RELATIONSHIPS BETWEEN INSTRUMENTAL MUSIC PARTICIPATION AND ACADEMIC ACHIEVEMENT IN LOW SES STUDENTS

A Thesis by

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The following faculty members have examined the final copy of this thesis for form and content, and recommended that it be accepted in partial fulfillment of the requirement for the degree of Master of Education with a major in Educational Psychology.

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ABSTRACT

The purpose of this study was to examine relationships between student participation in instrumental music class and academic achievement, specifically in low socioeconomic status (SES) students. The hypothesis was that students who participate in an instrumental music program will display increased levels of achievement, and that this relationship will be more pronounced among students who receive free and reduced lunches. Participants in this study were 320 students in grades 5 and 6 from an intermediate school in a rural south central Kansas school district. Students ranged in age from 10-12 years. A total of 172 fifth grade students and 148 sixth grade students participated. The Two-Way Analysis of Variance (ANOVA) was the main analytical method employed in this study. Separate ANOVAs were conducted for each of the two dependent measures, reading and mathematics, subscales of the Kansas State Assessment, for both grade levels with music status and lunch status as factors. Some of the findings from this study are consistent with previous research. Results show were no significant interactions found between instrumental music status and lunch status in any of the four ANOVAs. A statistically significant relationship was found between sixth grade instrumental music participation and reading scores, as well as sixth grade instrumental music participation and math scores. These results suggest that duration (i.e., months of instruction) in instrumental music class may be important to increases in academic achievement. Also consistent with previous research, fifth grade results showed a statistically significant relationship between lunch status and reading scores as well as lunch status and mathematics scores; free and reduced lunch students scored significantly lower than their peers.
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Chapter 1

Introduction

In the last several decades, the demands of society have increased in many ways. The use of technology in the world today has become progressively more essential. Jobs that require more than a high school diploma are more prevalent in the work force. In order to sustain more than a meager lifestyle, a college education has become a necessity. Griggs and Walker (2008) reported that “a work-force with lower skill levels, lower educational attainment and limited aspirations reduces productivity, economic growth and a country’s capacity to compete in a global economy” (Griggs & Walker, 2008, p.5).

Although high school dropout rates vary from state to state, and are greater among minority and low-income populations, the national high school dropout rate is currently estimated at approximately 25% (Balfanz, Bridgeland, Moore, & Fox, 2010). Because income over the course of a lifetime is positively correlated with educational attainment, the importance of academic achievement in the lives of young people must be acknowledged (Griggs & Walker, 2008). However, a growing number of impoverished children fall through the cracks of the educational system each year due to numerous risk factors, including single-parent families, a lack of available role models and resources, disadvantaged neighborhoods and schools, and negative peer-group influence (Catsambis & Beveridge, 2001).

In order to assist students to prevail against academic failure, it is imperative that educators understand the magnitude of this problem. Many external variables have been shown to counteract negative outcomes associated with poverty. In the next chapter, links between student achievement and external factors such as school influence, teacher connectedness, and the impact of neighborhood and community involvement are examined (Balfanz et al., 2010;
Although external factors play a significant role in assisting impoverished children, also influential in conquering academic failure is the construct of internal resiliency (Borman & Overman, 2004). Resiliency, particularly academic resiliency, is examined in the next chapter (Borman & Overman, 2004; Dass-Brailsford, 2005; Waxman, Padron, Shin, & Rivera, 2008). Research has shown that individual resiliency is an internal quality that facilitates student achievement (Borman & Overman, 2004; Dass-Brailsford, 2005). In spite of numerous risk factors, some low-income children develop internal resiliency, and manage to achieve academic success (Sharkey, You, & Schnoebelen, 2008; Waxman, Gray, & Padron, 2003).

Many changes have led to the current educational system. During the 1960’s, education underwent a major transformation, including desegregation, teacher and school shortages, and the expansion of the federal government’s role in public school education. As the achievement gap between low socioeconomic status (SES) students and more affluent children widened, the federal government took an active role to reduce the disparity. Federal legislation was drafted to ensure an equal educational opportunity for all populations of students, regardless of race, SES, gender, or ethnicity (Balfanz et al., 2010). As a result, President Lyndon Johnson signed the Elementary and Secondary Act (ESEA) into law in 1965. The ESEA was reauthorized as the No Child Left Behind Act of 2001 (NCLB) signed by President George W. Bush on January 8, 2002. The NCLB places an enormous amount of accountability on those involved in the educational process, primarily teachers, administrators, and students. After a decade of implementation, NCLB has been recognized as one of the most significant pieces of legislation in education today (Balfanz, Legters, West, & Weber, 2007). The law called for stringent regulations to measure
student achievement in core subjects such as reading and mathematics. States were assigned the responsibility of assessing student progress through the administration of standardized tests in each school district throughout the nation. Adequate yearly progress (AYP) for each district was and is carefully examined by the state departments of education, as proof of student achievement and teacher accountability. The official mandate of NCLB required that all students be brought to the “proficient” level of achievement on state standardized tests by the 2013-2014 school year (Balfanz et al., 2010). However the federal government has allowed and granted some states NCLB waivers. These waivers give states more discretion in determining the best way to meet the educational needs of their districts, by setting more realistic goals for their students (Balfanz et al., 2010).

As a result of the NCLB mandate, school curricula have changed significantly in the last decade. Because core subjects such as reading and mathematics are measured using standardized state assessments, the amount of time educators spend teaching core subjects has increased, but apparently to the detriment of the performing arts (music, art, drama, dance, etc). Instructional time for performing arts has markedly decreased (Abril & Gault, 2006). Because students in performing arts programs do not routinely have standardized achievement tests in their art forms, the programs are less easily quantifiable and their role in educational curricula are more difficult to define. Recently, a significant body of research has been devoted to examining the relationship between participation in arts programs across the nation, and the impact the arts have had on academic achievement (Abril & Gault, 2006; Campbell, Connell, & Beegle, 2007; Fitzpatrick, 2006; Miksza, 2007; Shellenberg, 2005; Vaughn, 2000). The next chapter will examine some of this research.
In 1994, Congress endorsed Goals 2000, which recognized the performing arts, for the first time, as part of the core curriculum (Ruppert, 2006). Although recognized as necessary core subjects, arts education in recent years has suffered in terms of cuts to funding and decreased instructional time. Currently, long-term funding for arts education appears relatively uncertain. For this reason, music advocates have expressed a critical need to illustrate their perception of a link between the performing arts and academic achievement.

**Purpose**

Many disciplines encompass what is considered the performing arts. This study specifically examined instrumental music (i.e., band and orchestra). Performing arts will be referred to throughout the remainder of this study as “the arts”. The purpose of this study was to examine relationships between student participation in instrumental music and academic achievement for low SES students. This study specifically examined the achievement of impoverished children, defined as free or reduced lunch (FRL) participants. The research question that was addressed in this study is, “Is participation in instrumental music significantly related to academic achievement, specifically in low SES students?”

**Overview**

Chapter two provides a literature review of research on poverty, education, and resilience, as well as the relationship between music and academic achievement.

Chapter three details the specific methodology used in this study. Characteristics of the participants are included, as well as instruments, methods, and procedures.

Chapter four provides a statistical analysis of the results of this research and demonstration of how this information relates to the research question.
Chapter five includes a summary of the research findings, a discussion and interpretation of the results, a comparison of the findings to previous research, a discussion of limitations of the current study and suggestions for future research based on the findings.
Chapter 2

Children and Poverty

Children are among the poorest groups in our society and for the youngest and most vulnerable members, the impacts of poverty are significant. Wright, Chau, and Aratani (2010) reported the official poverty rates were highest for young children. The negative consequences for impoverished children tend to build and increase the longer a child is disadvantaged (Seccombe, 2002). Moore, Redd, Burkhauser, Mbwana, and Collins (2009) reported outcomes of poverty include economic hardships, educational deficits, and social and emotional problems (e.g., defiance, impulsiveness, and aggression). Further, health concerns, psychological distress, depression, and self-esteem issues were reported in the research of Oberg (2003).

Approximately one in four American children lived in poverty (Moore et al., 2009), and 8% (approximately 6.2 million) lived in extreme poverty from 2000 to 2008 (Wright et al., 2010). In examining America’s poor, Wright et al. (2010) reported the United States poverty threshold is widely accepted as a chief measure of financial status for households across the nation. As of 2010, the poverty threshold was set at $22,050 per year for a family of four (Wright et al., 2010). However, the authors of this research claimed the formula used to determine the poverty threshold was archaic. Initially developed in the 1950’s, the formula for assessing family need began with an estimate of food costs, which were then multiplied by three and adjusted for family size to determine an appropriate dollar amount to be awarded to families in need. Currently, food consumption makes up approximately one-seventeenth of a family’s total cost of living; housing, child care, health care, and transportation expenditures have all grown disproportionately (Wright et al., 2010). The significance of these numbers translates to
the poverty threshold being extremely low for the current cost of living, which varies both within and across states.

