematics credits, but the trend is moving toward three mathematics credits to earn a high school diploma.

**High School Mathematics Standards**

The high school mathematics curriculum in Wisconsin, since 1998, has been driven by Wisconsin's model academic standards. The Governor's council on model academic standards designed these standards. The council was comprised of parents, teachers, business people, school board members, and administrators. The standards were designed to be general guidelines that local school districts adopted in the areas of English language arts, mathematics, science, and social studies in grades four, eight, and twelve. They were not intended to limit local school districts, but to be a basis from which individual schools could build their curriculum. The standards also reflected a change in how student achievement was gauged. In the past, student achievement was based on comparing a student's grades to those of his or her peers. Now, student achievement will be measured individually against these standards, using state mandated standardized tests.

The mathematics standards reflect a "shift in mathematical emphasis necessitated by technological advances in an information society" (WI DPI, 1998, n.p.). In the past, mathematics curriculum has mainly focused on skills and procedures. Traditional programs have focused on the details of mathematics, without connecting its unified themes. Most traditional textbooks have focused on the end product of knowledge, without the understanding of why a procedure works, actual applications, or different uses of the topic. With the standards in place, the focus has shifted to linking

mathematics with its applications and exploring connections. Using standards-based materials, according to Trafton, Reyes, and Wasman (2001), promoted coherence through an initial focus on big ideas, with an emphasis on connections and links to related mathematical ideas and applications. At all levels of mathematics education, students should be able to provide a reason why they have chosen a particular skill or concept, and should be able to apply the solutions to problems of varying types and complexities. Through standards-based materials, students should be able to see the practical relevance and usefulness of the mathematics they learn.

The Governor's council on model academic standards used various resource documents to design the standards. One of these documents was the *Curriculum and Evaluation Standards for School Mathematics*, published by the National Council of Teachers of Mathematics (NCTM). The NCTM is a professional organization for teachers of mathematics in grades kindergarten through twelve, that has the responsibility to provide broad national leadership in matters related to mathematics education. The mission of the organization is to provide the vision and leadership necessary to ensure a mathematics education of the highest quality for all students. The Wisconsin mathematics standards parallel the NCTM standards regarding student activity, but the organization goes further to include goals concerning the teaching of mathematics, the partnerships in mathematics education, and the professional development for mathematics educators. Another goal of the NCTM, which extends the standards, is to stimulate students' interest, achievement, and confidence in learning mathematics. According to Ma and Kishor (1997), educators generally believe that children learn more effectively when they are interested in what they learn and that they will achieve better in

mathematics if they like mathematics. Therefore, continual attention should be directed towards creating, developing, maintaining, and reinforcing positive attitudes toward mathematics. If a student experiences success in mathematics, he or she is more likely to enjoy the activity and therefore put more effort into learning and experiencing the subject.

**Mathematics in the Workforce and Everyday Life**

The importance of mathematics is clearly seen now, more than ever. Mathematics is shaping our workforce. As stated in Wisconsin's model academic standards, "The understanding of mathematical concepts has become imperative for each citizen as everyday functions become more mathematically complex and as low-skill jobs become nonexistent" (State of Wisconsin Department of Public Instruction, 1998, n.p.). There are several areas in mathematics that lend themselves directly to the work force and also to everyday life. The areas are related, as all of mathematics is, and a few of those areas will be explored.

Technology must be an integral part of learning mathematics. Society is more dependent on technology now than ever before. The technology world is different because of the wide range of tools available and the faster flow of information. Calculators, graphing calculators, computers, and other forms of electronic information technology are now standard tools for mathematics education. These tools are essential for problem solving in science, engineering, business, medicine, government, finance, among others. Federal Reserve Chair Alan Greenspan suggested that a strong foundation in mathematics would improve financial literacy, and therefore "help prevent younger people from making poor financial decisions that could take years to overcome" (NCTM,

2002, n.p.). The increasingly complex financial market makes it easier for people to become victims of scam artists because they lack adequate financial education. Mathematics and technology will empower students to be financially literate, and in turn will give them the tools to make sound financial decisions in every day life.

