

**Exploring the Relationship between Music
Participation on Math Scores and High School
Retention**

by

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ABSTRACT

“If I were not a physicist, I would probably be a musician. I often think in music. I live my daydreams in music. I see my life in terms of music... I get most joy in life out of music.”

-Albert Einstein

In the spirit of recent legislation, educational leaders are in search of ways to ensure a quality education for all students in America, vowing to leave no child behind. Unfortunately, most of the rhetoric surrounding quality in education fails to acknowledge the impact of *the arts* in standards-based reform initiatives. In fact, some school districts have discussed cutting the arts entirely from the curriculum. The purpose of this study is threefold: (1) to examine the impact of music education on high school students' achievement in mathematics, and (2) to examine the relationship between schools with music programs and their graduation rates, (3) to explore the personal impact of music participation through auto-ethnographic study. The results of this study revealed that participation in a music program can have a positive impact on mathematics retention of high school students. This study revealed information about the need for student participation in order to make a clear determination. However, the auto-ethnography shows a clear example of the impact music can have on student academic success.

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CHAPTER ONE: INTRODUCTION

Music is such a vital aspect of most civilizations around the world and has been since the dawn of time. This art form has been passed down from generation to generation to generation. Music is a part of our culture and our core being. Elliot Eisner (1998) proposed, “By failing to properly appreciate the significance of art, we are offering an unnecessarily narrow and seriously unbalanced approach to education.” Still, many policymakers and educational leaders question the significance of music to the processes of teaching and learning.

The most recent reauthorization of the Elementary and Secondary Education Act (ESEA, pg. 1) sent educators in a fury regarding effective strategies to ensure ‘no child’ is left behind. (NCLB 2002) Now, teachers seem inundated and overwhelmed with the demands of standards-based reform, while students seem less engaged in learning for the sake of learning. Students appear to believe that the primary purpose of schooling is to pass a test. Additionally, programs that students tend to enjoy as a part of their school day, such as music, are being threatened by greater emphasis on the core subjects and budget cuts. Instead of utilizing music to enhance students’ understanding and comprehension of core subjects, such as math, they are being deemed as unnecessary in the academic setting.

This study seeks to explore the role of music in standards-based secondary mathematics courses and the impact music has on high school students’ retention rates. The researcher seeks to find answers to the following questions:

- 1) How does participation in a music class enhance high school students’ performance in mathematics when taken in tandem?

- 2) How can incorporating the music in the core curriculum affect high school students' retention in school as measured by student graduation and dropout rates?
- 3) What was my own journey through high school as it pertains to music participation, math scores and student retention?

This type of study is important to show that music programs have been, and continue to be, an integral part of a student's experience and academic progress at school. While raising the academic expectations for our students is necessary, the essentialist perspective of teaching a "common core of knowledge that needs to be transmitted to students in a systematic, disciplined way," (Diehl, 2006, p.1) seems outdated and less effective for the 21st century classroom. Educators must explore the bond created with music, when involved in the core curriculum, and higher graduation rates.

This study is a timely response to those decision makers who feel a lack of urgency regarding music education and its role in standards based reform. Cutting art programs, such as music, could have a tremendous impact on a student's perspective of academic life. This perspective is what causes the continuous increase of high school dropout rates each school year. Sustaining students' interests in education and motivating them to enjoy learning is largely dependent on their overall experiences and available opportunities in school. Consequently, those individuals who value the presence of the arts, and the future success of America's school system, must continue to urge policymakers and educational leaders to fund these programs despite budgetary concerns.

These concerns do not only lie in the hands of policy makers, but also to teachers around the country as well. The inspiration for conducting a study of this nature spawned from my observations and internships in Elementary schools. I was noticing the lack of attention the arts were given and how that affected students' motivation to be in the classroom and to achieve their best. Schools that were rated higher tended to have the more acknowledged music programs, which sponsored the curiosity if the same were true for high schools as well. Knowledge of how to tap into a high school student's intrinsic source of motivation to excel in their academics would create a revolution in the American education system and would hopefully put us back on top on the world stage in terms of academics.

Chapter Two will provide readers with an in depth look into samples of literature supporting my theory on the impact and benefit music has on mathematics skills. The Literature Review discusses important facts and opinions on factors and topics pertinent to understanding while reading this study. These topics include Student Motivation, Benefits of a Music Infused Curriculum, Left and Right Brain Complexities, Studies on Music and Brain Functioning, The Big Picture on Americas' Educational System, and the Focus on High schools. Preceding chapters elaborate on the methodology of the study, a data analysis plan, descriptive quantitative data and a qualitative auto-ethnography.

CHAPTER TWO: LITERATURE REVIEW

The purpose of this study is to examine the impact of music education on high school students' achievement in mathematics, the relationship between schools with music programs and their graduation rates and to explore the personal impact of music participation through auto-ethnographic study. This chapter provides an in-depth look into samples of literature supporting my theory on the impact and benefit music has on mathematics skills. The Literature Review discusses important facts and opinions on factors and topics pertinent to understanding while reading this study. These topics include Student Motivation, Benefits of a Music Infused Curriculum, Left and Right Brain Complexities, Studies on Music and Brain Functioning, The Big Picture on Americas' Educational System, and the Focus on High schools.

Student Motivation

“Student motivation naturally has to do with students' desire to participate in the learning process.” (Lumsden, 1994, p. 7) The ideal reason for a student to be motivated to learn is from an intrinsic source. Intrinsic motivation is the urge and willingness to learn based on pure desire from the student. Keeping the intrinsic motivation of a student to continue learning seems to be a growing struggle in our reform initiatives emphasizing standards in America's education system. “Unfortunately, as children grow, their passion for learning frequently seems to shrink. Learning often becomes associated with drudgery instead of delight. A large number of students--more than one in four --leave school before graduating.” (Lumsden, 1994, p.45) One source that has often sustained a student's motivation, which is not given the proper attention and recognition, is the arts. Budget cuts are pushing the arts out of schools in many grades and school districts. “On-

ly 28 out of 50 states in the United States have arts requirements for graduation.” (Jensen, 2001, p) Depriving children of a subject area, which allows their imagination, creativity and cognitive expression flow freely will ultimately cause suffering in their academic career.

Benefits of a Music Infused Curriculum

Art classes, such as music, are often seen as extracurricular fluff that is not an important part of the daily learning process and brain functioning. Studies have proven the arts to be a very powerful tool in the academic setting. “The arts enhance the process of learning. The systems they nourish, which include our integrated sensory, attentional, cognitive, emotional, and motor capacities, are, in fact, the driving forces behind all other learning.” (Jensen, 2001, p.33)

Using music to open the minds of students can allow them to explore different realms of possibilities and expand their mode of thinking. This interest in music may hold the potential to fire up that natural intrinsic motivation for learning and increase students’ motivation to remain in school. As Jensen (2001, p12) pointed out, “the arts reach students not ordinarily reached, in ways not normally used. This keeps tardies and truancies and, eventually, dropouts down.”