**Free and Reduced Lunch Status**

In much of the current educational research, free and reduced lunch status (FRL) is used as the operational definition of low SES. The U.S. Department of Agriculture defined free and reduced lunch status in an eligibility manual provided by the Child Nutrition Program (U.S. Department of Agriculture, 2011). According to the published manual, children were eligible for reduced lunches if the family lives between 133% and 185% of the Federal poverty line. Students who were eligible for free lunches live at or below 133% of the Federal poverty line. The following criteria also qualified students for the FRL program: (a) enrollment in a Head Start program, a state-funded pre-kindergarten, or an Even Start program (birth to one year olds), (b) deemed homeless, (c) deemed a migrant child, (d) deemed a runaway, or (e) deemed a foster child (U.S. Department of Agriculture, 2011). Much of the research reviewed in this chapter used FRL as the measure of the low SES variable.

**Poverty and Health**

Typically, impoverished children experience inferior health outcomes in comparison to their peers. Because children cannot change family circumstances by themselves, they are dependent on others for their most basic needs, usually at least until reaching adolescence. Seccombe’s (2002) study examined the importance of preventative health care in the lives of the poor. In her research the author found 68% of children who lived below the poverty level maintained good or excellent health, compared to 86% of children who lived at or above the poverty line. The author reported health issues for impoverished children usually began within the first year of life, a result of inferior prenatal care, and extended into adulthood.
Moore et al. (2009) found health issues typically continued throughout adolescence in the form of chronic problems such as asthma and anemia, and were displayed into adulthood in the form of higher mortality rates. They also found poor families developed food insecurities including an insufficient amount of food available to them and an inferior diet.

Paul-Sen Gupta, de Wit, and McKeown’s (2007) research on health outcomes of the poor found impoverished children had: (a) problems with weight, specifically obesity, that led to Type 2 diabetes, (b) reduced functional health (vision, hearing, speech, and mobility), (c) mental health problems (conduct disorders, hyperactivity, and emotional disorders), and (d) reduced readiness upon entering the school system. Similar to the findings of Moore et al. (2000) and Seccombe (2002), Paul-Sen Gupta et al. (2007) found that the foundation for physical, emotional, and cognitive capabilities, as well as health-related behaviors were all processes established and developed during the early stages of life. Further, the authors found that it was not strictly children who suffered poor health outcomes; these problems typically continued into adulthood in the form of clinical depression, physical disability, and premature death.

In addition to many of the physical health concerns previously noted, Singer (2003) reported the oral health of impoverished children was a cause of great concern. Poor oral health negatively impacted a child’s mental and emotional well-being. In addition to physical pain experienced from poor and deteriorating teeth, other problems that developed from poor oral health included sleep disorders, an inability to concentrate, social and behavioral problems in school, chronic health issues, and fewer employment opportunities as adults.

In an effort to assist families with health needs, the United States government has taken an active role in implementing several programs that coalesce health care and screening with nutrition: (a) Women Infant and Children (WIC) program, a feeding plan that targets improved
nutrition of the poor, (b) Children’s Health and Insurance Program (CHIP), (c) the Federal Free and Reduced Price Lunch Eligibility program (FRL) used in schools across the nation, and (d) Head Start preschool, designed to address the needs of underprivileged three and four year olds in order to promote kindergarten readiness (Hodgkinson, 2003). A chief benefit of implementing such programs was the screening of various health-related issues in order that these issues could be addressed early and attempts to reduce negative effects of poverty could be targeted with adequate time to make changes.

**Poverty and Social/Emotional Issues**

Singer (2003) found that the physical and mental welfare of an individual was closely related to emotional health. Physical health problems negatively affected a child's self-esteem and self-confidence. Paul-Sen Gupta et al. (2007) found that mental health was important in forming connections with others. Suffering embarrassment and self-consciousness inhibited children in developing social relationships and friendships at school. As a result, many impoverished children had a more difficult time developing and sustaining relationships with others. Singer (2003) reported individuals who experienced feelings of isolation, hopelessness, bullying, and self-doubt were increasingly at risk for depression and suicide. Oberg (2003) also noted psychological distress and depression were associated with poverty.

More recently, Griggs and Walker’s (2008) review of literature examined research both within and outside of the United Kingdom. Their review reported findings similar to those of Paul-Sen Gupta et al. (2007) and Singer (2003) concerning the personal, social, and emotional impacts of poverty. Further, these authors noted a social stigma (self-described by impoverished children) attached to home situations that resulted in a lack of school and community
involvement. Although health issues for the poor are of significant concern, the impact these issues have on a child’s preparedness and participation in school further complicates their lives.

**Poverty and Education**

**Kindergarten readiness.** In his examination of the effectiveness of the No Child Left Behind Act, Hodgkinson (2003) reported many factors were already in place prior to a child entering the educational system that led students down a path of low achievement and potential failure. Hodgkinson posited:

> Long before children knock on the kindergarten door—during the crucial period from birth to age five when humans learn more than during any five year period—forces have already been put in place that encourage some children to “shine” and fulfill their potential in school and life while other forces stunt the growth and development of children who have just as much potential. The cost to the nation in terms of talent unfulfilled and lives of promise wasted is enormous. (p.1)

The Head Start program, developed in 1965, was unique at the time, in that the program recognized many factors coalesced in the lives of children, specifically poor children that needed to be countered in order for dynamic cognitive, social, and emotional growth to occur (Hodgkinson, 2003). Head Start is a federally-funded educational program designed to address the needs of impoverished children. It targets four specific areas: (a) health, (b) education, (c) parental involvement, and (d) social services (Hodgkinson, 2003).

**Literacy.** Literacy, that is, the ability to read and write at a competent level, is a vital component of a meaningful education. Dyson, Hett, and Blair (2003) investigated the effects of a reading intervention program on the reading achievement of 68 Canadian students, grades one and two from economically disadvantaged homes. The reading program used in their work,
called “Success for All” (SFA), was a reading tutoring program designed specifically to improve four areas of reading literacy: (a) reading recognition, (b) reading comprehension, (c) spelling, and (d) word recognition. The authors hypothesized that by providing low-income students with extra reading practice, these children would experience accelerated levels of reading. Using a true experimental design, the authors assigned two 20-minute SFA reading sessions per week to the experimental group. The control group received no extra reading practice. Pre-and post-tests were given to both groups. Results indicated that although the first grade experimental group initially scored lower than the control group in all areas of the pre-test, after SFA implementation, gains made by the experimental group surpassed gains made by the control group in all areas at post-test. Results for the second grade showed the differences in growth for these students were not as obvious, although both second grade groups demonstrated improvements in measured reading proficiency. Although the scores of the second second experimental group were lower than those the control group at pre-test, they were reading at grade-level at post-test. However their scores still remained lower than those of the control group. This research is an example of how assistance from schools and educators can facilitate academic achievement in low SES students.

Outcomes of Poverty

Brooks-Gunn and Duncan (1997) reviewed the literature concerning specific outcomes of poverty during five different developmental periods of a child’s life: prenatal to 2 years, early childhood (3-6 years), late childhood (7-10 years), early adolescence (11-15 years), and late adolescence (16-19 years). The authors found the effects of income during early childhood as opposed to the effects of income during adolescence were more likely to have a larger impact on child outcomes (e.g., physical health, cognitive abilities, and emotional and behavioral
tendencies). Further, extra-familial environments, such as school and neighborhoods, affected a child as much or more than home conditions upon entrance to the school system (Brooks-Gunn & Duncan, 1997). The authors also found that persistent poverty (i.e., a specific percentage of a child’s life that is lived below the poverty level) produced educational problems for children in the form of learning disabilities, grade retention, and developmental delays, and that persistent poverty was associated with internalizing behavior, such as dependence, anxiety, and unhappiness. The construct of poverty was further subdivided: (a) short-term poverty (i.e., poor in at least one out of four years); (b) long-term poverty (i.e., ratio of family income to that of the poverty level, averaged over 13 years); and (c) current poverty (i.e., current family income below the poverty level).