Whether working alone or as part of a team, students and people in the work force must be able to problem solve and communicate their thoughts and solutions to others. In an interview conducted by NCTM, PSINet's (one of the world's largest commercial Internet service providers) Chief Executive Officer and founder William Schrader stated that "if employees turn out to be good problem solvers, then progress rather rapidly...If it turns out that they don't understand the basics of mathematics, or they're not good communicators and they can't read and think, then they're pretty well limited. If you don't have a strong mathematics background, you are weak, under all circumstances" (2000, n.p.).

Mathematics is present in everyday life. Whether it be shopping, cooking, planning a budget, watching the Olympics, or analyzing information reported in the media, people use mathematics. Frequently, these same people don't realize that mathematics is used in these topics. Mathematics also opens up many career options for students about to graduate from high school. If the student has a strong background in mathematics, he or she can choose to go into whatever field they feel would fit them best. In order for that to happen, success in mathematics must start early. If students experience success, they are more likely to enjoy mathematics and continue to learn it throughout high school. To experience success, there needs to be encouragement and support coming from the student's parent or guardian in regards to his or her mathematics

education. If the support and encouragement is not there, the student will most likely not experience success, which may end the motivation to learn and the enjoyment of learning mathematics.

**Perceptions**

Perceptions are a part of everyday life. If you perceive something, you are using one of the senses to become aware of or understand something. Memory is also used in the process of perception. People encounter many situations throughout the day where they formulate a perception. From the smell of breakfast, to seeing someone new, to watching the news on television in the evening, perceptions are formed. Perceptions gathered by children about education play a role in that child's educational outlook and success.

The expectations and aspirations held by parents for their child's educational achievement has been shown to influence children's aspirations and expectations positively, which in turn affects their academic performance and achievement (Sing et al., 1995). These expectations and aspirations are conveyed to their children through many different ways. One of these ways is through perceptions. Since a perception is formulated using the senses or memory, many statements a parent makes about the expectations they hold, intentional or unintentional, encouraging or discouraging, as well as actions that are made, formulate the child's perception. Verbalizing parental expectations in the form of encouragement is an important factor in the improvement of student's achievement (Tokar,1999). Parental involvement is essential in a child's academic success. There is both theoretical and empirical evidence that parental

involvement improves student learning. This includes the parents supporting the work and values of the school (Sing et al., 1995).

Perceptions of not only education, but also mathematics given by a parent to a child may be a very important factor for the success that student can attain in mathematics. According to the NCTM, for students to succeed in their study of mathematics, they must believe that they can "do" mathematics (2002). NCTM also recommends that all educators, parents, counselors, and administrators' work together to shape, guide, and inform students' attitudes, perceptions, and decisions regarding their education in mathematics (1994).

Perceptions are very influential in the lives of adolescents. What a child perceives may become fact in the child's mind. If parents or guardians believe in the importance and value of mathematics, and relay those feelings to their children, the chance of the children experiencing success in mathematics is increased. Timothy Brusoe made an interesting conclusion in his thesis entitled "How perceptions students have about their parents' math ability influences the perceptions students have about their own math ability"(1997). He concluded there was "significant correlation between the perceptions students have of their mothers mathematics ability and the perception the students have of their own mathematics ability" (p. ii). If the mother of the child relayed a positive attitude and was supportive of the child's mathematical education, then the child would also hold a positive perception about mathematics. Therefore, the chances of the child experiencing success in mathematics would increase. To determine how much $5^{th}$ and $6^{th}$ grade math achievement is related to parental influence, a study was done by Campbell

and Mandel (1990). The most significant variable in the analysis of student mathematics achievement was parental influence.

Studies have shown that parental expectations and attitudes are factors in students' general academic achievement. Specifically in mathematics, a correlation was found between the perceptions of the mothers' mathematics ability and the perception of the child's mathematics ability (Brusoe, 1997). This study will attempt to tie perceptions with academic achievement in mathematics. The relationship between parental perceptions, as perceived by the child, and the child's academic success will be investigated.

# CHAPTER THREE

## Methodology

### Introduction

This chapter will include information about the sample in this study. A description of the instrument used will be discussed. Also, data collection and data analysis procedures will be given. The chapter will conclude with the methodological limitations.