The arts can also facilitate students with their comprehension and understanding of subjects’ across the curriculum. This study explores the notion that students who are involved in art programs during their daily instruction perform better in their core academic classes. Fowler (1996, p.7) reported that “students who are involved in the arts are more motivated, more engaged, more sensitive, and more focused, creative and responsible. They perform better in all aspects of school, including academic achievement.” Therefore, it seems reasonable that the core subjects that frustrate the majority of students, such as math, could be less taxing on students

mentally and emotionally if it were taught in tandem with an arts subject such as music. “The key ‘math areas’ of the brain are in the left temporal lobes, an area highly involved with music.” (Jensen, 2001, p. 10)

Infusing math content with music is a logical strategy considering that the brain involves the two in the same processing areas. “Musical rhythm is based upon mathematical relations, and it is certainly reasonable to assume that an understanding of music requires some understanding of ratios (e.g., 3/4 time vs. 4/4 time) and repeating patterns. In addition, if a music experience enhances spatial-temporal reasoning, then music may also enhance understanding of those aspects of math that involve spatial-temporal reasoning, such as geometry and proportional reasoning.” (Vaughn, 2000, p.149)

Left and Right Brain Complexities

The human brain is an extremely complex entity. Extensive research on the functions between the left and right brain have shown the hemispheres perform particular tasks. Common knowledge produced from these studies explains the left and right hemisphere control the opposite appendage functions and opposing personal characteristics, such as being artistic vs. logical. The left hemisphere is said to control or produce verbal, analytical and mathematical functions, which the right hemisphere controls visual and artistic abilities (Mitchell, 2004, p.4).

Recent research pursues heavy reconsideration to the level of truth to the functions each hemisphere has been previously designated. “When someone says they are right or left-brain, it's really just a metaphor for a cognitive style”, says neuropsychologist Professor Michael Salving, University of Melbourne and Austin Health's Epilepsy Research Centre. "Without a doubt

the popular left and right division of the brain is an over-simplification. For example, research is showing that musical, artistic and intuitive thinking can't be thought of as strictly lateralized, or exclusively of the right hemisphere.' ” (Mitchell, 2004, p. 4).

While each hemisphere may still have specific functions, it has been theorized from brain scans and monitors, both hemispheres collaborate when it comes to processing, retaining, comprehending and applying information. This evidence highlights the idea of music and mathematics benefiting each other because despite their refuge on opposing hemispheres, the ability to process one enhances performance with the other.

Studies on Music and Brain Functioning

In 1999, Graziano, Peterson, and Shaw performed a research study in order to find out the impact of music on math skills and abilities. This study was a four-month experiment where 29 students received piano instruction and a math video game developed by Shaw. A second group of 29 similar students received computer-based English training and a math video game, and finally the control group of 28 students received no piano and no video game. The results showed the video game increased math scores 36% higher than the control group. Scores of the group who learned piano in addition to the video game were boosted 15% higher than both groups, who were without piano. This study is one of many that prove infusing arts with the core curriculum can positively impact students academic achievement in school, which will encourage them and positively motivate them to continue their education.

Mickela (2006) discussed the impact of music on students' mental abilities. In this study, students received private keyboard lessons and engaged in group musicals that influenced their

cognitive and higher order thinking skills, in particular, math and science skills. This information is helpful to schools since the focal point for America is engaging our high school students in order to decrease the dropout rates, increase graduation rates, and particularly, to further STEM science, technology, engineering and math content areas. Many believe using music throughout elementary school, middle school and high school will have a long lasting impact on the math achievement in our students.

Furthermore, the intrinsic motivation to learn and continue learning needs to be infused into students in the beginning of their educational careers in order to be successful, impactful and everlasting. “If teachers provide experiences and assignments that engage all four areas of the cortex, they can expect deeper learning than if they engage fewer regions. The more brain areas we use, the more neurons fire and the more neural networks change; and thus the more learning occurs.” (Zull, 2004, p.8)

The Big Picture on Americas’ Educational System

Providing students with the opportunities to engage in the music, thus increasing motivation and eventually decreasing dropout rates does not solely help the individual, but will improve our entire education system as a whole. According to scores from the 2009 Programme for International Student Assessment (Fleischman, 2010, p. 17.), education in the United States does not rank at the top of the world stage, as it should be. This report (2009) revealed that 15-year-old students in the United States were merely maintaining adequate scores in reading and science, and were below adequate performance in math, when compared to our worldwide counterparts.

It was further reported that the United States, out of 34 top countries represented, ranked 14th in reading, 17th in science and 25th in math (See Appendix A).

Data of this nature has alarmed many administrators and educators, exposing the downward fall of America's education system. After hearing these reports in 2009, the Secretary of Education Arne Duncan wrote a letter to American educational leaders around the country bringing their attention to "the importance of the arts as a core academic subject and part of a complete education for all students." (Duncan, 2009, p.1) The letter states the United States Department of Education planned on conducting surveys of students to assess the "condition" of arts education in K-12 schools around the country. The urgency of the matter is apparent in the words of Duncan and should instill a sense of longing to fill the void in our educational system (See Appendix B).

The Focus on High Schools

For decades, the high school graduation rate has been the primary measure to determine a school's effectiveness in the United States. Today, it is become a mandatory accountability measure for public school systems as required by No Child Left Behind (NCLB) of 2001. Essentially, the high school diploma serves as the gateway to college, the military or well-paying jobs. Several researchers noted that high school graduates fare better in postsecondary education and employment earnings than their peers who drop out of school (Glenn, 1998; Hart, Zafft, & Zimbrich, 2001).

It is alarming that in 2001, the National Center for Education Statistics indicated that approximately 383,000 high school students dropped out of school in the United States. In order for

the United States to regain a headlining position in student achievement in school a change in our educational system will need to be implemented. Perhaps by, designing curricular goals not around standardized tests but around music, and other art programs. Schools leaders and teachers must find creative ways to address the rising dropout rate in America. Strengthening the ‘arts’ in our high schools is a good place to continue addressing students’ motivation to learn and their decision to remain in school. During the 2009 school year, only 13 out of the 50 States (26%) had a graduation rate of 80% or above (See Appendix C).

This chapter has provided current information regarding Student Motivation, Benefits of a Music Infused Curriculum, Left and Right Brain Complexities, Studies on Music and Brain Functioning, The Big Picture on America’s Educational System, and the Focus on High Schools. The following chapter reveals my thinking in regards to the methodology used for this thesis, explanations for the qualitative data used, a description of where this study takes place and who is involved, and the role I, as the researcher, performed throughout the study.

CHAPTER THREE: METHODOLOGY

This study examined the role of the arts, in particular, music in the current standards-based reform and the impact of music on retention, understanding that motivation may be an underlying factor. The focus on high school students, specifically ninth and tenth graders, was not the original choice of study. Initially, the research interest was on elementary schools and the importance of infusing music and content knowledge at an early age. Through a tremendous amount of discussion with my thesis chair and educators in the field, the decision to climb the ranks to the high school spectrum was made because of the interest in the long-term impact of music on students' mathematics success and ultimate retention. The following questions guided this research project: (1) How does participation in a music class enhance high school students' performance in mathematics when taken in tandem? (2) How can incorporating the music in the core curriculum affect high school students' retention in high school? (3) What was my own journey through high school as it pertains to music participation, math scores and student retention?

Descriptive statistics related to high school mathematics students were gathered from the Florida Department of Education. These statistics included the FCAT Math scores, school enrollment rates, dropout rates and related graduation rates. Additionally, a qualitative design, auto-ethnography, was employed as the primary research strategy in order to find answers to the research questions. An auto-ethnography appropriately satisfies the bulk of a qualitative design because it implements experience of the researcher as an "investigation in its own right." (Bochner, 2000, p.733)

Rationale for Qualitative Approaches

After exploring the literature on research techniques, a qualitative methodology was deemed the appropriate to accompany the quantitative data to accomplish the goals of this study. Qualitative research further suggests that the individual should interact with and reflect on the study of interest within their own social worlds, which will influence the research by considering the personal experiences. Sherman and Webb (1988) stated that naturalistic or qualitative research “implies a direct concern with experience as it is ‘lived’ or ‘felt’ or ‘undergone’ (p. 9).” Thus, the qualitative approach of an auto-ethnography of my personal experiences in a Florida high school, with a music based curriculum, was a beneficial addition to the quantitative figures. “Combining ethnography, biography, and self-analysis, auto-ethnography is a qualitative research method that utilizes data about self and context to gain an understanding of the connectivity between self and others within the same context.” (Ngunjiri, pg.2)

Setting of Study

This study is set in a large school district in South Florida and is focused on nine major high schools in the county. These nine schools were selected based on their large student body, ninth and tenth graders FCAT scores and participation in a magnet program. Magnet programs have become a growing trend in many school districts in order to attract students to certain schools based on the students interests in particular subjects. Offering different career focuses for students in hope of maintaining students to stay in school. Many magnet programs are academically based, offering career tracks such as pre-medical, engineering, and sports management, while other art based on the arts. Art magnet programs are those where students not only participate in the arts, their academic and art classes complement each other.