Brooks-Gunn and Duncan (1997) found three components of the poverty construct that played a significant role in accounting for a range of outcomes that impoverished children displayed: (a) duration (i.e., the length of time a child has been impoverished), (b) timing (i.e., the age in which a child experienced poverty), and (c) depth of poverty (i.e., the extent to which a child’s needs went unmet). Effects of poverty had a greater impact on cognitive outcomes than emotional outcomes. Current poverty was linked to more externalizing behaviors in children (e.g., hyperactivity and peer conflict). Much research revealed emotional problems such as externalizing behaviors (e.g., fighting) and internalizing behaviors (e.g., anxiety) existed in children of persistent poverty. Children who experienced poverty during preschool and early school years tended to have higher high school drop-out rates in later years than those who experienced poverty during their late childhood or adolescence. Finally, implementation of interventions during early childhood proved to be the most crucial period of time for lessening
the impacts of poverty, and timing for these interventions was critical to success in preschool and early school years.

For many impoverished children, the struggles of everyday life make focusing on school work more difficult. In their study, Payne and Biddle (1999) found that educational difficulties surfaced in the homes of poor families for numerous reasons: (a) a lack of available resources inside and outside the home, including books, writing materials, and computers; (b) a lack of parental involvement, both at home and at school; (c) a general lack of adequate health care; (d) poor living conditions and living in areas of serious crime, gang activity, or prevalent drug use; and (e) having older siblings who had left home, had been incarcerated, or led dysfunctional lives in some way. These factors were all associated with educational difficulties in impoverished children.

**School and Community Impact**

Much research has explored the idea that for a variety of reasons, some schools perform better than others (Borman & Overman, 2004; Dyson, Hett, & Blair, 2003; Payne & Biddle, 1999). Lacour and Tissington’s (2011) review of literature focused on numerous external factors that led to increased achievement. The authors found student learning was shaped by three factors: (a) the school environment, (b) the home or community environment, and (c) the educational policies of the district and state.

Dyson and colleagues (2003) investigated environmental factors that hindered student learning. The authors determined that neighborhood poverty, or “collective socialization,” influences its members in a number of ways. Communities teach their young what is acceptable and appropriate, often inadvertently. When children observed adults in their neighborhood behaving and acting in particular ways, those observations were considered to be the norm,
whether it was unemployment, alcoholism, or in contrast, college graduation, that was being scrutinized.

Since NCLB has required the subjects of reading and mathematics to be assessed using standardized tests, much research on these two school subjects is readily available (Balfanz & Byrnes, 2006; Catsambis & Beveridge, 2001; Chatterji, 2006; Sheldon & Epstein, 2005). The work of Sheldon and Epstein (2005) noted weaknesses in mathematics achievement beginning with numbers recognition in kindergarten, and continuing through high school-level mathematics classes. The authors hypothesized that a comprehensive school program, which involved a school-family-community interaction, would produce increases in mathematics achievement for their students. Mathematics achievement was measured using standardized math test scores, as well as grades on report cards. Because the comprehensive school program focused on an amalgamation of school, family, and community, it included several levels of parental participation practices: (a) parenting workshops (i.e., to develop positive learning environments at home), (b) communication (i.e., open exchange between parent and school regarding student progress), (c) volunteering (i.e., promoting parental involvement at school, home and other places), (d) learning at home (i.e., ideas/ways for parents to assist with homework) (e) decision making (i.e., to promote parental involvement at school, regardless of background), and (f) partnering with community (i.e., to join resources/services of the community to support school programs).

Sheldon and Epstein (2005) sent a baseline survey to 18 schools from seven states across the nation. Each school was asked to estimate the effectiveness that the six parental practices could have on their students. Upon completion of the study, the estimated effectiveness was then compared to the actual effectiveness of each parental practice. The actual effectiveness was
measured using school grades in mathematics and scores on the standardized mathematics test. Approximately 50.4% of the participants received free and reduced lunches, which ranged from 4.8% in some schools up to 88% in others. Approximately 75% of the schools targeted economically disadvantaged children. Results indicated students in large schools and in low SES schools still displayed more unsatisfactory scores and lower grades on report cards than their peers. However, after implementation, the parental practice that promoted “learning at home” was significantly linked to higher test scores in these schools. Overall, Sheldon and Epstein (2005) found that school leaders expressed confidence that family and community involvement pursuits positively assisted achievement in mathematics.

**Family Influence**

In addition to examining the interaction between neighborhood, school, and achievement, Catsambis and Beveridge (2001) speculated that few studies examined the potential inter-relationship between family influence, neighborhood impact, and school guidance. They examined the mathematics achievement of eighth grade adolescents using data from the National Educational Longitudinal Study (NELS: 88). The authors speculated that although neighborhoods and schools examined separately can have positive impacts on academic achievement, these factors work in tandem along with family influence to determine achievement outcomes for students. A statistically significant interaction was found between neighborhood attributes and four parental practices: (a) educational expectations, (b) academic communication, (c) supervision, and (d) music/dance lessons. For families living in poor neighborhoods, the most influential parental practice was supervision of children in the home. Also significant was parental support of music and dance lessons. The relationship between music and educational outcomes is explored later in this chapter.
Cultivating a child’s motivation to succeed can be complicated in families that do not consider education a priority. The work of Luster, Bates, Fitzgerald, and Vandenbelt (2000) explored the variable of maternal characteristics on poor children’s learning outcomes. They examined the mother’s own success in school, her psychological well-being, neighborhood safety, and quality of life. Quality of life was defined as: (a) the stability of the neighborhood, (b) a sense of community, (c) a presence or absence of places for children to play, and (d) the quality and maintenance of homes. Student scores from the Peabody Picture Vocabulary Test Revised (PPVT-R) outlined and defined learning outcomes of these children. Luster et al. (2000) found the mothers of the least successful children: (a) had fewer years of educational attainment, (b) were less likely to have a job, (c) lived in less advantageous neighborhoods, and (d) were less likely to be cohabitating with a partner. Not surprisingly, Luster et al. (2000) reported scores for low SES preschoolers measuring cognitive competence were significantly lower than for scores for their peers, especially in language-based assessments. Children who scored highest on the PPVT-R reported that their mothers had read to them frequently. The least successful children lived in the least desirable neighborhoods, and for children who lacked adults to model the importance of educational attainment, motivation towards achievement was lower.

Hodgkinson (2003) also examined the effects of maternal influence on the educational outcomes of children. He found that many teen mothers who typically experienced lower educational attainment themselves were less likely to read to their children, and perpetuated low educational cycles for their children.

**Achievement Gap**

Comparisons of national and international academic achievement showed that currently in the United States, the mathematics achievement gap between low SES students and their peers
originates around grades four to eight. The middle school grades are where students fall behind most rapidly in mathematics. The research of Balfanz and Byrnes (2006) investigated mathematics achievement of students in grades five through eight enrolled in high-poverty/high-minority schools. The study examined data from the Philadelphia School District over a six year period. The authors implemented a whole school reform (WSR) model. The WSR used research-based proven curricula, subject-specific teacher training, multiple layers of teacher and classroom support, and school climate reforms. Results concluded that the students, who entered middle school mathematics behind grade level, followed one of two paths. For a significant number of these students, effective learning took place if students were exposed to good teachers and successful instructional experiences. As a result, these students displayed increased effort and better attendance rates. They also made significant gains in achievement and successfully closed the achievement gap. Some of these students completed eighth grade mathematics functioning above grade level. On the other hand, the authors found the majority of these impoverished children entered and also left middle school behind grade level in mathematics, ill-equipped to succeed in high school math courses, without extensive and continued assistance. For these students, factors such as poor classroom behavior, poor attendance, and a lack of effort also contributed to their lack of success in mathematics.

**Protective Factors**

To insulate students from the effects of poverty, many schools have focused their efforts towards counteracting potentially negative consequences, with the implementation of protective factors. Protective factors are variables that help reduce exposure to many of the risks impoverished children face. Chatterji (2006) reported that simply providing smaller classrooms allowed for more individualized instruction. With reduced class size, teachers were able to
provide a greater variety of classroom activities to engage at-risk students. Chatterji (2006) also found that keeping school size smaller was beneficial to counteracting some of the negative effects of poverty.

**High Achievement**

Much research has examined the association between poverty and low achievement. In contrast, Burney and Beilke (2008) recognized the notion that high achievement, or gifted status, from low SES students was significantly underrepresented in current research. High achievement was operationally defined in this study as student mastery of instructional content above what was considered to be grade-level material. They found that most important to postsecondary success was the completion of a rigorous educational curriculum in high school, including the completion of such courses as trigonometry and calculus.

Alexander’s (2002) research examined links between standards-based schools and advanced courses offered in the curriculum. He found many schools with a high minority, low-income student-body do not offer challenging classes to their pupils.