### Subject Selection and Description

The Superintendent of Boyceville High School, in Boyceville, Wisconsin, was contacted and approved the study before any other contacts were made. The Institutional Review Board was also contacted and their approval was given before the survey was dispersed. One hundred thirty-one students were requested to participate, including all students in the Algebra classes, the PreAlgebra class, and one section of the Geometry class who attend Boyceville High School. These students range in age from fourteen to sixteen. Because all of the participants are minors, the student and the student's parent or guardian have signed a consent form before the student participated in the study. A copy of the consent form is located in Appendix A.

### Instrumentation

The survey that was used was specifically designed for this study. No other instrument was found to meet the specific needs of this study. The survey was designed to be easy to fill out because high school students with a wide range of abilities participated. It consisted of 10 statements regarding comments that may have been made

to the students by their parents/guardians regarding their opinion of mathematics. The student were asked to circle a one if their parent/guardian has made a comment similar to the one stated, or a 2 if the student has never heard a comment like the one stated. The first four statements were of a positive nature toward the importance of mathematics, and the last five were negative statements regarding the importance of mathematics. Because the survey was constructed specifically for this study, there were no documented measures of validity or reliability. A copy of the finalized survey is located in Appendix B.

**Data Collection**

Permission was sought from the Superintendent of Schools in Boyceville, Wisconsin. Once permission was granted, consent forms were given to each of the students who were asked to participate. The students were asked to sign the forms and also to bring the form home to get their parent/guardian signature. The forms were requested back in a timely manner. Once the consent forms were brought back with the required signatures, the survey was distributed to the students by the researcher during class time. There was an alternate activity available for those who chose not to participate. Adequate time was given to complete the survey. Mathematics grades from the previous year were collected from the guidance counselor at Boyceville High School by the researcher for the students participating and were matched with the answers the students gave on the survey.

**Data Analysis**

The data was analyzed using a computerized statistics package called SPSS for the PC. All appropriate descriptive statistics were run. Item analysis, cross tabulation,

and Spearman rho were run to address the correlation between the students' perception of mathematics from their parents/guardians and their mathematics grade from the previous school year.

**Limitations**

One limitation of the instrument was that it had no documented measures of validity or reliability because the survey was specifically designed for this study. Only one school district participated in the study at the high school level, therefore any results should be used cautiously to infer to other districts of similar size. Another limitation might be the truthfulness of the students filling out the survey. There is no way for the researcher to identify if the students answers were truthful. A third limitation involved students who chose not to participate because they did not return the required signed consent form. These students may be the ones the researcher was most interested in, but may not have had the motivation, responsibility, or support at home to return the signed consent form.

# CHAPTER FOUR

## Results

### Introduction

The purpose of this study was to determine if there is a relationship between parental perceptions and attitudes, as perceived by the child, toward mathematics, and their academic success in high school mathematics in Boyceville, Wisconsin during the 2004-2005 school year. In this chapter demographic information of the participants and item analysis of the survey will be discussed. The chapter will conclude with addressing the research hypothesis.

### Demographic Information

There were 134 students who were initially contacted to participate in this study. Of those contacted, seventy-three students returned the required parental consent form and were able to participate in the study, which accounted for approximately 56% of the total possible participants. Within the participants, 55% were freshman, 38% were sophomores, and 7% were juniors in high school. No seniors participated in this survey.

### Item Analysis

Item Number 1 Being good in math will help get a good job after high school:

Of the 73 participants, 13.7% (n=10) said they had never heard their parents/guardians say this, while 86.3% (n=63) said that they had heard this statement at home.

Kendall's tau correlation coefficient and Spearman rho were run with all of the survey items paired with the grade the student earned the previous year in his/her math

class. For this item there was a positive correlation, but it was not statistically significant (tau=.011; p=.460).

Item Number 2 I liked math when I was in school:

Of the 73 participants, 49.3% (n=36) said they had never heard their parents/guardians say this, while 50.7% (n=37) said that they had heard this statement at home. For this item there was a positive correlation, and it was statistically significant (tau=.181; p=.046). Students who reported having heard their parents/guardians say they liked math in school tended to do better in mathematics than those students who did not hear this statement.