In theory, magnet programs should increase students' willingness to remain in school because they are actively involved in an area that is said to be their chosen career path. However, does the theory match reality? Can one magnet program provide enough subjects for all students to find their chosen career path? It is possible that there will still be students who are not motivated to be active participants in their schooling because programs of interest are not offered, even in magnet programs.

In order to explore the relationship between math and music when taken in tandem, schools from the same county in South Florida are compared. Table 1 shows the breakdown of the nine high schools analyzed, A-I, if the school publicly displayed their involvement with a music program, if they have a magnet program, total population, and ninth/tenth grade populations. All data from the table was collected from the Florida Department of Education's website archives and specific schools' websites. This data is necessary to be able to compare and contrast the setting and situations of each school.

All schools chosen are fairly large with at least one thousand students enrolled during the 2009-2010 school year. Schools D, E, F, G, and I are slightly larger, with over two thousand students to account for. Schools of this size were chosen because having a larger student body makes capturing student motivation more difficult. Large schools are common across the country and provide not only data for this county, but also may paint a picture for similar scenarios occurring around the country.

Table 1: School Setting for 9 High Schools in South Florida

School	Schools with Music: Band, Vocal and/or Orchestra (Yes/No)	Magnet Programs (Yes/No) Program name/Kind	School total population 2009-2010	Total # of 9th Graders	Total # of 10th Graders
A	Yes: All	Yes: Performing Arts	1,310	348	337
B	Yes: Band	Yes: “The Academy”	1,617	415	373
C	Yes: Band	Yes: “ Project Lead the Way”	1,237	279	316
D	No	Yes: “ Choice Program”	2,178	596	492
E	No	Yes: “ Choice Program” Culinary, IT and Engineering	3,148	765	723
F	No	Yes: Five Star Magnet Program: Pre-Med, Sports Management, Hospitality, T.V Production.	2,854	727	670
G	Yes: Band and Vocal	Yes: “The Academy” Biotech, Entrepreneur	2,350	614	572
H	Yes: Band and Vocal	Yes: Computer Science, Math, IB, IT	1,391	421	349
I	Yes: Vocal	Yes: Army-ROTC, Teaching, Finance, Construction, Culinary.	2,366	731	618

Of the nine schools, three, D, E, and F did not show any music programs on their school websites’ course descriptions. All, however, were proudly displaying their participation in a magnet program, which offered different options for students to choose as a career path. The categories of career choice for the different programs include future vocations such as, arts, pre-

medical, engineering, computer science, entrepreneurship, culinary arts, math, technology, etc. Statistics on the number of students at each school who are participating in the magnet program versus those who are registered in the regular high school curriculum are not available for the public. This is one implication for the study, because it would help analyze the school scenario if knowledge of the percentage of students in the school who are actively involved in a career program.

Role of the Researcher

In qualitative research, no data can exist without the active participation of the researcher; therefore, I was the primary instrument for collecting data in this auto-ethnographic study. The advantages of using the researcher as the instrument of choice in this type of study include the ability of humans to: 1) collect data on multiple levels simultaneously, 2) interact with the situation, 3) respond to environmental cues, 4) request verification of data, and 5) explore aberrant responses (Lincoln & Guba, 1985). In this study, the data collected supplied knowledge of quantitative numbers relating to graduation rates, dropout rates, school memberships and FCAT scores. The role of the researcher was not limited to quantitative data which led to the collection of auto-ethnographic evidence based on the researchers primary experience in the field with the benefits seen when music and math courses are taken in tandem.

Given that the researcher is the primary instrument in qualitative inquiry, I had to confront my readiness to take on such a project. The quality of this type of research project rests on the researcher's ability to be aware and sensitive to data and make important decisions in the field. Glaser and Strauss (1967) and Strauss and Corbin (1990) refer to a useful concept to assess

a researcher's skill and readiness to attempt a qualitative study. This concept is known as "theoretical sensitivity", which is described by the authors as this:

Theoretical sensitivity refers to a personal quality of the researcher. It indicates an awareness of the subtleties of the meaning of the data. It refers to the attribute of having insight, the ability to give meaning to data, the capacity to understand, and capability to separate the pertinent from that which is not. (Strauss and Corbin, 1990, p. 42).

Theoretical sensitivity, in this study, developed from my professional experiences as a secondary student in a magnet program (Strauss & Corbin, 1990). Motivation was heightened not only within myself, but also within my peers. The available music program was taught in conjunction with math curriculum. This motivation had a direct influence on math performance, which reflects positively on the school through high math FCAT scores. Thus, theoretical sensitivity and my own connoisseurship regarding music's influence on my motivation in high school and mathematics enhanced the credibility of this qualitative study.

Chapter Three provided a rationale for the methodology of collecting data, a description of the schools used in this study and the researcher's role. The next chapter introduces the plan taken in order to analyze all the data gathered and an explanation of the data. Tables are provided for a more clear display of data and to provide visual aids for the descriptive statistics.

CHAPTER FOUR: DATA ANALYSIS

Analysis Plan

The data being presented examines the impact of music education on high school students' achievement in mathematics, the relationship between schools with music programs and their graduation rates and to explore the personal impact of music participation through auto-ethnographic study. The analysis plan includes educational criticism, a concept proposed by Elliot Eisner (1998). Eisner described educational criticism as “an art of disclosure”, as well as an effective technique to assist researchers in analyzing complex data. Further, data analysis included a blending of my own educational criticism and descriptive statistics from the Florida Department of education. The quantitative data used in this study corresponds to each of the previously mentioned magnet schools (A-I) FCAT scores, drop out and graduation rates. This specific data will be analyzed alongside current research on the impact of students' participation in the arts on their academic achievement in math and their motivation to learn.

Educational criticism includes four major dimensions. The first dimension is description, which describes an educational situation in order to identify what is most relevant about it and to permit the reader to visualize context and process. The second dimension is interpretation, which includes an explanation of the meaning behind what has been observed and heard in order to come to an understanding of that relevance. The third phases is evaluation, which involves an evaluation of the situation in order to “assess the educational significance of the events or objects described or interpreted” (Eisner, 1998 p.238). Thematics is the fourth dimension of educational

criticism, which involves the identification of themes embedded in the text and organized in a meaningful way (Eisner, 1998).

Educational criticism can be viewed as a way to “illuminate a situation or object so that it can be seen or appreciated” (Eisner, 1998, p.7). For the purpose of this study, educational criticism served to illuminate the influence of the arts or music on high school students’ performance in math and motivation to learn.