**Academic Resilience**

Why do some students succeed in spite of adversity, when others fail? Resiliency research examines some plausible explanations to this question (Borman & Overman, 2004). At-risk can be operationally defined as the presence of influences in a person’s life that increase the possibility of negative outcomes occurring (Sharkey et al., 2008). While many impoverished families experience unfavorable outcomes, not all children who live in poverty display poor health, are socially maladjusted, engage in defiant behaviors, follow cyclical patterns of their parents, or perform poorly academically (Sharkey et al., 2008). Much research (Borman & Overman, 2004; Sharkey et al., 2008; Waxman et al., 2008) has shown that building resilience is
a developmental process, predominantly individual in nature that occurs over time. Resilience has been defined as individual variation in response to risk (Rausch, Lovett, & Walker, 2003). With the help of caring, competent teachers and an engaging learning environment, acquiring academic resiliency is possible in spite of the numerous risk factors to which low income students may be exposed.

While resiliency is a complex, multi-faceted construct, its presence has been found to be crucial in avoiding academic failure. Waxman, Padron, Shin, and Rivera (2008) concluded that closing the achievement gap between resilient and non-resilient students was one of the greatest educational challenges that educators face. In their review of literature, the authors reported resiliency was formed by the interaction between the personal resources of the child and his or her external environment (Waxman et al., 2008).

The research of Borman and Overman (2004) examined an educational gap within schools and classrooms, as opposed to comparing gaps between schools. They posited differences within schools were often greater than differences between schools, and that by comparing students with similar backgrounds within the same learning environment, a more accurate assessment of individual resiliency would be found. They attempted to answer the question, “What school factors contributed to building academic resiliency in students?” In their study they used learning environment questionnaires and systematic observation methods to examine resiliency attitudes in students. The authors reported personal resources that were common in resilient students included higher levels of engagement in activities, an internal locus of control, math competency, and higher self-esteem. They speculated these personal resources are simply perceptions that students obtain from their individual environments, and can be
altered in a supportive school that promotes educational success. Further, teachers can create classrooms that promote resiliency through classroom activities.

Borman and Overman (2004) examined reading and mathematics achievement of elementary aged, African American, Latino, and White students from relatively homogeneous, low-SES backgrounds. Resilience was measured using student questionnaires which assessed some of the most widely cited individual characteristics associated with resiliency; self-esteem, self-efficacy, engagement in school, and a positive self-attitude. Resilient students were found to be more engaged in their school work, and displayed higher self-esteem by volunteering answers to questions in class. They also found resilient students were more persistent, attentive, and demonstrative of leadership skills. These students also displayed significant differences in classroom behaviors; specifically, they spent more time interacting with teachers for learning purposes and had fewer disruptive behaviors than their non-resilient peers. Resilient students also perceived their learning environment as positive.

Borman and Overman (2004) identified individual characteristics that separated academically successful and resilient students with a low SES background, from their non-resilient peers. They concluded that building academic resiliency was a developmental progression, which occurred over time despite risk factors a child had been exposed to. They examined both individual factors and school-related factors associated with the development of academic resiliency. The authors developed and tested four models of resiliency-promoting features of schools: (a) effective schools, (b) peer-group composition (c) school resources, and (d) the supportive school community model. Similar to the research of Chatterji (2006) these authors also found that many schools offered protective factors to assist their students in overcoming risks to which they were exposed. These school-implemented factors included: (a)
working with caring teachers and staff, (b) promoting excitement and enthusiasm for learning, (c) implementing kid-friendly activities into the school day, and (d) providing safe and orderly classrooms.

Borman and Overman (2004) followed student growth in mathematics from grades three to six. The authors found regardless of race, a student’s level of engagement in academic activities, a strong sense of self-efficacy, a positive outlook regarding school, and a high sense of self-esteem were all vital characteristics of students who achieved resilient outcomes in mathematics. In this study resilient outcomes were measured using scores from the sixth grade Comprehensive Test of Basic Skills. Residual scores from a least squares regression analysis were examined. Students with a residual score of 0.33 or higher were defined as academically resilient. Students with residuals of -0.33 or lower were determined non-resilient. Although peer-group interactions had little to do with achieving resiliency, an accommodating school community was vital to the development of the dynamic social and personal growth students need.

The Resiliency Youth Development Module. Sharkey et al. (2008) found that children were more likely to perform better when they were engaged in the learning process. Teacher support and connectedness were found to promote student engagement and were also shown to reduce negative outcomes such as delinquency, substance abuse, dropout, and teen pregnancy. Using statistical information from the California Healthy Kids Survey (CHKS), designed to assess health risk and resiliency in children, Sharkey and colleagues (2008) examined school connectedness, school assets, and internal assets of students in grades 7, 9, and 11. To measure external assets, the authors assessed four domains: school, family, community, and peer group. To measure internal resiliency, the authors used the Resiliency Youth Development Module
(RYDM; Orthner, Jones-Sanpei, and Williamson, 2004). The RYDM was developed by the California Department of Education (CDE) as an “integral component” of the Safe and Healthy Kids Program (Sharkey et al., 2008). It was created to assess both internal and external assets of children exposed to various risk factors. The RYDM assessment contained 18 items with Likert response scales. Results concluded, similar to the findings of Borman and Overman (2004) and Waxman et al. (2008), that school assets were critical for student achievement.

**Family resiliency**

Orthner et al. (2004) explored the notion that the development of resiliency was initially formed within the context of the family, and that individual resiliency was an internal attribute that resulted. They collected data from random sample surveys of North Carolina households (n = 2,118) during 1998-2001. The surveys were used to determine a status indicator of family strength and well-being amongst a diverse population of families. This information was also used to provide policy makers with a clearer picture of how well families of differing income levels were operating. The Family Strength Index (FSI) was used to assess the depth of resiliency a family possessed, in terms of five strengths related to the resiliency construct: (a) economic strengths, (b) communication strengths, (c) problem-solving strengths, (d) social strengths, and (e) family cohesion (Orthner et al., 2004). Their findings indicated that building family resiliency developed over time, and the level of resilience a family possessed was related to the family’s stage of development. Most of the resilient families believed with great confidence they possessed the ability to solve the problems in their lives. Further, when low-income families showed affective response toward their children along with disciplinary guidance, children were more likely to transition from adolescence to early adulthood competently. These findings are similar to those of Seccombe (2002) who found despite great challenges, many resilient families,
developed survival strategies and problem-solving skills necessary to bounce back in the face of adversity.

**Music as a Protective Factor**

In addition to school-related protective factors found in the research of Chatterji (2006) and Borman and Overman (2004), much music research has recognized that participation in, and exposure to, Arts education serves as a protective factor against negative effects of poverty for many children across the nation (Fitzpatrick, 2006; Miksza, 2007; Schellenberg, 2005; Schmidt, 2005; Vaughn, 2000).

**The Arts and Curriculum Reform.** While Arts education in the school curriculum has been recognized as valuable, the effects of NCLB have greatly affected the role of Arts programs in the United States. Because few standardized measures of assessment exist for music and other arts classes, the arts have not always been viewed as vital and necessary to a child’s academic success. A survey of elementary and secondary school principals (n = 956) revealed the majority of these administrators (75%) recognized the fact that school curricula has changed significantly since the implementation of NCLB (Borman & Overman, 2004). These administrators acknowledged instructional time in core subjects such as reading, mathematics, and writing has increased at the expense of instructional time for the arts (Abril & Gault, 2006; Alexander, 2002; Ruppert, 2006).

Alexander (2002) examined the link between impoverished children and course-taking patterns in public secondary schools. He reported standards-based reform narrowed the curriculum and focused teaching efforts on core subjects measured by state tests. He asserted standards-based reform benefited achievement by devoting more time to core subjects such as
mathematics, science, foreign languages, English, and social studies. However, this was often achieved at the expense of vocational and non-basic subjects.

**Music Education and Academic Achievement.** A May 2005 Harris Poll revealed 93% of Americans agreed Arts education was imperative to the development of a well-rounded educational experience (Ruppert, 2006). Catsambis and Beveridge (2001) observed that the positive effects of music on the lives of disadvantaged youth have been found to be noteworthy in producing increased achievement in mathematics. In Schellenberg’s (2005) study, she sought to answer the question, “Can simply listening to music make you smarter?” Her research replicated a previously reported finding from a newspaper article, which reported a “Mozart effect”. The “Mozart effect” recognized a correlation between music and mathematics achievement. It was credited for developing superior spatial abilities in individuals who listened to a recording of Mozart’s music, and then performed a specific task, such as completing a mathematics test. Participants displayed increased scores on tests that measured cognitive abilities. The results determined listening to Mozart’s music increased achievement. Although Schellenberg’s (2005) replicated research showed enhanced performance (i.e., higher scores on cognitive tests), the author revealed the effects were perhaps mediated by arousal and mood, and the same results could perhaps have been achieved by exposure to non-musical stimuli. Further, she noted these effects were short-lived (10-15 minutes).