Item Number 3 Math is used in everyday life:

Of the 73 participants, 20.5% (n=15) said they had never heard their parents/guardians say this, while 79.5% (n=58) said that they had heard this statement at home. For this item there was a positive correlation, but it was not statistically significant (tau=.079; p=.232).

Item Number 4 I understood math when I was in school:

Of the 73 participants, 34.2% (n=25) said they had never heard their parents/guardians say this, while 65.8% (n=48) said that they had heard this statement at home. For this item there was a positive correlation, but it was not statistically significant (tau=.100; p=.175).

Item Number 5 I did not like math in school:

Of the 73 participants, 57.5% (n=42) said they had never heard their parents/guardians say this, while 42.5% (n=31) said that they had heard this statement at

home. For this item there was a negative correlation, but it was not statistically significant (tau=-.074; p=.246).

Item Number 6 Only smart people can get math:

Of the 73 participants, 100% said they had never heard their parents/guardians say this, while 0% said that they had heard this statement at home. For this item no statistics could be run because this question is a constant.

Item Number 7 I could never do math:

Of the 73 participants, 68.5% (n=50) said they had never heard their parents/guardians say this, while 28.8% (n=21) said that they had heard this statement at home. Two participants chose not to complete this item. For this item there was a negative correlation, and it was statistically significant (tau=-.206; p=.030). Students who reported having heard their parents/guardians say that they could never do math tended to do worse in mathematics than those students who did not hear this statement.

Item Number 8 I never understood math:

Of the 73 participants, 74% (n=54) said that they have never heard this statement at home, while 26% (n=19) said they have heard this statement at home. There was a negative correlation, and it was statistically significant (tau=-.207; p=.027). Students who reported having heard their parents/guardians say that they never understood math tended to do worse in mathematics than those students who did not hear this statement.

Item Number 9 You really don't need math:

Of the 73 participants, 97.3% (n=71) said they had never heard their parents/guardians say this, while 2.7% (n=2) said that they had heard this statement at

home. For this item there was a negative correlation, but it was not statistically significant (tau=-.137; p=.101).

Item Number 10 Math is not important in life:

Of the 73 participants, 95.9% (n=70) said they had never heard their parents/guardians say this, while 4.1% (n=3) said that they had heard this statement at home. For this item there was a negative correlation, but it was not statistically significant (tau=-.118; p=.137).

**Hypothesis**

The data was collected to test the null hypothesis: There will be no relationship in the perception of mathematics given by parents to their child and their child's academic success in mathematics. To determine significance, the probability level was set at .05 for each item.

Seven of the ten items analyzed supported the null hypothesis. These items were as follows:

1.Being good in math will help get a good job after high school.

3.Math is used in everyday life.

4.I understood math when I was in school.

5.I did not like math in school.

6.Only smart people can get math.

9.You really don't need math.

10.Math is not important in life.

Three of the ten items analyzed rejected the null hypothesis. These items were as follows:

2.I liked math when I was in school.

7.I could never do math.

8.I never understood math.

The results show there are tendencies toward a relationship between perceptions conveyed by parents to their children concerning mathematics, and the academic success the children experience in mathematics. The null hypothesis was mostly supported, and minimally rejected, therefore further research is necessary to truly establish a relationship.

# CHAPTER FIVE

## Discussions, Conclusions, and Recommendations

### Introduction

This chapter will include a discussion and some conclusions regarding the results of this study. The chapter will conclude with possible recommendations for further study.

### Discussion

According to the research findings there are tendencies toward a relationship between parental perceptions, as perceived by the child, toward mathematics, and the academic success of the child in mathematics. Three items on the survey showed statistical significance. The first, "I liked math when I was in school" implied that when the children perceived that the parent/guardian liked mathematics, they attained academic success in mathematics. The second and third, "I could never do math" and "I never understood math" implied that when parents/guardians conveyed a negative perception of their own mathematics ability, the child did not have academic success in mathematics.