For Eisner (1998), connoisseurship is the hallmark of educational criticism. Based on Eisner’s approach, connoisseurship is “the art of appreciation”: and a connoisseur is “anyone who is highly perceptive in some domain” (Eisner, 1998). One goal of educational criticism is to make the connoisseur’s perceptions “seen and appreciated” and to provide connoisseurship with a public face (pp. 85-86). My own connoisseurship in an arts or music program assisted in the analysis of data by allowing me to examine the benefits I received during my high school years in a music program. This hindsight outlook provides me with an appreciation for the program I attended as well as relays quality information or data about what kind of products these high school programs produce. The auto-ethnography displayed in Chapter Five explains my experience in depth, showing a strong personal rationale for the importance of music programs in high schools.

Quantitative Data

The arts can have a positive impact on learning and student motivation. According to Jensen (2001), subjects like music can nourish a student’s sensory, cognitive and emotional capacities. In essence, music or the arts are perceived to be the driving force behind all other learn-

ing. Music has also been used as a vehicle to help open the minds of students, allowing them to explore different realms of possibilities and expand their mode of thinking. Music, undoubtedly, can help schools engage those hard to reach students, those prone to drop and truancy (2001).

Consistent with these and other findings in the literature, the results of this study indicate that participation in an arts program can positively impact math performance and motivation to remain in school. According to the data gathered from the Florida Department of Education (2010), schools with an arts program that includes music showed higher scores in mathematics, as indicated by the FCAT scores. Similarly, schools with arts programs including music, showed lower dropout rates and higher graduation rates.

Table 2 provides an illustration of each high school’s performance on the math section of the FCAT in 2010.

School	% Scoring 3 or Higher on Math FCAT 2010 9th grade	% Scoring 3 or Higher on Math FCAT 2010 10th grade
A	95	97
B	44	47
C	47	57
D	58	62
E	76	83
F	65	74
G	89	94
H	96	98
I	66	78

Table 2: 2010 Mathematics FCAT Scores for 9 High Schools with music programs

Key: Green = More than 80% of students earned a three or higher on FCAT
 Yellow = 50%- 80% of students earned a three or higher on FCAT
 Red = Less than 50% of students received a three or higher on FCAT

Schools A and H are the top performing schools in the district. Both schools have very low dropout rates and offer various music performance classes. Both schools also had a high percentage of ninth and tenth grade students passing the FCAT Math exam. Other schools that had less than one music offering did not perform as well. Essentially, schools with more options for music or the arts, tend to perform better in school, as evidenced by FCAT scores and dropout rates.

According to the Florida Department of Education's website, a passing score on each section of the FCAT is a three hundred, simplified as a three. Schools B and C had less than fifty percent of their students in ninth and tenth grade pass the math portion of the FCAT with a three or higher. Schools C, D, E, F and I had grade levels where only fifty to eighty percent of students received at least a three. Schools A, E, G, H were the only schools what had grade levels where 80% or more of the ninth and/ or tenth graders received an 80% or above on FCAT.

The schools' ninth and tenth graders who had the least amount of students passing the FCAT (B and C) offer a band program to their students, but not a vocal or orchestra section. This limits some musical inclination for students attending those schools by only offering one musical mean. Having a limiting course selection may be an instigator to a lack of motivation for students to stay in school, because of a disinterest in the only musical outlet offered. A descriptive statistic on student dropout rates versus graduation rates will determine the overall retention of the student body.

School	9-12 Grade Dropout # 2009-2010	9-12 Grade Dropout Rate 2009-2010	Florida Graduation Rate 2009-2010	NCLB Graduation Rate 2009-2010	NGA Graduation Rate 2009-2010
A	8	0.61	99.7	99.4	99.7
B	48	2.97	80.5	76.4	80.3
C	33	2.67	82.3	77.4	82.0
D	53	2.43	84.4	80.2	84.1
E	30	0.95	94.6	93.4	94.2
F	45	1.58	87.0	84.9	86.7
G	10	0.43	96.7	96.0	96.6
H	2	0.14	99.7	99.7	99.7
I	31	1.31	87.7	83.9	86.5

Table 3 shows the number of dropout and graduation rates at each of the schools. The different graduation rates represent different kinds of diplomas granted. Florida graduation rate encompasses all regular diplomas, special diplomas and GED's. NCLB graduation rate includes all diplomas and GED's except for special diplomas and adult GED's. The NGA Compact Rate is a modified version of the NCLB graduation by including all diplomas and excluding all GEDs.

A large number of students dropped out of schools B, C, D, E, F, and I in the year 2009-2010. Schools D, E, F, G, and I are the largest schools in this study with over 2,000 students enrolled, so naturally their dropout rate may be higher than the schools with only a little more than 1,000 students. When comparing the ratio of the statistics between a school with less

students dropouts and one with a significant amount of dropouts, it shows that size is not the issue.

School D and School H are very different in all of their statistical data. School D does not have any music programs available to their students, one of the highest student memberships of over 2,000 students, only a small margin over half of their ninth and tenth graders passed FCAT and finally, it has the largest dropout rate of all the schools in this study. School H offers two kinds of musical performance classes for their students, contains just over 1,000 students enrolled, has the highest percentage of students obtaining at least a three on the FCAT, and had a loss of the least amount of students. Comparisons begin to align while looking closer to the school populations versus dropout rates, for example, D only has 800 more students than School H, and their dropouts are significantly higher. Size differences of the two schools is minuscule when shines next to the difference in dropouts.

Schools B and C both have less than 50% of their ninth and tenth graders passing the FCAT math. These schools also offer a band program and a magnet program to help stir motivation and enjoyment for the students. However, it does not seem that the motivational tools are effectively keeping students in school, with 48 (School B) and 33 (School C) students dropping out in one year. It is not clear in the research how many students are able to enjoy the magnet program and only offering one kind of musical performance class alongside their academic classes, so it is more than likely that many students may not be involved in either and therefore do not have any intrinsic motivation. More detailed information about student participation is needed to create a more clear determination.

This chapter introduced the plan taken in order to analyze all the data gathered and an explanation of the data. Tables provided for a more clear display of the data and to show visual aids for the descriptive statistics. The next chapter summarizes results taken from the data collected and adds the qualitative aspect to this study with an auto-ethnography. My auto-ethnography shares insight on my own interactions in high school with an arts magnet high school. This reflection provides the reader with a personal experience on the impact music has on high school math.

CHAPTER FIVE: AUTO-ETHNOGRAPHIC RESULTS

The Early Years

Throughout my life, I have delved into almost all art forms, from dance, choir, to musical theater. As different as these attempts were, they have a common musical core. Each art form would either not be able to exist or would not communicate as effectively to the human soul without the musical component. I would be honored to be able to say I have been involved with the arts since, like many artists, I was about two years old, but in this story, the arts exploration began in second grade.

My elementary school years were filled with dance classes at Stella's Dancers Studio, three times a week. This is the first the time I can remember actually recognizing how music made me feel and how it related to other areas of life, such as math. One of the first things that was taught to all of Stella's Dancers is how to keep time with the music. Keeping track of eight counts is crucial to a successful dance performance, therefore knowing how to count at an early age is imperative. For many who pursue dance at an early age, this exposure to counting is the start of expanding their mind and commands students to count fluently, prior to many of their peers. Looking back, I believe this art form also instilled in me the notion of spatial reasoning, while dancing, keeping time with the music and being aware of where the other dancers are at every note and knowing the timing of how long it will take the you and the other dancers to travel across the stage.

Enrolling in dance was not just to engross me in artistic processes as far as my father was concerned, it was a way to get me out of a hostile home environment between my parents.