Schellenberg (2005) also examined the effects of participation in piano lessons on six-year-old children’s IQ scores (n = 144). She hypothesized participation in music lessons would increase these scores. The Wechsler Intelligence Scale for Children-III (WISC-III) was administered to participants prior to entering the first grade, and later between first and second grade. The WISC-III is an individually administered test that does not require reading or writing.
Test questions are asked and answered orally. The experimental group was divided into two subgroups: (a) students who received 36 weeks of piano instruction, and (b) students who received 36 weeks of vocal instruction. The control was also divided into two subgroups: (a) students who received drama lessons, and (b) students who received no lessons. Results indicated that all four subgroups had increased Full-Scale IQs between the first and second testing, a known consequence of attending school. However, the increase was greater for both groups of music participants than for non-music participants across the main areas of intellectual ability measured by the WISC-III. Results suggested a causal link between music lessons and increased intellectual ability. Further, Schellenberg reported positive associations between music lessons and reading, mathematical, verbal, and spatial abilities.

Another study examined what Vaughn (2000) called the “oft-claimed relationship between music and mathematics” (p.1). She examined previous studies that explored a music-mathematics relationship, with respect to three questions: (a) Do individuals who choose to study music show higher achievement in mathematics than those who do not? (b) Do individuals exposed to a music curriculum in a school setting show higher achievement in mathematics? (c) Does background music played while taking a mathematics test increase achievement, at least during music listening? Vaughn’s (2000) meta-analyses showed that no conclusion could be drawn regarding a correlation between listening to music and increased mathematics performance. However, students who chose music participation displayed a small association between participation and increased mathematics achievement. There was also a small correlation between musical training and enhanced mathematics achievement (i.e., second question). The author noted that students who studied music and performed well in math may come from families who value the arts as well as academic achievement.
The majority of Americans (86%) agree that arts education promotes and encourages a student’s overall attitude toward school and school work (Ruppert, 2006). Abril and Gault (2006) examined the perspective of the school principal regarding administrative support of music education in the school curriculum. A chief responsibility assigned to the school principal is the development, implementation, facilitation, and monitoring of the school curriculum. Since the implementation of NCLB, school principals have been assigned the enormous task of overseeing that students meet broad educational goals measured by the state. A random sample of principals (n = 8,506) who were members of the National Association of Elementary School Principals, were asked to participate in the study. A survey that examined perspectives regarding the function of music education in their schools was completed by 350 participants. Approximately 92.5% recognized that music education was a necessary part of the elementary school curriculum. Further, most administrators believed that music education had the potential of meeting both musical and broader, non-music-related educational goals. In as much as the majority of the principals were supportive of music in their schools, they also acknowledged a lack of control over certain factors that negatively impacted their school music programs: NCLB, budget cuts, standardized testing, and scheduling issues.

Children from low-income families are less likely to become involved in music for various reasons. A lack of funds for instruments and equipment, as well as a lack of parental involvement, are two reasons cited in the research of Ruppert (2006).

Fitzpatrick (2006) investigated the effects of participation in music, specifically for low SES students, on achievement as measured in several areas: citizenship, mathematics, science, and reading. Participants in this study were high school students enrolled in band, orchestra, or jazz band (n = 915) for the 2003-2004 school year. Achievement was measured using scores
from the Ohio Proficiency Test. This study attempted to examine the proficiency results of one specific group of students across time (i.e., students in grades 9-12 for the 2003-2004 academic school year.) A retrospective design was used. Test scores for this population were retrieved from their fourth, sixth, and ninth grade years. Four groups were compared: (a) instrumental music students who received free or reduced lunch (FRL-IM), (b) instrumental music students who paid full price for lunch (FP-IM), (c) non-instrumental music students who received free or reduced lunch price (FRL-NI), and (d) non-instrumental music students who paid full price for lunch (FP-NI). Results indicated that full price lunch students outscored all free or reduced lunch participants, regardless of music participation status, on 7 of the 23 subtests. The students in the FP-IM category achieved the highest scores of all groups for each subject at every grade level, while FRL-NI students scored lowest in every subject, at all grade levels. Fitzpatrick (2006) concluded that scores for instrumental music students compared to those of non-instrumental students with similar SES were significantly higher ($p < .05$), except for math between FRL-IM and FRL-NI students in grade 6. Fitzpatrick (2006) also noted (a) it is possible that higher scoring students were attracted to the arts more than their lower scoring peers, and (b) increased scores in mathematics (proportions, patterns, and ratios) could be linked to musical rhythm and therefore could have provided the music participants with an advantage.

Similar to Fitzpatrick (2006), the work of Miksza (2007), also examined the effects of music participation (band, orchestra, and choir) on academic achievement. Miksza’s (2007) longitudinal study was a reanalysis of the National Educational Longitudinal Study of 1988 (NELS:88) by the U.S. Department of Education. Achievement was measured using standardized scores in math, reading comprehension, social studies, and science. Miksza’s (2007) research did not attempt to examine a causal relationship between participation in music and academic
achievement, but rather it examined whether change in academic achievement (from 8th grade to 12th grade) varied as a function of participation in music. The sample consisted of high school students across the United States, in grades 8, 10, and 12, whose music participation status remained stable throughout the NELS: 88 study (n = 5,335). To measure SES, Miksza (2007) used the composite variable constructed by the NELS: 88 data. This variable was based on five areas of family information collected in a parent questionnaire: (a) father’s education level, (b) mother’s education level, (c) father’s occupation, (d) mother’s occupation, and (e) family income. Pearson correlations indicated significant relationships existed between SES and academic achievement at all points in time (p < .001). Although scores for music participants were initially higher than non-participants, their scores did not increase or decrease any faster or slower than non-participants. A slight gap between music participants and non-participants was observed, however, the gap was found to decrease over time (non-music participant scores increased slightly faster than music participants in reading comprehension). The research of Miksza (2007) revealed students who participated in school music may reach higher levels of achievement in reading, mathematics, science, and social studies than those who do not participate in music. Also they may maintain higher levels of achievement over time. However, the author reported these findings were likely true regardless of SES.

While standardized tests are an excellent measure of a student’s acquisition of knowledge and skills, the extent to which these tests are able to assess characteristics such as motivation, intuition, perception, imagination, inventiveness, creativity, and expression is very small. These characteristics are some examples of cognitive processes that have been linked to Arts education (Ruppert, 2006).
Schmidt’s (2005) research assessed motivational orientations of secondary instrumental music students, grades 7-12 (n = 300). Schmidt (2005) found that music students tend to use internal attributes over external attributes to explain success or failure. Student grade level, instrument played, gender, years of experience in band, and the total number of minutes the student practiced each week were examined. A survey containing 58 Likert scale items measured variables such as (a) self-concept in band, (b) commitment to band, and (c) motivation. This study did not attempt to find a correlation or causal link between music participation and academic achievement. Results suggested that overall, music students reported their success as being defined by mastery of the content. Statements such as “I feel most successful in band when I reach my own goals” and “I feel most successful when I really improve” revealed attitudes not easily measured on standardized tests. Not all benefits of music can be measured in terms of increased scores on tests. The Arts facilitate active engagement, increased discipline, prolonged attention to an activity, and risk-taking (Ruppert, 2006).

Campbell et al. (2007) also assessed the significance of music education in the lives of adolescents using a method unrelated to standardized testing. Students, aged 12 through high school, responded to essay questions which explored thoughts and feelings regarding music in their lives. Responses to questions were examined through the personal statements made by individuals. The authors noted many musical, as well as non-musical benefits of engagement in music, including (a) an historical and cultural awareness of society, (b) many social and emotional benefits, and (c) self-discipline derived through repetitive practice. Campbell et al. (2007) recognized that although their qualitative research could not be generalized to most populations, music in this study was found to fulfill a universal need among some adolescents in their attempt to express and organize themselves within their world.
Conclusion

The impact of poverty on children across the nation has been documented in many research studies. Legislation has been aimed at addressing the mental, physical, social, and emotional needs of impoverished children. Much research showed the enactment of the NCLB law placed greater accountability on teachers and school districts throughout the United States. In many school districts across the nation, educational reform has been aimed specifically at addressing the academic needs of at-risk students. Why some students flourish in spite of risk factors, and others fail is explored in resiliency research. Resiliency research examined protective factors that some successful schools have set in place for their students to assist them in overcoming effects of poverty. Some schools recognized music participation as protective factor for their students. The research that has been documented thus far has indicated participation in music classes has offered benefits to students in terms of higher achievement (i.e., grades and standardized tests) particularly for low income children.