Two items on the survey were agreed upon by most of the children through perceived parent perceptions as being important. One item, "Being good in math will help get a good job after high school", yielded a high probability value (p=.460). The second item, "Only smart people can get math", yielded a constant, which implies everyone who participated do not believe that only smart people can learn mathematics.

### Conclusions

Many school districts are beginning to recognize the importance of mathematics in today's society by requiring more mathematics credits to earn a diploma. Because of this, some students who never intended to take more mathematics credits must do so in order to earn a

diploma. They are typically the students who may not have a long-range plan of their future and may not have the desire to learn any more mathematics. These are the students who need the most help to experience academic success in mathematics. To increase the chance of experiencing success in mathematics, this study found there needs to be positive statements made by parents and support at home through encouraging conversations. The schools know what occurs during the school day, but do not know what occurs at home in the evenings, weekends, and time away from school.

In education today, teachers and administrators need assistance beyond the school day to help children experience academic success in mathematics. It seems as if more is being expected of the schools, yet budgets all across the state have been drastically reduced. As the researcher was completing this study, the 2004 presidential election occurred, with President George W. Bush being reelected for a second term. With this happening, the No Child Left Behind legislation was still in place. According to the State of Wisconsin Department of Public Instruction (2004), this legislation involves many aspects of education, but has a specific goal in mathematics. There will be a statewide accountability system that will ensure all students must score proficient or better on the mandated statewide standardized tests by the year 2013-2014, with goals and benchmarks that all schools must reach each year. The benchmark for the 2004-2005 school year in mathematics is 47.5%. In nine years the number of students in this category is expected to be 100%, along with a budget reduction. A lot more is being expected in education, but the money to fund the programs and employ the educators to help make it happen is being taken away.

The statewide standardized test scores, which come out in the spring of the year, are looked upon by many in the public as the only attribute that reflects the quality and the effectiveness of the school.

**Recommendations for Parents**

Many factors of education, beyond the test scores, are ignored in this situation. If a grade is followed and test scores for that grade are compared from the eighth grade scores and their tenth grade scores, a significant increase may occur. But if that increase isn't more than the previous years tenth grade test scores, it is looked at by many in the public as a very negative mark for the school, and the implication is that the school is not doing its job to educate their students. This situation produces a lot of pressure for everyone in the school district, and especially for the teachers. If every child who came to school lived with responsible, loving, caring adults, had a good night's sleep, eaten a nutritious breakfast, and had help with their homework, it would be easier to educate these children. This is just not the case. Another factor that needs to be considered is the percentage of special education or at-risk students who are in the grade being tested. This percentage fluctuates from year to year and has an effect on the test scores. The percentage of transient students must also be considered when thinking about test scores. Numerous students may move into the district the same year that the standardized tests are given. The district has not educated these students before, but the test scores of these students will be factored into the total scores for that district.

The bottom line is that teachers need all the help they can get to be able to provide a quality education to all types of students, and to keep the schools in a positive light. Specifically, more help is needed in the area of mathematics. This study showed that there is a relationship between parental perceptions by the child and the academic success of that child in mathematics.

If the negative perceptions about mathematics by the parents of the students were eliminated, the chance of success in mathematics would be increased.

There are many ways that parents/guardians can convey positive perceptions to their children. One of the easiest ways is not to talk negatively about mathematics. During parent/teacher conferences, with the children sitting right there, the researcher has heard numerous parents say that they could never do math, or they never understood math. The actions of the parents while they say these statements speak volumes also. As they say it, they lean back in their chair, shake their head, and look at their child like we're talking about something totally absurd. These statements seem to justify to the students that it's fine if they don't understand mathematics, and it's fine if they don't put forth as much effort as they can. After all, in the students' mind, their parents couldn't understand mathematics and they have the same genes as their parent, therefore they should not be expected to accomplish anything different. Other comments heard, such as "if they have homework, I can't help them" and "no one in our family is good at math" reflect this same feeling. Even when the researcher tries to turn the conversation in a positive direction by suggesting different strategies like having the child reteach the parent about mathematics, the parent shrugs off the suggestion quite rapidly. If the parents shut down when mathematics is brought up, so will the child. Support and positive comments with regard to mathematics need to be present to give the child every chance to succeed in mathematics. However, one positive aspect of these parent/teacher conferences is that the parents do make the effort to attend, which is an important part of communication. This shows that there is concern by the parents, but they may need help in how to get as much positive feelings out of this situation as they can.