During this part of my life my family was falling apart, my parents were on the brink of divorce and I had nowhere to turn but to music. Dancing to all types of music helped me feel transported into a different place, a happy place, unsurpassed by anything I had ever felt. Unfortunately, that joy was taken away when my parents divorced, and my father decided to move. I started at a new elementary school in the middle of my fourth grade year. I never understood why I was not enrolled into another dance class after the move; I assume it was because of all the chaos of the move, and my father trying to rebuild our lives. The end of that fourth grade year was the first time I had a problems with my academics. I was not scoring as high in my class tests and was quickly spiraling behind the rest of the class. Instead of dance classes I was to be enrolled into tutoring for Math at Sylvan Learning Center, where I worked hard to get back on my feet and be able to maintain my school work without tutoring.

Once able to dip my hands into something supplemental to school, I chose to be a part of the choir during my fifth grade year. Returning to music created a feeling of returning home. It was a very comfortable atmosphere to be in and brought some joy back into a very dull year. I was able to use my schema of keeping time from dance to enhance my abilities in choir because it involves the same notions. The differences between the two art forms involved the addition of breath, vocal ranges, and needing to learn how to read music. These aspects of choir are very mathematically charged, involving counting time, range, pitch, and fractions when deciphering notes on the page. This year not only provided me with new sense of revitalization when returning to music but also brought my grades, especially in math, to the highest they had been in over a year.

Middle School Years

The end of my elementary schools years and beginning of middle school brought more change to the family, my father had been dating and we were moving once again to live with my future stepmother. This change in atmosphere, once again brought anxiety to my life. I was worried history would repeat itself and my grades would tumble if I did not find a way to involve myself artistically as soon as possible. Our move happened three days after my sixth grade year started. It was hard to make friends with students who have been together since kindergarten. I scurried to the first art form I could find, drama club, and signed up.

I was not positive as to what to expect out of being a member of the drama club, but it was different from anything I had ever experienced. The theatrical art form embodies aspects from all other art forms, movement, music communication and visual art. It never occurred to me before to combine the different art forms to create one entirely its own. I became hooked on anything and everything theater, from different Broadway actors to knowing every lyric of every Broadway song. I loved being able to transport myself from my life into a different time, place, and even person. It brought an escape for me from my personal life continuing to whirl out of control at home.

The baggage began to accumulate as my family life became more stressful. My dad remarried, and the idea of having a stepmother was not a thrilling prospect, and as far as I was concerned, was not acceptable. Theatre helped relieve the tension because when I was acting I was not me anymore. I was an ugly duckling who became a swan or a wicked witch of the west. I became part of these characters and in turn, they helped me process the anger I held inside. As I sang during these shows, the music seemed to take away the sorrow right out of my lungs. I sang

out the anger I had for my mother being an alcoholic and tearing apart my family. Having the method of the arts to let out all my fear and pain is what was able to keep me on track and focused on continuing to do well in school. When it came time to go to high school, I did not realize I was going to be given a choice that would benefit my future.

High School Years

Normally, students attend the high school that is in their districted area, however, in South Florida many of the schools were switching to a magnet program. Magnet schools are those that not only deliver core academics but also provide specializations. These specializations may range from pre-med to the arts. Students are allowed to attend any school in the district if they are going to be a part of the magnet program that school provides. Each school may have certain criteria in order to attend; in my situation, it required an audition for the Theatre program. I chose to be in theatre because, as discovered before by my prior arts explorations, theatre encompasses all art forms.

The choice to attend a one of the first magnet program schools versus the local high school was a very hard decision for an upcoming high school student. It meant leaving my friends who I had spent every day of my life for the past three years behind. Life was just starting to feel a bit normal, I was seeing my mother on facilitated visits every other weekend, my grades were fantastic, and I was becoming closer with my dad and stepmother. Attending a different high school than all of my friends would make my for once-stable life rocky, and I was not sure if I was willing to travel down that road.

The choice, however, was made and I was off to live my passion of the arts. My high school was thirty minutes away from home to which I traveled on a commuter rail, called Tri-Rail, with 200 other students every day. The commute alone showed a dedication to my education, which required even more motivation to sustain a rigorous schedule that demanded hours of participation after school as well as during. The fact that I was not with my middle school friends soon became insignificant; I was having the time of my life and could not believe how much I enjoyed school. My academics seemed to come to me easier than ever before, I was excelling in all subjects and even went into honors math courses, such as trigonometry.

I did not realize the relationship between my art training in theatre and math at the time, but looking back, it had everything to do with it. In theatre classes, you are taught to read music in order to be more marketable, well, reading music based off mathematical concepts such as knowing fractions, timing, and rhythmic sense. Everything that I did had to do with math, and I did not even realize the impact it was having on my own life.

Summary of Results

As a product of an arts magnet program of four years, I witnessed and experienced, firsthand, the impact of participating in the arts on a high school student's motivation to remain in school, and how music assists students in comprehending and retaining math concepts. Many of my peers were also involved in an arts program and often expressed the positive impact of the arts on their academic performance. Becoming consumed in academia can create a rut in a students' repertoire day after day. Infusing the daily curriculum with music classes of either or both instrumental and performance modes fills their motivational drive to succeed. The secret, in

my case, was the music classes and core classes were not separate from each other. The curriculum flowed and seemed to work hand- in-hand, seamlessly reinforcing the each other. This companionship of art and academics help build and support the learning and retention process of math concepts because it boosts spatial capacities and logical functioning.

Several of my peers who at the local high school, were not participants in an arts program, were at risk for dropping out of school, often finding themselves not interested in their academics or futures and thus, becoming trapped in reckless and life- threatening situations. I do not recall any student in my art program expressing a desire to leave school prior to graduation or making negative choices for their lives and futures. In fact, we were highly motivated to graduate high school, beginning out college career and having bright futures. Thus, it is my personal background in the arts program and achievements in mathematics that make this qualitative research project a value-laden interactive process (Denzin & Lincoln, 2000).

Further, participation in the arts motivated students to do well in courses that may have been otherwise perceived as difficult, or challenging, courses like mathematics. For instance, reading musical notes, keeping time, tempo, and range all involve mathematical processing and development. Learning how to utilize these math concepts through music provides students will a less stressful, more enjoyable and natural approach.

This chapter summarized results taken from the data collected and added the qualitative aspect to this study with an auto-ethnography. My auto-ethnography shared insight on my own interactions in high school with an arts magnet high school. This reflection provided the reader with a personal experience on the impact music has on high school math. The next chapter

concludes this study, summarizing the results, describing limitations that occurred during the research process, sharing future research in order to continue the study, and what I, as the researcher, learned during this process.

CHAPTER SIX: CONCLUSIONS

Music seems to be a part of everyone's life, culture and soul, yet when we talk about what is important in the school setting; it is one of the last priorities. Combining music and education has proven to provide positive results in engaging students in their academics. This study is the beginning to another reinforcement of the fact that music is an essential component to student learning. The impact of music education on high school students' achievement in mathematics was analyzed through studying the relationship between school music programs, their graduation rates and to explore the personal impact of music participation through auto-ethnographic study.

Limitations

Limitations on research provides for some unanswered questions and unsolved aspects of a study. A few limitations occurred during the research process, these include not being able to obtain the data of how many students out of the total student population participating in the magnet programs or music programs versus the non magnet or music curriculum, for each school and not having access to the quality of the music curriculum in each school. Not all schools who have a magnet program insist all students enroll in those courses, some, such as International Baccalaureate programs only accept students who qualify. Knowing this information would add to the study because it would more accurately define if magnet programs sustain their student population more efficiently than the standard curriculum. Knowing the type of music program offered at the school would also be beneficial to the study because it would allow for a more detailed comparison of the schools. Comparing this portion

of the schools' curricula would allow the researcher to see if a more elaborate music program boosts scores higher than other programs.