Rationale

The next chapter details the specific methodology used in this study. Characteristics of the participants are included, as well as instruments, data collected, methods, procedures, and the data analysis used to conduct this research. The purpose of this study was to examine relationships between participation in school music programs and academic achievement, specifically for low SES students. The students who participated in this study comprised a volunteer sample. They were either enrolled in instrumental music class, or chose not to participate in instrumental music and therefore were enrolled in Academy class (i.e., study hall). This study did not address ethnicity nor gender, as reviews of music literature (Campbell,
Connell, & Beegle, 2007; Fitzpatrick, 2006; Miksza, 2007; Schellenberg, 2005; Schmidt, 2005; Vaughn, 2000) showed no significant differences for these groups.
Chapter 3

Method

Participants

Students. Participants included 320 students enrolled in fifth and sixth grades from a rural Kansas intermediate school during the 2011-2012 academic school year. The school district is located in the south central part of the state. Participants in grade 5 (n = 172) comprised 53.75% of the participants in this study. Participants in grade 6 (n = 148) comprised 46.25%. Participants ranged in age from 10 to 12 years.

School district. The school district in which this study was conducted served a population of 2,683 students and was a 5A classification during the 2011-2012 year. The school district served seven schools which included four elementary schools (grades K-4), an intermediate school (grades 5 and 6), a Middle school (grades 7 and 8) and a High school (grades 9-12). Six of these schools were subsidized by Title 1 funding. This district also assisted the community’s two elementary parochial schools (grades K-6). Students in grades 5 and 6 from these parochial schools were allowed to participate in the intermediate school’s instrumental music program.

Music Program. In this district, towards the end of the student’s fourth grade year, the band and orchestra teachers met with students to provide them with information regarding participation in the school’s instrumental music program their fifth grade year. The purpose of this music session was to provide students with an opportunity to test their ability to produce musical sounds on various band and orchestra instruments. The goal was to help students determine whether they were interested in participating in the instrumental music program in fifth grade. Band instruments available for students to try were flute, clarinet, trumpet, and trombone. Arrangements could be made to try the saxophone or percussion instruments as per
instructions included in a letter sent home with students. Violin, viola, cello, and bass were instruments of the orchestra that students could test. Participation in the fourth grade music session was voluntary. During the music session, students were encouraged to try any and all musical instruments of interest to help them best determine their instrument preference. Fourth grade students who were not interested in participating in band or orchestra remained in their homeroom class during this time.

After students tested the instruments, general information outlining guidelines for fifth grade band and orchestra enrollment was discussed. Practice expectations (i.e., 60 minutes per week), classroom expectations, and processes involved in obtaining a musical instrument were summarized during this session. An informal letter was sent home with students outlining enrollment procedures for the fifth grade year. This letter also explained which instrument(s) the student had the most musical aptitude towards, as observed by the teachers during the music session. A copy of the fourth grade informational letter to parents is included in Appendix A.

In order for the child to participate in fifth grade instrumental music, parental consent was required at the time of fifth grade Fall enrollment. If the student chose not to enroll in instrumental music, he or she was enrolled in “Academy” class. Academy class was a study hall that followed the same schedule as band and orchestra. Band, orchestra, and Academy students attended three 40 minute class sessions per week throughout the school year. All students, regardless of instrumental music participation attended two 30 minute general music class sessions per week throughout the year. The general music curriculum consisted of learning and singing new songs, as well as learning basic music theory. General music classes at the fifth and sixth grade level followed the same type of class format set forth by the K-4 general music teachers in the district. In this regard, students continued to participate in general music classes,
however, participation in instrumental music class was voluntary beginning at the fifth grade level. Table 1 displays the number of fifth and sixth grade participants enrolled in instrumental music and Academy.

Table 1 *Numbers of Instrumental Music and Academy Participants*

<table>
<thead>
<tr>
<th>Program Type</th>
<th>Fifth Grade</th>
<th>Sixth Grade</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Music</td>
<td>N 98</td>
<td>N 75</td>
<td>N 173</td>
</tr>
<tr>
<td>Academy</td>
<td>N 74</td>
<td>N 73</td>
<td>N 147</td>
</tr>
<tr>
<td>Total</td>
<td>N 172</td>
<td>N 148</td>
<td>N 320</td>
</tr>
</tbody>
</table>

**Attic Instrument Program.** In 1999, a group of educators within the school district organized the “Attic Instrument Program.” Because purchasing a musical instrument is considered to be an expensive investment, many parents are simply unable to add this expense to an already limited budget. The Attic Instrument Program was designed to offer low income students, who might not otherwise have the opportunity to participate in the district instrumental music program, with an instrument for rental at a greatly reduced cost.

In this district musical instruments were gathered from families within the community who no longer had a need for the instrument. Community members were encouraged each year through an article in the local newspaper to clean out their “attics” in order to provide low income beginning band and orchestra students with an opportunity to participate. These instruments were collected and then refurbished. An organization that assists the school district in funding many projects throughout the school year accepted the financial burden of funding this ongoing project for the benefit of providing children with this musical experience. Students who would otherwise be unable to participate due to financial hardship were given the instrument of their choice at a minimal cost for the school year (i.e., $60). Any student who wanted to participate in band or orchestra was allowed to participate. No child was discouraged
from participating, regardless of an IEP, physical handicap, etc. In this regard, all participants involved in this study comprised a volunteer sample. Despite the fact that no child was discouraged from participating, students who felt most successful in fifth grade band and orchestra were typically students who continued their participation through sixth grade and beyond. Upon completion of the fifth grade, Attic Instrumental students who demonstrated success in band and orchestra were allowed to renew check-out of their instrument in the Fall of their sixth grade year. Success in band and orchestra was measured by compliance with classroom procedures and policies, which included good classroom behavior and practice habits, as well as adequate progress on assigned music, as determined by the music teacher.

Measures

**Instrumental music participation.** In this volunteer sample, instrumental music participation was measured using only those students (grades 5 and 6) who were enrolled in the school instrumental program throughout the 2011-2012 academic school year. Students in fifth grade instrumental music were enrolled in their first year of class and had approximately 7 months of music instruction prior to taking the state standardized tests during the months of March and April. All students in sixth grade instrumental music were in their second year of participation and had approximately 15 months of instruction prior to testing.

Because skills learned in fifth grade instrumental music were used as a foundation for sixth grade, all students must have completed a full year of music instruction in order to be allowed to participate in sixth grade. If a student decided to play in the sixth grade, but had not participated in fifth grade, private tutoring was required. This did not involve any of the participants in this study.
Kansas State Assessment. Academic achievement in this study was measured using student scores from the Kansas State Assessment. This test was designed to measure proficiency in the subjects of reading and mathematics. Five descriptors from the assessment were used to indicate proficiency levels: Exemplary (EX), Exceeds Standard (ES), Meets Standard (MS), Approaches Standard (AS), and Academic Warning (AW). (AS and AW were considered non-passing scores.) The Kansas State Assessments were administered over 12 school days during March and April, 2012. In this study, all Kansas State assessments were administered by educators and staff employed within the school district. Proctor training is considered mandatory by the state and must be completed prior to any staff member administering the Kansas State Assessment. School districts are required by the State of Kansas to provide proof of this specialized training. To ensure student outcomes were a true representation of the student’s actual knowledge without help or influence from the proctor, specific instruction was given to all educators in the district to avoid providing assistance in any way. All procedures were followed specifically and systematically by the proctors to ensure that results were considered reliable and valid.

Classroom teachers (n = 26) and support staff members (n = 11), including tutors and para-educators, administered the Kansas State Assessments at the intermediate school. To assist students in performing their best, some accommodations within the school were made. These accommodations ranged from “a quiet place to test” to “a read aloud” in which the test, questions and multiple choice answers were read aloud. Accommodations were outlined on the student’s IEP form. Of the 320 students tested, administrators controlled for a range of accommodations for 90 participants during the 2011-2012 school year.
**Reading.** The reading portion of the assessment contained three different sections and included a total of 65 items for students in grade 5 and 85 items for students in grade 6. The primary difference between reading assessments at grade level 5 and 6 was the increased difficulty level at grade 6. All reading items were presented in multiple-choice format with only one correct answer for each question. All students received a single reading score and a single mathematics score.

**Mathematics.** The mathematics portion of the assessment contained four different sections: (a) Numbers and Computation; (b) Algebra; (c) Geometry; and (d) Data Standards. The major differences on the mathematics portion of the test between grades 5 and 6 were: (a) increased difficulty in items assessed, (b) an increase in the number of test items for grade 6 (from 76 to 86), and (c) differences in the distribution of percentages of items in each section.