Parents at home can also convey positive perceptions about mathematics quite easily. A simple conversation about how math class went that day, along with a little encouragement or praise would open the door to many other conversations and understanding in the future. They should be interested in whatever their child has to say about school. The parents could ask if their child had any work to do at home for their math class and help them if they could or have their child teach them what they learned that day. Parents can inquire when the next quiz or test is or if they are doing any projects. Any conversation about mathematics parents can have with their children, technical or not, that has a positive and encouraging tone, with will foster positive perceptions and therefore increase the chance for academic success in mathematics.

Parents' perceptions of mathematics play a role in their children's success in mathematics. If the perception is positive, there is an increased chance of the children seeing the importance of mathematics and experiencing academic success in the subject. Experiencing academic success in mathematics can lead to financial literacy, good problem solving techniques, knowledge about technology, higher paying jobs, many career opportunities, among others.

**Recommendations for further research**

One suggestion for further research on this topic would be to employ a larger subject sample. This study was limited to one small high school in western Wisconsin. A regional or statewide study would produce more meaningful results.

Another suggestion would be to compare the perceptions of mathematics with the last three years of the student's mathematics grade. In this study, only the previous year was considered.

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## Appendix A: Consent Form

Dear Parent or Guardian,

The students in your child's mathematics class have the opportunity to take part in a study about perceptions in mathematics. The Boyceville School District has fully approved this project. I am asking your permission for your child to participate.

The goal of this study is to administer a survey to determine if there is a relationship between parental perceptions, as perceived by the child, and the academic success of the child in mathematics. The survey will consist of 10 questions, and the answers to the questions will be matched to your child's grade in his/her mathematics class.

There is little or no risk for your child to fill out this survey. The information gathered will be kept strictly confidential and any reports of the findings of this survey will not contain your child's name or any other identifying information.

Your child's participation is strictly voluntary. You and your child may choose not to participate without any adverse consequences to you. Should you choose to participate and later wish to withdraw from the study, you may discontinue your child's participation at any time without incurring adverse consequences.

This study has been reviewed and approved by the University of Wisconsin-Stout's Institutional Review Board (IRB). The IRB has determined that this study meets the ethical obligations required by federal law and University policies. If you have questions, concerns, or reports regarding your rights of your child as a research subject, please contact the IRB Administrator.


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**Parent/Guardian Statement of Consent:**
By signing this consent form you agree to allow your child to participate in this research study.

Signature of Parent/Guardian _____ Date _____

**Student Statement of Consent:**
By signing this consent form you agree to participate in this research study.

Signature of Student _____ Date _____

**Appendix B: Subject Survey**

What Your Parents/Guardians Say About Math

Name: _____

The purpose of this survey is to determine if there is a relationship between what your parents/guardians say about math, and what grade you earn in your math class.

Circle your grade in school: $9^{th}$ $10^{th}$ $11^{th}$ $12^{th}$

Circle the math class are you in now: PreAlgebra Algebra Geometry

Please circle "1" if your parents/guardians have made a comment like this, or circle "2" if your parents/guardians have never made a comment like this:

| | My parents/guardians HAVE said something like this: | My parents/guardians HAVE NEVER said anything like this: |
|---|---|---|
| 1. Being good in math will help get a good job after high school. | 1 | 2 |
| 2. I liked math when I was in school. | 1 | 2 |
| 3. Math is used in everyday life. | 1 | 2 |
| 4. I understood math when I was in school. | 1 | 2 |
| 5. I did not like math in school. | 1 | 2 |
| 6. Only smart people can get math. | 1 | 2 |
| 7. I could never do math. | 1 | 2 |
| 8. I never understood math. | 1 | 2 |
| 9. You really don't need math. | 1 | 2 |
| 10. Math is not important in life. | 1 | 2 |

[ ] Please check this box if your parents/guardians have NEVER talked to you about the importance or unimportance of math.

Thank you for participating!