Continuation of Research

Through this research, the benefit of music has become clearer in terms of students' general higher performance on a math assessment but not as clear on student motivation. This study demonstrates the trend of schools who offered more music options to students had fewer dropout rates, but it was not constant enough to create a rule. In order to discover the true meaning behind what motivates students to stay in school, and care about their educational need, I suggest two procedures on extensive qualitative research procedures. These procedures are 1) Performing attitude surveys in schools reflecting students overall perception of their education and what subjects they enjoy most, and 2) Interviewing students and educators about the main motivations for students to attend school.

What I Learned

America's educational system is not at the top of the international scale. I believe it is a national issue when the most powerful country in the world does not academically surpass the performance of less powerful countries. My own personal experiences and teaching in schools opened my eyes and inspired this exploration. After exploring the relationship between music, math, and student retention, I still strongly believe music is a vital to increasing math abilities and student retention in high school.

Music is an important part of a student's academic lifestyle because it stimulates brain capacities that coincide with most, if not all, school subjects, such as math. After exploring

the relationship between music and math instruction when taken in tandem, the report highlights schools who did well on standardized testing having prominent music programs and low dropout rates. This quantitative data had an additional means of interpretation and exploration through my own auto-ethnography. Reflecting on my own music experience during my high school years was an important tool in using the benefits of my arts knowledge as a way to provide insight on the subject. I believe art programs, such as music, provides students with a more complete education, filling gaps that traditional instruction cannot fill.

In order for a student who truly receive a well-rounded and full education, it is important for educators to know the difference between when a student is memorizing material or actually understanding it. This has been an interesting concept to ponder while interning in a fourth grade classroom. While the curriculum is not as rigorous as that of a high school student it is still the same procedure of memorizing material to pass a test. Instructional goals seem to be getting the students to reach the adequate yearly progress deemed by the state instead of complete comprehension, mostly because of time constraints. I believe music can aid in comprehension of mathematical material because it reinforces mathematical skills without the student even realizing they are using math, it just seems natural and fun. Subconscious reinforcement of material allows students to be stimulating brain cells and expanding their scope of understanding without students' emotions or frustrations about the subject hindering them.

As I researched, wrote, and reflected, questions continued to scroll through my head, compelling me to broaden the scope of this study. The word motivation continued to pop in

my head as a desired aspect to explore. Motivation was a major factor of student retention in school and math scores that was not addressed, in full, during the results section of this study; however, it was a continuous topic of discussion. Student motivation can be linked to student success in school and is a piece that may be examined through additional research methods.

Motivation may not be limited to the rewards given to students who perform as expected during the school day. More subtle, yet attractive, motivational factors may be as natural as the enjoying a music class because of the friendships made between the tuba players. Playing the same instrument automatically provides similarities between the group members, which may lead to the discovery of more, creating friendships. These friendships alone could be a motivational force for a student to attend school on a daily basis and participate in class.

Grasping how to activate students' intrinsic motivation may allow us to boost America's education system by truly teaching students for comprehension rather than simply passing a test and raising retention rates.

It is my intention, by conducting this research, and reflecting on my own experiences that I will shed some insight on the importance music plays in the academic setting. It is an aspect of life that is celebrated by our culture in all modes of media, so it does not make sense to me to reject it from the learning environment. During my internships, I hear students humming and singing to their favorite songs on a daily basis, they remember every word to every song by their favorite artist, yet many cannot remember the topics taught in class the week before. The difference is students are brought up to listening to the radio or hearing music on television since they are infants and the songs that are played can relate to their everyday life.

Therefore, maybe the key is simply to infuse music into the core curriculum early on and make sure students are conscious of the fact that music relates to more than emotions and social scenarios, but also to math skills, which will benefit students their entire lives.

Appendix A: International Student Assessment Scores

2009 Program for International Student Assessment Scores

Results from the 2009 Program for International Student Assessment (PISA) show U.S. teenagers made modest progress on the international exam but continued to post scores that were only average or below average compared to peers in other industrialized countries in science, math and reading. **See average scores for reading, mathematics, and science literacy, by country. Click on column headers to sort.**

<u>Country</u>	<u>Reading</u>	<u>Mathematics</u>	<u>Science</u>
Albania	385	377	391
Argentina	398	388	401
Australia	515	514	527
Austria	470	496	494
Azerbaijan	362	431	373
Belgium	506	515	507
Brazil	412	386	405
Bulgaria	429	428	439
Canada	524	527	529
Chile	449	421	447
Chinese Taipei	495	543	520
Colombia	413	381	402
Croatia	476	460	486
Czech Republic	478	493	500
Denmark	495	503	499
Dubai-UAE	459	453	466
Estonia	501	512	528
Finland	536	541	554
France	496	497	498
Germany	497	513	520
Greece	483	466	470
Hong Kong-China	533	555	549
Hungary	494	490	503
Iceland	500	507	496
Indonesia	402	371	383
Ireland	496	487	508
Israel	474	447	455
Italy	486	483	489
Japan	520	529	539
Jordan	405	387	415
Kazakhstan	390	405	400

Korea, Republic of	539	546	538
Kyrgyz Republic	314	331	330
Latvia	484	482	494
Liechtenstein	499	536	520
Lithuania	468	477	491
Luxembourg	472	489	484
Macao-China	487	525	511
Mexico	425	419	416
Montenegro, Republic of	408	403	401
Netherlands	508	526	522
New Zealand	521	519	532
Norway	503	498	500
OECD average	493	496	501
Panama	371	360	376
Peru	370	365	369
Poland	500	495	508
Portugal	489	487	493
Qatar	372	368	379
Romania	424	427	428
Russian Federation	459	468	478
Serbia, Republic of	442	442	443
Shanghai-China	556	600	575
Singapore	526	562	542
Slovak Republic	477	497	490
Slovenia	483	501	512
Spain	481	483	488
Sweden	497	494	495
Switzerland	501	534	517
Thailand	421	419	425
Trinidad and Tobago	416	414	410
Tunisia	404	371	401
Turkey	464	445	454
United Kingdom	494	492	514
United States	500	487	502
Uruguay	426	427	427

Source: National Center for Education Statistics

Write to the Online Journal's editors at newseditors@wsj.com

Appendix B: Letter from Secretary of Education



THE SECRETARY OF EDUCATION
WASHINGTON, DC 20202

August 2009

Dear School and Education Community Leaders:

At this time when you are making critical and far-reaching budget and program decisions for the upcoming school year, I write to bring to your attention the importance of the arts as a core academic subject and part of a complete education for all students. The Elementary and Secondary Education Act (ESEA) defines the arts as a core subject, and the arts play a significant role in children's development and learning process.

In June, we received the 2008 National Assessment of Educational Progress (NAEP) in the Arts results for music and visual arts. I was reminded of the important role that arts education plays in providing American students with a well-rounded education. The arts can help students become tenacious, team-oriented problem solvers who are confident and able to think creatively. These qualities can be especially important in improving learning among students from economically disadvantaged circumstances. However, recent NAEP results found that only 57 percent of 8th graders attended schools where music instruction was offered at least three or four times a week, and only 47 percent attended schools where visual arts were offered that often.

Under ESEA, states and local school districts have the flexibility to support the arts. Title I, Part A of ESEA funds arts education to improve the achievement of disadvantaged students. Funds under Title II of ESEA can be used for professional development of arts teachers as well as for strategic partnerships with cultural, arts, and other nonprofit organizations. In addition, the Department's Arts in Education program supports grants for model program development and dissemination and for professional development for arts educators. Moreover, local school districts can use funds under the State Fiscal Stabilization Fund through the American Recovery and Reinvestment Act for the arts along with other district expenses.