**Procedure**

The school district administration provided archival data for this study. These data included scores from the Kansas State Assessment for the reading and mathematics portions of the test, FRL/non-FRL status, grade level, and instrumental music or Academy status for each student. The researcher was an educator employed by this school district.

Prior to data collection, the school district administration provided a letter to the Institutional Review Board of Wichita State University indicating its willingness to provide this information to the researcher. To protect the confidentiality of the students, each child was assigned a number. The association of the names with these numbers was not shared with anyone. Because personally identifiable information for students was not disclosed to anyone not employed by the school district, parental participation was not sought.
Chapter 4

Results

This study investigated relationships between participation in instrumental music and academic achievement for FRL and non-FRL students. In order to examine these relationships archival data, obtained with permission from the superintendent of schools from the district involved in this study, were used. This chapter discusses the results as they relate to the research question. Tables are included to display relevant data.

The Kansas State Assessment configures test scores as a percentage of test items that students answer correctly. Scores from the reading and mathematics portions of the assessment were used as dependent measures in this study with music status and lunch status as factors. The two independent variables each contained two levels: instrumental music participant or Academy participant, and FRL or non-FRL status. Free and reduced lunch status was measured using Federal guidelines for approved participation.

Fifth Grade

Reading Means. Table 2 displays fifth grade means and standard deviations for reading assessment scores. Descriptive data revealed mean scores for instrumental music participants (M = 83.27, SD = 10.66) were higher than mean scores for Academy participants (M = 79.91, SD = 10.96). Data also revealed mean scores for non-FRL students (M = 84.89, SD = 9.40) were higher than mean scores for FRL students (M = 80.00, SD = 11.33).
Table 2

*Means and Standard Deviations for Fifth Grade Reading Assessment Scores*

<table>
<thead>
<tr>
<th>Program</th>
<th>FRL</th>
<th>Non-FRL</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Music</td>
<td>59</td>
<td>81.42</td>
<td>11.09</td>
</tr>
<tr>
<td>Academy</td>
<td>49</td>
<td>78.29</td>
<td>11.49</td>
</tr>
<tr>
<td>Total</td>
<td>108</td>
<td>80.00</td>
<td>11.33</td>
</tr>
</tbody>
</table>

Mathematics Means. Table 3 displays fifth grade means and standard deviations for mathematics assessment scores. Descriptive data revealed mean scores for instrumental music participants (M = 81.04, SD = 13.67) were higher than mean scores for Academy participants (M = 78.76, SD = 11.95). Further, mean scores for non-FRL students (M = 84.36, SD = 11.58) were higher than mean scores for FRL students (M = 77.49, SD = 13.12)

Table 3

*Means and Standard Deviations for Fifth Grade Mathematics Assessment Scores*

<table>
<thead>
<tr>
<th>Program</th>
<th>FRL</th>
<th>Non-FRL</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Music</td>
<td>59</td>
<td>77.95</td>
<td>13.76</td>
</tr>
<tr>
<td>Academy</td>
<td>49</td>
<td>76.94</td>
<td>12.42</td>
</tr>
<tr>
<td>Total</td>
<td>108</td>
<td>77.49</td>
<td>13.12</td>
</tr>
</tbody>
</table>

An ANOVA was used to evaluate the effects of instrumental music status and lunch status on reading achievement. Separate ANOVAs were conducted for reading and mathematics. The fifth grade reading ANOVA indicated no significant interaction effect was found between music status and lunch status ($F(1,168) = .002, p > .05$). Results indicated that a main effect for instrumental music status approached significance ($F(1,168) = 3.22, p = .05$), while a significant main effect was found for lunch status ($F(1,168 ) = 7.66, p < .05$). Free and reduced lunch
students scored significantly lower than non-FRL students. Table 4 summarizes these main effect analyses for music and Academy status.

Table 4

Summary of Main Effect Analyses for Music versus Academy Students on State Assessments in Reading and Mathematics

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>Test</th>
<th>Group</th>
<th>Means</th>
<th>df</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>5th</td>
<td>Reading</td>
<td>Music</td>
<td>83.27</td>
<td>1, 168</td>
<td>3.22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Academy</td>
<td>79.91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5th</td>
<td>Mathematics</td>
<td>Music</td>
<td>81.04</td>
<td>1, 168</td>
<td>1.23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Academy</td>
<td>78.73</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .05

An ANOVA was also conducted to evaluate the effects of instrumental music status and lunch status on mathematics achievement. Results showed no significant interaction effect between instrumental music status and lunch status ($F(1,168) = .373, p > .05$). No significant main effect was found for instrumental music status, ($F(1,168) = 1.23, p > .05$), however, a significant main effect was found for lunch status ($F(1,168) = 10.45, p < .05$). Fifth grade FRL students scored significantly lower than non-FRL students. Results are displayed in Table 4.

**Sixth Grade**

**Reading Means.** Table 5 displays sixth grade means and standard deviations for reading assessment scores. Descriptive data revealed mean scores for instrumental music participants (M = 86.04, SD = 9.23) were higher than mean scores for Academy participants (M = 79.45, SD = 12.01). Means scores indicated no statistically significant differences existed in reading for students with different SES.
Table 5

*Means and Standard Deviations for Sixth Grade Reading Assessment Scores*

<table>
<thead>
<tr>
<th>Program</th>
<th>FRL</th>
<th></th>
<th></th>
<th>Non-FRL</th>
<th></th>
<th></th>
<th>Total</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>M</td>
<td>SD</td>
<td>N</td>
<td>M</td>
<td>SD</td>
<td>N</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Music</td>
<td>32</td>
<td>86.53</td>
<td>7.34</td>
<td>43</td>
<td>85.67</td>
<td>10.49</td>
<td>75</td>
<td>86.04</td>
<td>9.23</td>
</tr>
<tr>
<td>Academy</td>
<td>53</td>
<td>79.11</td>
<td>12.82</td>
<td>20</td>
<td>80.35</td>
<td>9.77</td>
<td>73</td>
<td>79.45</td>
<td>12.01</td>
</tr>
<tr>
<td>Total</td>
<td>85</td>
<td>81.91</td>
<td>11.61</td>
<td>63</td>
<td>83.98</td>
<td>10.49</td>
<td>148</td>
<td>82.79</td>
<td>11.16</td>
</tr>
</tbody>
</table>

**Mathematics Means.** Table 6 displays sixth grade means and standard deviations for mathematics assessment scores. Descriptive data revealed mean scores for instrumental music participants (M = 90.03, SD = 8.61) were higher than mean scores for Academy participants (M = 79.92, SD = 15.89). Mean scores indicated no statistically significant differences existed in mathematics for students with different SES.

Table 6

*Means and Standard Deviations for Sixth Grade Mathematics Assessment Scores*

<table>
<thead>
<tr>
<th>Program</th>
<th>FRL</th>
<th></th>
<th></th>
<th>Non-FRL</th>
<th></th>
<th></th>
<th>Total</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>M</td>
<td>SD</td>
<td>N</td>
<td>M</td>
<td>SD</td>
<td>N</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Music</td>
<td>32</td>
<td>89.91</td>
<td>7.88</td>
<td>43</td>
<td>90.12</td>
<td>9.20</td>
<td>75</td>
<td>90.03</td>
<td>8.61</td>
</tr>
<tr>
<td>Academy</td>
<td>53</td>
<td>78.81</td>
<td>16.08</td>
<td>20</td>
<td>82.85</td>
<td>15.36</td>
<td>73</td>
<td>79.92</td>
<td>15.89</td>
</tr>
<tr>
<td>Total</td>
<td>85</td>
<td>82.99</td>
<td>14.57</td>
<td>63</td>
<td>87.81</td>
<td>11.89</td>
<td>148</td>
<td>85.04</td>
<td>13.66</td>
</tr>
</tbody>
</table>

An ANOVA was conducted to evaluate the effects of instrumental music status and lunch status on sixth grade reading. No significant interaction was found between instrumental music status and lunch status for sixth grade reading ($F(1,144) = .307, p > .05$). A significant main effect was found for instrumental music status, ($F(1, 144) = 11.38, p < .05$). Students who participated in instrumental music displayed higher reading scores than students who participated
in Academy. No significant main effect was found for lunch status \((F(1,144) = .01, p > .05)\).

Table 7 displays a summary of these main effect analyses on reading and mathematics scores.