Because of the importance of the arts in a well-rounded curriculum, the Department of Education's National Center for Education Statistics (NCES) plans to undertake a survey to assess the condition of arts education in grades K-12. This fall, elementary and secondary principals will be asked about their schools' offerings in music, dance, theater, and visual arts. Next spring, NCES will survey elementary classroom teachers as well as music and visual arts specialists at the elementary and secondary levels about their programs and resources. In early 2011, the Department expects to begin reporting findings from this comprehensive profile, the first since the 1999-2000 school year. This data will help practitioners and policymakers make more informed decisions about arts education.

The Department of Education's mission is to promote student achievement and preparation for global competitiveness by fostering educational excellence and ensuring equal access.

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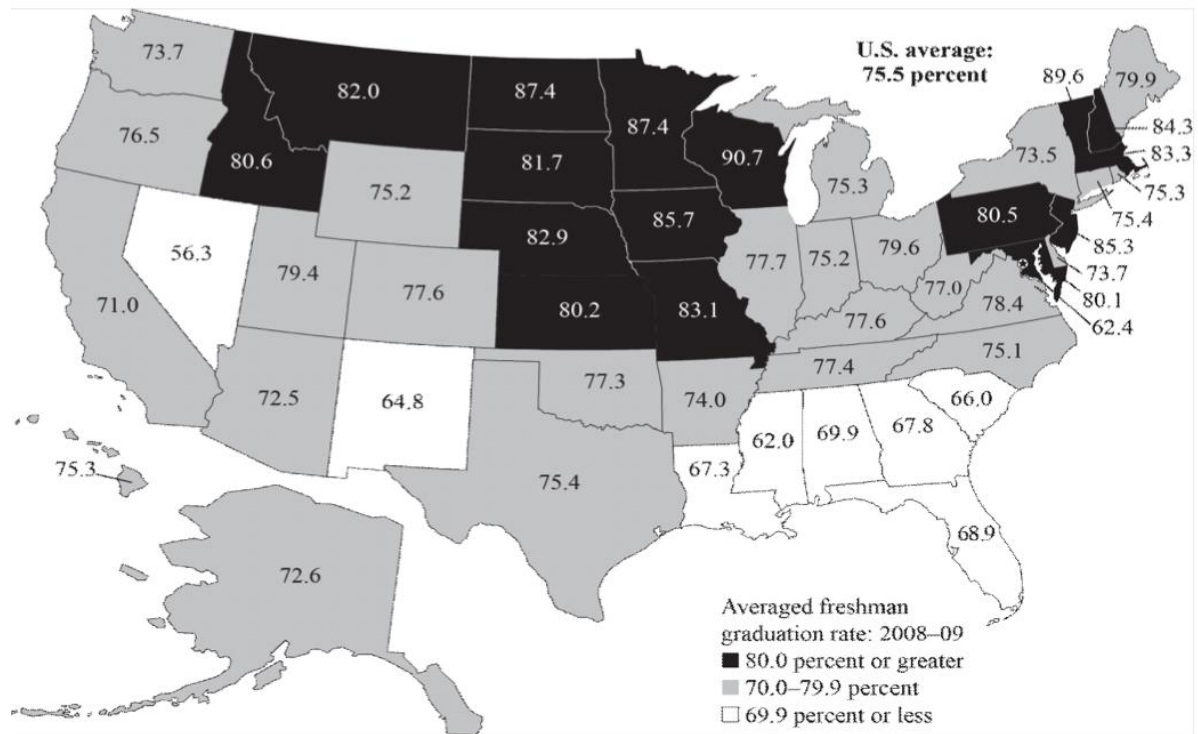
We encourage you to visit the Department's Web site for arts education at <http://www.ed.gov/about/offices/list/oii/programs.html> to learn more about our grant programs and find resources to meet the challenges ahead. Together, we can and should do better for America's students.

Sincerely,

/s/

Arne Duncan

Appendix C: Graduation Rate by State and District



Florida's Regular Cohort High School Graduation Rates												
District	98-99	99-00	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10
ALACHUA	63.3%	63.7%	61.2%	66.4%	67.5%	68.8%	69.6%	69.8%	68.2%	68.3%	77.1%	76.6%
BAKER	55.7%	54.3%	55.1%	60.8%	67.3%	68.2%	72.2%	73.1%	77.9%	77.5%	87.5%	77.3%
BAY	55.9%	65.9%	68.3%	70.3%	76.6%	75.4%	78.1%	77.5%	78.7%	78.5%	79.4%	81.9%
BRADFORD	60.4%	67.4%	70.8%	75.2%	74.7%	70.5%	76.1%	69.5%	70.7%	75.4%	78.4%	71.1%
BREVARD	64.0%	80.4%	86.8%	88.5%	88.4%	91.7%	91.5%	90.7%	92.1%	93.3%	95.3%	95.8%
BROWARD	53.5%	63.9%	62.3%	65.2%	62.7%	66.2%	67.1%	67.8%	66.3%	68.8%	74.2%	77.9%
CALHOUN	83.5%	90.4%	86.8%	86.8%	87.8%	90.5%	94.3%	89.6%	82.5%	93.3%	92.2%	89.0%
CHARLOTTE	68.4%	71.7%	74.7%	75.8%	68.0%	80.3%	76.7%	78.0%	81.6%	84.6%	84.3%	82.4%
CITRUS	70.8%	72.3%	73.6%	71.2%	75.3%	76.9%	73.3%	73.2%	76.1%	77.8%	84.6%	85.6%
CLAY	65.3%	65.9%	67.3%	70.9%	75.4%	73.8%	75.1%	73.8%	75.3%	77.6%	81.7%	85.9%
COLLIER	63.0%	63.3%	64.5%	68.2%	67.6%	72.5%	74.3%	74.7%	73.6%	75.8%	78.7%	80.4%
COLUMBIA	63.6%	61.8%	59.5%	68.1%	73.1%	75.6%	74.7%	67.4%	74.1%	77.6%	87.8%	88.5%
DADE	53.2%	52.2%	53.9%	55.7%	57.9%	60.6%	59.9%	59.2%	63.9%	65.8%	68.9%	72.6%
DESOTO	62.7%	67.5%	64.8%	69.7%	66.2%	66.3%	63.5%	70.0%	70.5%	66.5%	72.0%	69.0%
DIXIE	60.5%	71.2%	73.8%	75.1%	63.8%	72.8%	66.5%	70.4%	75.3%	76.6%	74.0%	66.4%
DUVAL	58.7%	57.4%	55.9%	61.0%	63.7%	67.2%	65.5%	60.5%	64.3%	65.9%	69.6%	73.1%
ESCAMBIA	62.6%	65.2%	65.2%	69.9%	64.9%	71.3%	73.2%	74.8%	75.2%	75.7%	77.8%	78.8%
FLAGLER	63.5%	64.4%	67.4%	72.2%	81.3%	79.4%	79.7%	78.4%	77.1%	80.9%	81.3%	83.5%
FRANKLIN	71.2%	63.2%	65.8%	57.9%	72.8%	71.1%	80.0%	60.7%	56.5%	57.8%	86.0%	81.6%
GADSDEN	46.0%	50.7%	51.0%	52.4%	48.1%	43.1%	45.9%	43.9%	53.3%	56.1%	64.2%	63.4%
GILCHRIST	64.1%	55.4%	66.5%	69.6%	76.8%	81.2%	85.4%	78.7%	86.0%	92.1%	96.5%	94.9%
GLADES	66.7%	51.0%	54.8%	54.7%	59.4%	54.8%	67.1%	63.4%	62.3%	43.7%	63.0%	66.2%
GULF	80.0%	83.0%	81.5%	83.8%	87.8%	93.8%	91.4%	83.8%	85.1%	89.1%	89.5%	96.2%
HAMILTON	54.3%	70.4%	59.5%	67.9%	61.5%	60.7%	65.7%	63.2%	68.1%	60.0%	58.6%	65.5%

HARDEE	65.0%	65.5%	57.6%	67.6%	62.0%	72.2%	66.3%	70.3%	72.7%	66.5%	72.6%	76.0%
HENDRY	66.7%	59.8%	50.5%	52.1%	63.9%	69.6%	69.3%	72.1%	68.3%	74.0%	76.5%	81.9%
HERNANDO	68.7%	67.4%	67.8%	74.0%	77.3%	79.5%	74.5%	74.1%	75.1%	76.9%	78.5%	84.9%
HIGHLANDS HILLSBO- ROUGH	70.0%	64.7%	68.6%	58.6%	66.9%	71.9%	72.8%	69.6%	73.0%	71.2%	76.3%	78.1%
HOLMES	69.5%	71.4%	74.4%	77.5%	75.8%	79.3%	79.5%	77.3%	79.1%	80.0%	84.6%	84.4%
INDIAN RIVER	76.6%	73.5%	79.2%	79.8%	85.4%	79.6%	80.6%	71.3%	76.2%	84.3%	87.3%	81.9%
JACKSON	65.2%	64.9%	65.9%	78.9%	76.1%	82.1%	85.3%	84.7%	82.9%	83.5%	86.1%	87.2%
JEFFERSON	58.1%	49.8%	53.0%	59.6%	76.5%	77.1%	78.6%	87.8%	81.7%	85.7%	85.0%	87.9%
LAFAYETTE	62.6%	65.3%	78.8%	64.5%	71.8%	64.9%	68.1%	53.5%	64.2%	57.5%	62.8%	51.6%
LAKE	80.6%	65.5%	58.0%	69.0%	79.5%	80.0%	79.4%	81.7%	79.4%	92.0%	79.7%	88.3%
LEE	65.0%	66.3%	67.5%	68.7%	73.0%	72.1%	72.2%	70.1%	73.5%	79.3%	80.8%	82.3%
LEON	69.4%	67.8%	65.9%	66.0%	68.3%	70.7%	69.4%	71.5%	71.8%	77.8%	78.3%	80.6%
LEVY	64.7%	67.3%	64.2%	74.3%	75.8%	79.8%	79.8%	76.2%	79.0%	81.2%	81.0%	80.2%
LIBERTY	61.2%	65.9%	55.7%	57.0%	63.5%	67.4%	64.8%	65.6%	66.4%	72.1%	67.9%	71.4%
MADISON	71.7%	72.7%	82.0%	77.5%	90.7%	89.8%	90.4%	89.7%	90.7%	95.9%	93.8%	91.2%
MANATEE	67.5%	56.3%	68.4%	63.8%	68.0%	68.7%	63.0%	58.5%	66.9%	69.5%	80.4%	79.7%
MARION	56.2%	61.4%	65.2%	68.9%	73.8%	75.3%	81.5%	76.9%	78.7%	79.3%	79.4%	79.2%
MARTIN	57.9%	60.3%	65.2%	69.1%	70.6%	73.1%	72.3%	71.8%	74.9%	73.8%	78.9%	79.5%
MONROE	60.6%	83.3%	85.4%	84.4%	85.1%	86.8%	84.9%	93.2%	91.2%	91.9%	93.9%	90.4%
NASSAU	71.0%	72.0%	68.5%	74.2%	73.9%	75.2%	76.7%	75.5%	83.6%	85.5%	87.4%	86.3%
OKALOOSA OKEECHO- BEE	73.7%	67.9%	55.1%	76.7%	79.5%	81.1%	85.2%	81.8%	80.7%	81.1%	84.8%	91.8%
ORANGE	77.1%	77.5%	76.8%	83.7%	83.7%	82.9%	85.2%	86.0%	84.7%	90.5%	91.7%	91.9%
OSCEOLA	62.7%	64.3%	63.6%	67.6%	67.3%	60.5%	62.5%	62.8%	64.0%	70.7%	69.3%	71.7%
	51.3%	49.5%	59.8%	68.3%	68.5%	72.7%	73.8%	72.2%	71.7%	75.6%	77.4%	79.6%
	55.7%	58.9%	58.4%	66.1%	66.7%	64.6%	67.7%	64.5%	66.6%	67.5%	79.2%	83.5%

PALM BEACH	58.2%	63.6%	64.9%	66.6%	66.0%	65.9%	69.0%	69.3%	71.8%	75.6%	80.1%	82.9%
PASCO	63.5%	64.8%	65.9%	71.7%	74.9%	75.9%	76.5%	74.4%	73.7%	79.5%	83.5%	87.2%
PINELLAS	65.3%	64.3%	64.4%	66.4%	69.0%	70.8%	70.1%	67.0%	67.3%	74.4%	80.6%	78.8%
POLK	53.3%	55.3%	52.6%	66.9%	65.7%	71.6%	70.5%	68.8%	70.6%	73.6%	74.7%	75.9%
PUTNAM	65.8%	61.2%	62.9%	71.1%	79.5%	80.2%	78.1%	76.4%	78.6%	78.0%	78.4%	82.0%
ST. JOHNS	72.0%	74.9%	77.1%	76.1%	78.2%	78.3%	76.8%	76.7%	78.3%	89.4%	90.8%	92.6%
ST. LUCIE	63.5%	62.9%	69.6%	77.0%	76.8%	79.5%	73.6%	72.7%	75.4%	77.9%	81.1%	79.1%
SANTA ROSA	75.4%	73.5%	75.4%	85.5%	83.3%	84.8%	84.5%	85.5%	86.8%	87.6%	89.0%	88.8%
SARASOTA	63.0%	63.4%	70.3%	71.8%	76.4%	77.8%	81.7%	79.9%	83.5%	86.0%	85.1%	86.1%
SEMINOLE	63.3%	67.0%	70.9%	77.8%	81.4%	84.0%	81.3%	83.4%	86.7%	91.1%	93.0%	94.2%
SUMTER	71.4%	74.8%	73.1%	72.1%	79.8%	81.2%	75.7%	76.3%	81.1%	83.5%	85.0%	87.7%
SUWANNEE	60.6%	57.7%	60.7%	71.2%	72.3%	69.1%	62.0%	65.1%	74.4%	71.6%	72.4%	74.5%
TAYLOR	61.4%	55.1%	58.2%	68.7%	71.2%	74.1%	78.7%	78.3%	77.4%	74.0%	75.1%	74.7%
UNION	61.0%	58.8%	63.2%	78.4%	67.1%	79.2%	84.1%	76.7%	81.7%	71.4%	80.7%	76.4%
VOLUSIA	70.1%	74.9%	77.0%	81.5%	80.1%	83.0%	83.0%	81.9%	82.6%	81.9%	82.0%	81.9%
WAKULLA	76.2%	73.7%	72.5%	81.2%	83.6%	84.7%	85.5%	77.6%	82.5%	81.6%	84.0%	84.9%
WALTON	68.9%	75.4%	72.1%	69.9%	71.3%	75.2%	77.8%	76.1%	74.2%	81.5%	82.3%	85.1%
WASHINGTON	65.9%	69.0%	70.5%	70.1%	66.8%	70.8%	68.5%	69.8%	71.5%	83.1%	85.0%	84.4%
FLORIDA	60.2%	62.3%	63.8%	67.9%	69.0%	71.6%	71.9%	71.0%	72.4%	75.4%	78.6%	80.7%

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