Table 7

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>Test</th>
<th>Group</th>
<th>Means</th>
<th>df</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>6th</td>
<td>Reading</td>
<td>Music</td>
<td>86.04</td>
<td>1, 144</td>
<td>11.38*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Academy</td>
<td>79.45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6th</td>
<td>Mathematics</td>
<td>Music</td>
<td>90.03</td>
<td>1, 144</td>
<td>16.81*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Academy</td>
<td>79.92</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .05

An ANOVA was also conducted to evaluate the effects of instrumental music status and lunch status on sixth grade mathematics. No significant interaction was found between instrumental music status and lunch status for mathematics \((F(1,144) = .731, p > .05)\). Results indicated a significant main effect for instrumental music status, \((F(1, 144) = 16.81, p < .05)\). Students who participated in instrumental music displayed higher mathematics scores than students who participated in Academy, however, no significant main effect was found for lunch status \((F(1,144) = .900, p > .05)\). These results are displayed in Table 7.

The next chapter will address in more detail the conclusions, practical implications, limitations, and suggestions for future research.
Chapter 5

Discussion

The first portion of this final chapter was designed to assist the reader by reviewing the research problem and methodology, summarizing the findings, and discussing the results. The subsequent sections of this chapter connect the interpretations of these findings with previously reviewed research and discuss practical implications, as well as some of the limitations of this study and suggestions for future research.

Research Problem

Effects of poverty have long been linked to lower levels of achievement in school-aged children (Balfanz & Byrnes, 2006; Balfanz et al., 2010; Borman & Overman, 2004; Catsambis & Beveridge, 2001; Sharkey et al., 2003; Waxman et al. 2003). The federal government's role in public school education expanded beginning in the 1960’s. In response to the implementation of the NCLB Law of 2001, those involved in the educational process, primarily educators and administrators have worked diligently to reduce an achievement gap between impoverished children and their peers. Test scores from standardized assessments have been used as a means of measuring progress and proficiency.

Research has shown that many schools have focused their efforts towards building resiliency in students, and insulating them against potentially negative effects of poverty (Borman & Overman, 2004; Catsambis & Beveridge, 2001; Chatterji, 2006). In addition, many schools view participation in Arts programs beneficial to a child's overall academic success (Campbell et al. 2007; Fitzpatrick, 2006; Miksza, 2007; Schellenberg, 2005; Schmidt, 2005; Vaughn, 2000).

Methodology Summary
The design of this study was a descriptive design as outlined in the Methodology section of Chapter 3. All data gathered were archival data provided by the school district. Reading and mathematics scores from the Kansas State Assessment were examined to assess student achievement in regards to music status and lunch status. This research attempted to answer the following questions: Is there a statistically significant interaction between music status and lunch status? Do significant differences in achievement exist for instrumental music students when compared to Academy student? Do significant differences in achievement exist for students with different SES? Prior to discussing limitations of this study, conclusions and application of the data will be considered.

Summary of Research Findings

**Fifth Grade.** This study found no significant interaction between fifth grade music status and lunch status. Results showed students who participated in instrumental music scored higher in reading than Academy students. Reading scores for fifth grade instrumental music students approached significance, although instrumental music status was not found to be statistically significant for mathematics. Socioeconomic status was found to be statistically significant for fifth grade students in both reading and mathematics. Students who received free and reduced lunches scored significantly lower in reading and mathematics on the state assessment than students who paid full price.

**Sixth Grade.** No significant interaction was found between sixth grade instrumental music status and lunch status. Results showed sixth grade instrumental music students scored higher in both reading and mathematics than their Academy peers. Sixth grade instrumental music status was found to be statistically significant for both subscales of the state assessment. Socioeconomic status was not found to be statistically significant for sixth grade students.
Discussion of Results

Previous research has indicated that for all grade levels, impoverished children typically achieve less than their peers (Balfanz & Byrnes, 2006; Balfanz et al., 2007; Borman & Overman, 2004; Catsambis & Beveridge, 2001; Lacour & Tissington, 2011; Seccombe, 2002). Contrary to the reviewed research, sixth grade students in this study showed no significant differences in academic achievement in regards to their SES. However, fifth grade lunch status was found to be statistically significant for both reading and mathematics. The fifth grade SES results were consistent with previously reviewed research. It is unclear why socioeconomic status made a significant difference in fifth grade student scores, and not in sixth grade scores. This is an area that may require additional research to determine.

Previous research has examined the effects of instrumental music on achievement (Campbell et al. 2007; Fitzpatrick, 2006; Schellenberg, 2005; Vaughn, 2000). In this study, fifth grade instrumental music students scored higher than Academy students in reading. Results showed a main effect for instrumental music status approached significance. This information lends support to the reviewed research. Sixth grade results showed instrumental music students scored significantly higher than Academy participants on both the reading and mathematics portions of the test. However, surprisingly SES was not found to be significant for this group of students.

Several explanations may exist for differences found between fifth grade and sixth grade instrumental music students. One explanation could be the longer a student is exposed to instrumental music instruction, the greater the effects. Prior to taking the Kansas State Assessment, fifth grade students participated in instrumental music class approximately 7 months. In comparison, sixth grade students participated approximately 15 months. These
findings suggest length of time (in months) may be a chief component to consider. If effects are greater after a mere 8 months of additional music instruction, results from a longitudinal study, as opposed to a cross-sectional study may magnify the effects.

**Practical Implications**

Although much research supports the relationship between music and achievement, participating in music for its own sake can be a valuable component in a child’s education. Music can be a means of expression that may contribute to a child’s academic success in ways unrelated to test scores. Music classrooms offer unique cooperative learning experiences that provide immediate feedback regarding performance. Enjoyment as well as self-discipline can be derived from the nature of repetitive practice. Although the results of this study cannot be generalized to all fifth and sixth grade students, this research suggests that instrumental music can be beneficial to a child’s overall education.

**Limitations**

This study was not without limitations. The participants involved were a relatively homogeneous group of students from a small rural Kansas community. Future research examining participants with different demographics could enhance the generalizability to larger, more urban populations. The narrow window of these students’ education provided a limited view of the scope and impact that music could have on a child’s overall education.

The unique characteristics of the Attic Instrument program, exclusive to this district, may have permitted a significantly larger number of FRL participants to enroll in instrumental music classes than might otherwise be observed in other school districts without such support.
Questions such as the following should be considered: Are higher achieving students initially attracted to the Arts? Does a community with strong support for the Arts somehow assist students in their decision to participate in instrumental music?

While these analyses do show some significant findings, no causal claims can be made about the effect of instrumental music on academic achievement.

**Suggestions for Future Research**

The school district and community in this study appears to have a strong historical support for music and the Arts. Future research may seek to examine a community’s historical influence on Arts education. Studies that examine student motivation for participation in the Arts could also be valuable. While ethnicity and gender were not examined in this study, future research could assess both of these variables in relation to music and achievement.

**Conclusion**

This study was conducted in order to examine relationships between instrumental music participation and academic achievement in low SES students. Many of the results were surprising and contradictory to previously reviewed research. This leaves some unanswered questions that may lead to additional research. However, what is known is music can play an important and meaningful role in the lives of students who participate.
REFERENCES


Appendix A: Fourth Grade Informational Letter to Parents

Dear parents,

As you know Winfield has a strong musical tradition dating back to the turn of the century. Many Winfield musical groups provide us as a community with opportunities and experiences not afforded all communities. This year as your child nears the end of the fourth grade, he/she is provided with the opportunity to try-out musical instruments that make-up our school’s band and orchestra programs. Today instrument try-outs were held at _______________ school. Instruments available for these try-outs included flute, clarinet, trumpet and trombone for band, and violin, viola, cello and bass for orchestra. Other instruments such as saxophone and percussion instruments round out our band instrumentation, but require both parent and director consent in order to play. Please contact the band director if your child is interested in trying one of these instruments. A follow-up try-out date will be arranged if necessary. Participation in the band or orchestra program is strictly voluntary and based upon the decisions you make as a family.

This letter is to inform you of the results of the instrumental try-out held today. Based upon teacher observations at fourth grade try-outs, ____________ showed musical aptitude towards the _____________ (first instrument) and ____________ (second instrument).

Unique to the Winfield community is the Attic Instrument Program. This organization was started in the 1980’s by a former music director along with fellow teachers. Students who qualify for free or reduced lunches are eligible to rent a school-owned instrument at the cost of $60 per year. This fee includes instrument rental, a music book and supplies to care for the instrument. Any damage incurred while the instrument is checked out to the student will be the responsibility of the parent. Attic Instrument applications are available at the WIS office during fifth grade Fall enrollment.

Please call or email if you have questions.
Thank you,

Teddi Ricketts-Band Director
Winfield Intermediate School phone: (620) 221-5180, email: teddi_ricketts@usd465.com

yyyyyyyyyyy-Orchestra Director
Winfield Intermediate School phone: (620) 221-5180, email yyyyy_yyyyy@usd465.com